- A gap is to be left in the embankment in the location where the natural confluence of runoff crosses the embankment line. The gap is to have a width in feet equal to 6 times the drainage area in acres.

- Geotextile Covered Rock Core: A core of filter stone having a minimum height of 1.5 feet and a minimum width at the base of 3 feet should be placed across the opening of the earth embankment and should be covered by geotextile fabric which should extend a minimum distance of 2 feet in either direction from the base of the filter stone core.

- Filter Stone Embankment: Filter stone should be placed over the geotextile and is to have a side slope which matches that of the earth embankment of 3:1 and should cover the geotextile/rock core a minimum of 6 inches when installation is complete. The crest of the outlet should be at least 1 foot below the top of the embankment.

Sediment Basins

The purpose of a sediment basin is to intercept sediment-laden runoff and trap the sediment in order to protect drainage ways, properties and rights of way below the sediment basin from sedimentation. A sediment basin is usually installed at points of discharge from disturbed areas. The drainage area for a sediment basin is recommended to be less than 100 acres.

Sediment basins are effective for capturing and slowly releasing the runoff from larger disturbed areas thereby allowing sedimentation to take place. A sediment basin can be created where a permanent pond BMP is being constructed. Guidelines for construction of the permanent BMP should be followed, but revegetation, placement of underdrain piping, and installation of sand or other filter media should not be carried out until the site construction phase is complete.

Materials:

- Riser should be corrugated metal or reinforced concrete pipe or box and should have watertight fittings or end to end connections of sections.

- An outlet pipe of corrugated metal or reinforced concrete should be attached to the riser and should have positive flow to a stabilized outlet on the downstream side of the embankment.

- An anti-vortex device and rubbish screen should be attached to the top of the riser and should be made of polyvinyl chloride or corrugated metal.

Attachment 4
Description of Best Management Practices (BMPs)

Basin Design and Construction:

- For common drainage locations that serve an area with ten or more acres disturbed at one time, a sediment basin should provide storage for a volume of runoff from a two-year, 24-hour storm from each disturbed acre drained.

- The basin length to width ratio should be at least 2:1 to improve trapping efficiency. The shape may be attained by excavation or the use of baffles. The lengths should be measured at the elevation of the riser de-watering hole.

- Place fill material in layers not more than 8 inches in loose depth. Before compaction, moisten or aerate each layer as necessary to provide the optimum moisture content of the material. Compact each layer to 95 percent standard proctor density. Do not place material on surfaces that are muddy or frozen. Side slopes for the embankment should be 3:1 (H:V).

- An emergency spillway should be installed adjacent to the embankment on undisturbed soil and should be sized to carry the full amount of flow generated by a 10-year, 3-hour storm with 1 foot of freeboard less the amount which can be carried by the principal outlet control device.

- The emergency spillway should be lined with riprap as should the swale leading from the spillway to the normal watercourse at the base of the embankment.

- The principal outlet control device should consist of a rigid vertically oriented pipe or box of corrugated metal or reinforced concrete. Attached to this structure should be a horizontal pipe, which should extend through the embankment to the toe of fill to provide a de-watering outlet for the basin.

- An anti-vortex device should be attached to the inlet portion of the principal outlet control device to serve as a rubbish screen.

- A concrete base should be used to anchor the principal outlet control device and should be sized to provide a safety factor of 1.5 (downward forces = 1.5 buoyant forces).

- The basin should include a permanent stake to indicate the sediment level in the pool and marked to indicate when the sediment occupies 50% of the basin volume (not the top of the stake).

- The top of the riser pipe should remain open and be guarded with a trash rack and anti-vortex device. The top of the riser should be 12 inches below the elevation of the emergency spillway. The riser should be sized to convey the runoff from the 2-year, 3-hour storm when the water surface is at the

emergency spillway elevation. For basins with no spillway the riser must be sized to convey the runoff from the 10-yr, 3-hour storm.

- Anti-seep collars should be included when soil conditions or length of service make piping through the backfill a possibility.

- The 48-hour drawdown time will be achieved by using a riser pipe perforated at the point measured from the bottom of the riser pipe equal to 1/2 the volume of the basin. This is the maximum sediment storage elevation. The size of the perforation may be calculated as follows:

$$Ao = \frac{As \times \sqrt{2h}}{Cd \times 980{,}000}$$

Where:
A_o = Area of the de-watering hole, ft 2
A_s = Surface area of the basin, ft 2
C_d = Coefficient of contraction, approximately 0.6
h = head of water above the hole, ft
Perforating the riser with multiple holes with a combined surface area equal to A_o is acceptable.

Erosion Control Compost

Description: Erosion control compost (ECC) can be used as an aid to control erosion on critical sites during the establishment period of protective vegetation. The most common uses are on steep slopes, swales, diversion dikes, and on tidal or stream banks.

Materials:

New types of erosion control compost are continuously being developed. The Texas Department of Transportation (TxDOT) has established minimum performance standards which must be met for any products seeking to be approved for use within any of TxDOT's construction or maintenance activities. Material used within any TxDOT construction or maintenance activities must meet material specifications in accordance with current TxDOT specifications. TxDOT maintains a website at https://www.txdot.gov/inside-txdot/division/support/recycling/speclist.html that provides information on compost specification data.

ECC used for projects not related to TxDOT should also be of quality materials by meeting performance standards and compost specification data. To ensure the quality of compost used as an ECC, products should meet all applicable state and federal regulations, including but not limited to the United States Environmental Protection

Agency (USEPA) Code of Federal Regulations (CFR), Title 40, Part 503 Standards for Class A biosolids and Texas Natural Resource Conservation Commission (now named TCEQ) Health and Safety Regulations as defined in the Texas Administration Code (TAC), Chapter 332, and all other relevant requirements for compost products outlined in TAC, Chapter 332. Testing requirements required by the TCEQ are defined in TAC Chapter 332, including Sections §332.71 Sampling and Analysis Requirements for Final Products and §332.72 Final Product Grades. Compost specification data approved by TxDOT are appropriate to use for ensuring the use of quality compost materials or for guidance.

Testing standards are dependent upon the intended use for the compost and ensures product safety, and product performance regarding the product's specific use. The appropriate compost sampling and testing protocols included in the United States Composting Council (USCC) Test Methods for the Examination of Composting and Compost (TMECC) should be conducted on compost products used for ECC to ensure that the products used will not impact public health, safety, and the environment and to promote production and marketing of quality composts that meet analytical standards. TMECC is a laboratory manual that provides protocols for the composting industry and test methods for compost analysis. TMECC provides protocols to sample, monitor, and analyze materials during all stages of the composting process. Numerous parameters that might be of concern in compost can be tested by following protocols or test methods listed in TMECC. TMECC information can be found at https://www.compostingcouncil.org/page/tmecc. The USCC Seal of Testing Assurance (STA) program contains information regarding compost STA certification. STA program information can be found at https://www.compostingcouncil.org/page/SealofTestingAssuranceSTA.

Installation:

- Install in accordance with current TxDOT specification.
- Use on slopes 3:1 or flatter.
- Apply a 2-inch uniform layer unless otherwise shown on the plans or as directed.
- When rolling is specified, use a light corrugated drum roller.

Mulch and Compost Filter Socks

Description: Mulch and compost filter socks (erosion control logs) are used to intercept and detain sediment laden run-off from unprotected areas. When properly used, mulch and compost filter socks can be highly effective at controlling sediment from disturbed areas. They cause runoff to pond which allows heavier solids to settle. Mulch and compost filter socks are used during the period of construction near the

perimeter of a disturbed area to intercept sediment while allowing water to percolate through. The sock should remain in place until the area is permanently stabilized. Mulch and compost filter socks may be installed in construction areas and temporarily moved during the day to allow construction activity provided it is replaced and properly anchored at the end of the day. Mulch and compost filter socks may be seeded to allow for quick vegetative growth and reduction in run-off velocity.

Materials:

New types of mulch and compost filter socks are continuously being developed. The Texas Department of Transportation (TxDOT) has established minimum performance standards which must be met for any products seeking to be approved for use within any of TxDOT's construction or maintenance activities. Mulch and compost filter socks used within any TxDOT construction or maintenance activities must meet material specifications in accordance with TxDOT specification 5049. TxDOT maintains a website at https://www.txdot.gov/inside-txdot/division/support/recycling/speclist.html that provides information on compost specification data.

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Attachment 4
Description of Best Management Practices (BMPs)

TMECC information can be found at https://www.compostingcouncil.org/page/tmecc. The USCC Seal of Testing Assurance (STA) program contains information regarding compost STA certification. STA program information can be found at https://www.compostingcouncil.org/page/SealofTestingAssuranceSTA.

Installation:

Install in accordance with TxDOT Special Specification 5049.

- Install socks (erosion control logs) near the downstream perimeter of a disturbed area to intercept sediment from sheet flow.
- Secure socks in a method adequate to prevent displacement as a result of normal rain events such that flow is not allowed under the socks.
- Inspect and maintain the socks in good condition (including staking, anchoring, etc.).
- Maintain the integrity of the control, including keeping the socks free of accumulated silt, debris, etc., until the disturbed area has been adequately stabilized.

Attachment 4
Description of Best Management Practices (BMPs)

POST-CONSTRUCTION TSS CONTROLS

Retention/Irrigation Systems

Description: Retention/irrigation systems refer to the capture of runoff in a holding pond, then use of the captured water for irrigation of appropriate landscape areas. Retention/irrigation systems are characterized by the capture and disposal of runoff without direct release of captured flow to receiving streams. Retention systems exhibit excellent pollutant removal but can require regular, proper maintenance. Collection of roof runoff for subsequent use (rainwater harvesting) also qualifies as a retention/irrigation practice but should be operated and sized to provide adequate volume. This technology, which emphasizes beneficial use of stormwater runoff, is particularly appropriate for arid regions because of increasing demands on water supplies for agricultural irrigation and urban water supply.

Design Considerations: Retention/irrigation practices achieve 100% removal efficiency of total suspended solids contained within the volume of water captured. Design elements of retention/irrigation systems include runoff storage facility configuration and sizing, pump and wet well system components, basin lining, basin detention time, and physical and operational components of the irrigation system. Retention/irrigation systems are appropriate for large drainage areas with low to moderate slopes. The retention capacity should be sufficient considering the average rainfall event for the area.

Maintenance Requirements: Maintenance requirements for retention/irrigation systems include routine inspections, sediment removal, mowing, debris and litter removal, erosion control, and nuisance control.

Extended Detention Basin

Description: Extended detention facilities are basins that temporarily store a portion of stormwater runoff following a storm event. Extended detention basins are normally used to remove particulate pollutants and to reduce maximum runoff rates associated with development to their pre-development levels. The water quality benefits are the removal of sediment and buoyant materials. Furthermore, nutrients, heavy metals, toxic materials, and oxygen-demanding materials associated with the particles also are removed. The control of the maximum runoff rates serves to protect drainage channels below the device from erosion and to reduce downstream flooding. Although detention facilities designed for flood control have different design requirements than those used for water quality enhancement, it is possible to achieve these two objectives in a single facility.

Design Considerations: Extended detention basins can remove approximately 75% of the total suspended solids contained within the volume of runoff captured in the basin. Design elements of extended detention basins include basin sizing, basin

configuration, basin side slopes, basin lining, inlet/outlet structures, and erosion controls. Extended detention basins are appropriate for large drainage areas with low to moderate slopes. The retention capacity should be sufficient considering the average rainfall event for the area.

Maintenance Requirements: Maintenance requirements for extended detention basins include routine inspections, mowing, debris and litter removal, erosion control, structural repairs, nuisance control, and sediment removal.

Vegetative Filter Strips

Description: Filter strips, also known as vegetated buffer strips, are vegetated sections of land similar to grassy swales except they are essentially flat with low slopes and are designed only to accept runoff as overland sheet flow. They may appear in any vegetated form from grassland to forest, and are designed to intercept upstream flow, lower flow velocity, and spread water out as sheet flow. The dense vegetative cover facilitates conventional pollutant removal through detention, filtration by vegetation, and infiltration.

Filter strips cannot treat high velocity flows, and do not provide enough storage or infiltration to effectively reduce peak discharges to predevelopment levels for design storms. This lack of quantity control favors use in rural or low-density development; however, they can provide water quality benefits even where the impervious cover is as high as 50%. The primary highway application for vegetative filter strips is along rural roadways where runoff that would otherwise discharge directly to a receiving water passes through the filter strip before entering a conveyance system. Properly designed roadway medians and shoulders make effective buffer strips. These devices also can be used on other types of development where land is available and hydraulic conditions are appropriate.

Flat slopes and low to fair permeability of natural subsoil are required for effective performance of filter strips. Although an inexpensive control measure, they are most useful in contributing watershed areas where peak runoff velocities are low as they are unable to treat the high flow velocities typically associated with high impervious cover.

Successful performance of filter strips relies heavily on maintaining shallow unconcentrated flow. To avoid flow channelization and maintain performance, a filter strip should:

- Be equipped with a level spreading device for even distribution of runoff
- Contain dense vegetation with a mix of erosion resistant, soil binding species
- Be graded to a uniform, even and relatively low slope

- Laterally traverse the contributing runoff area

Filter strips can be used upgradient from watercourses, wetlands, or other water bodies along toes and tops of slopes and at outlets of other stormwater management structures. They should be incorporated into street drainage and master drainage planning. The most important criteria for selection and use of this BMP are soils, space, and slope.

Design Considerations: Vegetative filter strips can remove approximately 85% of the total suspended solids contained within the volume of runoff captured. Design elements of vegetative filter strips include uniform, shallow overland flow across the entire filter strip area, hydraulic loading rate, inlet structures, slope, and vegetative cover. The area should be free of gullies or rills which can concentrate flow. Vegetative filter strips are appropriate for small drainage areas with moderate slopes. Other design elements include the following:

- Soils and moisture are adequate to grow relatively dense vegetative stands
- Sufficient space is available
- Slope is less than 12%
- Comparable performance to more expensive structural controls

Maintenance Requirements: Maintenance requirements for vegetative filter strips include pest management, seasonal mowing and lawn care, routine inspections, debris and litter removal, sediment removal, and grass reseeding and mulching.

Constructed Wetlands

Description: Constructed wetlands provide physical, chemical, and biological water quality treatment of stormwater runoff. Physical treatment occurs as a result of decreasing flow velocities in the wetland, and is present in the form of evaporation, sedimentation, adsorption, and/or filtration. Chemical processes include chelation, precipitation, and chemical adsorption. Biological processes include decomposition, plant uptake and removal of nutrients, plus biological transformation and degradation. Hydrology is one of the most influential factors in pollutant removal due to its effects on sedimentation, aeration, biological transformation, and adsorption onto bottom sediments.

The wetland should be designed such that a minimum amount of maintenance is required. The natural surroundings, including such things as the potential energy of a stream or flooding river, should be utilized as much as possible. The wetland should approximate a natural situation and unnatural attributes, such as rectangular shape or

rigid channel, should be avoided.

Site considerations should include the water table depth, soil/substrate, and space requirements. Because the wetland must have a source of flow, it is desirable that the water table is at or near the surface. If runoff is the only source of inflow for the wetland, the water level often fluctuates, and establishment of vegetation may be difficult. The soil or substrate of an artificial wetland should be loose loam to clay. A perennial baseflow must be present to sustain the artificial wetland. The presence of organic material is often helpful in increasing pollutant removal and retention. A greater amount of space is required for a wetland system than is required for a detention facility treating the same amount of area.

Design Considerations: Constructed wetlands can remove over 90% of the total suspended solids contained within the volume of runoff captured in the wetland. Design elements of constructed wetlands include wetland sizing, wetland configuration, sediment forebay, vegetation, outflow structure, depth of inundation during storm events, depth of micro pools, and aeration. Constructed wetlands are appropriate for large drainage areas with low to moderate slopes.

Maintenance Requirements: Maintenance requirements for constructed wetlands include mowing, routine inspections, debris and litter removal, erosion control, nuisance control, structural repairs, sediment removal, harvesting, and maintenance of water levels.

Wet Basins

Description: Wet basins are runoff control facilities that maintain a permanent wet pool and a standing crop of emergent littoral vegetation. These facilities may vary in appearance from natural ponds to enlarged, bermed (manmade) sections of drainage systems and may function as online or offline facilities, although offline configuration is preferable. Offline designs can prevent scour and other damage to the wet pond and minimize costly outflow structure elements needed to accommodate extreme runoff events.

During storm events, runoff inflows displace part or all of the existing basin volume and are retained and treated in the facility until the next storm event. The pollutant removal mechanisms are settling of solids, wetland plant uptake, and microbial degradation. When the wet basin is adequately sized, pollutant removal performance can be excellent, especially for the dissolved fraction. Wet basins also help provide erosion protection for the receiving channel by limiting peak flows during larger storm events. Wet basins are often perceived as a positive aesthetic element in a community and offer significant opportunity for creative pond configuration and landscape design. Participation of an experienced wetland designer is suggested. A significant potential drawback for wet ponds in arid climates is that the contributing watershed for these facilities is often incapable of providing an adequate water supply to

maintain the permanent pool, especially during the summer months. Makeup water (i.e., well water or municipal drinking water) is sometimes used to supplement the rainfall/runoff process, especially for wet basin facilities treating watersheds that generate insufficient runoff.

Design Considerations: Wet basins can remove over 90% of the total suspended solids contained within the volume of runoff captured in the basin. Design elements of wet basins include basin sizing, basin configuration, basin side slopes, sediment forebay, inflow and outflow structures, vegetation, depth of permanent pool, aeration, and erosion control. Wet basins are appropriate for large drainage areas with low to moderate slopes.

Maintenance Requirements: Maintenance requirements for wet basins include mowing, routine inspections, debris and litter removal, erosion control, nuisance control, structural repairs, sediment removal, and harvesting.

Grassy Swales

Descripton: Grassy swales are vegetated channels that convey stormwater and remove pollutants by filtration through grass and infiltration through soil. They require shallow slopes and soils that drain well. Pollutant removal capability is related to channel dimensions, longitudinal slope, and type of vegetation. Optimum design of these components will increase contact time of runoff through the swale and improve pollutant removal rates.

Grassy swales are primarily stormwater conveyance systems. They can provide sufficient control under light to moderate runoff conditions, but their ability to control large storms is limited. Therefore, they are most applicable in low to moderate sloped areas or along highway medians as an alternative to ditches and curb and gutter drainage. Their performance diminishes sharply in highly urbanized settings, and they are generally not effective enough to receive construction stage runoff where high sediment loads can overwhelm the system. Grassy swales can be used as a pretreatment measure for other downstream BMPs, such as extended detention basins. Enhanced grassy swales utilize check dams and wide depressions to increase runoff storage and promote greater settling of pollutants.

Grassy swales can be more aesthetically pleasing than concrete or rock-lined drainage systems and are generally less expensive to construct and maintain. Swales can slightly reduce impervious area and reduce the pollutant accumulation and delivery associated with curbs and gutters. The disadvantages of this technique include the possibility of erosion and channelization over time, and the need for more right-of-way as compared to a storm drain system. When properly constructed, inspected, and maintained, the life expectancy of a swale is estimated to be 20 years.

Design Considerations:

- Comparable performance to wet basins
- Limited to treating a few acres
- Availability of water during dry periods to maintain vegetation
- Sufficient available land area

The suitability of a swale at a site will depend on land use, size of the area serviced, soil type, slope, imperviousness of the contributing watershed, and dimensions and slope of the swale system. In general, swales can be used to serve areas of less than 10 acres, with slopes no greater than 5 %. The seasonal high water table should be at least 4 feet below the surface. Use of natural topographic lows is encouraged, and natural drainage courses should be regarded as significant local resources to be kept in use.

Maintenance Requirements:

Research in the Austin area indicates that vegetated controls are effective at removing pollutants even when dormant. Therefore, irrigation is not required to maintain growth during dry periods but may be necessary only to prevent the vegetation from dying.

Vegetation Lined Drainage Ditches

Description: Vegetation lined drainage ditches are similar to grassy swales. These drainage ditches are vegetated channels that convey storm water and remove pollutants by filtration through grass and infiltration through soil. They require soils that drain well. Pollutant removal capability is related to channel dimensions, longitudinal slope, and type of vegetation. Optimum design of these components will increase contact time of runoff through the ditch and improve pollutant removal rates. Vegetation lined drainage ditches are primarily storm water conveyance systems. They have vegetation lined in the low flow channel and may include vegetated shelves.

Vegetation in drainage ditches reduces erosion and removes pollutants by lowering water velocity over the soil surface, binding soil particles with roots, and by filtration through grass and infiltration through soil. Vegetation lined drainage ditches can be used where:

- A vegetative lining can provide sufficient stability for the channel grade by increasing maximum permissible velocity
- Slopes are generally less than 5%, with protection from sheer stress as needed through the use of BMPs, such as erosion control blankets

- Site conditions required to establish vegetation, i.e. climate, soils, topography, are present

Design Criteria: The suitability of a vegetation lined drainage ditch at a site will depend on land use, size of the area serviced, soil type, slope, imperviousness of the contributing watershed, and dimensions and slope of the ditch system. The hydraulic capacity of the drainage ditch and other elements such as erosion, siltation, and pollutant removal capability, must be taken into consideration. Use of natural topographic lows is encouraged, and natural drainage courses should be regarded as significant local resources to be kept in use. Other items to consider include the following:

- Capacity, cross-section shape, side slopes, and grade
- Select appropriate native vegetation
- Construct in stable, low areas to conform with the natural drainage system. To reduce erosion potential, design the channel to avoid sharp bends and steep grades.
- Design and build drainage ditches with appropriate scour and erosion protection. Surface water should be able to enter over the vegetated banks without erosion occurring.
- BMPs, such as erosion control blankets, may need to be installed at the time of seeding to provide stability until the vegetation is fully established. It may also be necessary to divert water from the channel until vegetation is established or to line the channel with sod.
- Vegetated ditches must not be subject to sedimentation from disturbed areas.
- Sediment traps may be needed at channel inlets to prevent entry of muddy runoff and channel sedimentation.
- Availability of water during dry periods to maintain vegetation
- Sufficient available land area

Maintenance:

During establishment, vegetation lined drainage ditches should be inspected, repaired, and vegetation reestablished if necessary. After the vegetation has become established, the ditch should be checked periodically to determine if the channel is

withstanding flow velocities without damage. Check the ditch for debris, scour, or erosion and immediately make repairs if needed. Check the channel outlet and all road crossings for bank stability and evidence of piping or scour holes and make repairs immediately. Remove all significant sediment accumulations to maintain the designed carrying capacity. Keep the vegetation in a healthy condition at all times, since it is the primary erosion protection for the channel. Vegetation lined drainage ditches should be seasonally maintained by mowing or irrigating, depending on the vegetation selected. The long-term management of ditches as stable, vegetated, "natural" drainage systems with native vegetation buffers is highly recommended due to the inherent stability offered by grasses, shrubs, trees, and other vegetation.

