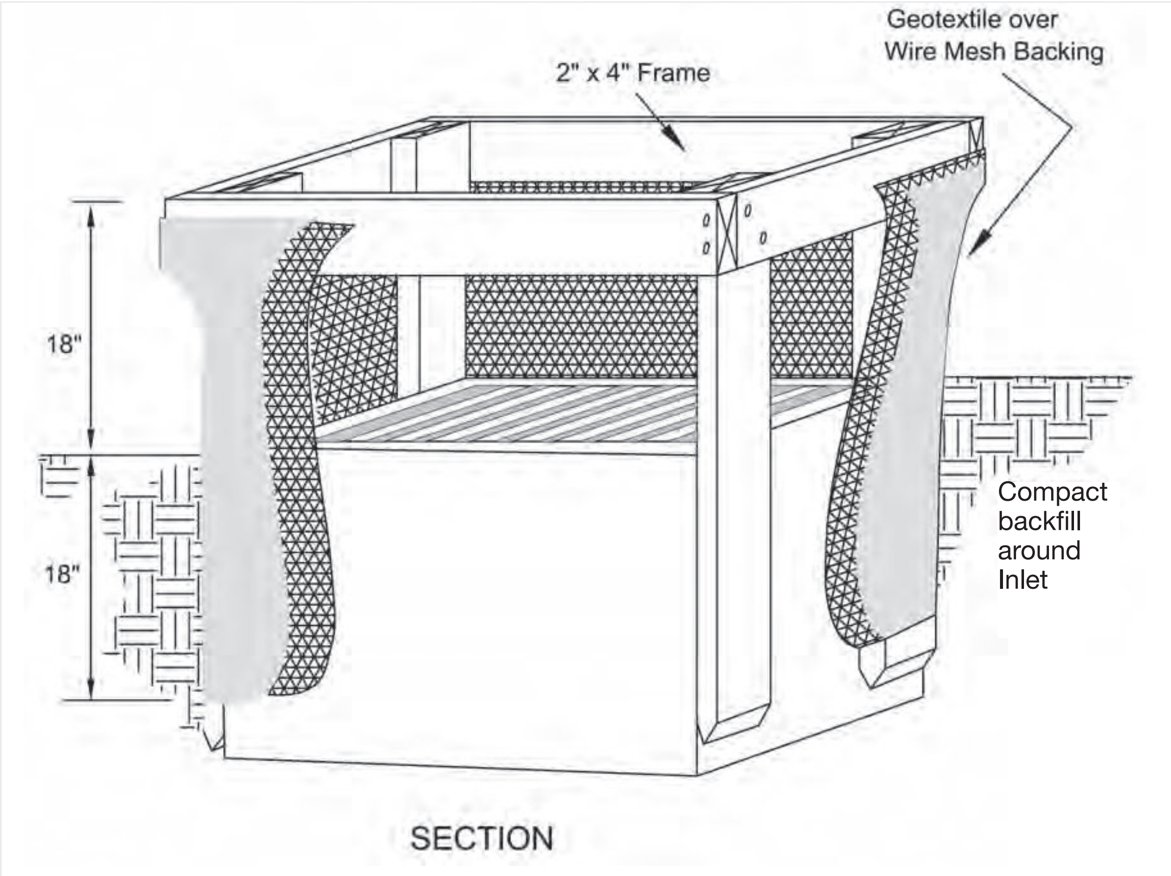
Specifications
for

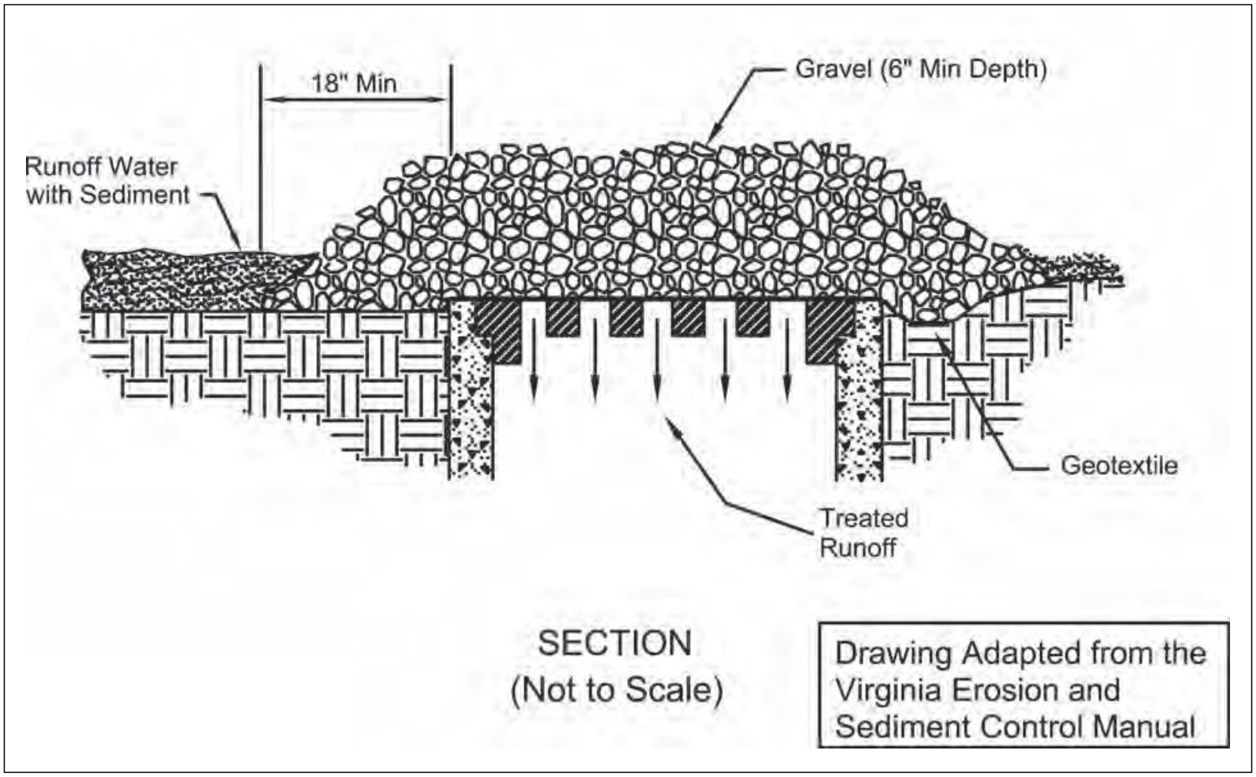
Geotextile Inlet Protection (AS NEEDED)



1. Inlet protection shall be constructed either before upslope land disturbance begins or before the inlet becomes functional.
2. The earth around the inlet shall be excavated completely to a depth at least 18 inches.
3. The wooden frame shall be constructed of 2-inch by 4-inch construction grade lumber. The 2-inch by 4-inch posts shall be driven one (1) ft. into the ground at four corners of the inlet and the top portion of 2-inch by 4-inch frame assembled using the overlap joint shown. The top of the frame shall be at least 6 inches below adjacent roads if ponded water will pose a safety hazard to traffic.
4. Wire mesh shall be of sufficient strength to support fabric with water fully impounded against it. It shall be stretched tightly around the frame and fastened securely to the frame.
5. Geotextile material shall have an equivalent opening size of 20-40 sieve and be resistant to sunlight. It shall be stretched tightly around the frame and fastened securely. It shall extend from the top of the frame to 18 inches below the inlet notch elevation. The geotextile shall overlap across one side of the inlet so the ends of the cloth are not fastened to the same post.
6. Backfill shall be placed around the inlet in compacted 6-inch layers until the earth is even with notch elevation on ends and top elevation on sides.
7. A compacted earth dike or check dam shall be constructed in the ditch line below the inlet if the inlet is not in a depression. The top of the dike shall be at least 6 inches higher than the top of the frame.

Specifications
for

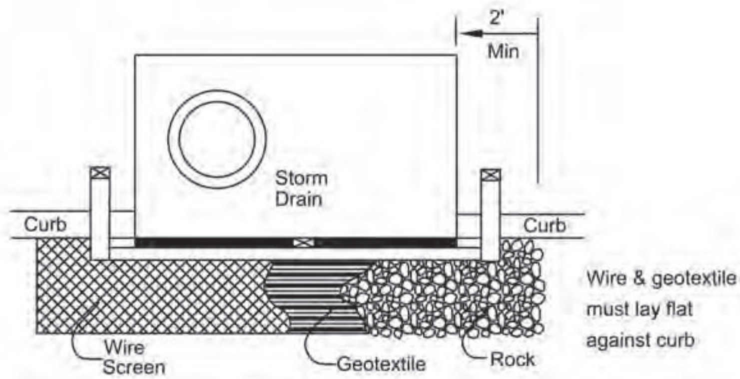
Geotextile-Stone Inlet Protection (AS NEEDED)



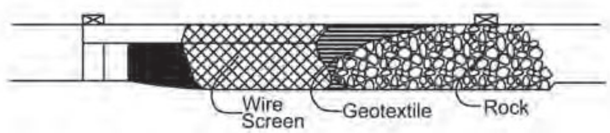
1. Inlet protecion shall be constructed either before upslope land disturbance begins or before the inlet becomes functional.
2. Geotextile and/or wire material shall be placed over the top of the storm sewer and approximately six (6) inches of 2-inch or smaller clean aggregate placed on top. Extra support for geotextile is provided by placing hardware cloth or wire mesh across the inlet cover. The wire should be no larger than ½" mesh and should extend an extra 12 inches across the top and sides of the inlet cover.
3. Maintenance must be performed regularly, especially after storm events. When clogging of the stone or geotextile occurs, the material must be removed and replaced.

Specifications
for

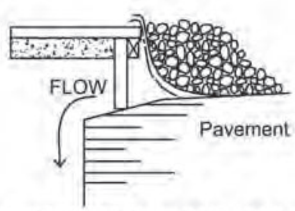
Geotextile - Stone Inlet Protection for Curb Inlets (AS NEEDED)



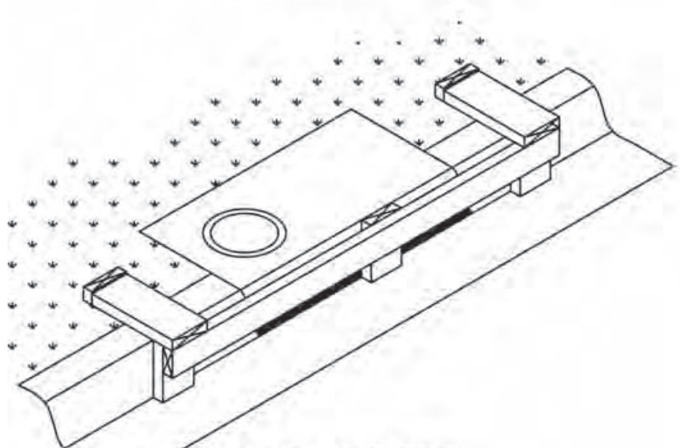
PLAN VIEW



ELEVATION



CROSS SECTION



ISOMETRIC

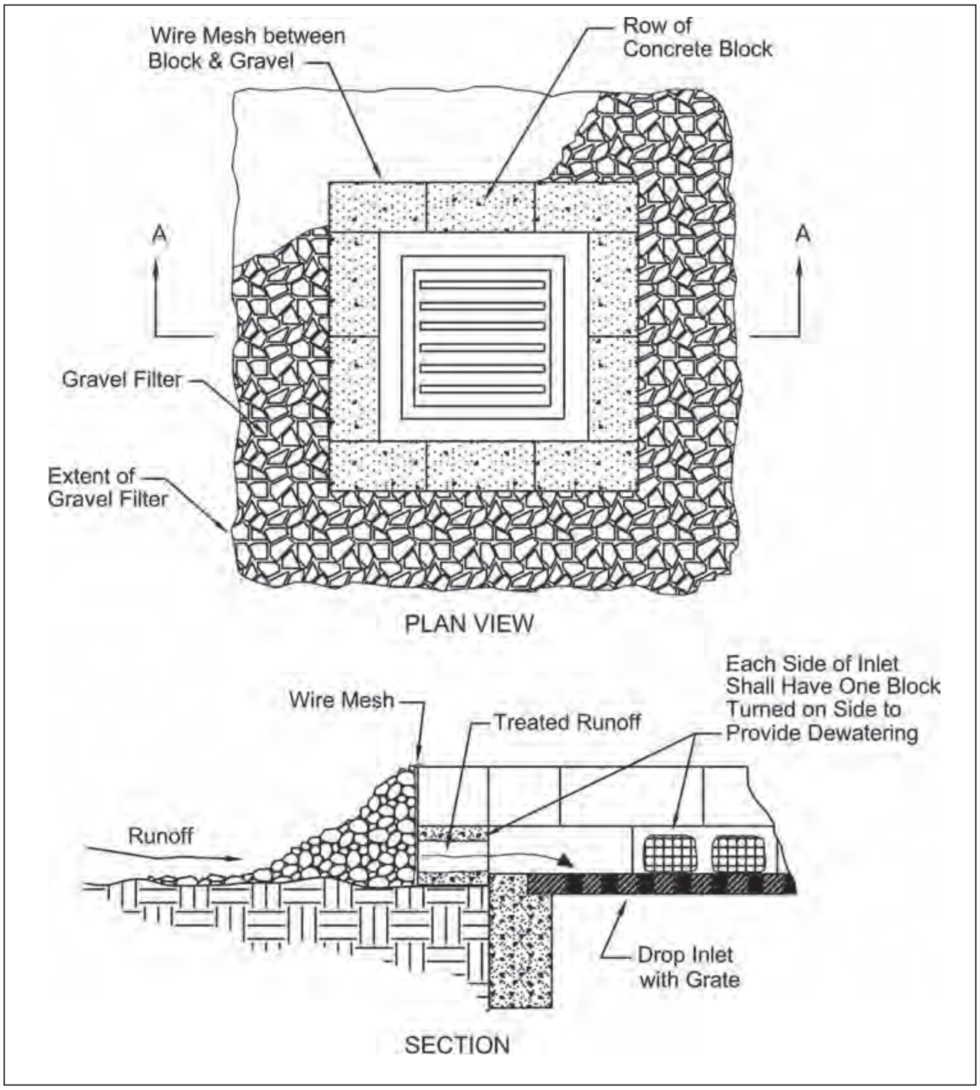
Specifications
for

Geotextile - Stone Inlet Protection for Curb Inlets (AS NEEDED)

1. Inlet protection shall be constructed either before upslope land disturbance begins or before the inlet becomes functional.
2. Construct a wooden frame of 2-by-4-in. construction-grade lumber. The end spacers shall be a minimum of 1 ft. beyond both ends of the throat opening. The anchors shall be nailed to 2-by-4-in. stakes driven on the opposite side of the curb.
3. The wire mesh shall be of sufficient strength to support fabric and stone. It shall be a continuous piece with a minimum width of 30 in. and 4 ft. longer than the throat length of the inlet, 2 ft. on each side.
4. Geotextile cloth shall have an equivalent opening size (EOS) of 20-40 sieve and be resistant to sunlight. It shall be at least the same size as the wire mesh.
5. The wire mesh and geotextile cloth shall be formed to the concrete gutter and against the face of the curb on both sides of the inlet and securely fastened to the 2-by-4-in. frame.
6. Two-inch stone shall be placed over the wire mesh and geotextile in such a manner as to prevent water from entering the inlet under or around the geotextile cloth.
7. This type of protection must be inspected frequently and the stone and/or geotextile replaced when clogged with sediment.

Specifications
for

Block and Gravel Drop Inlet Filter (AS NEEDED)



1. Place 4-inch by 8-inch by 12-inch concrete blocks lengthwise on their sides in a single row around the perimeter of the inlet, with the ends of adjacent blocks abutting. The height of the barrier can be varied, depending upon the design needs, by stacking combinations of the same size blocks. The barrier of blocks should be at least 12-inches high but no greater than 24-inches high.
2. Wire mesh should be placed over the outside vertical face (webbing) of the concrete blocks to prevent stone from being washed through the block cores. Hardware cloth or comparable wire mesh with ½-inch openings should be used.
3. Two-inch stone should be piled against the wire to the top of the block barrier, as shown below.
4. If the stone filter becomes clogged with sediment so that it no longer adequately performs its function, pull stone away from the blocks, clean and/or replace.

5.7 Dewatering Measures (AS NEEDED)

Description

Dewatering measures provide a stable area for receiving and treating water pumped from excavation or work areas prior to being released off the site. These practices reduce sediment impacts to downstream water resources.

Conditions Where Practice Applies

De-watering measures are used whenever water, either surface or subsurface, prevents or hinders construction activities and has the potential of contributing sediment to streams. This practice is appropriate for any kind of pumping used in conjunction with construction activities.

Planning Considerations

Construction activities often require that water be pumped from an area to facilitate work. This water often has large amounts of suspended sediments. Rather than discharge this water directly to a stream, a means to settle or remove sediment must be provided.

A dewatering plan should be prepared utilizing ground water conditions and soils information to predict areas where de-watering will likely occur. Plans should include the length of time de-watering will occur, the method of de-watering (pumping, siphon...), the discharge point(s), methods to control sediment impacts and the contents of a written log to be kept on-site. These plans may need to be approved by local authorities prior to construction.

All dewatering discharges with suspended solids should pass through a practice to remove sediments While a vegetated filter areas may be sufficient for some situations (e.g. short duration low pumping rates) many will need additional measures, such as sediment traps, filter bag or flocculation. All structures must have adequate outlet protection to prevent gully erosion. Please note that the Ohio Environmental Protection Agency will find turbid discharges to the stream resulting from any dewatering activity a violation of Ohio Revised Code 6111.04 independent of the methods employed. Therefore even if one method is selected, additional measures may be required to fully treat turbid water.

The particle size distribution, that is the relative proportion of sands, silts and clays, of a soil that is suspended will determine the difficulty of removing sediments. Soils with coarser particle size distributions (large proportion of sand) will be easier to settle out with filter strips and settling ponds. Finer particle size distributions (predominantly silt and clays) will be increasingly difficult and may need a series of measures.

Ground Water Lowering: Often dewatering wells are established to lower the ground water table for utility installation or construction. Generally, this water is free from suspended solids and may be discharged to waters of the state provided the water is not contaminated.

Measures should be taken to ensure the discharge from the de-watering wells does not flow over disturbed areas and suspend sediments, resulting in contaminated discharge. Waterways established to transport dewatering flow should be protected from erosion from the point of discharge all the way to waters of the state. Extending hoses to waters of the state will ensure the discharge remains free from suspended solids. This practice is recommended for discharges of short duration.

Water pumped from wells is about 55^{o} F, which may cause thermal impacts in some situations. High pumping rates near small streams in summer will have major changes in stream metabolism, i.e., throw off spawning. Where this potential occurs, groundwater should not be discharged directly to the stream but roughed through settling ponds or other shallow holding ponds.

The Ohio Department of Natural Resources, Division of Water requires a Water Withdraw Registration for the de-watering activities in the event the facility has the capacity of pumping in excess of 100, 000 gallons per day. This registration must be submitted to ODNR within 90 days following the completion of the project. A water withdraw registration can be obtained by contacting ODNR, Division of Water at 614-265-6735. Assistance regarding proper well installation and abandonment is also available.

Design Criteria

Vegetated Filter Areas: Densely vegetated areas may offer sufficient conditions to treat short duration discharges provided that: flow is not channelized directly to a water resource and the area encourages infiltration, slow overland flow and settling. A minimum of 100 feet is required to utilize a vegetated area. Dense grass or areas with natural depressions will provide the best conditions. Critical areas like wetlands (e.g. vernal pools) or areas with sensitive vegetation that will be damaged (smothering) by sedimentation should not be used.

Sediment trap or basin: In most cases, contaminated discharge should be directed to a sediment trap where the suspended solids can settle/filter out prior to the discharge to waters of the state. Sediment traps should have sufficient storage to receive all the discharged water from pumping and detain this water a minimum of 24 hours. The sediment storage volume is directly related to the pumping capacity and the amount of turbidity. The sediment pond should be designed to optimize the amount of travel time through the impoundment.

The sediment pond should not be more than 4 feet deep with the distance between the intake and outlet maximized to the extent practical.

Pump intakes should withdraw water from the surface of the trench or work area in order not to re-suspend or continually mix water. Continually drawing water from the floor of the area will draw the muddiest water and increase the amount of sediment that must be removed.

Geotextile Filter Bags are a increasingly common way to remove sediment from dewatering discharge. Commonly discharge is pumped into a filter bag chosen for the predominant sediment size. Filter bags are manufactured products made typically from woven monofilament polypropylene textile (coarse materials, e.g. sands) or non-woven geotextile (silts/clays). They are single use products that must be replaced when they become clogged or half full of sediment.

While they may be useful, they are generally high flow products, which have limited ability to treat fine-grained sediments. Gravity drained filter bags should apply the following:

- They should place outside of a vegetated filter area and not in close proximity to the stream or water resource.
- They must sit on a relatively flat grade so that water leaving the bag does cause additional erosion. Placing the bag on a flat bed of aggregate will maximize the flow and useful surface area of the bag.
- They should be used in conjunction with a large vegetative buffer or a secondary pond or barrier

Enhanced Treatment Through Multiple Practices. The need for further reduction in turbidity will likely require more than one treatment measure. The following are devices or measures that when used in sequence with others will reduce turbidity.

Filter bags (gravity flow) are highly variable depending on the pore size and flow rate. Typically filter bags are limited to removing large particles (small sands and large silts).

Sediment traps, weir tanks, filter boxes are effective for the removal of large particles such as sand. Their effective increases as detention times increase.

Sand Media Filters effective for removal of smaller particles such as sand and large silts. These often have the ability to backflush and thus maintain effectiveness and flow rate.

Some commercially available additives are available for further decreasing turbidity. Chitosan and chitin based additives have been shown to significantly increase the effectiveness of filtration and settling. Chitosan (Poly-D-glucosamine) is a low-toxicity product extracted from Chitin (Poly-N-acetyl-D-glucosamine), a by-product of the shellfish industry. Other products such as anionic polyacrylamide (anionic PAM) are commercially available to increase settling. Often these are utilized through wet or dry dosing mechanisms or as water runs over a gel block upstream of a settling or filtration practice. Each product should be utilized within the manufacturers specifications and tailored to the soil and site conditions.

Particulate filter units utilizing cartridges or enclosed filter bags can remove smaller particles depending on the filter size. This type of measure is usually necessary to treat clays. Filters may be need to be changed daily or more frequently.

An example of an enhanced treatment might include: dewatering a trench with a trash pump to a settling tank or pit then pumping from the settling practice to a sand media filter or to a particulate filter.

Common Problems/Concerns

Complete settling of solids within the Sediment Basin does not occur prior to discharge. The length to width ratio of the pond must be increased to lengthen travel time through the structure. In addition, flocculent may be necessary to promote settlement.

Water discharged from subsurface/ground water pumping maybe significantly lower in temperature than that of the receiving stream. The water will need pre-conditioned in order to minimize the biological affects on the stream.

References

Virginia Department of Conservation and Recreation, 2002. *Erosion & Sediment Control Technical Bulletin #2: Application of Anionic Polyacrylimide for soil stabilization and stormwater management*. http://www.dcr.state.va.us/sw/docs/anoinic.pdf

Specifications
for

De-Watering

1. A de-watering plan shall be developed prior to the commencement of any pumping activities.
2. The de-watering plan shall include all pumps and related equipment necessary for the dewatering activities and designate areas for placement of practices. Outlets for practices shall be protected from scour either by riprap protection, fabric liner, or other acceptable method of outlet protection.
3. Water that is not discharged into a settling/treatment basin but directly into waters of the state shall be monitored hourly. Discharged water shall be within +/- 5° F of the receiving waters.
4. Settling basins shall not be greater than four (4) feet in depth. The basin shall be constructed for sediment storage as outlined in Chapter 6, SEDIMENT BASIN OR SEDIMENT TRAP. The inlet and outlet for the basin shall be located at the furthest points of the storage. A floating outlet shall be used to ensure that settled solids do not re-suspend during the discharge process. The settling basin shall be cleaned out when the storage has been reduced by 50% of its original capacity.
5. All necessary National, State and Local permits shall be secured prior to discharging into waters of the state

7.5 Dust Control (AS NEEDED)

Description

Dust control involves preventing or reducing dust from exposed soils or other sources during land disturbing, demolition and construction activities to reduce the presence of airborne substances which may present health hazards, traffic safety problems or harm animal or plant life.