Research in the Austin area indicates that vegetated controls are effective at removing pollutants even when dormant. Therefore, irrigation is not required to maintain growth during dry periods but may be necessary only to prevent the vegetation from dying.

Sand Filter Systems

Description: The objective of sand filters is to remove sediment and the pollutants from the first flush of pavement and impervious area runoff. The filtration of nutrients, organics, and coliform bacteria is enhanced by a mat of bacterial slime that develops during normal operations. One of the main advantages of sand filters is their adaptability; they can be used on areas with thin soils, high evaporation rates, low-soil infiltration rates, in limited-space areas, and where groundwater is to be protected.

Since their original inception in Austin, Texas, hundreds of intermittent sand filters have been implemented to treat stormwater runoff. There have been numerous alterations or variations in the original design as engineers in other jurisdictions have improved and adapted the technology to meet their specific requirements. Major types include the Austin Sand Filter, the District of Columbia Underground Sand Filter, the Alexandria Dry Vault Sand Filter, the Delaware Sand Filter, and peat-sand filters which are adapted to provide a sorption layer and vegetative cover to various sand filter designs.

Design Considerations:

- Appropriate for space-limited areas
- Applicable in arid climates where wet basins and constructed wetlands are not appropriate
- High TSS removal efficiency

Cost Considerations:

Filtration Systems may require less land than some other BMPs, reducing the land acquisition cost; however the structure itself is one of the more expensive BMPs. In addition, maintenance cost can be substantial.

Erosion Control Compost

Description: Erosion control compost (ECC) can be used as an aid to control erosion on critical sites during the establishment period of protective vegetation. The most common uses are on steep slopes, swales, diversion dikes, and on tidal or stream banks.

Materials:

New types of erosion control compost are continuously being developed. The Texas Department of Transportation (TxDOT) has established minimum performance standards which must be met for any products seeking to be approved for use within any of TxDOT=s construction or maintenance activities. Material used within any TxDOT construction or maintenance activities must meet material specifications in accordance with current TxDOT specifications. TxDOT maintains a website at https://www.txdot.gov/inside-txdot/division/support/recycling/speclist.html that provides information on compost specification data.

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Installation:

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https://www.txdot.gov/inside-txdot/division/support/recycling/speclist.html that provides information on compost specification data.

Mulch and compost filter socks used for projects not related to TxDOT should also be of quality materials by meeting performance standards and compost specification data. To ensure the quality of compost used for mulch and compost filter socks, products should meet all applicable state and federal regulations, including but not limited to the United States Environmental Protection Agency (USEPA) Code of Federal Regulations (CFR), Title 40, Part 503 Standards for Class A biosolids and Texas Natural Resource Conservation Commission Health and Safety Regulations as defined in the Texas Administration Code (TAC), Chapter 332, and all other relevant requirements for compost products outlined in TAC, Chapter 332. Testing requirements required by the TCEQ are defined in TAC Chapter 332, including Sections '332.71 Sampling and Analysis Requirements for Final Products and '332.72 Final Product Grades. Compost specification data approved by TxDOT are appropriate to use for ensuring the use of quality compost materials or for guidance.

Testing standards are dependent upon the intended use for the compost and ensures product safety, and product performance regarding the product=s specific use. The appropriate compost sampling and testing protocols included in the United States Composting Council (USCC) Test Methods for the Examination of Composting and Compost (TMECC) should be conducted on compost products used for mulch and compost filter socks to ensure that the products used will not impact public health, safety, and the environment and to promote production and marketing of quality composts that meet analytical standards. TMECC is a laboratory manual that provides protocols for the composting industry and test methods for compost analysis. TMECC provides protocols to sample, monitor, and analyze materials during all stages of the composting process. Numerous parameters that might be of concern in compost can be tested by following protocols or test methods listed in TMECC. TMECC information can be found at https://www.compostingcouncil.org/page/tmecc. The USCC Seal of Testing Assurance (STA) program contains information regarding compost STA certification. STA program information can be found at https://www.compostingcouncil.org/page/SealofTestingAssuranceSTA.

Installation:

- Install in accordance with TxDOT Special Specification 5049.
- Install socks (erosion control logs) near the downstream perimeter of a disturbed area to intercept sediment from sheet flow.
- Secure socks in a method adequate to prevent displacement as a result of normal rain events such that flow is not allowed under the socks.

- Inspect and maintain the socks in good condition (including staking, anchoring, etc.). Maintain the integrity of the control, including keeping the socks free of accumulated silt, debris, etc., until the disturbed area has been adequately stabilized.

Sedimentation Chambers (only to be used when there is no space available for other approved BMP's)

Description: Sedimentation chambers are stormwater treatment structures that can be used when space is limited such as urban settings. These structures are often tied into stormwater drainage systems for treatment of stormwater prior to entering state waters. The water quality benefits are the removal of sediment and buoyant materials. These structures are not designed as a catch basin or detention basin and not typically used for floodwater attenuation.

Design Considerations: Average rainfall and surface area should be considered when following manufacturer's recommendations for chamber sizing and/or number of units needed to achieve effective TSS removal. If properly sized, 50-80% removal of TSS can be expected.

Maintenance Requirements: Maintenance requirements include routine inspections, sediment, debris and litter removal, erosion control and nuisance control.

RAILROAD COMMISSION OF TEXAS
OIL AND GAS DIVISION

December 18, 2020

Colonel Timothy R. Vail
Galveston District
U.S. Army Corps of Engineers
P.O. Box 1229
Galveston, Texas 77553-1229

Re: 2020 USACE Nationwide Permits Reissuance
NPWs 2, 3, 6, 7, 8, 12, 14, 16, 18, 19, 20, 25, 38, 43, 46, D and E

Dear Colonel Vail:

This letter is in response to your letter dated October 19, 2020, requesting Clean Water Act Section 401 certification of the United States Army Corps of Engineers (USACE) Nationwide Permits (NWPs), notification of which was published in the September 15, 2020, issue of the Federal Register (85 FR 57298). Regional conditions for NWPs in Texas were proposed in public notices on September 30, 2020 and October 1, 2020.

Texas Natural Resources Code, §91.101, and Texas Water Code, §26.131, grant the RRC jurisdiction for water quality certifications for federal permits covering activities associated with the exploration, development, and production, including pipeline transportation, of oil, gas or geothermal resources that may result in discharges to waters of the United States. No person may conduct any activity subject to RRC jurisdiction pursuant to a USACE permit if that activity may result in a discharge into to waters of the United States within the boundaries of the State of Texas, unless the RRC has first issued a certification or waiver of certification under 16 Texas Administrative Code §3.93 (Rule 93). Although the RRC is responsible for water quality certification of activities under the jurisdiction of the RRC, the Texas Commission on Environmental Quality (TCEQ) establishes the Texas Water Quality Standards. This certification is limited to those activities under the jurisdiction of the RRC. For all other activities, the TCEQ will issue the certification as provided in Texas Water Code §26.131.

This office has reviewed the following proposed NWPs: 2 (Structures in Artificial Canals), 3 (Maintenance), 6 (Survey Activities), 7 (Outfall Structures and Associated Intake Structures), 8 (Oil and Gas Structures on the Outer Continental Shelf), 12 (Utility Line Activities), 14 (Linear Transportation Projects), 16 (Return Water From Upland Contained Disposal Areas), 18 (Minor Discharges), 19 (Minor Dredging), 20 (Oil Spill Cleanup), 25 (Structural Discharges), 38 (Cleanup of Hazardous and Toxic Waste), 43 (Stormwater Management Facilities), 46

(Discharges in Ditches), D (Utility Line Activities for Water and Other Substances), and E (Water Reclamation and Reuse Facilities).

Based on our evaluation of the information contained in these documents, the RRC certifies that the activities authorized by NWPs 2, 8, 20, and E should not result in a violation of Texas Surface Water Quality Standards as required by Section 401 of the Federal Clean Water Act and pursuant to 16 Texas Administrative Code (TAC) §3.93.

The RRC conditionally certifies that the activities authorized by NWPs 3, 6, 7, 12, 14, 16, 18, 19, 25, 38, 43, 46, and D should not result in a violation of Texas Surface Water Quality Standards as required by Section 401 of the Federal Clean Water Act and pursuant to 16 TAC §3.93. Conditions for each NWP are defined in Attachment 1, in accordance with Texas Water Code, §26.003 and 30 TAC §307.5(a), which establish the antidegradation policy. The antidegradation policy and implementation procedures apply to actions regulated under state and federal authority that would increase pollution of the water in the state, including federal permits relating to the discharge of fill or dredged material under Federal Clean Water Act, §404.

Conditions for NWPs 6, 7, 12, 14, 16, 18, 19, 25, 38, 43, 46, and D: Certification of these NWPs is conditioned on inclusion of a prohibition on the use of these NWPs in coastal dune swales, mangrove marshes, and Columbia bottomlands in the Galveston District. Impacts to rare and ecologically significant coastal dune swales, mangrove marshes, and Columbia bottomlands, would not be considered minimal. Wetland water quality functions as defined in the Texas Surface Water Quality Standards (30 TAC §307) are attributes of wetlands that protect and maintain the quality of water in the state, which include stormwater storage and retention and the moderation of extreme water level fluctuations; shoreline protection against erosion through the dissipation of wave energy and water velocity, and anchoring of sediments; habitat for aquatic life; and removal, transformation, and retention of nutrients and toxic substances. No discharge can be certified if there is a practicable alternative to the proposed discharge that would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other more significant adverse environmental consequences.

Condition for NWP 12 and NWP D: Certification on NWP 12 and NWP D is conditioned on a prohibition on mechanized land clearing in forested wetlands. Wetland water quality functions as defined in the Texas Surface Water Quality Standards (30 TAC §307) are attributes of wetlands that protect and maintain the quality of water in the state, which include stormwater storage and retention and the moderation of extreme water level fluctuations; shoreline protection against erosion through the dissipation of wave energy and water velocity, and anchoring of sediments; habitat for aquatic life; and removal, transformation, and retention of nutrients and toxic substances. No discharge can be certified if there is a practicable alternative to the proposed discharge that would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other more significant adverse environmental consequences.

Condition for NWP 16: Certification of NWP 16 is conditioned on inclusion of a limit of 300 mg/L total suspended solids (TSS) concentration on the return water from upland contained dredged material disposal areas. This limit is promulgated as an effluent limit under Title 40 of

the Code of Federal Regulations. The requirement has also been included in individual 404 permits.

The RRC is conditionally certifying NWP General Condition #12 *Soil Erosion and Sediment Controls*, and General Condition #25 *Water Quality*. The conditions address three categories of water quality management with specific recommendations for Best Management Practices (BMPs) for each category intended to enhance the water quality protection. A list of recommended BMPs is included as Attachment 2. The BMPs identified in Attachment 2 are in accordance with the Texas Water Code, §26.003 and the antidegradation policy and implementation procedures in 30 TAC §307.5(a), which apply to actions regulated under state and federal authority that would increase pollution of the water in the state, including federal permits relating to the discharge of fill or dredged material under Federal Clean Water Act, §404.

Attachment 3 is provided as a reference for all NWPs. A detailed description of the BMPs is provided in Attachment 4. These BMPs should be included for the protection of waters in the state specific to each NWP as part of the regional conditions for Texas. The conditions identified in Attachment 3 and 4 are in accordance with the Texas Water Code, §26.003 and the antidegradation policy and implementation procedures in 30 TAC §307.5(a), which apply to actions regulated under state and federal authority that would increase pollution of the water in the state, including federal permits relating to the discharge of fill or dredged material under Federal Clean Water Act, §404.

USACE is proposing to remove the 300 linear foot limit for NWP 43 and quantify impacts to streams using a ½-acre limit. Removal of the 300 linear foot limit would also remove the waiver requirement for proposed impacts to streams greater than 300 linear feet. The RRC is concerned about the potential adverse impact to state aquatic resources of the proposed removal of the 300 linear foot limit on stream bed losses. Removing the stream loss limit would mean that stream losses associated with activities covered by this NWP would only be limited by the existing 1/2 - acre limit on overall impacts to waters of the U.S., which could significantly affect state stream resources by allowing upwards of several thousand linear feet of stream impacts under these permits, depending on the dimensions of the streams being impacted. The RRC conditionally certifies this NWP with a cap of 1,500 linear feet on the stream length impacted based on the amount of stream impacts considered minimal by the state. The greater than minimal loss of stream length would result in significant loss of aquatic habitat and degradation of water quality **per the state's Antidegradation Policy** (30 TAC §307.4(i)) for aquatic life uses and habitat, where vegetative and physical components of the aquatic environment must be maintained or mitigated to protect aquatic life uses.

Certification of General Condition 23 *Mitigation* is conditioned to require USACE to copy RRC on any written notification of a mitigation waiver so that RRC may fulfill its responsibility to ensure water of the state is appropriately protected by understanding the impact of waivers being granted in Texas.

By letter dated November 14, 2020, the Texas Parks and Wildlife Department (TPWC) provided substantive recommendations. TPWD commented that the proposal to replace the 300 linear

foot limit with a half-acre limit would greatly increase the amount of stream subject to impact without PCN and the length of stream allowed to be impacted under a NWP. TPWD recommended that Regional Condition 10 be revised to include resource agency coordination for any proposed discharges into mangrove forests or coastal dune swales.

TPWD recommended new Regional Conditions for NWP 3, 6, and 12 include PCN for activities that include general conditions for aquatic life movement, shellfish beds, adverse effects from impoundments, endangered species, designated critical resource waters and notice of fish, shellfish, and other aquatic resource mortality events as it related to the general conditions. The General Conditions cover many of these concerns.

In addition, a new regional condition should prohibit use of NWP 12 for discharges into Critical Resource Water (CRW) (GEMS, State Coastal Preserves, Sanctuaries, state Scientific areas, and Ecologically Significant Stream Segments, and Texas protected Mussel Sanctuaries; as well as state designated areas for known mussel habitat and known occurrences of state-and/or federally-listed freshwater mussels species) and their adjacent wetlands. Discharges of dredged or fill material into waters of the U.S. are not authorized by NWP 12 for any activity within, or directly affecting, Designated Critical Resource Waters, including wetlands adjacent to such waters (General Condition 22). PCN is required for NWPs 3 for any activity proposed by permittees in the designated critical resource waters including wetlands adjacent to those waters. The district engineer may authorize activities under these NWPs only after she or he determines that the impacts to the critical resource waters will be no more than minimal (General Condition 22). N addition, USACE advised by letter dated December 11, 2020, that USACE may designate, after notice and opportunity for public comment, additional waters having particular environmental or ecological significance. Although the process for designating the requested areas as CRWs was initiated, it has not been completed.

The RRC reserves the right to modify this certification should it be determined that significant cumulative or secondary impacts are occurring as a result of the activities authorized by the USACE under these NPWs.

The RRC has reviewed this proposed action for consistency with the Texas Coastal Management Plan (TCMP) goals and policies, in accordance with the regulations of the TCMP, and has found that the proposed action will have direct and significant adverse effect on any coastal natural resource area identified in the applicable policies, but has determined that the proposed action is consistent with the applicable goals and policies of the TCMP. This consistency determination is conditioned on inclusion in the NWPs of the conditions discussed above, as well as the following conditions:

Under General Condition 18 (Endangered Species), no activity is authorized under any NWP which is likely to directly or indirectly jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act (ESA), or which will directly or indirectly destroy or adversely modify the critical habitat of such species. However, the General Condition does not include such a prohibition on activity that could jeopardize the continued existence of a threatened or

endangered species or a species proposed for such designation, as identified by the State of Texas. USACE should coordinated with Texas Parks and Wildlife for all discharges, work, dredging activities, or dewatering activities proposed in non-tidal waters in which state and/or federal listed freshwater mussel species are known to occur and/or are within one of the 18 listed Texas protected mussel sanctuaries.

If you require further assistance, please contact me at 512-463-7308 or by email at Leslie.savage@rrc.texas.gov.

Regards,

Leslie Savage

Leslie Savage, Chief Geologist
Oil and Gas Division
Railroad Commission of Texas

Ccs: (Via Electronic mail)
Mr. Stephen Brooks, Branch Chief, U.S. Army Corp of Engineers, Regulatory Branch, Fort Worth
Branch Chief, U.S. Army Corps of Engineers, Albuquerque District
Regulatory Branch Chief, U.S. Army Corps of Engineers, Regulatory Branch, Tulsa
Regulatory Branch Chief, U.S. Army Corps of Engineers, El Paso Regulatory Office
Ms. Leslie Koza, Texas Parks and Wildlife
Ms. Allison Buchtien, Texas General Land Office via e-mail

Attachment 1
Conditions of Section 401 Certification for Nationwide Permits and General Conditions

General Condition 12 (Soil Erosion and Sediment Controls)
Erosion control and sediment control BMPs described in Attachment 2 are required with the use of this general condition. If the applicant does not choose one of the BMPs listed in Attachment 2, an individual 401 certification is required.

General Condition 25 (Water Quality)
Post-construction total suspended solids (TSS) BMPs described in Attachment 2 are required with the use of this general condition. If the applicant does not choose one of the BMP's listed in Attachment 2, an individual 401 certification is required.

General Condition 23 (Mitigation)
The USACE will copy the RRC on all mitigation waivers sent to applicants.

NWP 43
The USACE will copy the RRC on all written approvals of waivers for impacts to ephemeral, intermittent or perennial streams.

NWPs 2, 3, 6, 7, 8, 12, 14, 16, 18, 19, 20, 25, 38, 43, and 46
These *NWPs* are not authorized for use in coastal dune swales, mangrove marshes, and Columbia bottomlands in the Galveston District, Texas.

NWP 3 (Maintenance)
Soil Erosion and Sediment Controls under General Condition 12 are required.

NWP 6 (Survey Activities)
Soil Erosion and Sediment Controls under General Condition 12 are required.

NWP 7 (Outfall Structures and Associated Intake Structures)
Soil Erosion and Sediment Controls under General Condition 12 are required.

NWP 12 (Utility Line Activities)
Soil Erosion and Sediment Controls under General Condition 12 are required. Postconstruction TSS controls under General Condition 25 are required.

NWP 14 (Linear Transportation Projects)
Soil Erosion and Sediment Controls under General Condition 12 are required. Postconstruction TSS controls under General Condition 2 5 are required.

NWP 16 (Return Water From Upland Contained Disposal Areas)
Effluent from an upland contained disposal area shall not exceed a TSS concentration of 300 mg/L unless a site-specific TSS limit, or a site specific correlation curve for turbidity (nephelometric turbidity units (NTU)) versus TSS has been approved by TCEQ.

NWP 18 (Minor Discharges)
Soil Erosion and Sediment Controls under General Condition 12 are required. Postconstruction TSS controls under General Condition 2 5 are required.

NWP 19 (Minor Dredging)
Soil Erosion: and Sediment Controls under General Condition 12 are required.

NWP 25 (Structural Discharges)
Soil Erosion and Sediment Controls under General Condition 12 are required.

NWP 38 (Cleanup of Hazardous and Toxic Waste)
Soil Erosion and Sediment Controls under General Condition 12 are required.

NWP 43 (Stormwater Management Facilities)
Soil Erosion and Sediment Controls under General Condition 12 are required.

NWP 46 (Discharges in Ditches)
Soil Erosion and Sediment Controls under General Condition 12 are required.

Attachment 2

401 Water Quality Certification Best Management Practices (BMPs) for Nationwide Permits

I. **Erosion Control**

Disturbed areas must be stabilized to prevent the introduction of sediment to adjacent wetlands or water bodies during wet weather conditions (erosion). *At least one* of the following BMPs must be maintained and remain in place until the area has been stabilized for NWPs 3, 6, 7, 12, 14, 18, 19, 25, 38, 43, and 46. If the applicant does not choose one of the BMPs listed, an individual 401 certification is required.

o Temporary Vegetation
o Mulch
o Interceptor Swale
o Erosion Control Compost
o Compost Filter Socks

II. **Sedimentation Control**

o Blankets/Matting
o Sod
o Diversion Dike
o Mulch Filter Socks

Prior to project initiation, the project area must be isolated from adjacent wetlands and water bodies by the use of BMPs to confine sediment. Dredged material shall be placed in such a manner that prevents sediment runoff into water in the state, including wetlands. Water bodies can be isolated by the use of one or more of the required BMPs identified for sedimentation control. These BMP's must be maintained and remain in place until the dredged material is stabilized. *At least one* of the following BMPs must be maintained and remain in place until the area has been stabilized for NWPs 3, 6, 7, 12, 14, 18, 19, 25, 38, 43, and 46. If the applicant does not choose one of the BMPs listed, an individual 401 certification is required.

o Sand Bag Berm
o Rock Berm
o Silt Fence
o Triangular Filter Dike
o Stone Outlet Sediment Traps
o Erosion Control Compost
o Compost Filter Socks

III. **Post-Construction TSS Control**

o Hay Bale Dike
o Brush Berms
o Sediment Basins
o Mulch Filter Socks

After construction has been completed and the site is stabilized, total suspended solids (TSS) loadings shall be controlled by *at least one* of the following BMPs for NWPs 12, 14, and 18. If the applicant does not choose one of the BMPs listed, an individual 401 certification is required.
o Retention/Irrigation Systems
o Constructed Wetlands
o Extended Detention Basin
o Wet Basins
o Vegetative Filter Strips
o Vegetation lined drainage ditches
o Grassy Swales
o Sand Filter Systems
o Erosion Control Compost
o Mulch Filter Socks
o Compost Filter Socks
o Sedimentation Chambers*
* Only to be used when there is no space available for other approved BMPs.

IV. NWP 16: Return Water from Upland Contained Disposal Areas
Effluent from an upland contained disposal area shall not exceed a TSS concentration of 300 mg/L unless a site-specific TSS limit, or a site specific correlation curve for turbidity (nephelometric turbidity units (NTU)) versus TSS has been approved by TCEQ.

V. All NWPs except NWP 3
These NWPs are not authorized for use in coastal dune swales, mangrove marshes, and Columbia bottomlands in the Galveston District, Texas.

Attachment 3
Reference to Nationwide Permits Best Management Practices Requirements

NWP	Permit Description	Erosion Control	Sediment Control	Post Construction TSS
2	Structures in Artificial Canals			
3	Maintenance	X	X	
6	Survey Activities Trenching	X	X	
7	Outfall Structures and Associated Intake Structures	X	X	
8	Oil and Gas Structures on the Outer Continental Shelf	X	X	
12 14	Utility Line Activities Liner Transportation Projects	X X	X X	X X
16	Return Water From Upland Contained Disposal Areas			
18	Minor Discharges	X	X	X
19	Minor Dredging	X	X	
20	Response Operations for Oil and Hazardous Substances			
25	Structural Discharges	X	X	
38	Cleanup o Hazardous and Toxic Waste	X	X	
43	Stormwater Management Facilities	X	X	
46	Discharges in Ditches	X	X	

Attachment 4
EROSION CONTROL BMPs

Temporary Vegetation

Description: Vegetation can be used as a temporary or permanent stabilization technique for areas disturbed by construction. Vegetation effectively reduces erosion in swales, stockpiles, berms, mild to medium slopes, and along roadways. Other techniques such as matting, mulches, and grading may be required to assist in the establishment of vegetation.

Materials:

- The type of temporary vegetation used on a site is a function of the season and the availability of water for irrigation.
- Temporary vegetation should be selected appropriately for the area.
- County agricultural extension agents are a good source for suggestions for temporary vegetation.
- All seed should be high quality, U.S. Dept. of Agriculture certified seed.

Installation:

- Grading must be completed prior to seeding.
- Slopes should be minimized.
- Erosion control structures should be installed.
- Seedbeds should be well pulverized, loose, and uniform.
- Fertilizers should be applied at appropriate rates.
- Seeding rates should be applied as recommended by the county agricultural extension agent.
- The seed should be applied uniformly.
- Steep slopes should be covered with appropriate soil stabilization matting.

Blankets and Matting

Description: Blankets and matting material can be used as an aid to control erosion on critical sites during the establishment period of protective vegetation. The most common uses are in channels, interceptor swales, diversion dikes, short, steep slopes, and on tidal or stream banks.

Materials:

The Texas Department of Transportation (TxDOT) has defined the critical performance factors for these types of products and has established minimum performance standards which must be met for any product seeking to be approved for use within any of TxDOT's construction or maintenance activities. The products that have been approved by TxDOT are also appropriate for general construction site stabilization. TxDOT maintains a web site at http://www.txdot.gov/business/doing_business/product_evaluation/erosion_control.htm, which is updated as new products are evaluated.

Installation:

- Install in accordance with the manufacturer's recommendations.
- Proper anchoring of the material.
- Prepare a friable seed bed relatively free from clods, rocks and any foreign material.
- Fertilize and seed in accordance with seeding or other type of planting plan.

• Erosion stops should extend beyond the channel liner to full design cross-section of the channel.
• A uniform trench perpendicular to line of flow may be dug with a spade or a mechanical trencher.
• Erosion stops should be deep enough to penetrate solid material or below level of ruling in sandy soils.
• Erosion stop mats should be wide enough to allow turnover at bottom of trench for stapling, while maintaining the top edge flush with channel surface.

Mulch

Description: Mulching is the process of applying a material to the exposed soil surface to protect it from erosive forces and to conserve soil moisture until plants can become established. When seeding critical sites, sites with adverse soil conditions or seeding on other than optimum seeding dates, mulch material should be applied immediately after seeding. Seeding during optimum seeding dates and with favorable soils and site conditions will not need to be mulched.

Materials:
• Mulch may be small grain straw which should be applied uniformly.
• On slopes 15 percent or greater, a binding chemical must be applied to the surface.
• Wood-fiber or paper-fiber mulch may be applied by hydroseeding.
• Mulch nettings may be used.
• Wood chips may be used where appropriate.

Installation:
Mulch anchoring should be accomplished immediately after mulch placement. This may be done by one of the following methods: peg and twine, mulch netting, mulch anchoring tool, or liquid mulch binders.

Description: Sod is appropriate for disturbed areas which require immediate vegetative covers, or where sodding is preferred to other means of grass establishment. Locations particularly suited to stabilization with sod are waterways carrying intermittent flow, areas around drop inlets or in grassed swales, and residential or commercial lawns where quick use or aesthetics are factors. Sod is composed of living plants and those plants must receive adequate care to provide vegetative stabilization on a disturbed area.

Materials:
• Sod should be machine cut at a uniform soil thickness.
• Pieces of sod should be cut to the supplier's standard width and length.
• Torn or uneven pads are not acceptable.
• Sections of sod should be strong enough to support their own weight and retain their size and shape when suspended from a firm grasp.
• Sod should be harvested, delivered, and installed within a period of 36 hours.

Installation:
• Areas to be sodded should be brought to final grade.
• The surface should be cleared of all trash and debris.

• Fertilize according to soil tests.
• Fertilizer should be worked into the soil.
• Sod should not be cut or laid in excessively wet or dry weather.
• Sod should not be laid on soil surfaces that are frozen.
• During periods of high temperature, the soil should be lightly irrigated.
• The first row of sod should be laid in a straight line with subsequent rows placed parallel to and butting tightly against each other.
• Lateral joints should be staggered to promote more uniform growth and strength.
• Wherever erosion may be a problem, sod should be laid with staggered joints and secured.
• Sod should be installed with the length perpendicular to the slope (on the contour).
• Sod should be rolled or tamped.
• Sod should be irrigated to a sufficient depth.
• Watering should be performed as often as necessary to maintain soil moisture.
• The first mowing should not be attempted until the sod is firmly rooted.
• Not more than one third of the grass leaf should be removed at any one cutting.

Interceptor Swale

Interceptor swales are used to shorten the length of exposed slope by intercepting runoff, prevent off-site runoff from entering the disturbed area, and prevent sediment-laden runoff from leaving a disturbed site. They may have a v-shape or be trapezoidal with a flat bottom and side slopes of 3:1 or flatter. The outflow from a swale should be directed to a stabilized outlet or sediment trapping device. The swales should remain in place until the disturbed area is permanently stabilized.

Materials:

• Stabilization should consist of a layer of crushed stone three inches thick, riprap or high velocity erosion control mats.
• Stone stabilization should be used when grades exceed 2% or velocities exceed 6 feet per second.
• Stabilization should extend across the bottom of the swale and up both sides of the channel to a minimum height of three inches above the design water surface elevation based on a 2-year, 24-hour storm.

Installation:

• An interceptor swale should be installed across exposed slopes during construction and should intercept no more than 5 acres of runoff.
• All earth removed and not needed in construction should be disposed of in an approved spoils site so that it will not interfere with the functioning of the swale or contribute to siltation in other areas of the site.
• All trees, brush, stumps, obstructions and other material should be removed and disposed of so as not to interfere with the proper functioning of the swale.
• Swales should have a maximum depth of 1.5 feet with side slopes of 3:1 or flatter. Swales should have positive drainage for the entire length to an outlet.
• When the slope exceeds 2 percent, or velocities exceed 6 feet per second (regardless of slope), stabilization is required. Stabilization should be crushed stone placed in a layer of at least 3 inches thick or may be high velocity erosion control matting. Check dams are also

recommended to reduce velocities in the swales possibly reducing the amount of stabilization necessary.
• Minimum compaction for the swale should be 90% standard proctor density.

Diversion Dikes

A temporary diversion dike is a barrier created by the placement of an earthen embankment to reroute the flow of runoff to an erosion control device or away from an open, easily erodible area. A diversion dike intercepts runoff from small upland areas and diverts it away from exposed slopes to a stabilized outlet, such as a rock berm, sandbag berm, or stone outlet structure. These controls can be used on the perimeter of the site to prevent runoff from entering the construction area. Dikes are generally used for the duration of construction to intercept and reroute runoff from disturbed areas to prevent excessive erosion until permanent drainage features are installed and/or slopes are stabilized.

Materials:

• Stone stabilization (required for velocities in excess of 6 fps) should consist of riprap placed in a layer at least 3 inches thick and should extend a minimum height of 3 inches above the design water surface up the existing slope and the upstream face of the dike.
• Geotextile fabric should be a non-woven polypropylene fabric designed specifically for use as a soil filtration media with an approximate weight of 6 oz./yd2, a Mullen burst rating of 140 psi, and having an equivalent opening size (EOS) greater than a #50 sieve.

Installation:

• Diversion dikes should be installed prior to, and maintained for the duration of, construction and should intercept no more than 10 acres of runoff.
• Dikes should have a minimum top width of 2 feet and a minimum height of compacted fill of 18 inches measured form the top of the existing ground at the upslope toe to top of the dike and have side slopes of 3:1 or flatter.
• The soil for the dike should be placed in lifts of 8 inches or less and be compacted to 95 % standard proctor density .
• The channel, which is formed by the dike, must have positive drainage for its entire length to an outlet.
• When the slope exceeds 2 percent, or velocities exceed 6 feet per second (regardless of slope), stabilization is required. In situations where velocities do not exceed 6 feet per second, vegetation may be used to control erosion.

Erosion Control Compost

Description: Erosion control compost (ECC) can be used as an aid to control erosion on critical sites during the establishment period of protective vegetation. The most common uses are on steep slopes, swales, diversion dikes, and on tidal or stream banks.

Materials:

ECC used for projects not related to TxDOT should also be of quality materials by meeting performance standards and compost specification data. To ensure the quality of compost used as an ECC, products should meet all applicable state and federal regulations, including but not limited to the United States Environmental Protection Agency (USEPA) Code of Federal

Regulations (CFR), Title 40, Part 503 Standards for Class A biosolids and TCEQ Health and Safety Regulations as defined in the Texas Administration Code (TAC), Chapter 332, and all other relevant requirements for compost products outlined in TAC, Chapter 332. TCEQ testing requirements are defined in TAC Chapter 332, including Sections §332.71 (Sampling and Analysis Requirements for Final Products) and §332.72 (Final Product Grades). Compost specification data approved by TxDOT are appropriate to use for ensuring the use of quality compost materials or for guidance.

Testing standards are dependent upon the intended use for the compost and ensures product safety, and product performance regarding the product's specific use. The appropriate compost sampling and testing protocols included in the United States Composting Council (USCC) Test Methods for the Examination of Composting and Compost (TMECC) should be conducted on compost products used for ECC to ensure that the products used will not impact public health, safety, and the environment and to promote production and marketing of quality composts that meet analytical standards. TMECC information can be found at http://www.tmecc.org/tmecc/index.html. The USCC Seal of Testing Assurance (STA) program contains information regarding compost STA certification. STA program information can be found at http://tmecc.org/sta/STA_program_description.html.

Installation:
- Install in accordance with current TxDOT specification.
- Use on slopes 3:1 or flatter.
- Apply a 2-inch uniform layer unless otherwise shown on the plans or as directed.
- When rolling is specified, use a light corrugated drum roller.

Mulch and Compost Filter Socks

Description: Mulch and compost filter socks (erosion control logs) are used to intercept and detain sediment laden run-off from unprotected areas. When properly used, mulch and compost filter socks can be highly effective at controlling sediment from disturbed areas. They cause runoff to pond which allows heavier solids to settle. Mulch and compost filter socks are used during the period of construction near the perimeter of a disturbed area to intercept sediment while allowing water to percolate through. The sock should remain in place until the area is permanently stabilized. Mulch and compost filter socks may be installed in construction areas and temporarily moved during the day to allow construction activity provided it is replaced and properly anchored at the end of the day. Mulch and compost filter socks may be seeded to allow for quick vegetative growth and reduction in run-off velocity.

Materials:

Mulch and compost filter socks used for projects not related to TxDOT should also be of quality materials by meeting performance standards and compost specification data. To ensure the quality of compost used for mulch and compost filter socks, products should meet all applicable state and federal regulations, including but not limited to the United States Environmental Protection Agency (USEPA) Code of Federal Regulations (CFR), Title 40, Part 503 Standards for Class A biosolids and TCEQ Health and Safety Regulations as defined in the Texas Administration Code (TAC), Chapter 332, and all other relevant requirements for compost products outlined in TAC, Chapter 332. TCEQ testing requirements are defined in TAC Chapter

332, including Sections §332.71 (Sampling and Analysis Requirements for Final Products) and §332.72 (Final Product Grades). Compost specification data approved by TxDOT are appropriate to use for ensuring the use of quality compost materials or for guidance.

Testing standards are dependent upon the intended use for the compost and ensures product safety, and product performance regarding the product's specific use. The appropriate compost sampling and testing protocols included in the United States Composting Council (USCC) Test Methods for the Examination of Composting and Compost (TMECC) should be conducted on compost products used for mulch and compost filter socks to ensure that the products used will not impact public health, safety, and the environment and to promote production and marketing of quality composts that meet analytical standards. TMECC information can be found at http://www.tmecc.org/tmecc/index.html. The USCC Seal of Testing Assurance (ST A) program contains information regarding compost ST A certification. STA program information can be found at http://tmecc.org/sta/STA_program_description.html.

Installation:
• Install in accordance with TxDOT Special Specification 5049.
• Install socks (erosion control logs) near the downstream perimeter of a disturbed area to intercept sediment from sheet flow.
• Secure socks in a method adequate to prevent displacement as a result of normal rain events such that flow is not allowed under the socks.
• Inspect and maintain the socks in good condition (including staking, anchoring, etc.). Maintain the integrity of the control, including keeping the socks free of accumulated silt, debris, etc., until the disturbed area has been adequately stabilized.

SEDIMENT CONTROL BMPS

Sand Bag Berm

Description: The purpose of a sandbag berm is to detain sediment carried in runoff from disturbed areas by intercepting runoff and causing it to pool behind the sand bag berm. Sediment carried in the runoff is deposited on the upstream side of the sand bag berm due to the reduced flow velocity. Excess runoff volumes are allowed to flow over the top of the sand bag berm. Sand bag berms are used only during construction activities in streambeds when the contributing drainage area is between 5 and 10 acres and the slope is less than 15%, i.e., pipeline construction in channels, temporary channel crossing for construction equipment, etc. Plastic facing should be installed on the upstream side and the berm should be anchored to the streambed by drilling into the rock and driving in T-posts or rebar (#5 or #6) spaced appropriately.

Materials:
• The sand bag material should be polypropylene, polyethylene, polyamide or cotton burlap woven fabric, minimum unit weight 4 oz/yd 2, mullen burst strength exceeding 300 psi and ultraviolet stability exceeding 70%.
• The bag length should be 24 to 30 inches, width should be 16 to 18 inches and thickness should be 6 to 8 inches.

• Sandbags should be filled with coarse grade sand and free from deleterious material. All sand should pass through a No. 10 sieve. The filled bag should have an approximate weight of 40 pounds.
• Outlet pipe should be schedule 40 or stronger polyvinyl chloride (PVC) having a nominal internal diameter of 4 inches.

Installation:
• The berm should be a minimum height of 18 inches, measured from the top of the existing ground at the upslope toe to the top of the berm.
• The berm should be sized as shown in the plans but should have a minimum width of 48 inches measured at the bottom of the berm and 16 inches measured at the top of the berm.
• Runoff water should flow over the tops of the sandbags or through 4-inch diameter PVC pipes embedded below the top layer of bags.
• When a sandbag is filled with material, the open end of the sandbag should be stapled or tied with nylon or poly cord.
• Sandbags should be stacked in at least three rows abutting each other, and in staggered arrangement.
• The base of the berm should have at least 3 sandbags. These can be reduced to 2 and 1 bag in the second and third_ rows respectively.
• For each additional 6 inches of height, an additional sandbag must be added to each row width.
• A bypass pump-around system, or similar alternative, should be used on conjunction with the berm for effective dewatering of the work area.

Silt Fence
Description: A silt fence is a barrier consisting of geotextile fabric supported by metal posts to prevent soil and sediment loss from a site. Silt fences can be highly effective at controlling sediment from disturbed areas by causing runoff to pond, allowing heavier solids to settle. The purpose of a silt fence is to intercept and detain water-borne sediment from unprotected areas of a limited extent. Silt fence is used during the period of construction near the perimeter of a disturbed area to intercept sediment while allowing water to percolate through. This fence should remain in place until the disturbed area is permanently stabilized. Silt fence should not be used where there is a concentration of water in a channel or drainage way. If concentrated flow occurs after installation, corrective action must be taken such as placing a rock berm in the areas of concentrated flow. Silt fencing within the site may be temporarily moved during the day to allow construction activity provided it is replaced and properly anchored to the ground at the end of the day. Silt fences on the perimeter of the site or around drainage ways should not be moved at any time.

Materials:
• Silt fence material should be polypropylene, polyethylene or polyamide woven or nonwoven fabric. The fabric width should be 36 inches, with a minimum unit weight of 4.5 oz/yd, mullen burst strength exceeding 190 lb/in 2, ultraviolet stability exceeding 70%, and minimum apparent opening size of U.S. Sieve No. 30.
• Fence posts should be made of hot rolled steel, at least 4 feet long with Tee or Y-bar cross section, surface painted or galvanized, minimum nominal weight 1.25 lb/ft 2, and Brindell hardness exceeding 140.

• Woven wire backing to support the fabric should be galvanized 2-inch x 4-inch welded wire, 12 gauge minimum.

Installation:
• Steel posts, which support the silt fence, should be installed on a slight angle toward the anticipated runoff source. Post must be embedded a minimum of 1 foot deep and spaced not more than 8 feet on center. Where water concentrates, the maximum spacing should be 6 feet.
• Lay out fencing down-slope of disturbed area, following the contour as closely as possible. The fence should be sited so that the maximum drainage area is * acre/100 feet of fence.
• The toe of the silt fence should be trenched in with a spade or mechanical trencher so that the down-slope face of the trench is flat and perpendicular to the line of flow. Where fence cannot be trenched in, weight fabric flap with 3 inches of pea gravel on uphill side to prevent flow from seeping under fence.
• The trench must be a minimum of 6 inches deep and 6 inches wide to allow for the silt fence fabric to be laid in the ground and backfilled with compacted material.
• Silt fence should be securely fastened to each steel support post or to woven wire attached to the steel fence post. There should be a 3-foot overlap, securely fastened where ends of fabric meet.

Triangular Sediment Filter Dike
Description: The purpose of a triangular sediment filter dike is to intercept and detain water-borne sediment from unprotected areas of limited extent. The triangular sediment filter dike is used where there is no concentration of water in a channel or other drainage way above the barrier and the contributing drainage area is less than one acre. If the uphill slope above the dike exceeds 10%, the length of the slope above the dike should be less than 50 feet. If concentrated flow occurs after installation, corrective action should be taken such as placing rock berm in the areas of concentrated flow. This measure is effective on paved areas where installation of silt fence is not possible or where vehicle access must be maintained. The advantage of these controls is the ease with which they can be moved to allow vehicle traffic and then reinstalled to maintain sediment.

Materials:
• Silt fence material should be polypropylene, polyethylene or polyamide woven or nonwoven fabric. The fabric width should be 36 inches, with a minimum unit weight of 4.5 oz/yd, mullen burst strength exceeding 190 lb/in 2 , ultraviolet stability exceeding 70%, and minimum apparent opening size of U.S. Sieve No. 30.
• The dike structure should be 6 gauge 6-ing x 6-inch wire mesh folded into triangular form being eighteen (18) inches on each side.

Installation:
• The frame of the triangular sediment filter dike should be constructed of 6-inch x 6-inch, 6 gauge welded wire mesh, 18 inches per side, and wrapped with geotextile fabric the same composition as that used for silt fences.
• Filter material should lap over ends 6 inches to cover dike to dike junction; each junction should be secured by shoat rings.

• Position dike parallel to the contours, with the end of each section closely abutting the adjacent sections.
• There are several options for fastening the filter dike to the ground. The fabric skirt may be toed-in with 6 inches of compacted material, or 12 inches of the fabric skirt should extend uphill and be secured with a minimum of 3 inches of open graded rock, or with staples or nails. If these two options are not feasible the dike structure may be trenched in 4 inches.
• Triangular sediment filter dikes should be installed across exposed slopes during construction with ends of the dike tied into existing grades to prevent failure and should intercept no more than one acre of runoff.
• When moved to allow vehicular access, the dikes should be reinstalled as soon as possible, but always at the end of the workday.