Conditions Where Practice Applies

In areas sub ect to surface and air movement of dust where on-site and off-site damage is likely to occur if preventive measures are not taken.

Planning Considerations

Construction activities inevitably result in the exposure and disturbance of soil. ugitive dust results from both construction activities and as a result of wind erosion over the exposed earth surfaces. Large quantities of dust are typically generated in heavy construction activities, such as road construction and subdivision, commercial or industrial development, which involve disturbing significant areas of the soil surface. Research of construction sites has established an average dust emission rate of 1.2 tons acre month for active construction. Earth-moving activities comprise the ma or source of construction dust emissions, but traffic and general disturbance of the soil also generate significant dust emissions.

Planning for dust control involves limiting the amount of soil disturbance at any one time as a key objective. Therefore, phased clearing and grading operations (minimize disturbance-phasing) and the utilization of other stabilization practices can significantly reduce dust emissions. Undisturbed vegetative buffers (minimum 50-foot widths) left between graded areas and protected areas can also be very helpful in dust control by providing windbreaks and non-erosive areas.

Design Criteria

A number of measures can be utilized to limit dust either during or between construction stages or once construction is complete. enerally the same methods that are used to limit erosion by limiting exposure of soils to rainfall can be used to limit dust including: stabilizing exposed soils with mulch, vegetation or permanent cover. Additional methods particular to dust control include managing vehicles and construction traffic, road treatment and treatment of exposed soil with chemical stabilizers.

Vegetative Cover – The most effective way to prevent dust from exposed soil is to provide a dense cover of vegetation. In areas subject to little or no construction traffic, vegetative stabilization reduces dust drastically. Timely temporary and permanent seedings must be utilized to accomplish this. See TEMPORAR SEEDIN PERMANENT SEEDIN .

Mulch - When properly applied, mulch offers a fast, effective means of controlling dust. Mulching is not recommended for areas within heavy traffic pathways. Binders or tackifiers should be used to tack organic mulches. See MULCHING.

Rough Graded Soils – Leaving the soil in a temporary state of rough grade, where clods rather than flattened soils predominate the surface can reduce the amount of dust generated from areas during periods of higher winds. This must be balanced by the need to reach a stage where the soil can be stabilized and may be only be necessary when high winds are predicted.

Watering - This is the most commonly used dust control practice. The site is sprinkled with water until the surface is wet before and during grading and is repeated as needed. It offers fast protection for haul roads and other heavy traffic routes. Watering should be done at a rate that prevents dust but does not cause soil erosion. Wetting agents are also available to increase the effectiveness of watering and must follow manufacturers instructions.

Chemical Stabilizers/Wetting Agents – Many products of this type are available and are usually most effective on typical mineral soils but may not be on predominantly organic soils such as muck. Users are advised to pay attention to the limitations and instructions regarding each product. The following table lists various adhesives and provides corresponding information on mixing and application:

Table 7.5.1 Adhesives for Dust Control

Adhesive	Water Dilution (Adhesive: Water)	Nozzle Type	Application Rate Gallon/Acre
Latex Emulsion	12.5:1	Fine	235
Resin in Water	4:1	Fine	300
Acrylic Emulsion (No-traffic)	7:1	Coarse	450
Acrylic Emulsion (Traffic)	3.5:1	Coarse	350

Stone - Stone can be used to stabilize roads or other areas during construction using crushed stone or coarse gravel. Research has shown the addition of bentonite to limestone roads (not igneous gravel) has shown benefits in reducing dust.

Windbreaks and Barriers – Where dust is a known problem, existing windbreak vegetation should be preserved. Maintaining existing rows of trees or constructing a wind fence, sediment fence, or similar barrier can help to control air currents and blowing soil. Place barriers perpendicular to prevailing air currents at intervals of about 15 times the barrier height.

Calcium Chloride - This chemical may be applied by mechanical spreader as loose, dry granules or flakes at a rate that keeps the surface moist but not so high as to cause water pollution or plant damage. Liquid application of a 35% calcium chloride solution is common. Note: application rates should be strictly in accordance with suppliers' specified rates.

Street Cleaning - Paved areas that have accumulated sediment from construction sites should be cleaned daily, or as needed, utilizing a street sweeper or bucket -type loader or scraper.

Operation and Maintenance

Most dust control measures, such as applications of water or road treatments will require monitoring and repeat applications as needed to accomplish good control.

Common Problems / Concerns

Vegetation is removed from large areas of the construction site and left barren for long periods of time.

Continuous, scheduled monitoring of the construction site conditions is not made.

Specifications
for

Dust Control

1. Vegetative Cover and/mulch – Apply temporary or permanent seeding and mulch to areas that will remain idle for over 21 days. Saving existing trees and large shrubs will also reduce soil and air movement across disturbed areas. See Temporary Seeding; Permanent Seeding; Mulching Practices; and Tree and Natural Area Protection practices.
2. Watering – Spray site with water until the surface is wet before and during grading and repeat as needed, especially on haul roads and other heavy traffic routes. Watering shall be done at a rate that prevents dust but does not cause soil erosion. Wetting agents shall be utilized according to manufacturers instructions.
3. Spray-On Adhesives – Apply adhesive according to the following table or manufacturers' instructions.

Table 7.5.1 Adhesives for Dust Control

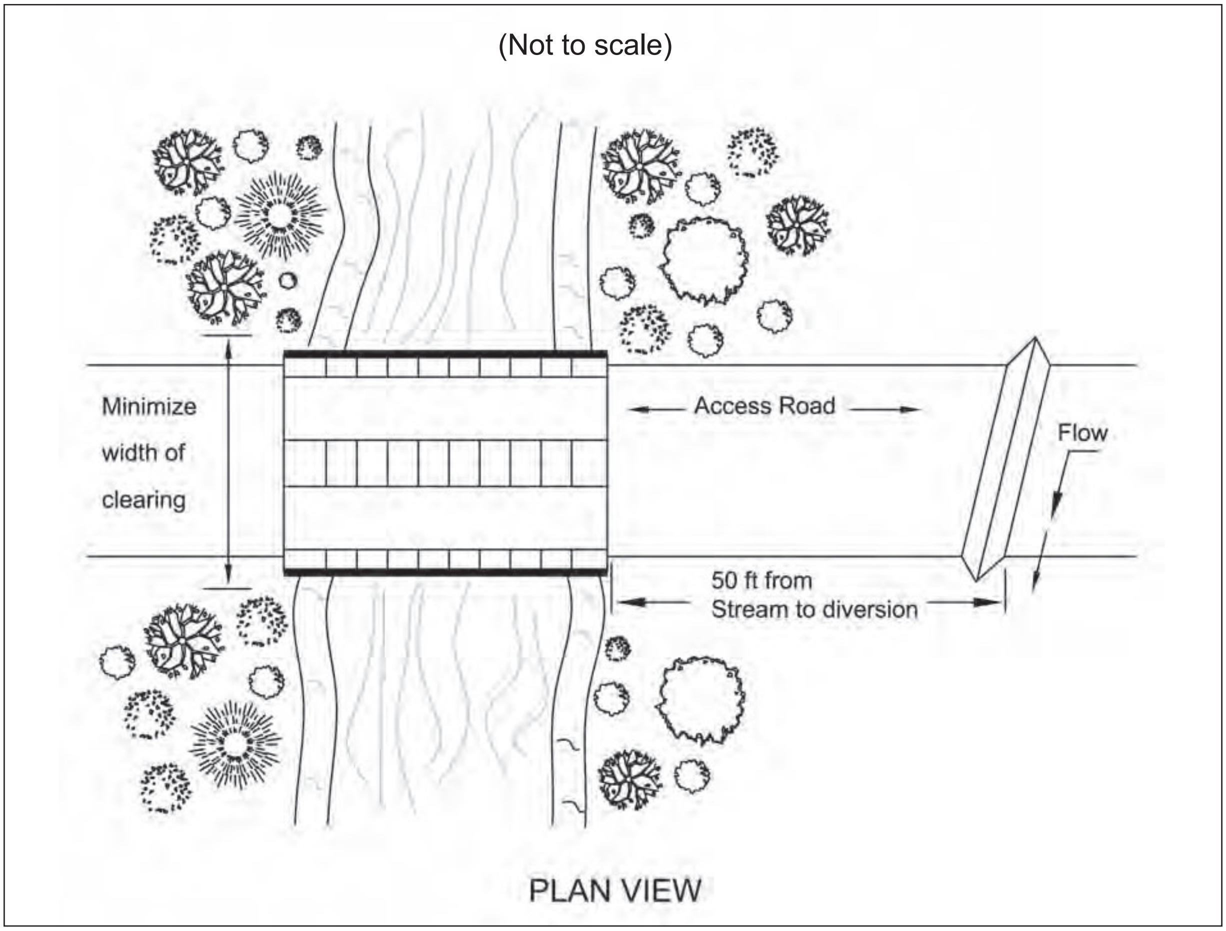
Adhesive	Water Dilution (Adhesive: Water)	Nozzle Type	Application Rate Gal./Ac.
Latex Emulsion	12.5:1	Fine	235
Resin in Water Acrylic Emulsion (No-traffic)	4:1	Fine	300
Acrylic Emulsion (No-traffic)	7:1	Coarse	450
Acrylic Emulsion (Traffic)	3.5:1	Coarse	350

4. Stone – Graded roadways and other suitable areas will be stabilized using crushed stone or coarse gravel as soon as practicable after reaching an interim or final grade. Crushed stone or coarse gravel can be used as a permanent cover to provide control of soil emissions.
5. Barriers – Existing windbreak vegetation shall be marked and preserved. Snow fencing or other suitable barrier may be placed perpendicular to prevailing air currents at intervals of about 15 times the barrier height to control air currents and blowing soil.
6. Calcium Chloride - This chemical may be applied by mechanical spreader as loose, dry granules or flakes at a rate that keeps the surface moist but not so high as to cause water pollution or plant damage. Application rates should be strictly in accordance with suppliers' specified rates.
7. Operation and Maintenance - When Temporary Dust Control measures are used; repetitive treatment should be applied as needed to accomplish control.

   Street Cleaning - Paved areas that have accumulated sediment from construction should be cleaned daily, or as needed, utilizing a street sweeper or bucket -type endloader or scraper.

Specifications
for
Temporary Access Bridge

This specification does not define the strength of the temporary bridge. It shall be the designer's responsibility to select bridge construction materials with adequate strength for the anticipated construction traffic loads.



1. Stream Disturbance -Disturbance to the stream shall be kept to a minimum. Streambank vegetation shall be preserved to the maximum extent practical and the stream crossing shall be as narrow as practical.
2. Clearing shall be done by cutting NOT grubbing. The roots and stumps shall be left in place to help stabilize the banks and accelerate revegetation.
3. Water shall be prevented from flowing along the road directly to the stream. Diversions and swales shall direct runoff away from the access road to a sediment-control practice.
4. Bridges shall be constructed to span the entire channel. If the channel width exceeds 8 ft. as measured from the top-of-bank, then a footing, pier or bridge support may be constructed within the waterway. No more than one additional footing, pier or bridge support shall be permitted for each additional 8-ft. width of the channel. However, no footing, pier or bridge support will be permitted within the channel for waterways less than 8 ft. wide.
5. Some steep watersheds subject to flash flood events may require that the bridge be cabled ore secured to prevent downstream damage or hazard.
6. No fill other than clean stone free from soil shall be placed within the stream channel.

7.12 Temporary Rolled Erosion Control Products (Erosion Control Matting)

Description

A Temporary Rolled Erosion Control Product (TRECP) is a degradable manufactured material used to stabilize easily eroded areas while vegetation becomes established. Temporary Rolled Erosion Control Products are degradable products composed of biologically, photo chemically or otherwise degradable materials. Temporary RECPs consist of erosion control netting, open weave textiles, and erosion control blankets and mattings. These products reduce soil erosion and assist vegetative growth by providing temporary cover from the erosive action of rainfall and runoff while providing soil-seed contact.