Rock Berm

Description: The purpose of a rock berm is to serve as a check dam in areas of concentrated flow, to intercept sediment-laden runoff, detain the sediment and release the water in sheet flow. The rock berm should be used when the contributing drainage area is less than 5 acres. Rock berms are used in areas where the volume of runoff is too great for a silt fence to contain. They are less effective for sediment removal than silt fences, particularly for fine particles, but can withstand higher flows than a silt fence. As such, rock berms are often used in areas of channel flows. Rock berms are most effective at reducing bed load in channels and should not be substituted for other erosion and sediment control measures further up the watershed.

Materials:

• The berm structure should be secured with a woven wire sheathing having maximum opening of one inch and a minimum wire diameter of 20 gauge galvanized and should be secured with shoat rings.
• Clean, open graded 3- to 5-inch diameter rock should be used, except in areas where high velocities or large volumes of flow are expected, where 5- to 8-inch diameter rocks may be used.

Installation:

• Lay out the woven wire sheathing perpendicular to the flow line. The sheathing should be 20 gauge woven wire mesh with 1 inch openings.
• Berm should have a top width of 2 feet minimum with side slopes being 2:1 (H:V) or flatter.
• Place the rock along the sheathing to a height not less than 18 inches.
• Wrap the wire sheathing around the rock and secure with tie wire so that the ends of the sheathing overlap at least 2 inches, and the berm retains its shape when walked upon.
• Berm should be built along the contour at zero percent grade or as near as possible.
• The ends of the berm should be tied into existing upslope grade and the berm should be buried in a trench approximately 3 to 4 inches deep to prevent failure of the control.

Hay Bale Dike

Description: The purpose of a hay or straw bale dike is to intercept and detain small amounts of sediment-laden runoff from relatively small unprotected areas. Straw bales are to be used when it is not feasible to install other, more effective measures or when the construction phase is expected to last less than 3 months. Straw bales should not be used on areas where rock or other hard surfaces prevent the full and uniform anchoring of the barrier.

Materials:
Straw: The best quality straw mulch comes from wheat, oats or barley and should be free of weed and grass seed which may not be desired vegetation for the area to be protected. Straw mulch is light and therefore must be properly anchored to the ground.
Hay: This is very similar to straw with the exception that it is made of grasses and weeds and not grain stems. This form of mulch is very inexpensive and is widely available but does introduce weed and grass seed to the area. Like straw, hay is light and must be anchored.
• Straw bales should weigh a minimum of 50 pounds and should be at least 30 inches long.
• Bales should be composed entirely of vegetable matter and be free of seeds.
• Binding should be either wire or nylon string, jute or cotton binding is unacceptable.
Bales should be used for not more than two months before being replaced.

Installation:
• Bales should be embedded a minimum of 4 inches and securely anchored using 2-inch x 2-inch wood stakes or 3/8-inch diameter rebar driven through the bales into the ground a minimum of 6 inches.
• Bales are to be placed directly adjacent to one another leaving no gap between them.
• All bales should be placed on the contour.
• The first stake in each bale should be angled toward the previously laid bale to force the bales together.

Brush Berms
Organic litter and spoil material from site clearing operations is usually burned or hauled away to be dumped elsewhere. Much of this material can be used effectively on the construction site. The key to constructing an efficient brush berm is in the method used to obtain and place the brush. It will not be acceptable to simply take a bulldozer and push whole trees into a pile as this does not assure continuous ground contact with the berm and will allow uncontrolled flows under the berm. Brush berms may be used where there is little or no concentration of water in a channel or other drainage way above the berm. The size of the drainage area should be no greater than one-fourth of an acre per 100 feet of barrier length; the maximum slope length behind the barrier should not exceed 100 feet; and the maximum slope gradient behind the barrier should be less than 50% (2:1).

Materials:
• The brush should consist of woody brush and branches, preferably less than 2 inches in diameter.
• The filter fabric should conform to the specifications for filter fence fabric.
• The rope should be 1/4 - inch polypropylene or nylon rope.
• The anchors should be 3/8-inch diameter rebar stakes that are 18-inches long.

Installation:
• Lay out the brush berm following the contour as closely as possible.

• The juniper limbs should be cut and hand placed with the vegetated part of the limb in close contact with the ground. Each subsequent branch should overlap the previous branch providing a shingle effect.
• The brush berm should be constructed in lifts with each layer extending the entire length of the berm before the next layer is started.
• A trench should be excavated 6-inches wide and 4-inches deep along the length of the barrier and immediately uphill from the barrier.
• The filter fabric should be cut into lengths sufficient to lay across the barrier from its up-slope base to just beyond its peak. The lengths of filter fabric should be draped across the width of the barrier with the uphill edge placed in the trench and the edges of adjacent pieces overlapping each other. Where joints are necessary, the fabric should be spliced together with a minimum 6-inch overlap and securely sealed.
• The trench should be backfilled and the soil compacted over the filter fabric.
• Set stakes into the ground along the downhill edge of the brush barrier, and anchor the fabric by tying rope from the fabric to the stakes. Drive the rope anchors into the ground at approximately a 45-degree angle to the ground on 6-foot centers.
• Fasten the rope to the anchors and tighten berm securely to the ground with a minimum tension of 50 pounds.
• The height of the brush berm should be a minimum of 24 inches after the securing ropes have been tightened.

Stone Outlet Sediment Traps

A stone outlet sediment trap is an impoundment created by the placement of an earthen and stone embankment to prevent soil and sediment loss from a site. The purpose of a sediment trap is to intercept sediment-laden runoff and trap the sediment in order to protect drainage ways, properties and rights of way below the sediment trap from sedimentation. A sediment trap is usually installed at points of discharge from disturbed areas. The drainage area for a sediment trap is recommended to be less than 5 acres.

Larger areas should be treated using a sediment basin. A sediment trap differs from a sediment basin mainly in the type of discharge structure. The trap should be located to obtain the maximum storage benefit from the terrain, for ease of clean out and disposal of the trapped sediment and to minimize interference with construction activities. The volume of the trap should be at least 3600 cubic feet per acre of drainage area.

Materials:

• All aggregate should be at least 3 inches in diameter and should not exceed a volume of 0. 5 cubic foot.
• The geotextile fabric specification should be woven polypropylene, polyethylene or polyamide geotextile, minimum unit weight of 4.5 oz/yd 2, mullen burst strength at least 2 50 lb/in 2, ultraviolet stability exceeding 70%, and equivalent opening size exceeding 40.

Installation:

• Earth Embankment: Place fill material in layers not more than 8 inches in loose depth. Before compaction, moisten or aerate each layer as necessary to provide the optimum moisture content of the material. Compact each layer to 95% standard proctor density. Do not place material on

surfaces that are muddy or frozen. Side slopes for the embankment are to be 3: 1. The minimum width of the embankment should be 3 feet.
• A gap is to be left in the embankment in the location where the natural confluence of runoff crosses the embankment line. The gap is to have a width in feet equal to 6 times the drainage area in acres.
• Geotextile Covered Rock Core: A core of filter stone having a minimum height of 1.5 feet and a minimum width at the base of 3 feet should be placed across the opening of the earth embankment and should be covered by geotextile fabric which should extend a minimum distance of 2 feet in either direction from the base of the filter stone core.
• Filter Stone Embankment: Filter stone should be placed over the geotextile and is to have a side slope which matches that of the earth embankment of 3:1 and should cover the geotextile/rock core a minimum of 6 inches when installation is complete. The crest of the outlet should be at least 1 foot below the top of the embankment.

Sediment Basins:
The purpose of a sediment basin is to intercept sediment-laden runoff and trap the sediment to protect drainage ways, properties and rights of way below the sediment basin from sedimentation. A sediment basin is usually installed at points of discharge from disturbed areas. The drainage area for a sediment basin is recommended to be less than 100 acres.

Sediment basins. are effective for capturing and slowly releasing the runoff from larger disturbed areas thereby allowing sedimentation to take place. A sediment basin can be created where a permanent pond BMP is being constructed. Guidelines for construction of the permanent BMP should be followed, but revegetation, placement of underdrain piping, and installation of sand or other filter media should not be carried out until the site construction phase is complete.
Materials:
• Riser should be corrugated metal or reinforced concrete pipe or box and should have watertight fittings or end to end connections of sections.
• An outlet pipe of corrugated metal or reinforced concrete should be attached to the riser and should have positive flow to a stabilized outlet on the downstream side of the embankment.
• An anti-vortex device and rubbish screen should be attached to the top of the riser and should be made of polyvinyl chloride or corrugated metal.

Basin Design and Construction:
• For common drainage locations that serve an area with ten or more acres disturbed at one time, a sediment basin should provide storage for a volume of runoff from a two-year, 24-hour storm from each disturbed acre drained.
• The basin length to width ratio should be at least 2:1 to improve trapping efficiency. The shape may be attained by excavation or the use of baffles. The lengths should be measured at the elevation of the riser de-watering hole.
• Place fill material in layers not more than 8 inches in loose depth. Before compaction, moisten or aerate each layer as necessary to provide the optimum moisture content of the material. Compact each layer to 95% standard proctor density. Do not place material on surfaces that are muddy or frozen. Side slopes for the embankment should be 3:1 (H:V).

• An emergency spillway should be installed adjacent to the embankment on undisturbed soil and should be sized to carry the full amount of flow generated by a 10-year, 3-hour storm with 1 foot of freeboard less the amount which can be carried by the principal outlet control device.
• The emergency spillway should be lined with riprap as should the swale leading from the spillway to the normal watercourse at the base of the embankment.
• The principal outlet control device should consist of a rigid vertically oriented pipe or box of corrugated metal or reinforced concrete. Attached to this structure should be a horizontal pipe, which should extend through the embankment to the toe of fill to provide a de-watering outlet for the basin.
• An anti-vortex device should be attached to the inlet portion of the principal outlet control device to serve as a rubbish screen.
• A concrete base should be used to anchor the principal outlet control device and should be sized to provide a safety factor of 1.5 (downward forces= 1.5 buoyant forces).
• The basin should include a permanent stake to indicate the sediment level in the pool and marked to indicate when the sediment occupies 50% of the basin volume (not the top of the stake).
• The top of the riser pipe should remain open and be guarded with a trash rack and anti-vortex device. The top of the riser should be 12 inches below the elevation of the emergency spillway. The riser should be sized to convey the runoff from the 2-year, 3-hour storm when the water surface is at the emergency spillway elevation. For basins with no spillway the riser must be sized to convey the runoff from the 10-yr, 3-hour storm.
• Anti-seep collars should be included when soil conditions or length of service make piping through the backfill a possibility.
• The 48-hour drawdown time will be achieved by using a riser pipe perforated at the point measured from the bottom of the riser pipe equal to 1/2 the volume of the basin. This is the maximum sediment storage elevation. The size of the perforation may be calculated as follows:

$$Ao = \frac{As \times \sqrt{2h}}{Cd \times 980{,}000}$$

Where:
A_s = Area of the de-watering hole, ft 2
A_o = Surface area of the basin, ft 2
Cd = Coefficient of contraction, approximately 0.6
h = head of water above the hole, ft
Perforating the riser with nultiple holes in a combined surface area equal to A_o is acceptable.

Erosion Control Compost

Description: Erosion control compost (ECC) can be used as an aid to control erosion on critical sites during the establishment period of protective vegetation. The most common uses are on steep slopes, swales, diversion dikes, and on tidal or stream banks.

Materials:

ECC used for projects not related to TxDOT should be of quality materials by meeting performance standards and compost specification data. Products should meet all applicable state and federal regulations, including but not limited to the United States Environmental Protection Agency (USEPA) Code of Federal Regulations (CFR), Title 40, Part 503 Standards for Class A biosolids and TCEQ Health and Safety Regulations as defined in the Texas Administration Code (TAC), Chapter 332, and all other relevant requirements for compost products outlined in TAC, Chapter 332. TCEQ testing requirements are defined in TAC Chapter 332, including Sections §332.71 (Sampling and Analysis Requirements for Final Products) and §332.72 (Final Product Grades). Compost specification data approved by TxDOT are appropriate to use for ensuring the use of quality compost materials or for guidance.

Testing standards are dependent upon the intended use for the compost and ensures product safety, and product performance regarding the product's specific use. The appropriate compost sampling and testing protocols included in the United States Composting Council (USCC) Test Methods for the Examination of Composting and Compost (TMECC) should be conducted on compost products used for ECC to ensure that the products used will not impact public health, safety, and the environment and to promote production and marketing of quality composts that meet analytical standards. TMECC provides protocols to sample, monitor, and analyze materials during all stages of the composting process. TMECC information can be found at http://www.tmecc.org/tmecc/index.html. The USCC Seal of Testing Assurance (STA) program contains information regarding compost STA certification. STA program information can be found at http://tmecc.org/sta/STA_program_description.html.

Installation:

- Install in accordance with current TxDOT specification.
- Use on slopes 3:1 or flatter.
- Apply a 2-inch uniform layer unless otherwise shown on the plans or as directed.
- When rolling is specified, use a light corrugated drum roller.

Mulch and Compost Filter Socks

Description: Mulch and compost filter socks (erosion control logs) are used to intercept and detain sediment laden run-off from unprotected areas. When properly used, mulch and compost filter socks can be highly effective at controlling sediment from disturbed areas. They cause runoff to pond which allows heavier solids to settle. Mulch and compost filter socks are used during the period of construction near the perimeter of a disturbed area to intercept sediment while allowing water to percolate through. The sock should remain in place until the area is permanently stabilized. Mulch and compost filter socks may be installed in construction areas and temporarily moved during the day to allow construction activity provided it is replaced and properly anchored at the end nf the day. Mulch and compost filter socks may be seeded to allow for quick vegetative growth and reduction in run-off velocity.

Materials:
Mulch and compost filter socks used for projects not related to TxDOT should also be of quality materials by meeting performance standards and compost specification data. To ensure the quality of compost used for mulch and compost filter socks, products should meet all applicable state and federal regulations, including but not limited to the United States Environmental Protection Agency (USEPA) Code of Federal Regulations (CFR), Title 40, Part 503 Standards for Class A biosolids and TCEQ Health and Safety Regulations as defined in the Texas Administration Code (TAC), Chapter 332, and all other relevant requirements for compost products outlined in TAC, Chapter 332. TCEQ testing requirements are defined in TAC Chapter 332, including Sections §332.71 (Sampling and Analysis Requirements for Final Products) and §332.72 (Final Product Grades). Compost specification data approved by TxDOT are appropriate to use for ensuring the use of quality compost materials or for guidance.

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Installation:
• Install socks (erosion control logs) near the downstream perimeter of a disturbed area to intercept sediment from sheet flow.
• Secure socks in a method adequate to prevent displacement as a result of normal rain events such that flow is not allowed under the socks.
• Inspect and maintain the socks in good condition (including staking, anchoring, etc.). Maintain the integrity of the control, including keeping the socks free of accumulated silt, debris, etc., until the disturbed area has been adequately stabilized.

POST-CONSTRUCTION TSS CONTROLS

Retention/Irrigation Systems

Description: Retention/irrigation systems refer to the capture of runoff in a holding pond, then use of the captured water for irrigation of appropriate landscape areas. Retention/irrigation systems are characterized by the capture and disposal of runoff without direct release of captured flow to receiving streams. Retention systems exhibit excellent pollutant removal but require regular, proper maintenance.

Design Considerations: Retention/irrigation practices achieve 100% removal efficiency of total suspended solids contained within the volume of water captured. Design elements of

retention/irrigation systems include runoff storage facility configuration and sizing, pump and wet well system components, basin lining, basin detention time, and physical and operational components of the irrigation system. Retention/irrigation systems are appropriate for large drainage areas with low to moderate slopes. The retention capacity should be sufficient considering the average rainfall event for the area.

Maintenance Requirements: Maintenance requirements for retention/irrigation systems include routine inspections, sediment removal, mowing, debris and litter removal, erosion control, and nuisance control.

Extended Detention Basin

Description: Extended detention facilities are basins that temporarily store a portion of stormwater runoff following a storm event. Extended detention basins are normally used to remove particulate pollutants and to reduce maximum runoff rates associated with development to their pre-development levels. The water quality benefits are the removal of sediment and buoyant materials. Furthermore, nutrients, heavy metals, toxic materials, and oxygen-demanding materials associated with the particles also are removed. The control of the maximum runoff rates serves to protect drainage channels below the device from erosion and to reduce downstream flooding.

Design Considerations: Extended detention basins can remove approximately 75% of the total suspended solids contained within the volume of runoff captured in the basin. Design elements of extended detention basins include basin sizing, basin configuration, basin side slopes, basin lining, inlet/outlet structures, and erosion controls. Extended detention basins are appropriate for large drainage areas with low to moderate slopes. The retention capacity should be sufficient considering the average rainfall event for the area.

Maintenance Requirements: Maintenance requirements for extended detention basins include routine inspections, mowing, debris and litter removal, erosion control, structural repairs, nuisance control, and sediment removal.

Vegetative Filter Strips

Description: Filter strips, also known as vegetated buffer strips, are vegetated sections of land similar to grassy swales except they are essentially flat with low slopes, and are designed only to accept runoff as overland sheet flow. They may appear in any vegetated form from grassland to forest, and are designed to intercept upstream flow, lower flow velocity, and spread water out as sheet flow. The dense vegetative cover facilitates conventional pollutant removal through detention, filtration by vegetation, and infiltration. Filter strips cannot treat high velocity flows, and do not provide enough storage or infiltration to effectively reduce peak discharges to predevelopment levels for design storms. This lack of quantity control favors use in rural or low-density development; however, they can provide water quality benefits even where the impervious cover is as high as 50%.

Flat slopes and low to fair permeability of natural subsoil are required for effective performance of filter strips. Although an inexpensive control measure, they are most useful in contributing watershed areas where peak runoff velocities are low as they are unable to treat the high flow

velocities typically associated with high impervious cover. Successful performance of filter strips relies heavily on maintaining shallow unconcentrated flow. To avoid flow channelization and maintain performance, a filter strip should:
• Be equipped with a level spreading device for even distribution of runoff
• Contain dense vegetation with a mix of erosion resistant, soil binding species
• Be graded to a uniform, even and relatively low slope
• Laterally traverse the contributing runoff area

Filter strips can be used upgradient from watercourses, wetlands, or other water bodies along toes and tops of slopes and at outlets of other stormwater management structures. They should be incorporated into street drainage and master drainage planning. The most important criteria for selection and use of this BMP are soils, space, and slope.

Design Considerations: Vegetative filter strips can remove approximately 85% of the total suspended solids contained within the volume of runoff captured. Design elements of vegetative filter strips include uniform, shallow overland flow across the entire filter strip area, hydraulic loading rate, inlet structures, slope, and vegetative cover. The area should be free of gullies or rills which can concentrate flow. Vegetative filter strips are appropriate for small drainage areas with moderate slopes. Other design elements include the following:
• Soils and moisture are adequate to grow relatively dense vegetative stands
• Sufficient space is available
• Slope is less than 12%
• Comparable performance to more expensive structural controls

Maintenance Requirements: Maintenance requirements for vegetative filter strips include pest management, seasonal mowing and lawn care, routine inspections, debris and litter removal, sediment removal, and grass reseeding and mulching.

Constructed Wetlands

Description: Constructed wetlands provide physical, chemical, and biological water quality treatment of stormwater runoff. Physical treatment occurs as a result of decreasing flow velocities in the wetland, and is present in the form of evaporation, sedimentation, adsorption, and/or filtration. Chemical processes include chelation, precipitation, and chemical adsorption. Biological processes include decomposition, plant uptake and removal of nutrients, plus biological transformation and degradation. Hydrology is one of the most influential factors in pollutant removal due to its effects on sedimentation, aeration, biological transformation, and adsorption onto bottom sediments. The wetland should be designed such that a minimum amount of maintenance is required. The natural surroundings, including such things as the potential energy of a stream or flooding river, should be utilized as much as possible. The wetland should approximate a natural situation and unnatural attributes, such as rectangular shape or rigid channel, should be avoided.

Site considerations should include the water table depth, soil/substrate, and space requirements. Because the wetland must have a source of flow, it is desirable that the water table is at or near the surface. If runoff is the only source of inflow for the wetland, the water level often fluctuates and establishment of vegetation may be difficult. The soil or substrate of an artificial wetland

should be loose loam to clay. A perennial baseflow must be present to sustain the artificial wetland. The presence of organic material is often helpful in increasing pollutant removal and retention. A greater amount of space is required for a wetland system than is required for a detention facility treating the same amount of area.

Design Considerations: Constructed wetlands can remove over 90% of the total suspended solids contained within the volume of runoff captured in the wetland. Design elements of constructed wetlands include wetland sizing, wetland configuration, sediment forebay, vegetation, outflow structure, depth of inundation during storm events, depth of micropools, and aeration. Constructed wetlands are appropriate for large drainage areas with low to moderate slopes.

Maintenance Requirements: Maintenance requirements for constructed wetlands include mowing, routine inspections, debris and litter removal, erosion control, nuisance control, structural repairs, sediment removal, harvesting, and maintenance of water levels.

Wet Basins

Description: Wet basins are runoff control facilities that maintain a permanent wet pool and a standing crop of emergent littoral vegetation. These facilities may vary in appearance from natural ponds to enlarged, bermed (manmade) sections of drainage systems and may function as online or offline facilities, although offline configuration is preferable. Offline designs can prevent scour and other damage to the wet pond and minimize costly outflow structure elements needed to accommodate extreme runoff events. During storm events, runoff inflows displace part or all of the existing basin volume and are retained and treated in the facility until the next storm event. The pollutant removal mechanisms are settling of solids, wetland plant uptake, and microbial degradation. When the wet basin is adequately sized, pollutant removal performance can be excellent, especially for the dissolved fraction. Wet basins also help provide erosion protection for the receiving channel by limiting peak flows during larger storm events. Wet basins are often perceived as a positive aesthetic element in a community and off er significant opportunity for creative pond configuration and landscape design. Participation of an experienced wetland designer is suggested. A significant potential drawback for wet ponds in arid climates is that the contributing watershed for these facilities is often incapable of providing an adequate water supply to maintain the permanent pool, especially during the summer months. Makeup water (i.e., well water or municipal drinking water) is sometimes used to supplement the rainfall/runoff process, especially for wet basin facilities treating watersheds that generate insufficient runoff.

Design Considerations: Wet basins can remove over 90% of the total suspended solids contained within the volume of runoff captured in the basin. Design elements of wet basins include basin sizing, basin configuration, basin side slopes, sediment forebay, inflow and outflow structures, vegetation, depth of permanent pool, aeration, and erosion control. Wet basins are appropriate for large drainage areas with low to moderate slopes.

Maintenance Requirements: Maintenance requirements for wet basins include mowing, routine inspections, debris and litter removal, erosion control, nuisance control, structural repairs, sediment removal, and harvesting.

Grassy Swales

Grassy swales are vegetated channels that convey stormwater and remove pollutants by filtration through grass and infiltration through soil. They require shallow slopes and soils that drain well. Pollutant removal capability is related to channel dimensions, longitudinal slope, and type of vegetation. Optimum design of these components will increase contact time of runoff through the swale and improve pollutant removal rates. Grassy swales are primarily stormwater conveyance systems. They can provide sufficient control under light to moderate runoff conditions, but their ability to control large storms is limited. Therefore, they are most applicable in low to moderate sloped areas or along highway medians as an alternative to ditches and curb and gutter drainage. Their performance diminishes sharply in highly urbanized settings, and they are generally not effective enough to receive construction stage runoff where high sediment loads can overwhelm the system. Grassy swales can be used as a pretreatment measure for other downstream BMPs, such as extended detention basins. Enhanced grassy swales use check dams and wide depressions to increase runoff storage and promote greater settling of pollutants. Grassy swales can be more aesthetically pleasing than concrete or rock-lined drainage systems and are generally less expensive to construct and maintain. Swales can slightly reduce impervious area and reduce the pollutant accumulation and delivery associated with curbs and gutters. The disadvantages of this technique include the possibility of erosion and channelization over time, and the need for more right-of-way as compared to a storm drain system. When properly constructed, inspected, and maintained, the life expectancy of a swale is estimated to be 20 years.

Design Considerations:

- Comparable performance to wet basins
- Limited to treating a few acres
- Availability of water during dry periods to maintain vegetation
- Sufficient available land area

The suitability of a swale at a site will depend on land use, size of the area serviced, soil type, slope, imperviousness of the contributing watershed, and dimensions and slope of the swale system. In general, swales can be used to serve areas of less than 10 acres, with slopes no greater than 5 %. The seasonal high water table should be at least 4 feet below the surface. Use of natural topographic lows is encouraged, and natural drainage courses should be regarded as significant local resources to be kept in use.

Maintenance Requirements:

Research in the Austin area indicates that vegetated controls are effective at removing pollutants even when dormant. Therefore, irrigation is not required to maintain growth during dry periods, but may be necessary only to prevent the vegetation from dying.

Vegetation Lined Drainage Ditches

Vegetation lined drainage ditches are similar to grassy swales. These drainage ditches are vegetated channels that convey storm water and remove pollutants by filtration through grass and infiltration through soil. They require soils that drain well. Pollutant removal capability is related to channel dimensions, longitudinal slope, and type of vegetation. Optimum design of these components will increase contact time of runoff through the ditch and improve pollutant

removal rates. Vegetation lined drainage ditches are primarily storm water conveyance systems. They have vegetation lined in the low flow channel and may include vegetated shelves. Vegetation in drainage ditches reduces erosion and removes pollutants by lowering water velocity over the soil surface, binding soil particles with roots, and by filtration through grass and infiltration through soil. Vegetation lined drainage ditches can be used where:
• A vegetative lining can provide sufficient stability for the channel grade by increasing maximum permissible velocity
• Slopes are generally less than 5%, with protection from sheer stress as needed through the use of BMPs, such as erosion control blankets
• Site conditions required to establish vegetation, i.e. climate, soils, topography, are present

Design Criteria: The suitability of a vegetation lined drainage ditch at a site will depend on land use, size of the area serviced, soil type, slope, imperviousness of the contributing watershed, and dimensions and slope of the ditch system. The hydraulic capacity of the drainage ditch and other elements such as erosion, siltation, and pollutant removal capability, must be taken into consideration. Use of natural topographic lows is encouraged, and natural drainage courses should be regarded as significant local resources to be kept in use. Other items to consider include the following:
• Capacity, cross-section shape, side slopes, and grade
• Select appropriate native vegetation
• Construct in stable, low areas to conform with the natural drainage system. To reduce erosion potential, design the channel to avoid sharp bends and steep grades.
• Design and build drainage ditches with appropriate scour and erosion protection. Surface water should be able to enter over the vegetated banks without erosion occurring.
• BMPs, such as erosion control blankets, may need to be installed at the time of seeding to provide stability until the vegetation is fully established. It may also be necessary to divert water from the channel until vegetation is established or to line the channel with sod.
• Vegetated ditches must not be subject to sedimentation from disturbed areas.
• Sediment traps may be needed at channel inlets to prevent entry of muddy runoff and channel sedimentation.
• Availability of water during dry periods to maintain vegetation
• Sufficient available land area

Maintenance:
During establishment, vegetation lined drainage ditches should be inspected, repaired, and vegetation reestablished if necessary. After the vegetation has become established, the ditch should be checked periodically to determine if the channel is withstanding flow velocities without damage. Check the ditch for debris, scour, or erosion and immediately make repairs if needed. Check the channel outlet and all road crossings for bank stability and evidence of piping or scour holes and make repairs immediately. Remove all significant sediment accumulations to maintain the designed carrying capacity. Keep the vegetation in a healthy condition at all times, since it is the primary erosion protection for the channel. Vegetation lined drainage ditches should be seasonally maintained by mowing or irrigating, depending on the vegetation selected. The long-term management of ditches as stable, vegetated, "natural" drainage systems with native vegetation buffers is highly recommended due to the inherent stability offered by grasses, shrubs, trees, and other vegetation.

Sand Filter Systems

The objective of sand filters is to remove sediment and the pollutants from the first flush of pavement and impervious area runoff. The filtration of nutrients, organics, and coliform bacteria is enhanced by a mat of bacterial slime that develops during normal operations. One of the main advantages of sand filters is their adaptability; they can be used on areas with thin soils, high evaporation rates, low-soil infiltration rates, in limited-space areas, and where groundwater is to be protected. There have been numerous alterations or variations in the original design as engineers in other jurisdictions have improved and adapted the technology to meet their specific requirements. Major types include the Austin Sand Filter, the District of Columbia Underground Sand Filter, the Alexandria Dry Vault Sand Filter, the Delaware Sand Filter, and peat-sand filters which are adapted to provide a sorption layer and vegetative cover to various sand filter designs.

Design Considerations:

- Appropriate for space-limited areas
- Applicable in arid climates where wet basins and constructed wetlands are not appropriate
- High TSS removal efficiency

Cost Considerations:

Filtration Systems may require less land than some other BMPs, reducing the land acquisition cost; however the structure itself is one of the more expensive BMPs. In addition, maintenance cost can be substantial.

Erosion Control Compost

Description: Erosion control compost (ECC) can be used as an aid to control erosion on critical sites during the establishment period of protective vegetation. The most common uses are on steep slopes, swales, diversion dikes, and on tidal or stream banks.

Materials:

ECC used for projects not related to TxDOT should also be of quality materials by meeting performance standards and compost specification data. To ensure the quality of compost used as an ECC, products should meet all applicable state and federal regulations, including but not limited to the United States Environmental Protection Agency (USEPA) Code of Federal Regulations (CFR), Title 40, Part 503 Standards for Class A biosolids and TCEQ Health and Safety Regulations as defined in the Texas Administration Code (TAC), Chapter 332, and all other relevant requirements for compost products outlined in TAC, Chapter 332. TCEQ testing requirements are defined in TAC Chapter 332, including Sections §332.71 (Sampling and Analysis Requirements for Final Products) and §332.72 (Final Product Grades). Compost specification data approved by TxDOT are appropriate to use for ensuring the use of quality compost materials or for guidance.

Testing standards are dependent upon the intended use for the compost and ensures product safety, and product performance regarding the product's specific use. The appropriate compost sampling and testing protocols included in the United States Composting Council (USCC) Test Methods for the Examination of Composting and Compost (TMECC) should be conducted on compost products used for ECC to ensure that the products used will not impact public health,

safety, and the environment and to promote production and marketing of quality composts that meet analytical standards. TMECC information can be found at http://www.tmecc.org/tmecc/index.html. The USCC Seal of Testing Assurance (STA) program contains information regarding compost ST A certification. STA program information can be found at http://tmecc.org/sta/STA_program_description.html.

Installation:
- Install in accordance with current TxDOT specification.
- Use on slopes 3:1 or flatter.
- Apply a 2-inch uniform layer unless otherwise shown on the plans or as directed.
- When rolling is specified, use a light corrugated drum roller.

Mulch and Compost Filter Socks

Description: Mulch and compost filter socks (erosion control logs) are used to intercept and detain sediment laden run-off from unprotected areas. When properly used, mulch and compost filter socks can be highly effective at controlling sediment from disturbed areas. They cause runoff to pond which allows heavier solids to settle. Mulch and compost filter socks are used during the period of construction near the perimeter of a disturbed area to intercept sediment while allowing water to percolate through. The sock should remain in place until the area is permanently stabilized. Mulch and compost filter socks may be installed in construction areas and temporarily moved during the day to allow construction activity provided it is replaced and properly anchored at the end of the day. Mulch and compost filter socks may be seeded to allow for quick vegetative growth and reduction in run-off velocity.

Materials:
Mulch and compost filter socks used for projects not related to TxDOT should also be of quality materials by meeting performance standards and compost specification data. To ensure the quality of compost used for mulch and compost filter socks, products should meet all applicable state and federal regulations, including but not limited to the United States Environmental Protection Agency (USEPA) Code of Federal Regulations (CFR), Title 40, Part 503 Standards for Class A biosolids and TCEQ Health and Safety Regulations as defined in the Texas Administration Code (TAC), Chapter 332, and all other relevant requirements for compost products outlined in TAC, Chapter 332. TCEQ testing requirements are defined in TAC Chapter 332, including §332.71 (Sampling and Analysis Requirements for Final Products) and §332.72 (Final Product Grades). Compost specification data approved by TxDOT are appropriate to use for ensuring the use of quality compost materials or for guidance.

Testing standards are dependent upon the intended use for the compost and ensures product safety, and product performance regarding the product.es specific use. The appropriate compost sampling and testing protocols included in the United States Composting Council (USCC) Test Methods for the Examination of Composting and Compost (TMECC) should be conducted on compost products used for mulch and compost filter socks to ensure that the products used will not impact public health, safety, and the environment and to promote production and marketing of quality composts that meet analytical standards. TMECC information can be found at http://www.tmecc.org/tmecc/index.html. The USCC Seal of Testing Assurance (STA) program

contains information regarding compost STA certification. STA program information can be found at http://tmecc.org/sta/STA_program_description.html.

Installation:
• Install in accordance with TxDOT Special Specification 5049.
• Install socks (erosion control logs) near the downstream perimeter of a disturbed area to intercept sediment from sheet flow.
• Secure socks in a method adequate to prevent displacement as a result of normal rain events such that flow is not allowed under the socks.
• Inspect and maintain the socks in good condition (including staking, anchoring, etc.). Maintain the integrity of the control, including keeping the socks free of accumulated silt, debris, etc., until the disturbed area has been adequately stabilized.

Sedimentation Chambers (only to be used when there is no space available for other approved BMP's)
Description: Sedimentation chambers are stormwater treatment structures that can be used when space is limited such as urban settings. These structures are often tied into stormwater drainage systems for treatment of stormwater prior to entering state waters. The water quality benefits are the removal of sediment and buoyant materials. These structures are not designed as a catch basin or detention basin and not typically used for floodwater attenuation.

Design Considerations: Average rainfall and surface area should be considered when following manufacturer's recommendations for chamber sizing and/or number of units needed to achieve effective TSS removal. If properly sized, 50-80% removal of TSS can be expected.

Maintenance Requirements: Maintenance requirements include routine inspections, sediment, debris and litter removal, erosion control and nuisance control.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1201 ELM STREET, SUITE 500
DALLAS, TEXAS 75270

December 14, 2020

Joe McMahan
Chief, Regulatory Division
Galveston District, U.S. Army Corps of Engineers
2000 Fort Point Road
Galveston, TX 77550

RE: Clean Water Act Section 401 Water Quality Certification for the 2020 U.S. Army Corps of Engineers Section 404 Nationwide Permits Reissuance, on behalf of Indian tribes that have not received Treatment in a Similar Manner as a State for Section 401 in EPA Region 6.

Dear Mr. McMahan:

This water quality certification (WQC) applies to any potential point source discharges from potential projects authorized under the proposed reissuance of the following U.S. Corps of Engineers (Corps) Nationwide Permits (NWPs) into waters of the United States that occur within tribal boundaries within the State of Texas: NWP 3, 4, 5, 6, 7, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 25, 27, 29, 30, 31, 32, 33, 34, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 48, 49, 50, 51, 52, 53, 54, C, D and E. The Corps is not requesting certification for 11 NWPs: 1, 2, 8, 9, 10, 11, 24, 28, 35, A, and B.

Section 401(a)(1) of the Clean Water Act (CWA) requires applicants for Federal permits and licenses that may result in discharges into waters of the United States to obtain certification that potential discharges will comply with applicable provisions of the CWA, including Sections 301, 302, 303, 306 and 307. Where no state agency or tribe has authority to give such certification, the U.S. Environmental Protection Agency (EPA) is the certifying authority. In this case, Ysleta del Sur Pueblo, Alabama-Coushatta Tribe of Texas, and Kickapoo Traditional Tribe of Texas do not have the authority to provide CWA Section 401 certification for discharges occurring within the boundaries of the aforementioned tribal lands, therefore, EPA Region 6 is making the certification decisions for discharges that may result from the potential projects authorized under the proposed Corps CWA 404 NWPs. This letter is being directed to Galveston District, which is the lead regulatory program for NWP reissuance in Texas; the Albuquerque, Fort Worth, Galveston, and Tulsa Districts are also represented. Consistent with the *EPA Policy on Consultation and Coordination with Indian Tribes*, EPA Region 6 circulated a letter dated September 18, 2020 offering to consult with tribes on the certification process and invite their participation.

Reissuance of NWPs Description

The Corps is proposing to re-issue its existing NWPs and associated general conditions and definitions, with some **modifications. The Corps states that it is "proposing these modifications to simplify and** clarify the NWPs, reduce burdens on the regulated public, and continue to comply with the statutory requirement that these NWPs authorize only activities with no more than minimal individual and **cumulative adverse environmental effects." 85 FR 57298.** For more details:

https://www.usace.army.mil/Missions/Civil-Works/Regulatory-Program-and-Permits/Nationwide-Permits/.

General Information

The general information provided in this section does not constitute a certification condition(s).

Project proponents for potential projects authorized under the NWPs are responsible for obtaining all other permits, licenses, and certifications that may be required by federal, state, or tribal authorities.

Project proponents for potential projects authorized under the NWPs should conduct all work in such a manner as to comply with all Corps Section 404 permit conditions.

Copies of the Corps permit including this certification should be kept on the job site and readily available to the public for reference.

Project proponents for potential projects authorized under the NWPs should retain this certification in **their files with the applicable NWPs as documentation of EPA's certification decisions for the above-**referenced proposed NWPs. This certification is specifically associated with the proposed NWPs described above and expires when those NWPs expire, five years from Corps issuance date.

During project planning, EPA highly recommends the project proponent notify the appropriate tribal environmental office of the project details and location.

Certification Determination

Grant (121.7(c)):

On behalf of Ysleta del Sur Pueblo, Alabama-Coushatta Tribe of Texas, and Kickapoo Traditional Tribe of Texas, CWA Section 401 certification, for the following proposed NWPs, is granted with no conditions. EPA Region 6 has determined that any discharge that could be authorized under the following proposed NWPs will comply with water quality requirements, as defined at 40 CFR 121.1(n).

> **NWP 3, 4, 5, 6, 7, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 25, 27, 29, 30, 31, 32, 33, 34, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 48, 49, 50, 51, 52, 53, 54, C, D, and E**

Thank you for your ongoing partnership in implementing the regulatory programs of the CWA. Should your office have any questions, please feel free to contact our staff: 1) Paul Kaspar at 214-665-7459, Kaspar.Paul@epa.gov; 2) Daniel Landeros at 214-665-8077, Landeros.Daniel@epa.gov.

Sincerely,

Charles Maguire

Charles W. Maguire
Director
Water Division

From: Skoruppa, Mary Kay <mary_kay_skoruppa@fws.gov>
Sent: Friday, December 6, 2024 10:40 AM
To: Jody Urbanovsky
Subject: Transmission Line in Webb County

Hi Mr. Urbanovsky,
I received your letter dated October 11, 2024, to the USFWS and would like to suggest that the first step, if not done already, is to visit our Information for Planning, and Consultation web site at https://ipac.ecosphere.fws.gov/.
This web site will produce a list of species for the project area entered and also has Determination Keys and Consultation steps. The USFWS is happy to provide additional assistance as needed.
Mary Kay

Mary Kay Skoruppa
Fish and Wildlife Biologist/Texas Sea Turtle Coordinator
U.S. Fish and Wildlife Service
Texas Coastal and Central Plains Ecological Services
4444 Corona Dr., Suite 215
Corpus Christi, TX 78411
Work cell 346-815-0009
Email: mary_kay_skoruppa@fws.gov
https://www.fws.gov/office/texas-coastal-and-central-plains-ecological-services

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Texas Coastal & Central Plains Esfo
17629 El Camino Real, Suite 211
Houston, TX 77058-3051
Phone: (281) 286-8282 Fax: (281) 488-5882

In Reply Refer To: 01/29/2025 17:09:24 UTC
Project Code: 2025-0048962
Project Name: 41670.002 Mangana Hein

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The U.S. Fish and Wildlife Service (Service) field offices in Clear Lake, Corpus Christi, Fort Worth, and Alamo, Texas, have combined administratively to form the Texas Coastal Ecological Services Field Office. All project related correspondence should be sent to the field office address listed below responsible for the county in which your project occurs:

Project Leader; U.S. Fish and Wildlife Service; 17629 El Camino Real Ste. 211; Houston, Texas 77058
Angelina, Austin, Brazoria, Brazos, Chambers, Colorado, Fayette, Fort Bend, Freestone, Galveston, Grimes, Hardin, Harris, Houston, Jasper, Jefferson, Leon, Liberty, Limestone, Madison, Matagorda, Montgomery, Newton, Orange, Polk, Robertson, Sabine, San Augustine, San Jacinto, Trinity, Tyler, Walker, Waller, and Wharton.

Assistant Field Supervisor, U.S. Fish and Wildlife Service; 4444 Corona Drive, Ste 215; Corpus Christi, Texas 78411
Aransas, Atascosa, Bee, Brooks, Calhoun, De Witt, Dimmit, Duval, Frio, Goliad, Gonzales, Hidalgo, Jackson, Jim Hogg, Jim Wells, Karnes, Kenedy, Kleberg, La Salle, Lavaca, Live Oak, Maverick, McMullen, Nueces, Refugio, San Patricio, Victoria, and Wilson.

U.S. Fish and Wildlife Service; Santa Ana National Wildlife Refuge; Attn: Texas Ecological Services Sub-Office; 3325 Green Jay Road, Alamo, Texas 78516
Cameron, Hidalgo, Starr, Webb, Willacy, and Zapata.

For questions or coordination for projects occurring in counties not listed above, please contact arles@fws.gov.

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your

proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the Service under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2) (c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at: http://www.fws.gov/media/endangered-species-consultation-handbook.

Non-Federal entities may consult under Sections 9 and 10 of the Act. Section 9 and Federal regulations prohibit the take of endangered and threatened species, respectively, without special exemption. “Take” is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. “Harm” is further defined (50 CFR § 17.3) to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. “Harass” is defined (50 CFR § 17.3) as intentional or negligent actions that create the likelihood of

injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Should the proposed project have the potential to take listed species, the Service recommends that the applicant develop a Habitat Conservation Plan and obtain a section 10(a)(1)(B) permit. The Habitat Conservation Planning Handbook is available at: https://www.fws.gov/library/collections/habitat-conservation-planning-handbook.