Condition where practice applies:

Temporary rolled erosion control products (matting or blankets) should be used on:

- Areas where erosion potential is high or a failure to establish vegetation is costly such as slopes greater than 3:1, constructed channels or stream banks
- Areas where establishing vegetation is difficult such as southern exposures or areas prone to drying
- Areas of concentrated flow, especially where flows exceeds 3.5 feet per second (e.g near culverts)
- Problem areas with highly erosive soils
- Areas where mulch is difficult to hold in place due to wind or water

Planning Considerations:

Temporary RECPs can be applied to critical or problem areas to enhance the erosion control as vegetation is being established. Although these materials add cost, they insure more immediate stability following construction reducing grading repairs and a faster greening of projects. Permanent non-degradable rolled erosion control products (turf reinforcement mats) are beyond the scope of this practice, but may be useful where design discharges or runoff exert velocities and shear stresses exceeding the ability of mature vegetation to withstand.

Temporary RECPs provide stable and rapid greening for areas conveying stormwater runoff. Care must be taken to choose the type of RECP, which is most appropriate for the specific needs of a project. Designers must take into account the vegetated and unvegetated velocities and sheer stresses in channel applications. With the abundance of soil stabilization products available, it is impossible to cover all the advantages, disadvantages and specifications of all manufactured RECPs. Therefore, as with many erosion control-type products, there is no substitute for a thorough understanding of the manufacturer's instructions and recommendations and a site visit by a product's designer or plan reviewer to verify appropriateness.

Temporary RECPs should be used to help establish vegetation on previously disturbed slopes - especially slopes of 3:1 or greater. The materials that compose the RECP will deteriorate over time. If used in permanent conveyance channels, designers should consider the system's resistance to erosion as it relates to the type of vegetation planted and the existing soil characteristics. As much as possible during establishment of vegetation, soil stabilization blankets should not be subjected to concentrated flows moving at greater than 3.5 feet second.

Design Criteria

Choose a product that will provide the appropriate time period of protection. Allowable velocity range during vegetation establishment should be 3.5 feet per second or less.

Erosion Control Blankets - shall consist of photodegradable plastic netting or biodegradable natural fiber netting that covers and is entwined in a natural organic or man-made mulching material. The mulching material shall consist of wood fibers, wood excelsior, straw, coconut fiber, or man-made fibers, or a combination of the same. The blanket shall be of consistent thickness with the mulching material/fibers evenly distributed over its entire length. Mulching material/fibers must interlock or entwine to form a dense layer, which not only resists raindrop impact, but also will allow vegetation to penetrate the blanket. The mulching material degradation rate must be consistent with the designers desired slope protection time. Temporary Rolled Erosion Control Products (or erosion control blankets) shall meet the specifications that follow.

Table 7.12.1

Material	Maximum Length Of Protection
Straw	10-12 Months
Straw/Coconut	24 Months
Coconut	36 Months
Excelsior	36 Months

Erosion Control Netting - shall consist of a woven natural fiber or extruded geosynthetic mesh used as a component in the manufacture of RECPs, or separately as a temporary RECP to anchor loose fiber mulches.

Open Weave Textile - shall consist of processed natural or polymer yarns woven into a matrix, used to provide erosion control and facilitate vegetation establishment.

Maintenance:

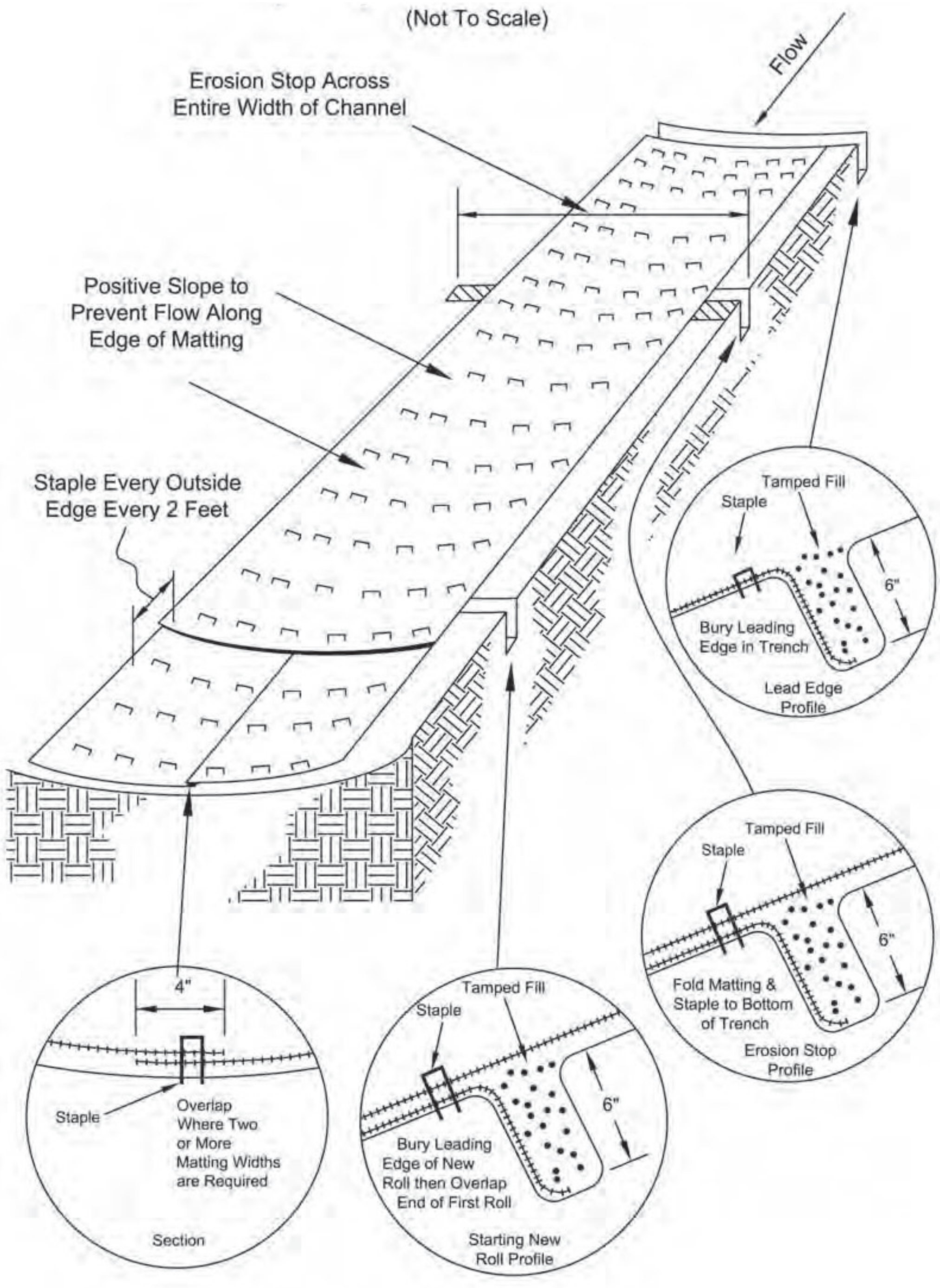
All RECPs should be inspected regularly after installation, especially after storms to check for erosion or undermining of the product. Make needed repairs immediately, addressing rills or gullies that have developed prior to replacing the RECP. In the case erosion repairs, assure that subsequent runoff across the area is dispersed or adequately spread.

Common Problems/Concerns:

- Manufacturer's selection and installation recommendations not followed. Results in failure of the RECP.
- Poor contact between soil and the RECP. Results in erosion below the RECP and lower seed germination rates, causing failure.
- Proper stapling guidelines not followed. Results in movement or displacement of RECP.
- Erosion check slots are not used. Results in erosion under the RECP, causing failure.
- Unstable slopes that result in RECP or slope failure. Determine cause of slope failure, correct, and reinstall RECP
- In channels, the width of RECP used is not sufficient, this causes water to flow along the sides of RECP causing erosion. Install RECP up side slopes of ditch line as well as the bottom.

Specifications
for

Temporary Rolled Erosion Control Product



Specifications
for

Temporary Rolled Erosion Control Product

1. Channel/Slope Soil Preparation Grade and compact area of installation, preparing seedbed by loosening 2"-3" of topsoil above final grade. Incorporate amendments such as lime and fertilizer into soil. Remove all rocks, clods, vegetation or other debris so that installed RECP will have direct contact with the soil surface.
2. Channel/Slope Seeding Apply seed to soil surface prior to installation. All check slots, anchor trenches, and other disturbed areas must be reseeded. Refer to the Permanent Seeding specification for seeding recommendations.

Slope Installation

3. Excavate top and bottom trenches (12"x6"). Intermittent erosion check slots (6"x6") may be required based on slope length. Excavate top anchor trench 2' x 3' over crest of the slope.
4. If intermittent erosion check slots are required, install RECP in 6"x6" slot at a maximum of 30' centers or the mid point of the slope. RECP should be stapled into trench on 12" centers.
5. Install RECP in top anchor trench, anchor on 12" spacings, backfill and compact soil.
6. Unroll RECP down slope with adjacent rolls overlapped a minimum of 3". Anchor the seam every 18". Lay the RECP loose to maintain direct soil contact, do not pull taught.
7. Overlap roll ends a minimum of 12" with upslope RECP on top for a shingle effect. Begin all new rolls in an erosion check slot if required, double anchor across roll every 12".
8. Install RECP in bottom anchor trench (12"x6"), anchor every 12". Place all other staples throughout slope at 1 to 2.5 per square yard dependant on slope. Refer to manufacturer's anchor guide.

Channel Installation

9. Excavate initial anchor trench (12"x6") across the lower end of the project area.
10. Excavate intermittent check slots (6"x6") across the channel at 30' intervals along the channel.
11. Excavate longitudinal channel anchor slots (4"x4") along both sides of the channel to bury the edges. Whenever possible extend the RECP 2'-3' above the crest of channel side slopes.
12. Install RECP in initial anchor trench (downstream) anchor every 12", backfill and compact soil.
13. Roll out RECP beginning in the center of the channel toward the intermittent check slot. Do not pull taught. Unroll adjacent rolls upstream with a 3" minimum overlap (anchor every 18") and up each channel side slope.
14. At top of channel side slopes install RECP in the longitudinal anchor slots, anchor every 18".
15. Install RECP in intermittent check slots. Lay into trench and secure with anchors every 12", backfill with soil and compact.
16. Overlap roll ends a minimum of 12" with upstream RECP on top for a shingling effect. Begin all new rolls in an intermittent check slot, double anchored every 12".
17. Install upstream end in a terminal anchor trench (12"x6"); anchor every 12", backfill and compact.
18. Complete anchoring throughout channel at 2.5 per square yard using suitable ground anchoring devices (U shaped wire staples, metal geotextile pins, plastic stakes, and triangular wooden stakes). Anchors should be of sufficient length to resist pullout. Longer anchors may be required in loose sandy or gravelly soils.

Concrete Washout

Concrete washout *areas are designated locations within a construction site that are either a prefabricated unit or a designed measure that is constructed to contain concrete washout. Concrete washout systems are typically used to contain washout water when chutes and hoppers are rinsed following delivery.*

Purpose

Concrete washout systems are implemented to reduce the discharge of pollutants that are associated with concrete washout waste through consolidation of solids and retention of liquids. Uncured concrete and associated liquids are highly alkaline which may leach into the soil and contaminate ground water or discharge to a waterbody or wetland which can elevate the pH and be harmful to aquatic life. Performing concrete washout in designated areas and into specifically designed systems reduces the impact concrete washout will have on the environment.

Specifications

Site Management

- Complete construction/installation of the system and have washout locations operational prior to concrete delivery.
- Do not wash out concrete trucks or equipment into storm drains, wetlands, streams, rivers, creeks, ditches, or streets.
- Never wash out into a storm sewer drainage system. These systems are typically connected to a natural conveyance system.
- Where necessary, provide stable ingress and egress (see **Temporary Construction Ingress/Egress Pad** on page 17).
- It is recommended that washout systems be restricted to washing concrete from mixer and pump trucks and not used to dispose of excess concrete or

residual loads due to potential to exceed the design capacity of the washout system. Small amounts of excess or residual concrete (not washout water) may be disposed of in areas that will not result in flow to an area that is to be protected.

- Install systems at strategic locations that are convenient and in close proximity to work areas and in sufficient number to accommodate the demand for disposal.
- Install signage identifying the location of concrete washout systems.

Location

- Locate concrete washout systems at least 50 feet from any creeks, wetlands, ditches, karst features, or storm drains/manmade conveyance systems.
- To the extent practical, locate concrete washout systems in relatively flat areas that have established vegetative cover and do not receive runoff from adjacent land areas.
- Locate in areas that provide easy access for concrete trucks and other construction equipment.
- Locate away from other construction traffic to reduce the potential for damage to the system.

General Design Considerations

- The structure or system shall be designed to contain the anticipated washout water associated with construction activities.
- The system shall be designed, to the extent practical, to eliminate runoff from entering the washout system.
- Runoff from a rainstorm or snowmelt should not carry wastes away from the washout location.
- Washout will not impact future land uses (i.e., open spaces, landscaped areas, home sites, parks).
- Washout systems/containment measures may also be utilized on smaller individual building sites. The design and size of the system can be adjusted to accommodate the expected capacity.

Prefabricated Washout Systems/Containers

- Self-contained sturdy containment systems that are delivered to a site and located at strategic locations for concrete disposal.

- These systems are manufactured to resist damage from construction equipment and protect against leaks or spills.
- Manufacturer or supplier provides the containers. The project site manager maintains the system or the supplier provides complete service that includes maintenance and disposal.
- Units are often available with or without ramps. Units with ramps lend themselves to accommodate pump trucks.
- Maintain according to the manufacturer's recommendations.

Designed and Installed Units

These units are designed and installed on site. They tend to be less reliable than prefabricated systems and are often prone to failure. Concrete washout systems can be constructed above or below grade. It is not uncommon to have a system that is partly below grade with an additional containment structure above grade.

- Washout systems shall utilize a pit or bermed area designed and maintained at a capacity to contain all liquid and concrete waste generated by washout operations.
- The volume of the system must also be designed to contain runoff that drains to the system and rainfall that enters the system for a two-year frequency, 24-hour storm event.

■ Below Grade System

- ♦ A washout system installed below grade should be a minimum of ten feet wide by ten feet long, but sized to contain all liquid and waste that is expected to be generated between scheduled cleanout periods. The size of the pit may be limited by the size of polyethylene available. The polyethylene lining should be of adequate size to extend over the entire excavation.
- ♦ Include a minimum 12-inch freeboard to reasonably ensure that the structure will not overtop during a rain event.
- ♦ Line the pit with ten millimeter polyethylene lining to control seepage.
- ♦ The bottom of excavated pit should be above the seasonal high water table.

■ Above Grade System

- ♦ A system designed and built above grade should be a minimum of ten feet wide by ten feet long, but sized to contain all liquid and waste that is expected to be generated between scheduled cleanout periods. The size of the containment system may be limited by the size of polyethylene available. The polyethylene lining should be of adequate size to extend over the berm or containment system.

- The system design may utilize an earthen berm, straw bales, sandbags, or other acceptable barriers that will maintain its shape and integrity and support the polyethylene lining.
- Include a minimum four-inch freeboard as part of the design.

Washout Procedures

- Do not leave excess mud in the chutes or hopper after the pour. Every effort should be made to empty the chutes and hopper at the pour. The less material left in the chutes and hopper, the quicker and easier the cleanout. Small amounts of excess concrete (not washout water) may be disposed of in areas that will not result in flow to an area that is to be protected.
- At the washout location, scrape as much material from the chutes as possible before washing them. Use non-water cleaning methods to minimize the chance for waste to flow off site.
- Remove as much mud as possible when washing out.
- Stop washing out in an area if you observe water running off the designated area or if the containment system is leaking or overflowing and ineffective.
- Do not back flush equipment at the project site. Back flushing should be restricted to the plant as it generates large volumes of waste that more than likely will exceed the capacity of most washout systems. If an emergency arises, back flush should only be performed with the permission of an on-site manager for the project.
- Do not use additives with wash water. Do not use solvents or acids that may be used at the target plant.

Materials

- Minimum of ten millimeter polyethylene sheeting that is free of holes, tears, and other defects. The sheeting selected should be of an appropriate size to fit the washout system without seams or overlap of the lining **(designed and installed systems)**.
- Signage.
- Orange safety fencing or equivalent.
- Straw bales, sandbags (bags should be ultraviolet-stabilized geotextile fabric), soil material, or other appropriate materials that can be used to construct a containment system **(above grade systems)**.

- Metal pins or staples at a minimum of six inches in length, sandbags, or alternative fastener to secure polyethylene lining to the containment system.
- Non-collapsing and non-water holding cover for use during rain events (optional).

Installation

Prefabricated Washout Systems/Containers

- Install and locate according to the manufacturer's recommendations.

Designed and Installed Systems

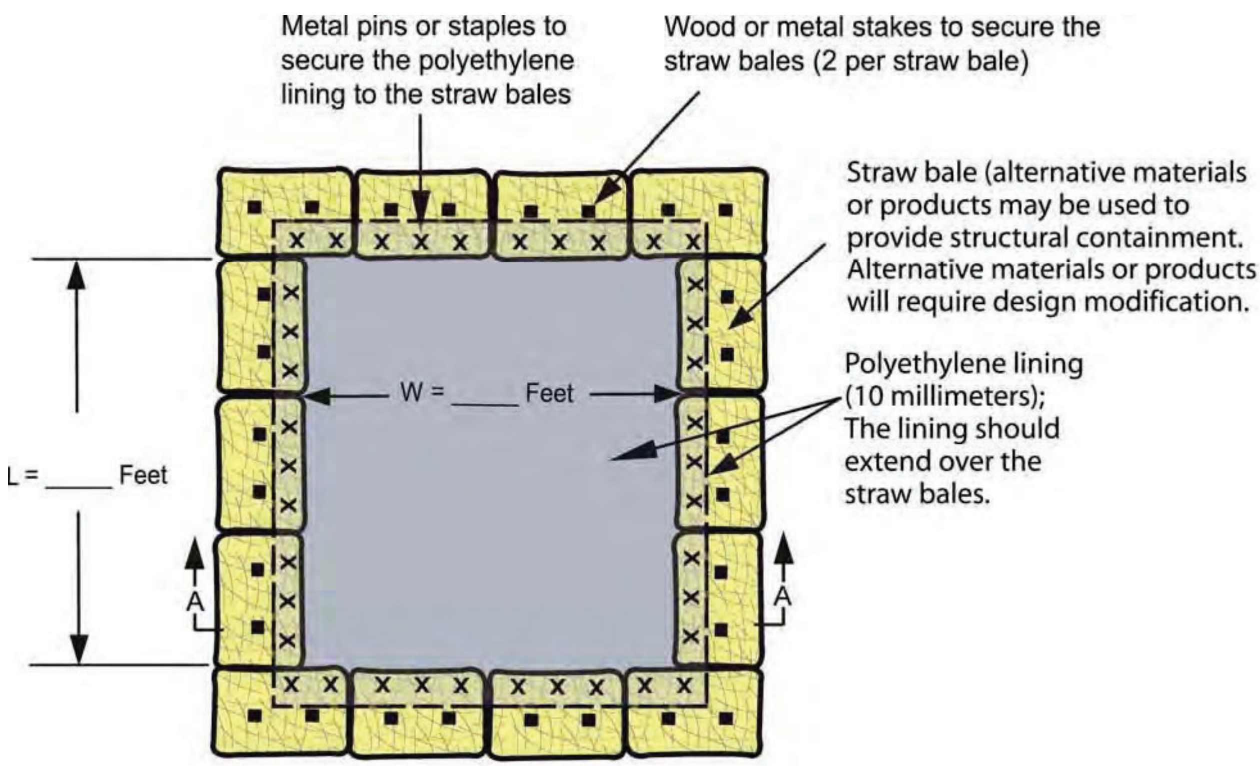
- Utilize and follow the design in the storm water pollution prevention plan to install the system.
- Dependent upon the type of system, either excavate the pit or install the containment system.
- A base shall be constructed and prepared that is free of rocks and other debris that may cause tears or punctures in the polyethylene lining.
- Install the polyethylene lining. For excavated systems, the lining should extend over the entire excavation. The lining for bermed systems should be installed over the pooling area with enough material to extend the lining over the berm or containment system. The lining should be secured with pins, staples, or other fasteners.
- Place flags, safety fencing, or equivalent to provide a barrier to construction equipment and other traffic.
- Place a non-collapsing, non-water holding cover over the washout facility prior to a predicted rainfall event to prevent accumulation of water and possible overflow of the system (optional).
- Install signage that identifies concrete washout areas.
- Post signs directing contractors and suppliers to designated locations.
- Where necessary, provide stable ingress and egress (see **Temporary Construction Ingress/Egress Pad** on page 17) or alternative approach pad for concrete washout systems.

Maintenance

- Inspect daily and after each storm event.
- Inspect the integrity of the overall structure including, where applicable, the containment system.
- Inspect the system for leaks, spills, and tracking of soil by equipment.
- Inspect the polyethylene lining for failure, including tears and punctures.
- Once concrete wastes harden, remove and dispose of the material.
- Excess concrete should be removed when the washout system reaches 50 percent of the design capacity. Use of the system should be discontinued until appropriate measures can be initiated to clean the structure. Prefabricated systems should also utilize this criterion, unless the manufacturer has alternate specifications.
- Upon removal of the solids, inspect the structure. Repair the structure as needed or construct a new system.
- Dispose of all concrete in a legal manner. Reuse the material on site, recycle, or haul the material to an approved construction/demolition landfill site. Recycling of material is encouraged. The waste material can be used for multiple applications including but not limited to roadbeds and building. The availability for recycling should be checked locally.
- The plastic liner should be replaced after every cleaning; the removal of material will usually damage the lining.
- The concrete washout system should be repaired or enlarged as necessary to maintain capacity for concrete waste.
- Concrete washout systems are designed to promote evaporation. However, if the liquids do not evaporate and the system is near capacity it may be necessary to vacuum or remove the liquids and dispose of them in an acceptable method. Disposal may be allowed at the local sanitary sewer authority provided their National Pollutant Discharge Elimination System permits allow for acceptance of this material. Another option would be to utilize a secondary containment system or basin for further dewatering.
- Prefabricated units are often pumped and the company supplying the unit provides this service.
- Inspect construction activities on a regular basis to ensure suppliers, contractors, and others are utilizing designated washout areas. If concrete waste is being disposed of improperly, identify the violators and take appropriate action.

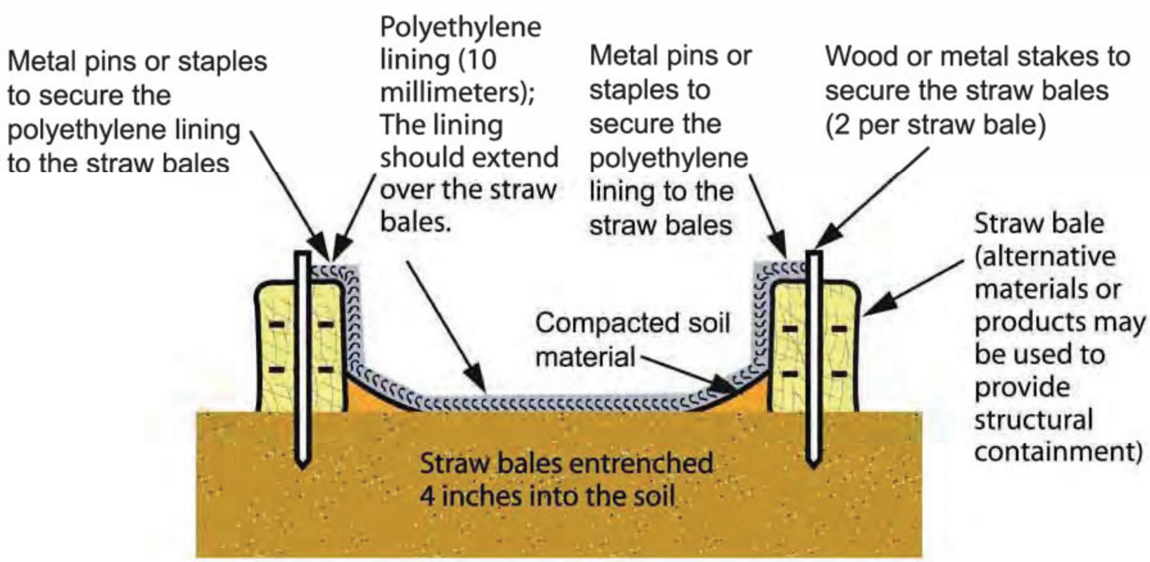
- When concrete washout systems are no longer required, the concrete washout systems shall be closed. Dispose of all hardened concrete and other materials used to construct the system.
- Holes, depressions and other land disturbances associated with the system should be backfilled, graded, and stabilized.