Migratory Birds:
In addition to responsibilities to protect threatened and endangered species under the Act, there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts visit: https://www.fws.gov/program/migratory-birds.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable National Environmental Policy Act (NEPA) documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures see https://www.fws.gov/library/collections/threats-birds.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
- Bald & Golden Eagles
- Migratory Birds
- Wetlands

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Texas Coastal & Central Plains Esfo
17629 El Camino Real, Suite 211
Houston, TX 77058-3051
(281) 286-8282

PROJECT SUMMARY

Project Code: 2025-0048962
Project Name: 41670.002 Mangana Hein
Project Type: Distribution Line - New Construction - Above Ground
Project Description: 138-kV Transmission Line
Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@27.40333185,-99.44550241057863,14z

Counties: Webb County, Texas

ENDANGERED SPECIES ACT SPECIES

There is a total of 8 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Note that 2 of these species should be considered only under certain conditions.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

BIRDS

NAME	STATUS
Cactus Ferruginous Pygmy-owl *Glaucidium brasilianum cactorum* There is **final** critical habitat for this species. Species profile: https://ecos.fws.gov/ecp/species/1225	Threatened
Piping Plover *Charadrius melodus* Population: [Atlantic Coast and Northern Great Plains populations] - Wherever found, except those areas where listed as endangered. There is **final** critical habitat for this species. Your location does not overlap the critical habitat. This species only needs to be considered under the following conditions: ▪ Wind related projects within migratory route. Species profile: https://ecos.fws.gov/ecp/species/6039	Threatened
Rufa Red Knot *Calidris canutus rufa* There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. This species only needs to be considered under the following conditions: ▪ Wind Related Projects Within Migratory Route Species profile: https://ecos.fws.gov/ecp/species/1864	Threatened

CLAMS

NAME	STATUS
Mexican Fawnsfoot *Truncilla cognata* There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/7870	Proposed Endangered
Salina Mucket *Potamilus metnecktayi* There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8753	Proposed Endangered
Texas Hornshell *Popenaias popeii* There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/919	Endangered

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus* There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/9743	Proposed Threatened

FLOWERING PLANTS

NAME	STATUS
Ashy Dogweed *Thymophylla tephroleuca*	Endangered

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/7696

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

BALD & GOLDEN EAGLES

Bald and Golden Eagles are protected under the Bald and Golden Eagle Protection Act [2] and the Migratory Bird Treaty Act (MBTA) [1]. Any person or organization who plans or conducts activities that may result in impacts to Bald or Golden Eagles, or their habitats, should follow appropriate regulations and consider implementing appropriate avoidance and minimization measures, as described in the various links on this page.

---

1. The Bald and Golden Eagle Protection Act of 1940.
2. The Migratory Birds Treaty Act of 1918.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

THERE ARE NO BALD AND GOLDEN EAGLES WITHIN THE VICINITY OF YOUR PROJECT AREA.

MIGRATORY BIRDS

The Migratory Bird Treaty Act (MBTA) [1] prohibits the take (including killing, capturing, selling, trading, and transport) of protected migratory bird species without prior authorization by the Department of Interior U.S. Fish and Wildlife Service (Service). The incidental take of migratory birds is the injury or death of birds that results from, but is not the purpose, of an activity. The Service interprets the MBTA to prohibit incidental take.

---

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the "Probability of Presence Summary" below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Brownsville Curve-billed Thrasher *Toxostoma curvirostre oberholseri* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/11981	Breeds Feb 15 to Aug 15
Chihuahuan Raven *Corvus cryptoleucus* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/11945	Breeds Apr 1 to Aug 31
Chimney Swift *Chaetura pelagica* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9406	Breeds Mar 15 to Aug 25
Eastern Meadowlark *Sturnella magna* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9455	Breeds Apr 25 to Aug 31
Painted Bunting *Passerina ciris* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9511	Breeds Apr 25 to Aug 15

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

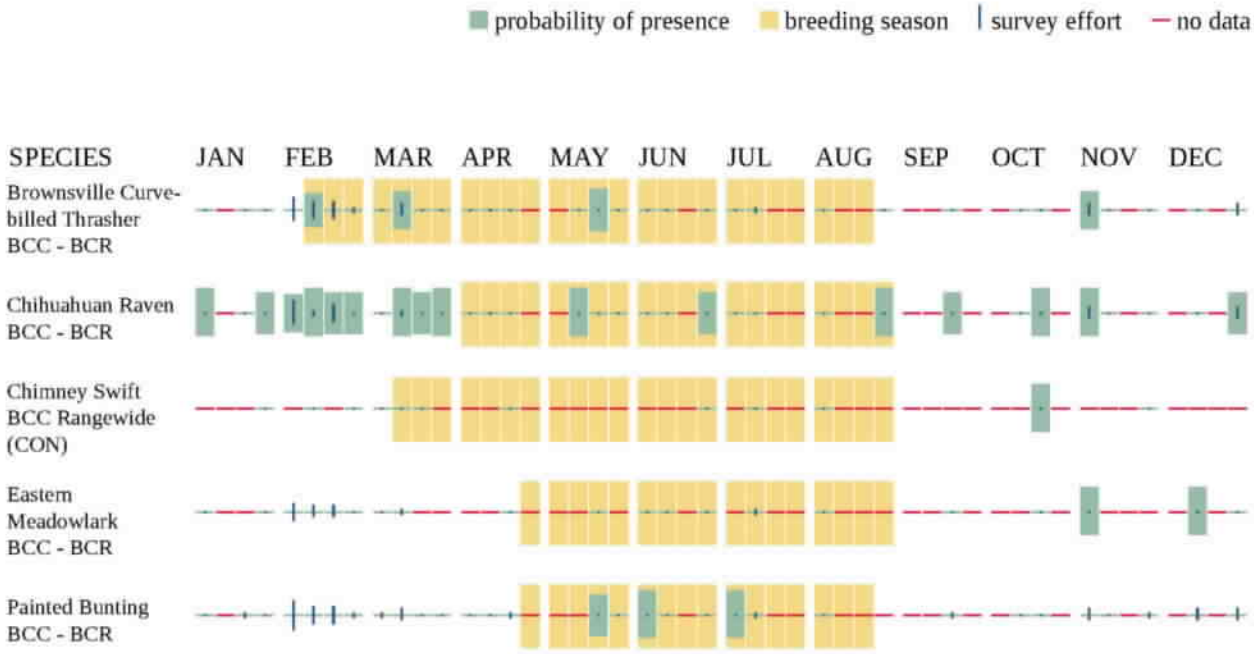
Probability of Presence (□)

Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

Breeding Season ( )
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

Survey Effort (|)
Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data (–)
A week is marked as having no data if there were no survey events for that week.



Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide avoidance and minimization measures for birds
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

WETLANDS

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

FRESHWATER POND

- PUBF
- PUBH

RIVERINE

- R4SBC

IPAC USER CONTACT INFORMATION

Agency: Halff Associates Inc.
Name: Margaret Harpe
Address: 1201 North Bowser Road
City: Richardson
State: TX
Zip: 75081-2275
Email mharpe@halff.com
Phone: 2142176478

From:	lpaul@jca-law.com
Sent:	Thursday, October 17, 2024 9:41 AM
To:	Jody Urbanovsky
Cc:	Jed Brown; 'TONY ARCE Jr'
Subject:	Response to October 11, 2024 Correspondence Addressed to Webb County - City of Laredo Regional Mobility Authority

Mr. Urbanovsky:

My name is Lisa Paul, an attorney with JCA Law. JCA Law serves as counsel and administrative offices for the WC-CL RMA.

The WC-CL RMA is in receipt of your October 11th correspondence regarding the environmental assessment and alternative analysis that will be conducted by HALFF in support of AEP's CCN application.

The WC-CL RMA does not have any projects in the vicinity of Loop 20 and Magana-Hein Road. You may wish to contact Webb County regarding your request.

Best Regards,

Lisa Paul

Lisa M. Paul
Attorney at Law

JCA | LAW PLLC

Laredo
216 W. Village Blvd.,
Ste. 202,
Laredo, Tx 78041
(956) 717-1300

San Antonio
100 N. E. Loop 410,
Ste. 1070,
San Antonio, Tx 78216
(210) 465-7440

Corpus Christi
4466 South Staples St.,
Corpus Christi, Tx 78411
(361) 333-2229

lpaul@jca-law.com www.jca-law.com

APPENDIX B - PUBLIC INVOLVEMENT

PUBLIC OPEN HOUSE INVITATION LETTER

AEP TEXAS
An AEP Company

January 6, 2025

IMPORTANT INFORMATION ABOUT YOUR PROPERTY
«Name_1» «Name_2»
«Mailing_Address»
«City», «State» «Zip_Code»

RE: Mangana Hein Transmission Improvements Project Open House Invitation

Dear Neighbor,

You are receiving this letter because you own property or live in the area where AEP Texas representatives plan to upgrade the local transmission power grid in Webb County. We want to share information about the proposed upgrades and invite you to an open house to learn more.

WE WANT YOUR FEEDBACK

Please join us on Thursday, January 23, from 5-7 p.m. at the La Presa Community Center located at 1983 Mangana Hein Road in Laredo.

See more information below.

The Magana Hein Transmission Improvements Project involves building about two miles of double-circuit 138-kilovolt transmission line in Laredo. The new line connects AEP Texas' existing Rio Bravo – Wormser Road transmission line to the recently constructed Mangana Hein Substation just west of La Presa.

The proposed project improves regional reliability and resiliency and allows more flexibility to address the area's growing power demand.

The Public Utility Commission of Texas (PUC) requires AEP Texas officials to file a Certificate of Convenience and Necessity (CCN) application for review and approval of the project. The PUC determines the final line route following the review of the CCN application. AEP Texas representatives plan to file a CCN application for the project next spring and expect to receive a response on the project from the PUC in **early 2026**.

AEP Texas representatives are evaluating preliminary route links in the area for the proposed power line. Each preliminary route link represents an option for the PUC to consider when selecting a final transmission line route.

AEP Texas representatives invite you to learn more about this project and share your input on the route development process in the ways listed below.

IN-PERSON OPEN HOUSE: Join us on **Thursday, January 23, from 5-7 p.m.** at the **La Presa Community Center** located at **1983 Mangana Hein Road** in Laredo. At the open house, you can view detailed maps and talk with team members about the preliminary route links. We encourage visitors to bring the attached comment form to the meeting to provide comments to the team after reviewing maps. There will be no formal presentation, so you can arrive at any time during the event.

AEP TEXAS
An AEP Company

VIRTUAL OPEN HOUSE: If you can't attend the in-person open house l, you may visit the virtual open house at **AEPTexas.com/Mangana** to access project information, view an interactive map and submit comments.

ALTERNATE WAYS TO PROVIDE INPUT OR CONTACT THE PROJECT TEAM:

- Call **833-329-4865** to leave a message with your feedback or questions for the project team.
- Email your input or questions to AEPTexasOutreach@aep.com
- Review the enclosed fact sheet and FAQ (Frequently Asked Questions), complete the enclosed property information comment form and mail it back to us in the envelope provided.
- Submit comments to the project team through the interactive map on the project website.

When sharing your input please feel free to include information about your property, such as:

- Historically significant buildings or landmarks such as cemeteries
- Natural features such as wetlands or springs
- Future plans for your property

To learn more about the project, please visit **AEPTexas.com/Mangana. Please share your input by February 13, 2025**. We welcome and encourage your feedback about this project.

Sincerely,

AKnight

Adriana Knight
Project Outreach Specialist
833-329-4865
AEPTexasOutreach@aep.com

Para obtener más información en español, visite AEPTexas.com/Mangana

el 6 de enero de 2025

INFORMACIÓN IMPORTANTE SOBRE SU PROPIEDA
«Name_1» «Name_2»
«Mailing_Address»
«City», «State» «Zip_Code»

RE: Invitación Para La Casa Abierta Del Magana Hein Transmission Improvements Project

Querido vecino,

Usted recibe esta carta porque es propietario de una propiedad o vive en el área donde los representantes de AEP Texas planean mejorar la red eléctrica de transmisión local en el condado de Webb. Queremos compartir información sobre las mejoras propuestas e invitarlo a una casa abierta para obtener más información.

QUEREMOS SUS COMENTARIOS

Únase a nosotros el jueves 23 de enero de 5 a 7 p. m. en La Presa Community Center ubicado en 1983 Mangana Hein Road en Laredo.

Vea más información a continuación.

El Mangana Hein Transmission Improvements Project implica la construcción de aproximadamente dos millas de línea de transmisión de 138 kilovoltios de doble circuito en Laredo. La nueva línea conecta la línea de transmisión Rio Bravo – Wormser Road existente de AEP Texas con la Subestación Mangana Hein al este de La Presa.

El proyecto propuesto mejora la confiabilidad y resiliencia para permitir más flexibilidad para abordar la creciente demanda de energía del área.

La Comisión de Servicios Públicos de Texas (PUC) requiere que los funcionarios de AEP Texas presenten una solicitud de Certificado de Conveniencia y Necesidad (CCN) para la revisión y aprobación del proyecto. La PUC determina el recorrido final de la línea tras la revisión de la solicitud del CCN. Los representantes de AEP Texas planean presentar una solicitud de CCN para el proyecto esta primavera y esperan recibir una respuesta de la PUC sobre el proyecto para **los principios de 2026**.

Los representantes de AEP Texas están evaluando enlaces de rutas preliminares en el área para la línea eléctrica propuesta. Cada enlace de ruta preliminar representa una opción que la PUC debe considerar al seleccionar una ruta final de línea de transmisión.

Los representantes de AEP Texas lo invitan a conocer más sobre este proyecto y compartir sus comentarios sobre el proceso de desarrollo de rutas de las maneras que se enumeran a continuación.

CASA ABIERTA EN PERSONA: Únase a nosotros **el jueves 23 de enero de 5 a 7 p. m. La Presa Community Center** ubicado en **1983 Mangana Hein Road** en Laredo. En la casa abierta, podrá ver mapas detallados y hablar con los miembros del equipo sobre los enlaces de ruta preliminares.

Alentamos a los visitantes a traer la forma de comentarios adjunta a la reunión para brindar comentarios al equipo después de revisar los mapas. No habrá presentación formal, por lo que podrá llegar en cualquier momento durante el evento.

CASA ABIERTA VIRTUAL: Si no puede asistir a la casa abierta en persona, puede visitar la casa abierta virtual en **AEPTexas.com/Mangana** para acceder a información del proyecto, ver un mapa interactivo y enviar comentarios.

FORMAS ALTERNATIVAS PARA COMENTAR O CONTACTAR AL EQUIPO DEL PROYECTO:

- Llame al **833-329-4865** para dejar un mensaje con sus comentarios o preguntas para el equipo del proyecto.
- Envíe sus comentarios o preguntas por correo electrónico a AEPTexasOutreach@aep.com
- Revise la hoja informativa adjunta y la hoja con preguntas frecuentes, complete el formulario de comentarios de información de propiedad adjunto y envíenoslo por correo en el sobre provisto.
- Enviar comentarios al equipo del proyecto a través del mapa interactivo en el sitio web del proyecto.

Al compartir sus comentarios, no dude en incluir información sobre su propiedad, como, por ejemplo:

- Edificios o puntos de referencia de importancia histórica, como cementerios.
- Características naturales como humedales o manantiales.
- Planes futuros para su propiedad

Para obtener más información sobre el proyecto, visite **AEPTexas.com/Mangana**. **Comparta sus comentarios antes del 13 de febrero de 2025**. Agradecemos y alentamos sus comentarios sobre este proyecto.

Sinceramente,

Adriana Knight
Especialista en Divulgación de Proyectos
833-329-4865
AEPTexasOutreach@aep.com

PUBLIC OPEN HOUSE INVITATION POSTCARD

MANGANA HEIN TRANSMISSION IMPROVEMENTS PROJECT

January 23, 2025 · 5-7 p.m. · La Presa Community Center · 1983 Mangana Hein · Laredo, TX 78046

Join Us For An Open House

PROJECT INFORMATION

AEP Texas representatives plan to upgrade the local transmission power grid in Webb County. The project involves building approximately 2 miles of new double-circuit 138-kV transmission line to connect the new Mangana Hein Substation to the AEP Texas' existing Rio Bravo - Wormser Road transmission line.

PROJECT BENEFITS

Installing an additional power source to the area improves the region's electric reliability and resiliency. This improvements allows for more flexibility to address the area's growing power demand and reduces the likelihood and duration of outages for area customers.

SHARE YOUR INPUT

Please join us from 5 p.m. - 7 p.m. on Thursday, January 23, at La Presa Community Center. You can view detailed maps and talk with project team members about the possible route options for the new 2-mile transmission line. There is no formal presentation so you can arrive at any time during the event. Spanish-speaking representatives and informational materials will also be available at the open house.

If you can't attend the in-person open house or are feeling unwell, you may visit the virtual open house at AEPTexas.com/Mangana to access project information, view an interactive map and submit comments. **Please share your input by February 13, 2025.**

Acompañenos En La Casa Abierta

INFORMACIÓN DEL PROYECTO

Los representantes de AEP Texas planean mejorar la red eléctrica de transmisión local en el condado de Webb. El proyecto implica la construcción de aproximadamente 2 millas de nueva línea de transmisión de 138 kV de doble circuito para conectar la nueva subestación Mangana Hein a la línea de transmisión existente Río Bravo - Wormser Road de AEP Texas.

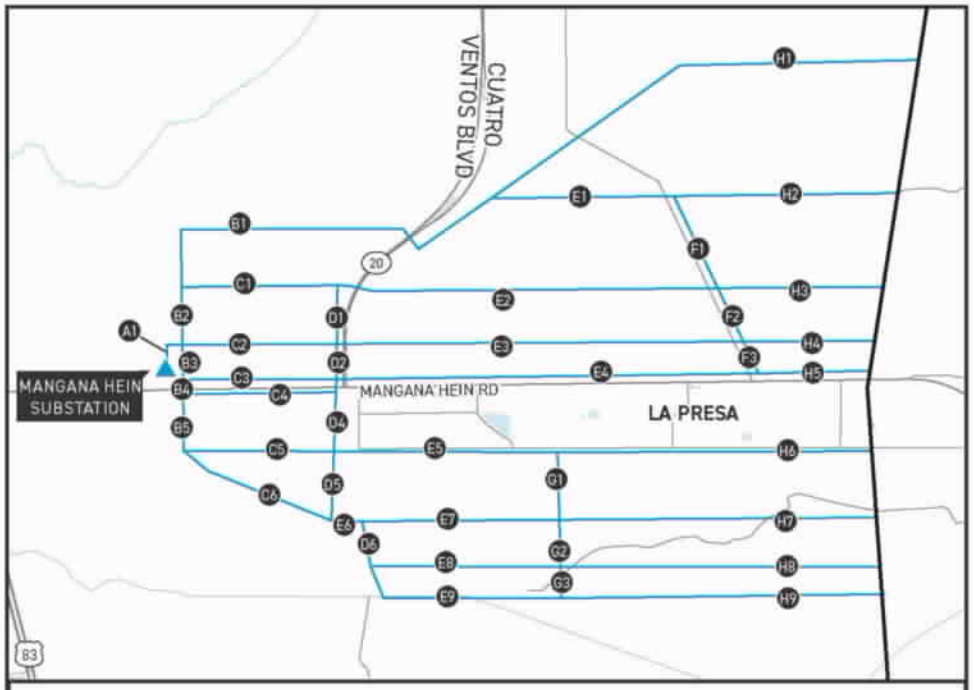
BENEFICIOS DEL PROYECTO

La instalación de una fuente de energía adicional en el área mejora la confiabilidad y resiliencia eléctrica de la región. Estas mejoras permiten una mayor flexibilidad para abordar la creciente demanda de energía del área y reducen la probabilidad y la duración de los cortes para los clientes del área.

COMPARTE TUS COMENTARIOS

Únase a nosotros desde las 5 p.m. - 7 p.m. el jueves 23 de enero en La Presa Community Center. Puede ver mapas detallados y hablar con los miembros del equipo del proyecto sobre posibles opciones de ruta para la nueva línea de transmisión de 2 millas.. No hay presentación formal por lo que puedes llegar en cualquier momento durante el evento. Representantes de que hablan español y materiales informativos también estarán disponibles en la casa abierta.

Si no puede asistir a la casa abierta en persona o no se siente bien, puede visitar la casa abierta virtual en AEPTexas.com/Mangana para acceder la información del proyecto, ver un mapa interactivo y enviar comentarios. **Comparta sus comentarios antes del 13 de febrero de 2025.**



MANGANA HEIN TRANSMISSION IMPROVEMENTS PROJECT

N

PRELIMINARY ROUTE LINKS

EXISTING TRANSMISSION LINE

FUTURE SUBSTATION

00 ROUTE LINK LABEL

WE VALUE YOUR INPUT. PLEASE SEND COMMENTS AND QUESTIONS TO:

ADRIANA KNIGHT · PROJECT OUTREACH SPECIALIST
AEPTEXASOUTREACH@AEP.COM · 833-329-4865
AEPTEXAS.COM/MANGANA

AEP TEXAS
An AEP Company

539 N Carancahua,
Corpus Christi, TX 78401

PROJECT FACTSHEET WITH PROJECT MAP AND TYPICAL STRUCTURE GRAPHIC

MANGANA HEIN TRANSMISSION IMPROVEMENTS PROJECT

The Mangana Hein Transmisson Improvements Project involves the construction of approximately 2 miles of new double-circuit 138-kilovolt (kV) transmission line in Webb County. Crews expect to begin construction late 2026 and conclude late 2027.

WHAT

The project involves building approximately 2 miles of new double-circuit 138-kV transmission line.

AEP Texas officials plan to file an application to amend its Certificate of Convenience and Necessity (CCN) application with the Public Utility Commission of Texas (PUC) in spring 2025, following a review of public input on route link development and additional route analysis. The final line route is determined by the PUC.

WHY

The proposed project improves regional reliability and resiliency with the addition of a new 138-kV transmission line and modernizes the electric system to allow more flexibility to address the area's growing power demand and ensures reliable power, reducing the likelihood and duration of outages for area customers.

WHERE

The project area includes the city of Laredo in Webb County.

Landowner feedback is critical because it allows AEP Texas to further define the preliminary route links before they are submitted to the PUC as part of the CCN application.