Concrete Washout (Above Grade System) Worksheet



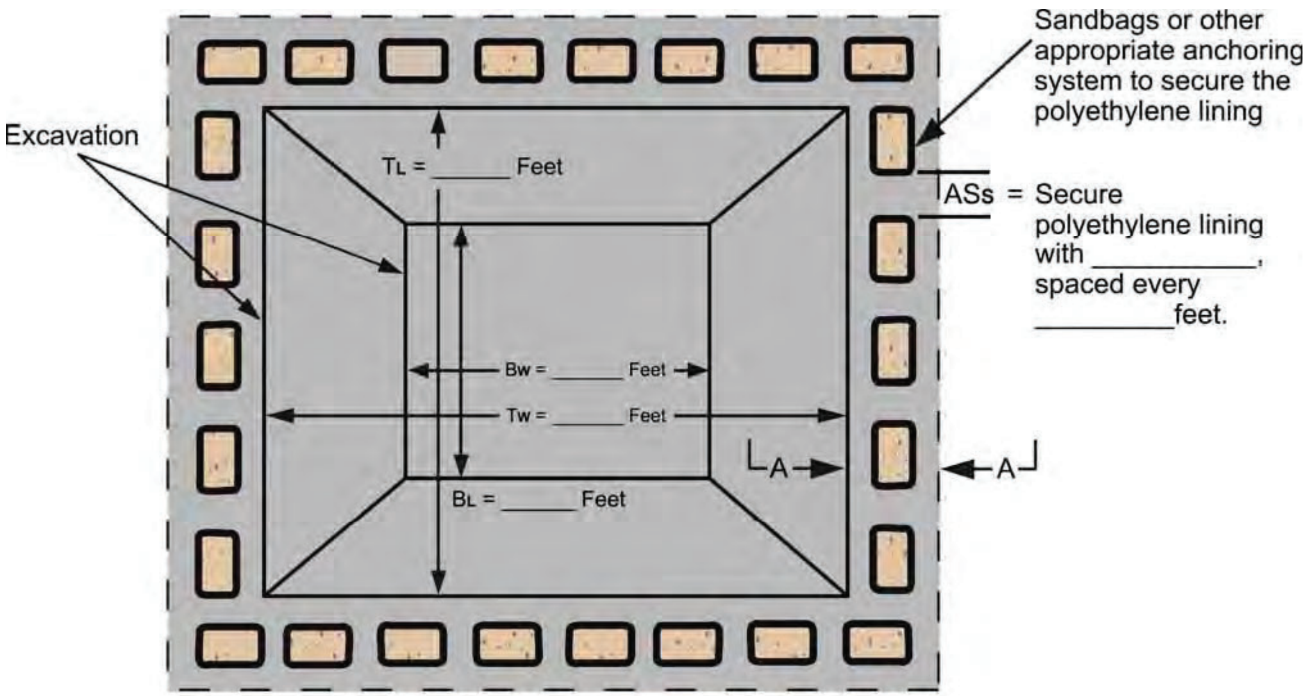
L = inside length
W = inside width

Plan View
Not to Scale



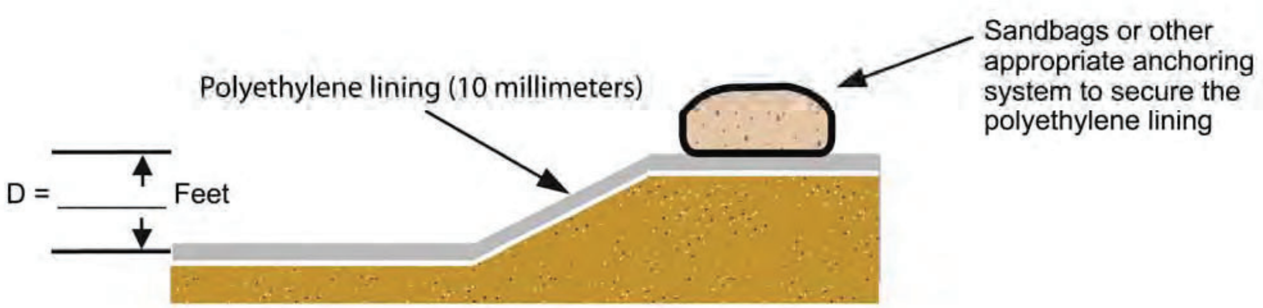
Section A-A
Not to scale

Concrete Washout (Below Grade System) Worksheet

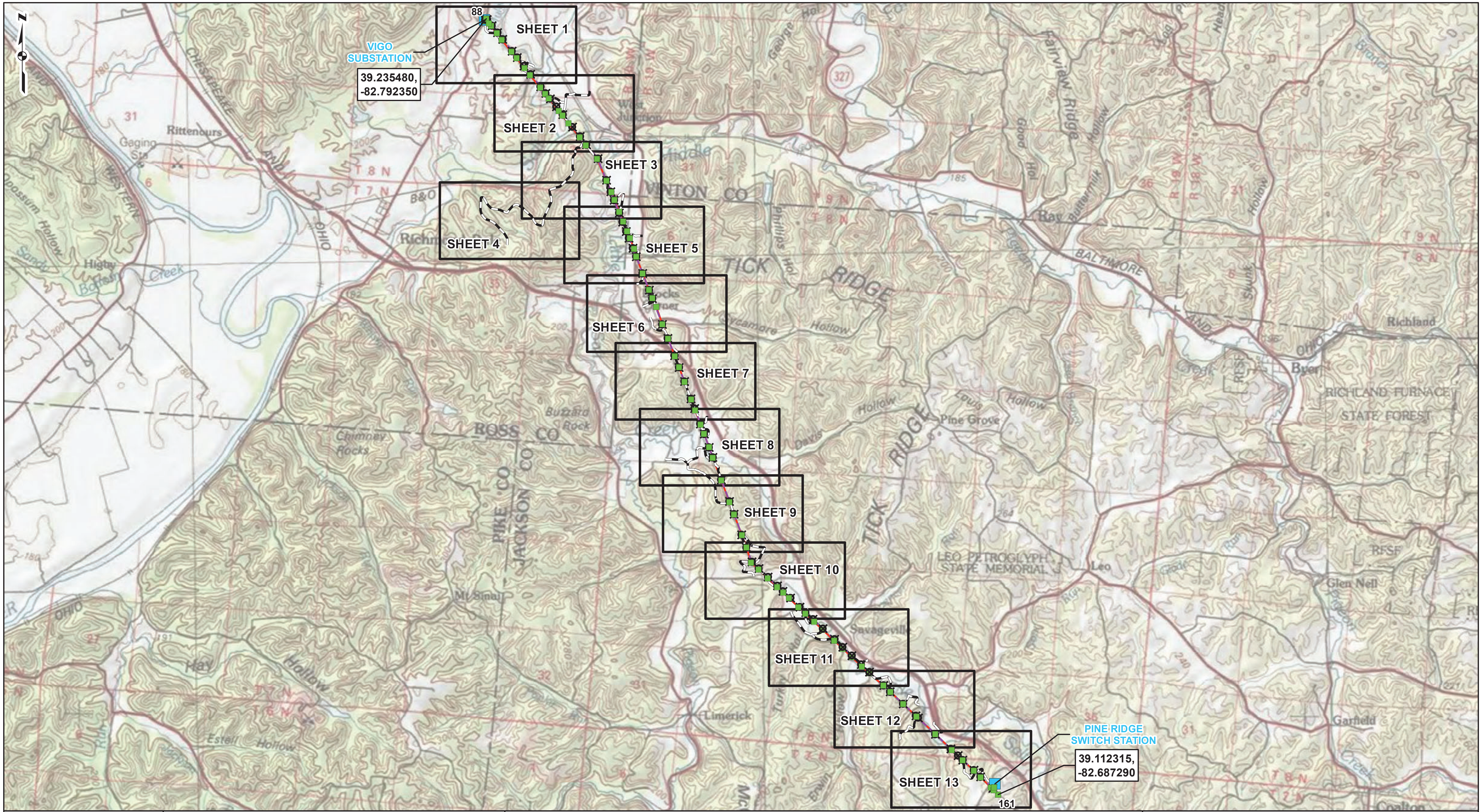


TL = Top Length of Excavation
BL = Bottom Length of Excavation
Tw = Top Width of Excavation
Bw = Bottom Width of Excavation
ASs = Anchoring System type and spacing

Plan View
Not to Scale



Section A-A
Not to Scale



PROJECT LOCATION

ROSS AND JACKSON COUNTIES, OHIO

REFERENCE: USGS 30'x60' TOPOGRAPHIC QUADRANGLE: WELLSTON (1985), OHIO, OBTAINED THROUGH ESRI USA TOPO MAPS, NATIONAL GEOGRAPHIC TOPO AND USGS, ACCESSED 10/2021.

NO.:	DATE:	DWN:	CHKD:	APPD:	DESCRIPTION:

REVISIONS:

LEGEND

- EXISTING SUBSTATION
- PROPOSED CONCRETE FOUNDATION STRUCTURE ###
- EXISTING STRUCTURE TO BE REMOVED
- PROPOSED 138kV TRANSMISSION LINE
- EXISTING 69kV TRANSMISSION LINE
- PROPOSED ACCESS ROAD
- SHEET INDEX

0 0.5 1 2 Miles

FIGURE 3
SOILS MAP
SHEET INDEX

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VIGO-PINE RIDGE
LINE REBUILD PROJECT
AMERICAN ELECTRIC POWER

DRAWN BY: JACKSEF
CHECKED: RAMACB
DATE: 10/14/2021
APPROVED: JONESAR

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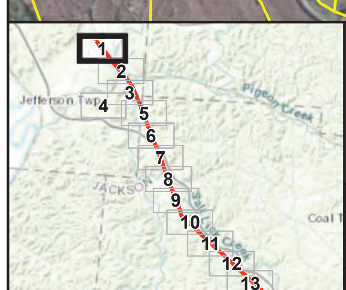

REFERENCE: ESRI WORLD IMAGERY, CLARITY, ARCGIS ONLINE, ACCESSED 10/2021. SOIL SURVEY GEOGRAPHIC (SSURGO) DATABASE FOR ROSS COUNTY, OHIO, USDA/NRCS, 2020.