PROJECT ANNOUNCEMENT
December 2024

2025

OPEN HOUSE
January 2025

CCN* APPLICATION FILED WITH THE PUC
Late Spring 2025

ANTICIPATED PUC* APPROVAL & FINAL ROUTE DETERMINATION
Early 2026

2026

RIGHT-OF-WAY COMMUNICATIONS BEGIN
Spring 2026

PRE-CONSTRUCTION ACTIVITIES BEGIN
Late Spring 2026

2027

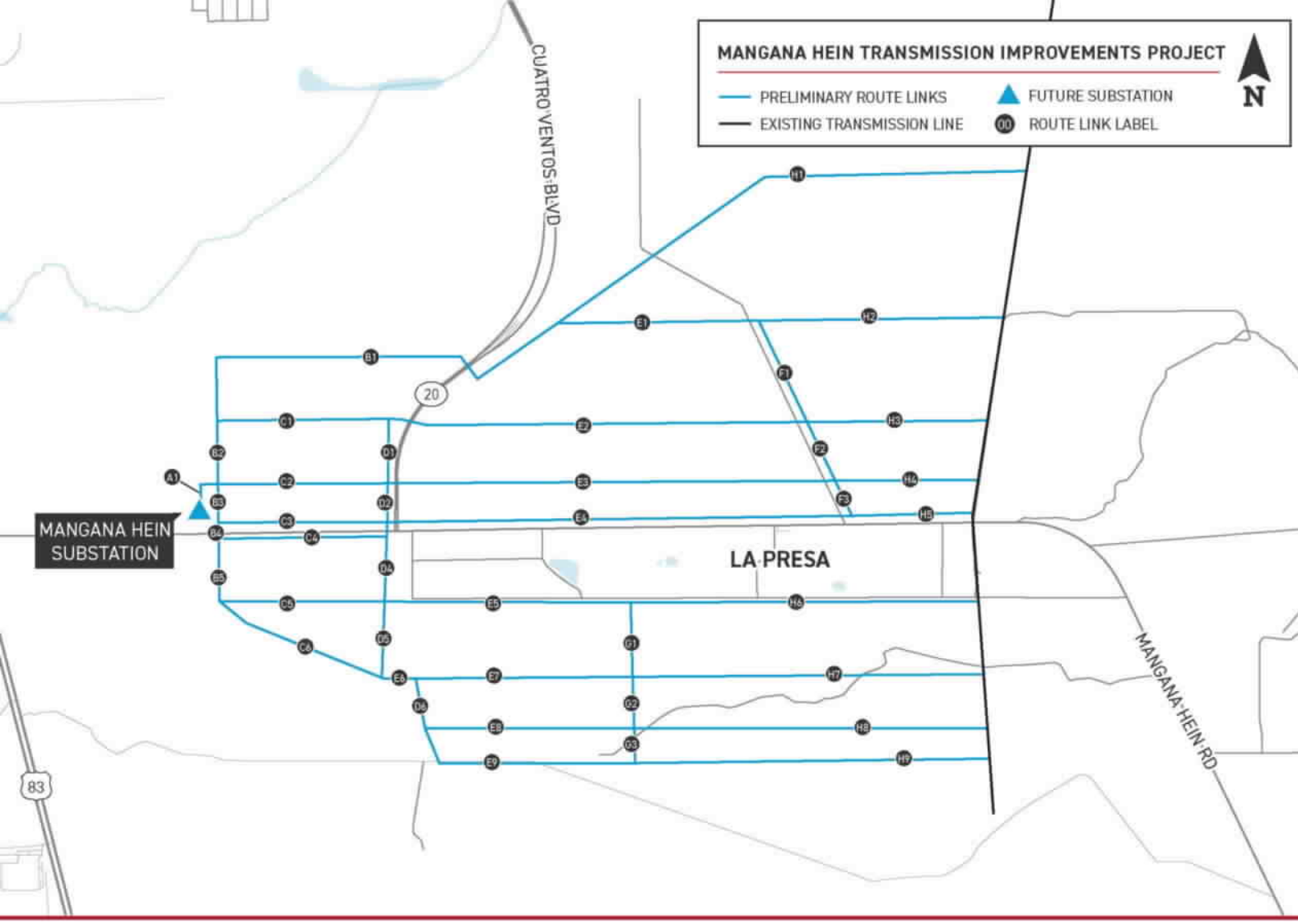
CONSTRUCTION BEGINS
Spring 2027

2028

FACILITIES PLACED IN-SERVICE
Late 2028

2029

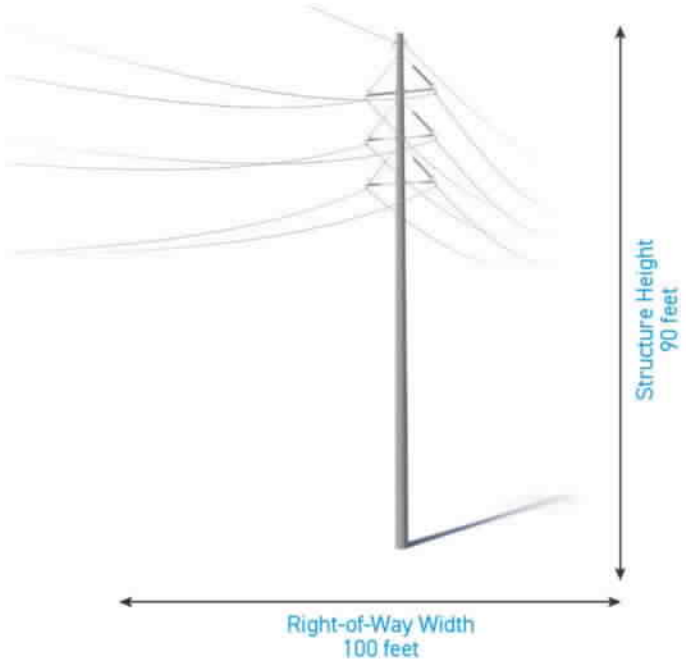
*CCN: Certificate of Convenience and Necessity
PUC: Public Utility Commission of Texas
**Timeline Subject to Change



TYPICAL STRUCTURE

AEP Texas plans to install single steel poles for this project.

Typical Structure Height: Approximately 90 feet*
Typical Distance Between Structures: Approximately 550 feet*
Typical Right-of-Way Width: Approximately 100 feet*



*Exact structure, height, and right-of-way requirements may vary.

WE VALUE YOUR INPUT. PLEASE SEND COMMENTS AND QUESTIONS TO:
AEPTEXASOUTREACH@AEP.COM · 833-329-4865
AEPTEXAS.COM/MANGANA

AEP TEXAS
An AEP Company

12/09/2024

MANGANA HEIN TRANSMISSION IMPROVEMENTS PROJECT

El Mangana Hein Transmission Improvements Project implica la construcción de aproximadamente 2 millas de nueva línea de transmisión de doble circuito de 138-kilovoltios (kV) en el condado de Webb. Los equipos esperan comenzar la construcción a fines de 2026 y concluirla a fines de 2027.

¿QUE?

El proyecto implica la construcción de aproximadamente 2 millas de una nueva línea de transmisión de doble circuito de 138-kV.

Los funcionarios de AEP Texas planean presentar una solicitud para amendar su Certificado de Conveniencia y Necesidad (CCN) ante la Comisión de Servicios Públicos de Texas (PUC) en la primavera de 2025, luego de una revisión de los aportes públicos sobre el desarrollo de LOS enlaces de ruta y un análisis adicional de la ruta. La ruta final de la línea la determina la PUC.

¿POR QUÉ?

El proyecto propuesto mejora la confiabilidad y resiliencia regional con la adición de una nueva línea de transmisión de 138-kV y moderniza el sistema eléctrico para permitir una mayor flexibilidad para abordar la creciente demanda de energía del área y garantizar una energía confiable, reduciendo la probabilidad y la duración de los cortes para los clientes del área.

¿DÓNDE?

El área del proyecto incluye la ciudad de Laredo en el condado de Webb.

Los comentarios de los propietarios es fundamental porque permite a AEP Texas definir con más detalle los enlaces de la ruta preliminar antes de que se envíen a la PUC como parte de la solicitud de CCN.

ANUNCIO DEL PROYECTO
Diciembre de 2024

2025

CASA ABIERTA
Enero 2025

SOLICITUD DE CCN* PRESENTADA ANTE LA PUC
A finales de primavera 2025

APROBACIÓN PREVISTA DE LA PUC* Y DETERMINACIÓN DE LA RUTA FINAL
Principios de 2026

2026

COMIENZAN LAS COMUNICACIONES DEL DERECHO DE PASO
Primavera de 2026

ACTIVIDADES DE PRECONSTRUCCIÓN COMIENZAN
A finales de la primavera de 2026

2027

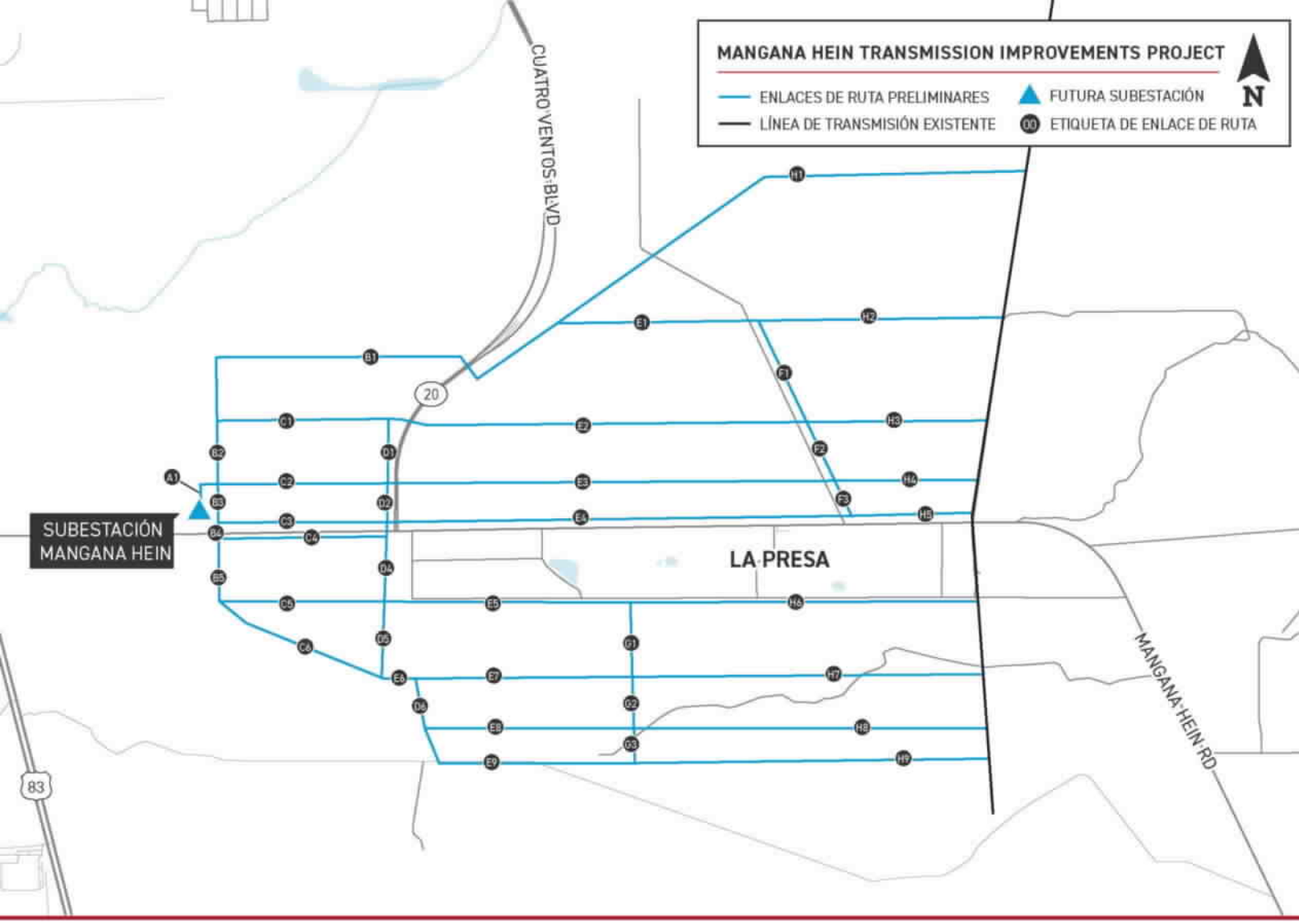
COMIENZA LA CONSTRUCCIÓN
Primavera 2027

2028

INSTALACIONES PUESTAS EN SERVICIO
A finales de 2028

2029

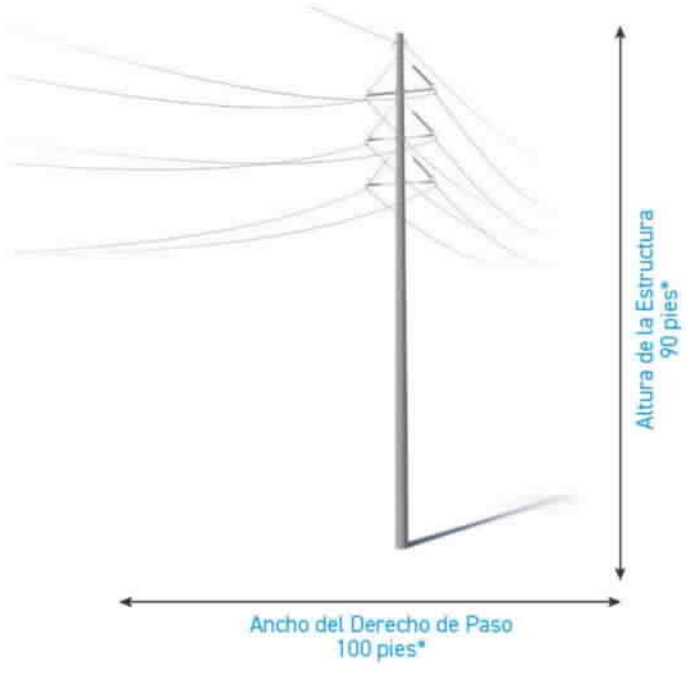
*CCN: Certificado de Conveniencia y Necesidad
PUC: Comisión de Servicios Públicos de Texas
**Cronograma sujeto a cambios



ESTRUCTURA TÍPICA

AEP Texas planea instalar postes de acero individuales para este proyecto.

Altura Típica de la Estructura: Aproximadamente 90 pies*
Distancia Típica Entre Estructuras: Aproximadamente 550 pies*
Ancho Típico del Derecho de Paso: Aproximadamente 100 pies*



*Los requisitos exactos de estructura, altura y derecho de paso pueden variar.

WE VALUE YOUR INPUT. PLEASE SEND COMMENTS AND QUESTIONS TO:
AEPTEXASOUTREACH@AEP.COM · 833-329-4865
AEPTEXAS.COM/MANGANA

AEP TEXAS
An AEP Company

12/09/2024

PUC REGULATORY PROCESS FREQUENTLY ASKED QUESTIONS (FAQ)

PUBLIC UTILITY COMMISSION OF TEXAS REGULATORY PROCESS

Frequently Asked Questions

What is the Public Utility Commission of Texas?

The Public Utility Commission of Texas (PUC) is a state agency created by the Texas Legislature to provide statewide regulation of the rates and services of certain electric, telecommunications and water utilities. The PUC has jurisdiction over AEP Texas.

How can I provide feedback on the proposed route links?

You can share your comments and concerns by:

- Returning the questionnaire you received as part of your initial informational packet
- Calling the (800) number or writing to the email address listed on the project fact sheet
- Visiting the project website and submitting questions/ comments
- Attending an in-person open house to speak directly to a project team member

How does the PUC determine the final line route?

By law, the PUC must consider a number of factors when evaluating the proposed line, including cost, environmental impacts, compatibility with existing rights-of-way, property lines and natural features.

The PUC also accounts for the proximity to existing habitable structures; recreation and historic areas; and aesthetic values.

Ultimately, the PUC approves a single line route connecting one substation to the other substation, using any combination of the proposed routing links.

Do I have an opportunity to participate in the route selection and regulatory process?

Yes. At AEP Texas, we encourage all landowners to learn about the process by viewing the provided informational materials and visiting the project website.

How do directly impacted landowners participate in the CCN proceeding?

Directly impacted landowners can participate in two ways:

- **Become an Intervenor.** Intervenors are permitted to become a party in the proceeding after showing a justiciable interest. As an Intervenor, the landowner may make legal arguments, conduct discovery, file testimony, cross examine witnesses and testify to the PUC.
- **Become a Protester.** Protesters do not choose to participate fully in the CCN proceeding as an Intervenor, but may file comments in support or opposition of the application. Protesters are not considered parties in the proceeding but can send written comments to the PUC stating their position at the time of application or hearing.

How long does the PUC review and approval process take?

This project has been deemed critical by the Electric Reliability Council of Texas (ERCOT), meaning the PUC will look to approve a final line route six (6) months after company officials file the CCN application.

What happens after the final line route has been approved?

Once approved, landowners in the project area are notified of the PUC Final Order, determining the final line route. Company right-of-way agents will begin contacting landowners along the final line route to negotiate easements on their properties. Easements are rights that give AEP Texas the ability to safely construct, operate and maintain the transmission line.

Can AEP Texas use eminent domain to obtain rights-of-way?

We make every effort to work directly with affected landowners and pay fair market values for required easements, including financial damages for things like crops that might be damaged during construction.

However, AEP Texas is a certificated electric utility that is fully regulated by the PUC and therefore has the power of eminent domain.

Can I speak to someone if I have additional questions?

Yes. At AEP Texas, we strongly encourage landowners to contact us with question, comments and concerns. Please refer to the project fact sheet to find an (800) number, email address and project website.

PROCESO REGULATORIO DE LA COMISIÓN DE SERVICIOS PÚBLICOS DE TEXAS

Preguntas Frecuentes

¿Qué es la Comisión de Servicios Públicos de Texas?

La Comisión de Servicios Públicos de Texas (PUC, por sus siglas en inglés) es una agencia estatal creada por la Legislatura de Texas para proporcionar una regulación estatal de las tarifas y los servicios de ciertos servicios públicos de electricidad, telecomunicaciones y agua. La PUC tiene jurisdicción sobre AEP Texas.

¿Cómo puedo dar mi opinión sobre los enlaces de ruta propuestos?

Puede compartir sus comentarios e inquietudes:

- Devolviendo el cuestionario que recibió como parte de su paquete informativo inicial
- Llamando al número del proyecto o escribiendo a la dirección de correo electrónico que aparece en hoja informativa del proyecto
- Visitando el sitio web del proyecto y enviando preguntas y comentarios
- Asistiendo a una de las casas abiertas en persona para hablar directamente con un miembro del equipo del proyecto

¿Cómo determina la PUC el enrutamiento final de la línea?

Por ley, la PUC debe tener en cuenta una serie de factores a la hora de evaluar la línea propuesta, como el costo, el impacto ambiental, la compatibilidad con los derechos de paso existentes, las líneas de propiedad y las características naturales.

La PUC también tiene en cuenta la proximidad a las estructuras habitables existentes, las zonas recreativas e históricas y los valores estéticos.

En última instancia, la PUC aprueba una ruta de una sola línea que conecta una subestación con la otra, utilizando cualquier combinación de los enlaces de enrutamiento propuestos.

¿Tengo la oportunidad de participar en la selección de rutas y en el proceso de regulación?

Sí. En AEP Texas animamos a todos los propietarios de tierras a que se informen sobre el proceso consultando el material informativo proporcionado y visitando el sitio web del proyecto.

¿Cómo participan los propietarios directamente afectados en el procedimiento del Certificados de Conveniencia y Necesidad (CCN)?

Los propietarios de tierras directamente afectados pueden participar de dos maneras:

- **Siendo interventores.** Se permite a los interventores pueden ser parte del procedimiento después de acreditar un interés justiciable. Como Interventor, el propietario puede presentar argumentos legales, realizar pruebas, presentar testimonios, contrainterrogar a los testigos y testificar ante la PUC.
- **Siendo un protestante.** Los protestantes no pueden participar plenamente en el procedimiento de CCN como interventores, pero pueden presentar comentarios en apoyo u oposición a la solicitud. Los protestantes no se consideran ser partes del procedimiento, pero pueden enviar comentarios por escrito a la PUC indicando su posición en el momento de la solicitud o la audiencia.

¿Cuánto dura el proceso de revisión y aprobación de la PUC?

Este proyecto ha sido considerado crítico por el Consejo de Fiabilidad Eléctrica de Texas (ERCOT), lo que significa que la PUC buscará aprobar una ruta final de la línea seis (6) meses después de que los oficiales de la Compañía presenten la solicitud de CCN.

¿Qué ocurre después de que se apruebe la ruta de la línea final?

Una vez aprobada, se notifica a los propietarios de la zona del proyecto la orden final de la PUC, que determina la ruta final de la línea. Los agentes de derechos de paso de la Compañía comenzarán a ponerse en contacto con los propietarios a lo largo de la ruta de la línea final para negociar las servidumbres en sus propiedades. Las servidumbres son derechos que otorgan a AEP Texas la capacidad de construir, operar y mantener la línea de transmisión de manera segura.

¿Pueden AEP Texas utilizar el dominio eminente para obtener derechos de paso?

Hacemos todo lo posible para trabajar directamente con los propietarios afectados y pagar valores de mercado justos para las servidumbres requeridas, incluyendo daños financieros para cosas como los cultivos que podrían ser dañados durante la construcción.

Sin embargo, AEP Texas es una empresas eléctricas certificadas que están totalmente reguladas por la PUC y, por lo tanto, tienen el poder de dominio eminente.

¿Puedo hablar con alguien si tengo más preguntas?

Sí. En AEP Texas, alentamos firmemente a los propietarios de tierras a que se pongan en contacto con nosotros para hacer preguntas, comentarios e inquietudes. Consulte la hoja informativa del proyecto para encontrar el número del proyecto, la dirección de correo electrónico y el sitio web del proyecto.

COMMENT CARD

COMMENT CARD

MANGANA HEIN TRANSMISSION IMPROVEMENTS PROJECT

AEP TEXAS
An AEP Company

FOLLOW-UP QUESTIONS AND COMMENTS

Please fill out and mail this comment card using the enclosed self-addressed, stamped envelope by February 13, **2025. If you prefer to provide comments online, visit AEPTexas.com/Mangana.**

Please provide your name and contact information below to ensure we have the most up-to-date information for our records.

NAME: _____

ADDRESS: _____

EMAIL: _____ PHONE: _____

Please complete this comment card after you have reviewed the information provided about this project.

Did you find the content provided to be informative? ☐ Yes ☐ No

If no, please explain

_____

_____

Please include below any information about features on your property that are in the project area.

If you prefer that a project team member contact you to discuss any of your comments, please note in the additional comments below.

Example: "Study Segment 3 is on the west side of my property at 123 Main Street, and there is an existing gas line running parallel to this study segment" and "There is a family cemetery located along the rebuild section approximately 100 feet west of 345 Broad Street."

☐ House, shed or other structure

_____

_____

☐ Springs, streams, wetlands, sensitive species or protected areas

_____

_____

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TRANSMISSION IMPROVEMENTS PROJECT

AEP TEXAS
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- [ ] Cave, sinkhole, mine or portal

- [ ] Approved or documented planned project

- [ ] Existing conservation easement

- [ ] Historical or archaeological feature (i.e., homestead, Native American site)

- [ ] Underground utilities or pipelines (including gas, water, oil, etc.)

- [ ] Agricultural features including irrigation systems, drainage tiles, etc.

- [ ] Other land use such as private airstrips, past landfills or buried waste, radio or cellular antennas

- [ ] Additional comments

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TRANSMISSION IMPROVEMENTS PROJECT

The routing of a transmission line project involves many considerations. Please circle the number corresponding to the level of importance that each specific factor in the routing of the transmission line is to you.

FACTORS	NOT IMPORTANT		SOMEWHAT IMPORTANT		MOST IMPORTANT
a. Maintain distance from residences, businesses, and schools	1	2	3	4	5
b. Maximize distance from parks and recreational facilities	1	2	3	4	5
c. Maximize length along existing transmission lines	1	2	3	4	5
d. Maximize length along highways or other roads	1	2	3	4	5
e. Maximize length along property boundary lines	1	2	3	4	5
f. Minimize total length of line (reduces cost of line)	1	2	3	4	5
g. Minimize visibility of the line	1	2	3	4	5
h. Minimize loss of trees	1	2	3	4	5
i. Minimize length across cropland	1	2	3	4	5
j. Minimize length through grassland or pasture	1	2	3	4	5
k. Minimize impacts on streams and rivers	1	2	3	4	5
l. Minimize length through wetlands/floodplains	1	2	3	4	5
m. Minimize impacts to archaeological and historic sites	1	2	3	4	5

If you wish to comment on the factors listed in the previous question or add any additional factors that you think should be considered, please use the space below.

_____

_____

_____

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☐ **If you have a concern with a particular transmission line link shown on the map, please identify the link and describe your concern.**

LINK	CONCERN

☐ **Additional comments**

539 N Carancahua, Corpus Christi, TX 78401

TARJETA DE COMENTARIOS

MANGANA HEIN TRANSMISSION IMPROVEMENTS PROJECT

AEP TEXAS
An AEP Company

PREGUNTAS Y COMENTARIOS DE SEGUIMIENTO

Por favor, llene esta tarjeta de comentarios y envíela por correo usando el sobre adjunto con su dirección y sello antes del 13 de febrero **de 2025. Si prefiere enviar sus comentarios en línea, visite AEPTexas.com/Mangana.**

Por favor, proporcione su nombre e información de contacto a continuación para asegurar que tenemos la información más actualizada para nuestros registros.

NOMBRE: _____

DIRECCIÓN: _____

CORREO ELECTRONICO _____ TELÉFONO: _____

Por favor, complete esta tarjeta de comentarios después de haber revisado la información proporcionada sobre este proyecto.

¿Le ha parecido que el contenido proporcionado es informativo? ☐ Sí ☐ No

Si su respuesta es no, por favor explique

_____

_____

Por favor, incluya a continuación cualquier información sobre las características de su propiedad que se encuentren en el área del proyecto.
Si prefiere que un miembro del equipo del proyecto se ponga en contacto con usted para tratar alguno de sus comentarios, indíquelo en los comentarios adicionales que aparecen a continuación.

Ejemplo: "El segmento de estudio 3 se encuentra en el lado oeste de mi propiedad, en la calle principal 123, y hay una línea de gas existente que corre paralela a este segmento de estudio" y "Hay un cementerio familiar situado a lo largo de la sección de reconstrucción aproximadamente 100 pies al oeste de la 345 Broad Street."

☐ Casa, cobertizo u otra estructura

_____

_____

☐ Manantiales, arroyos, humedales, especies vulnerables o zonas protegidas

_____

_____

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☐ Cueva, sumidero, mina o portal

☐ Proyecto planificado aprobado o documentado

☐ Servidumbre de conservación existente

☐ Elemento histórico o arqueológico (por ejemplo, una granja o un sitio de los nativos americanos)

☐ Servicios públicos subterráneos o tuberías (incluyendo gas, agua, aceite, etc.)

☐ Elementos agrícolas, como sistemas de riego, baldosas de drenaje, etc.

☐ Otros usos del suelo, como pistas de aterrizaje privadas, rellenos de tierra o residuos enterrados, antenas de radio o de telefonía móvil

☐ Comentarios adicionales

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El enrutamiento de un proyecto de línea de transmisión implica muchas consideraciones. Marque con un círculo el número correspondiente al nivel de importancia que tiene para usted cada factor específico del enrutamiento de la línea de transmisión.

FACTORES	SIN IMPORTANCIA		ALGO IMPORTANTE		MÁS IMPORTANTE
a. Mantener distancia de las residencias, negocios y escuelas	1	2	3	4	5
b. Maximizar la distancia de parques y centros recreacionales	1	2	3	4	5
c. Maximizar la longitud a lo largo de las líneas de transmisión existentes	1	2	3	4	5
d. Maximizar la longitud a lo largo de carreteras u otros caminos	1	2	3	4	5
e. Maximizar la longitud a lo largo de los límites de la propiedad	1	2	3	4	5
f. Minimizar la longitud total de la línea (reduce el costo de la línea)	1	2	3	4	5
g. Minimizar la visibilidad de la línea	1	2	3	4	5
h. Minimizar la pérdida de árboles	1	2	3	4	5
i. Minimizar la longitud a través de las tierras de cultivo	1	2	3	4	5
j. Minimizar la longitud a través de praderas o pastos	1	2	3	4	5
k. Minimizar el impacto en los arroyos y rios	1	2	3	4	5
l. Minimizar la longitud a través de los humedales/planicies forestales	1	2	3	4	5
m. Minimizar los impactos a sitios arqueológicos e históricos	1	2	3	4	5

Si desea comentar los factores enumerados en la pregunta anterior o añadir cualquier otro factor que crea que deba tenerse en cuenta, utilice el espacio que aparece a continuación.

_____

_____

_____

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☐ **Si tiene alguna inquietud con un enlace de línea de transmisión en particular que se muestra en el mapa, identifique el enlace y describa su preocupación.**

ENLACE	INQUIETUD

☐ **Comentarios adicionales**

539 N Carancahua, Corpus Christi, TX 78401

PROJECT TRIFOLD

QUESTIONS OR COMMENTS?

PLEASE FILL OUT THIS PANEL, TEAR IT OFF AND MAIL IT BACK TO US

Please provide your name and contact information to ensure our records are up to date.

NAME: _____

EMAIL: _____

PHONE: _____

Please provide feedback about your property after you review the project details and the study segments under consideration to rebuild the power line. Detailed maps of study segments are available at AEPTexas.com/Mangana.

Feedback example: "There is a family cemetery located along the rebuild section approximately 100 feet west of 345 Broad Street."

_____

_____

_____

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_____

_____

We value your input about this project. You may provide comments by hovering over this QR code with your smartphone camera and clicking on the webpage that appears.

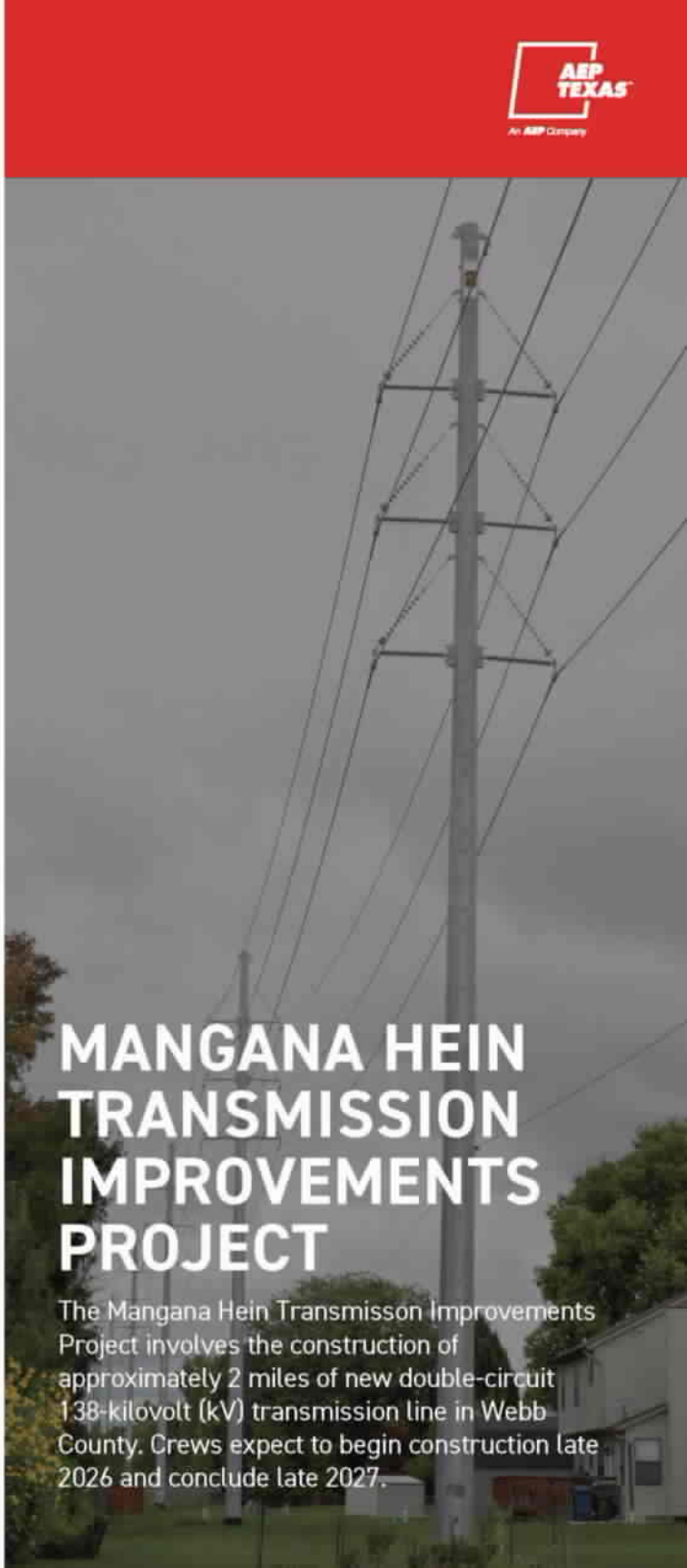
IMPORTANT INFORMATION ABOUT YOUR PROPERTY

Property Owner
000 example rd
City, State, Zip

AEP TEXAS
An AEP Company

000 example rd
City, State, Zip

AEP TEXAS
An AEP Company



MANGANA HEIN TRANSMISSION IMPROVEMENTS PROJECT

The Mangana Hein Transmisson Improvements Project involves the construction of approximately 2 miles of new double-circuit 138-kilovolt (kV) transmission line in Webb County. Crews expect to begin construction late 2026 and conclude late 2027.

IMPORTANT MESSAGE ABOUT YOUR PROPERTY

Dear Neighbor,

You are receiving this because you own property or live in the area where AEP Texas representatives plan to upgrade the local transmission power grid in Webb County.

We recently contacted you about the Mangana Hein Transmission Improvements Project. The Magana Hein Transmission Improvements Project involves building about two miles of double-circuit 138-kilovolt transmission line in Laredo. The new line connects AEP Texas' existing Rio Bravo – Wormser Road transmission line to the recently constructed Mangana Hein Substation just west of La Presa.

The proposed project improves regional reliability and resiliency and allows more flexibility to address the area's growing power demand.

We are writing again to request feedback on the preliminary route links by February 13. Your feedback is important to us and helps us determine potential routes that minimize the impact on the community and environment.

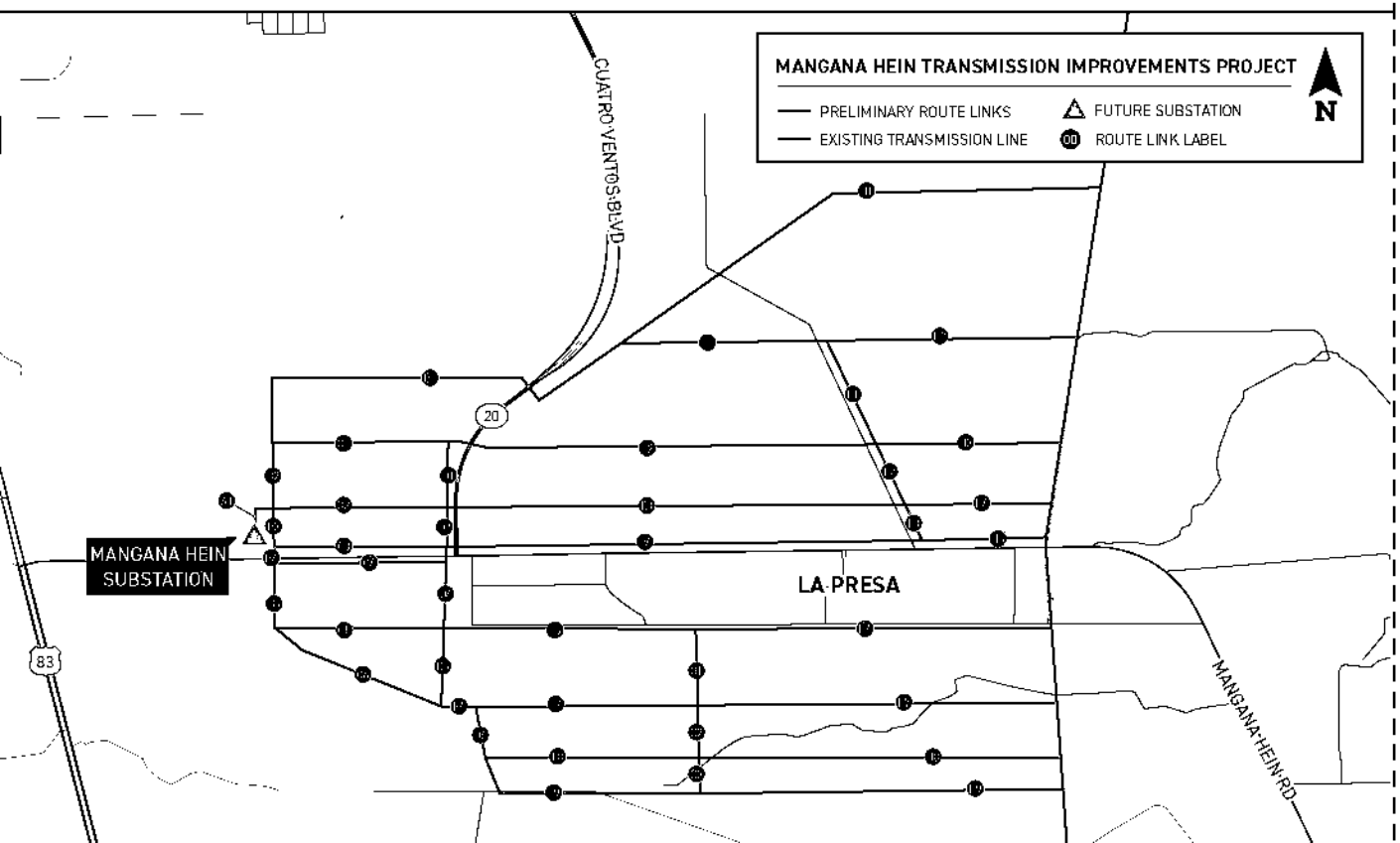
You are also able to share your feedback online by visiting AEPTexas.com/Mangana. On this website you can access project information, view an interactive map, and submit comments. You can also complete and return the attached, removable comment card and mail it back to us. When sharing your input please feel free to include information about your property, such as:

- Historically significant buildings or landmarks such as cemeteries
- Natural features such as wetlands or springs
- Future plans for your property

Feel free to contact me if you have any questions.

Sincerely,

ADRIANA KNIGHT
Project Outreach Specialist
833-329-4865
AEPTexasOutreach@aep.com
AEPTexas.com/Mangana



AEP TEXAS
An AEP Company

ATTN: Adriana Knight
Project Outreach Specialist
539 N Carancahua,
Corpus Christi, TX 78401

PROJECT WEBSITE SLIDES

CONTACT US MENU

MANGANA HEIN
TRANSMISSION IMPROVEMENTS PROJECT

AEP TEXAS
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Welcome! Thank you for visiting our virtual open house to learn more about the project and share your input to help us develop project plans. We welcome feedback through the project website, phone, email and mail as we strive to make the most informed decisions possible.

The virtual open house includes details on the following information:

- Project Need & Benefits
- Project Map
- Routing Process
- Engineering
- Right-of-Way Practices
- The Construction Process

JUMP TO A SECTION:

LET'S GET STARTED!

1

CONTACT US MENU

PROJECT NEED & BENEFITS

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The project involves:

Building approximately 2 miles of new double-circuit 138-kV transmission line that connects to the new Mangana Hein Substation to the existing Rio Bravo - Wormser transmission line.

Why is the project important to our community?

IMPROVED RELIABILITY
Adding a new 138-kilovolt double-circuit transmission line to the area enhances the region's electric service reliability and resiliency.

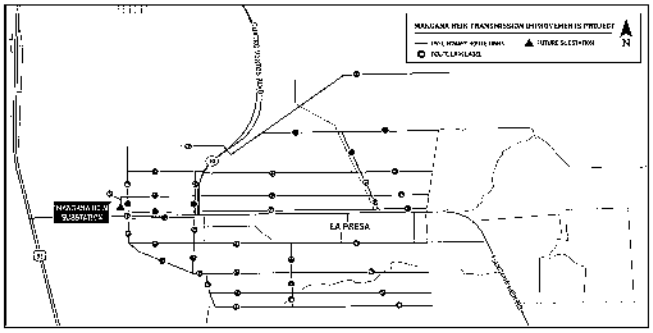
STRENGTHENS LOCAL GRID
The proposed project modernizes the electric system to allow more flexibility to address the area's growing power demand and ensures reliable power, reducing the likelihood and duration of outages for area customers.

0:02 / 0:30 Download Audio

2

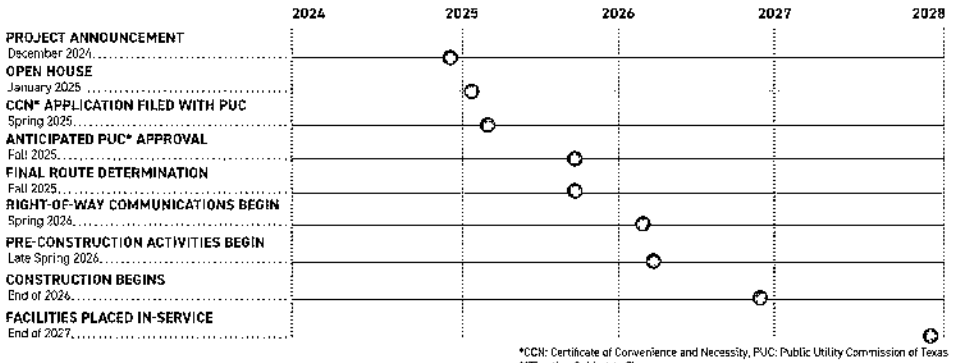
CONTACT US MENU

PROJECT MAP



CONTACT US MENU

PROJECT TIMELINE



*CCN: Certificate of Convenience and Necessity, PUC: Public Utility Commission of Texas
**Timeline Subject to Change

0:01 / 0:29 Download Audio

CONTACT US MENU

TYPICAL STRUCTURE

AEP Texas plans to install single steel poles for this project.

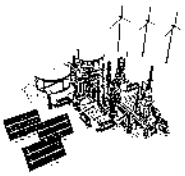
Typical Structure Height: Approximately 90 feet*
Typical Distance Between Structures: Approximately 550 feet*
Typical Right-of-Way Width: Approximately 100 feet*

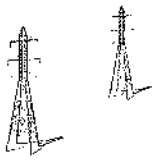
0:02 / 0:31 Download Audio

5

CONTACT US MENU

HOW THE SYSTEM WORKS





1. **Generation Stations:** A generation station produces power to be transported long distances through transmission lines.

2. **EHV Transmission:** Extra-high voltage (EHV) electric transmission lines are generally 765-kilovolt (kV), 500-kV and 345-kV.

3. **Transmission Substations:** Substations direct the flow of electricity and either decrease or increase voltage levels for transport.

6