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- EXISTING 69kV TRANSMISSION LINE
- PROPOSED ACCESS ROAD
- ENVIRONMENTAL STUDY AREA
- PROPOSED LIMIT OF DISTURBANCE (LOD)
- SOIL TYPE BOUNDARY

0 250 500 1,000 Feet

FIGURE 3
SOILS MAP
SHEET 1 OF 13

VIGO-PINE RIDGE
LINE REBUILD PROJECT
AMERICAN ELECTRIC POWER

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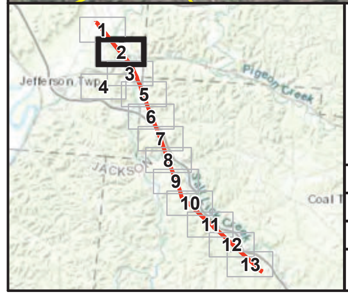

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- PROPOSED LIMIT OF DISTURBANCE (LOD)
- SOIL TYPE BOUNDARY

0 250 500 1,000 Feet

FIGURE 3
SOILS MAP
SHEET 2 OF 13

VIGO-PINE RIDGE
LINE REBUILD PROJECT
AMERICAN ELECTRIC POWER

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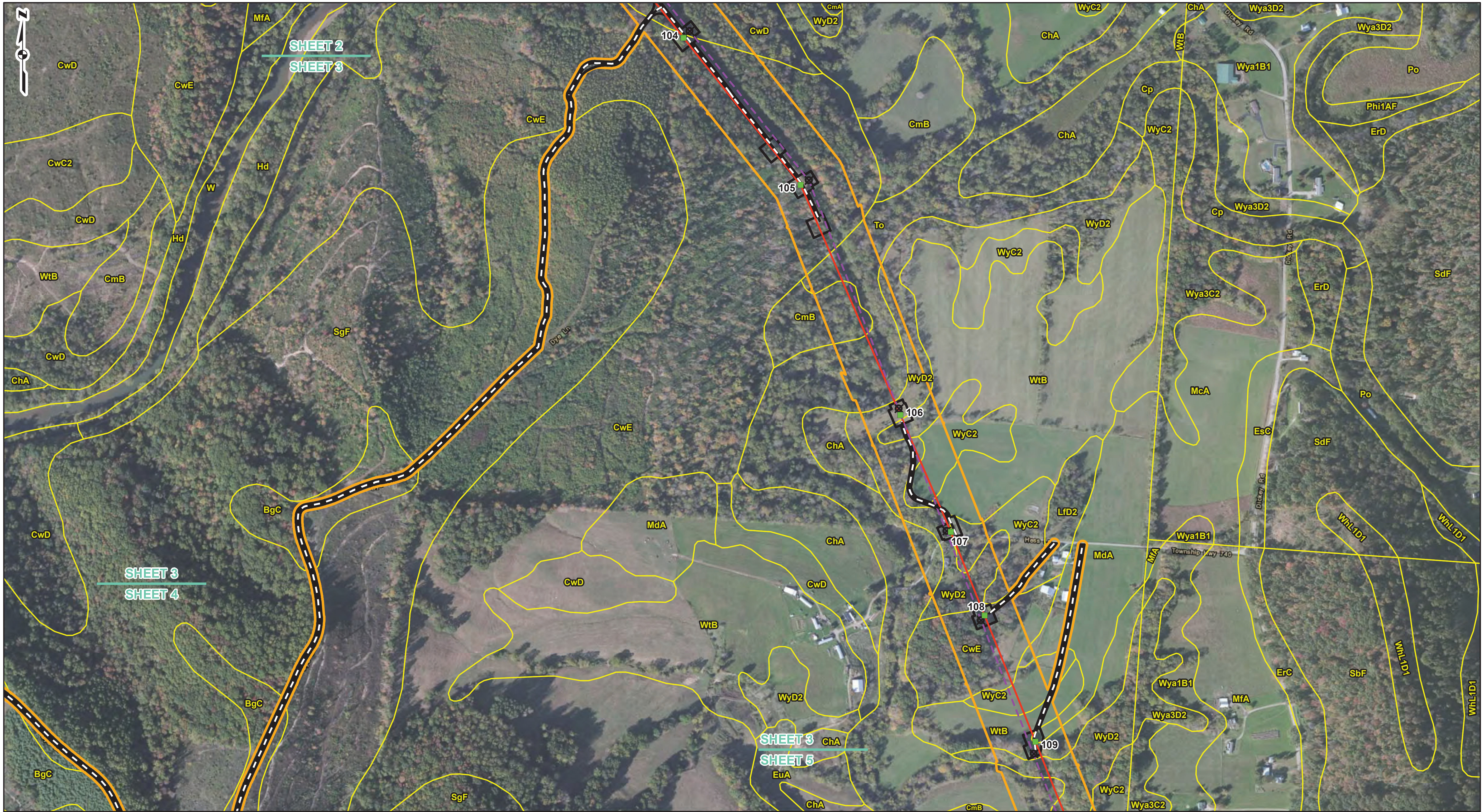

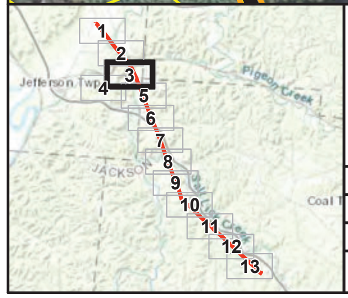

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- PROPOSED LIMIT OF DISTURBANCE (LOD)
- SOIL TYPE BOUNDARY

0 250 500 1,000 Feet

FIGURE 3
SOILS MAP
SHEET 3 OF 13

VIGO-PINE RIDGE
LINE REBUILD PROJECT
AMERICAN ELECTRIC POWER

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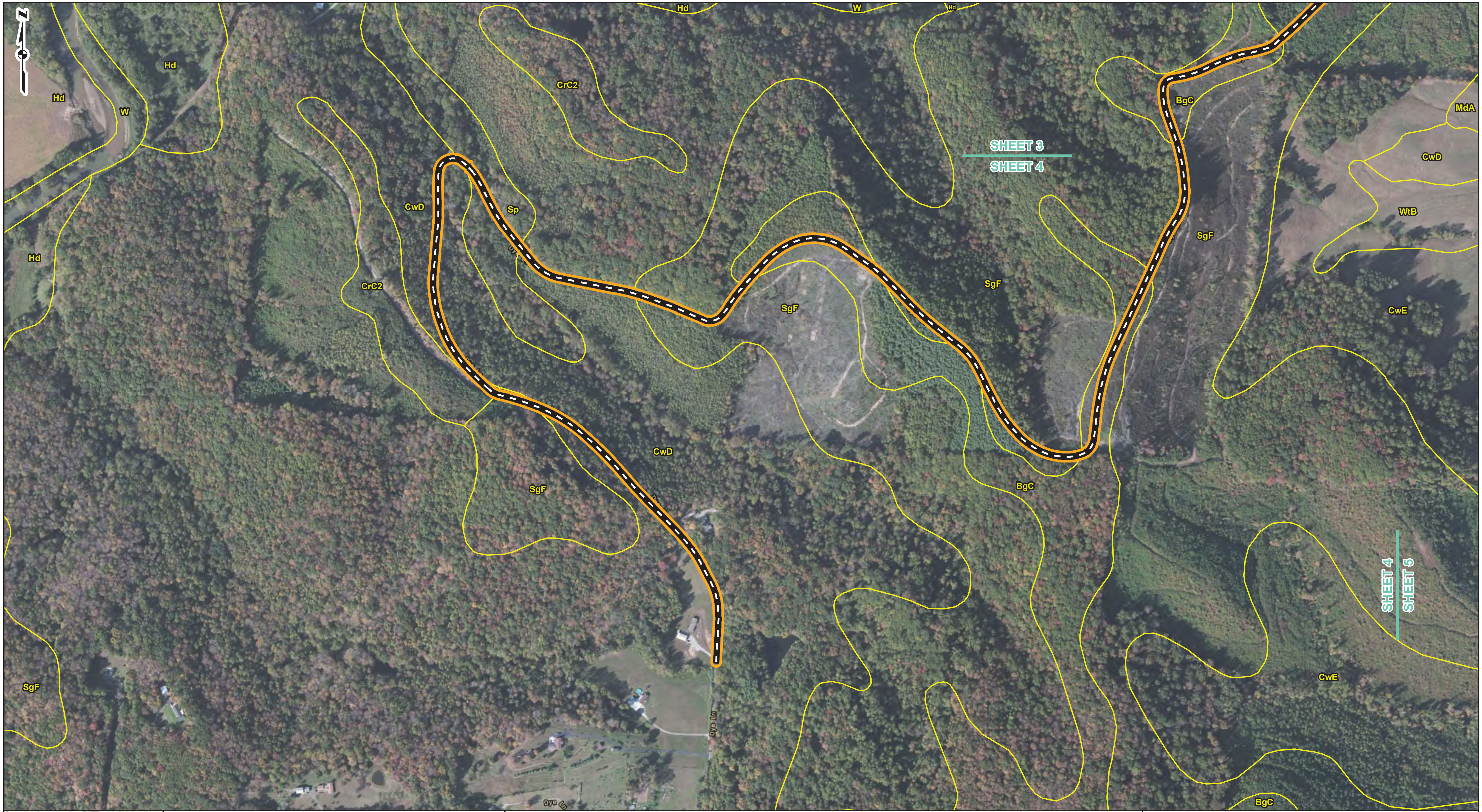

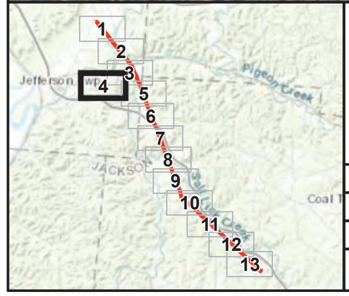

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- SOIL TYPE BOUNDARY

0 250 500 1,000 Feet

FIGURE 3
SOILS MAP
SHEET 4 OF 13

VIGO-PINE RIDGE
LINE REBUILD PROJECT
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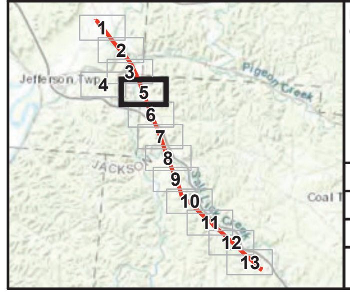

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- PROPOSED LIMIT OF DISTURBANCE (LOD)
- SOIL TYPE BOUNDARY

0 250 500 1,000 Feet

FIGURE 3
SOILS MAP
SHEET 5 OF 13

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VIGO-PINE RIDGE
LINE REBUILD PROJECT
AMERICAN ELECTRIC POWER

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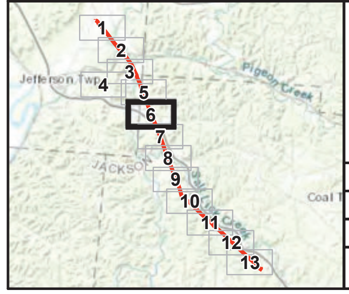

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- ENVIRONMENTAL STUDY AREA
- PROPOSED LIMIT OF DISTURBANCE (LOD)
- SOIL TYPE BOUNDARY

0 250 500 1,000
Feet

FIGURE 3
SOILS MAP
SHEET 6 OF 13

VIGO-PINE RIDGE
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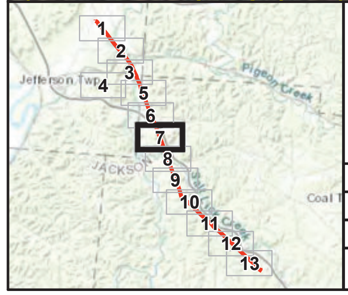

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- PROPOSED LIMIT OF DISTURBANCE (LOD)
- SOIL TYPE BOUNDARY

0 250 500 1,000 Feet

FIGURE 3
SOILS MAP
SHEET 7 OF 13

VIGO-PINE RIDGE
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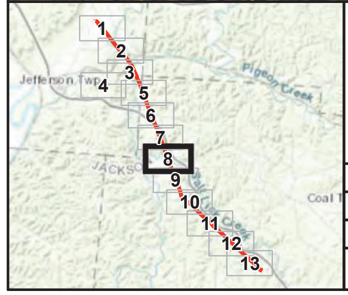

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- PROPOSED ACCESS ROAD
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- PROPOSED LIMIT OF DISTURBANCE (LOD)
- SOIL TYPE BOUNDARY

0 250 500 1,000 Feet

FIGURE 3
SOILS MAP
SHEET 8 OF 13

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VIGO-PINE RIDGE
LINE REBUILD PROJECT
AMERICAN ELECTRIC POWER

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REVISIONS:

LEGEND

- EXISTING SUBSTATION
- ### PROPOSED CONCRETE FOUNDATION STRUCTURE
- EXISTING STRUCTURE TO BE REMOVED
- PROPOSED 138kV TRANSMISSION LINE
- EXISTING 69kV TRANSMISSION LINE
- PROPOSED ACCESS ROAD
- ENVIRONMENTAL STUDY AREA
- PROPOSED LIMIT OF DISTURBANCE (LOD)
- SOIL TYPE BOUNDARY

0 250 500 1,000 Feet

FIGURE 3
SOILS MAP
SHEET 9 OF 13

VIGO-PINE RIDGE
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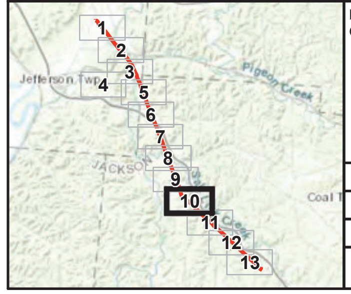

REFERENCE: ESRI WORLD IMAGERY, CLARITY, ARCGIS ONLINE, ACCESSED 10/2021. SOIL SURVEY GEOGRAPHIC (SSURGO) DATABASE FOR ROSS COUNTY, OHIO, USDA/NRCS, 2020.

NO.:	DATE:	DWN:	CHKD:	APPD:	DESCRIPTION:

REVISIONS:

LEGEND

- EXISTING SUBSTATION
- PROPOSED CONCRETE FOUNDATION STRUCTURE
- EXISTING STRUCTURE TO BE REMOVED
- PROPOSED 138kV TRANSMISSION LINE
- EXISTING 69kV TRANSMISSION LINE
- PROPOSED ACCESS ROAD
- ENVIRONMENTAL STUDY AREA
- PROPOSED LIMIT OF DISTURBANCE (LOD)
- SOIL TYPE BOUNDARY

0 250 500 1,000 Feet

FIGURE 3
SOILS MAP
SHEET 10 OF 13

VIGO-PINE RIDGE
LINE REBUILD PROJECT
AMERICAN ELECTRIC POWER

gai consultants

DRAWN BY: JACKSEF
DATE: 10/14/2021
CHECKED: RAMACB
APPROVED: JONESAR

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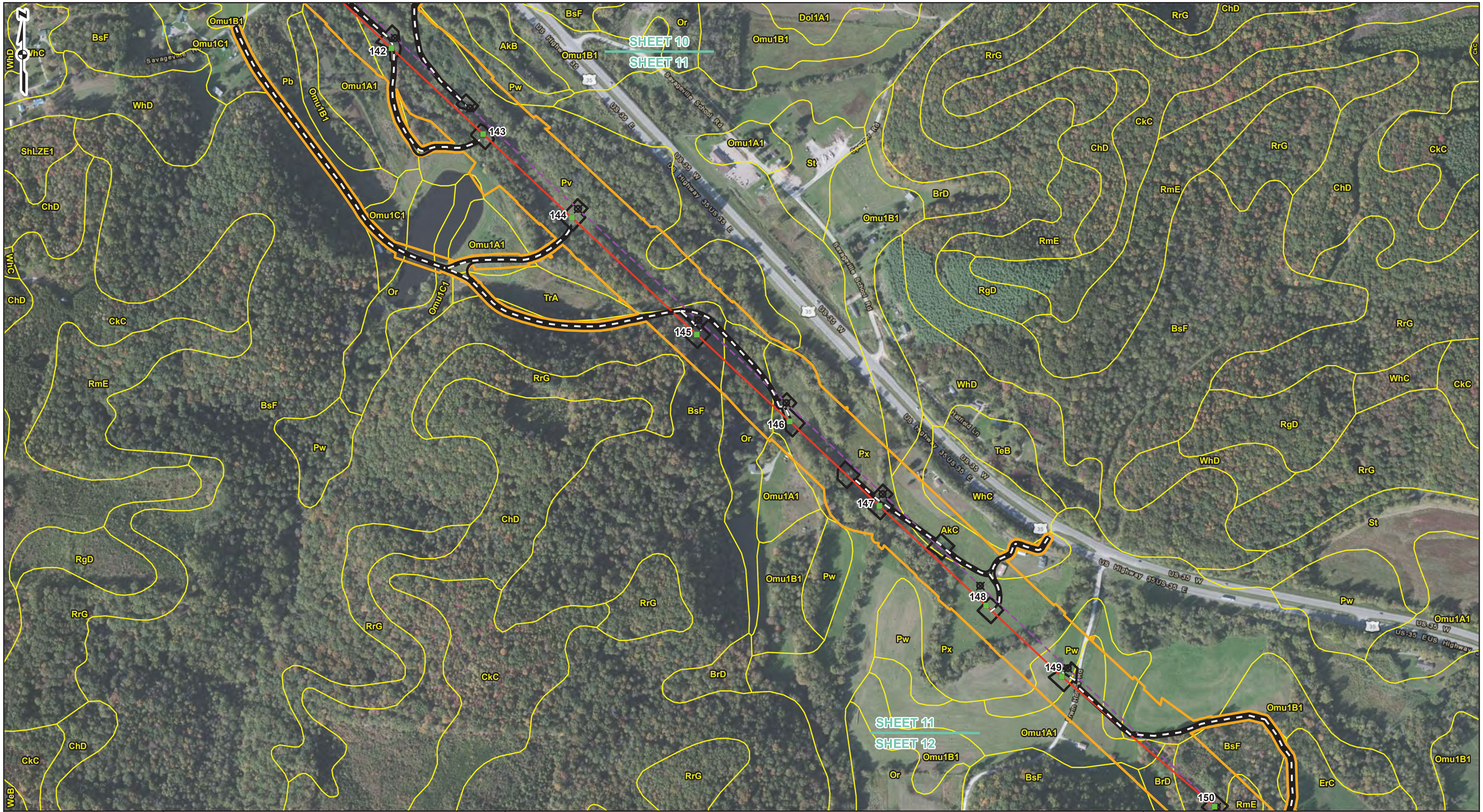
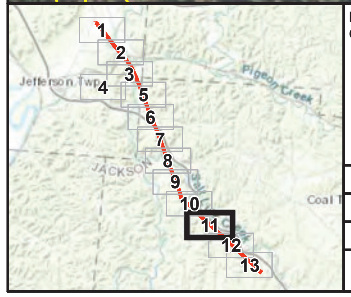


REFERENCE: ESRI WORLD IMAGERY, CLARITY, ARCGIS ONLINE, ACCESSED 10/2021. SOIL SURVEY GEOGRAPHIC (SSURGO) DATABASE FOR ROSS COUNTY, OHIO, USDA/NRCS, 2020.



NO.:	DATE:	DWN:	CHKD:	APPD:	DESCRIPTION:

REVISIONS:

LEGEND

- EXISTING SUBSTATION
- PROPOSED CONCRETE FOUNDATION STRUCTURE ###
- EXISTING STRUCTURE TO BE REMOVED
- PROPOSED 138kV TRANSMISSION LINE
- EXISTING 69kV TRANSMISSION LINE
- PROPOSED ACCESS ROAD
- ENVIRONMENTAL STUDY AREA
- PROPOSED LIMIT OF DISTURBANCE (LOD)
- SOIL TYPE BOUNDARY

0 250 500 1,000 Feet

FIGURE 3
SOILS MAP
SHEET 11 OF 13

VIGO-PINE RIDGE
LINE REBUILD PROJECT
AMERICAN ELECTRIC POWER

gai consultants

DRAWN BY: JACKSEF DATE: 10/14/2021
CHECKED: RAMACB APPROVED: JONESAR

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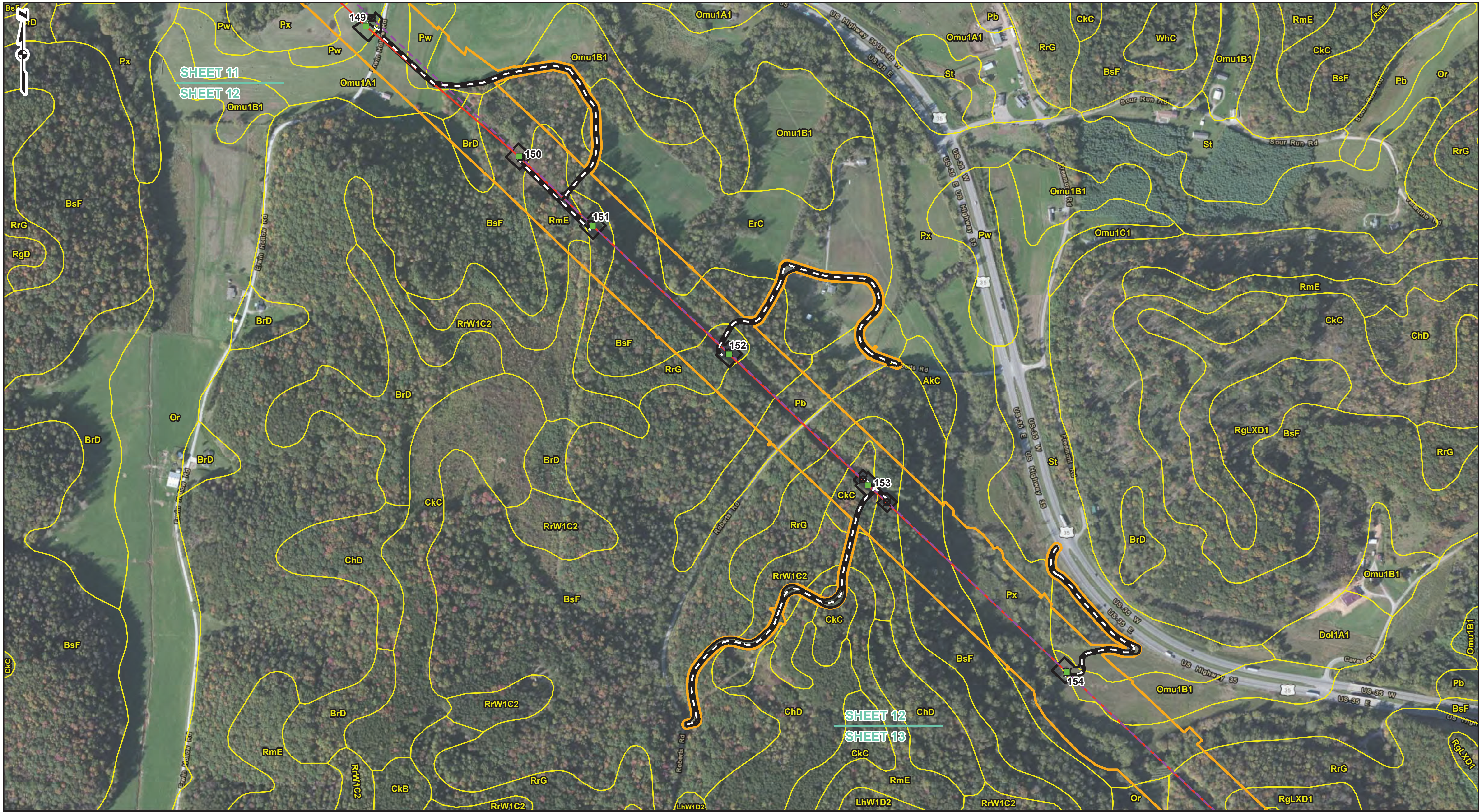

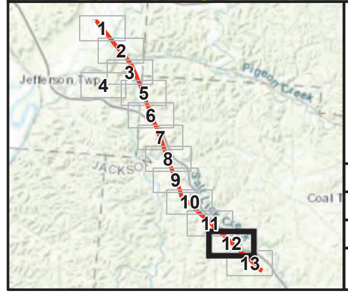

REFERENCE: ESRI WORLD IMAGERY, CLARITY, ARCGIS ONLINE, ACCESSED 10/2021. SOIL SURVEY GEOGRAPHIC (SSURGO) DATABASE FOR ROSS COUNTY, OHIO, USDA/NRCS, 2020.

NO.:	DATE:	DWN:	CHKD:	APPD:	DESCRIPTION:

REVISIONS:

LEGEND

- EXISTING SUBSTATION
- PROPOSED CONCRETE FOUNDATION STRUCTURE
- EXISTING STRUCTURE TO BE REMOVED
- PROPOSED 138kV TRANSMISSION LINE
- EXISTING 69kV TRANSMISSION LINE
- PROPOSED ACCESS ROAD
- ENVIRONMENTAL STUDY AREA
- PROPOSED LIMIT OF DISTURBANCE (LOD)
- SOIL TYPE BOUNDARY

0 250 500 1,000 Feet

FIGURE 3
SOILS MAP
SHEET 12 OF 13

gai consultants

VIGO-PINE RIDGE
LINE REBUILD PROJECT
AMERICAN ELECTRIC POWER

AMERICAN ELECTRIC POWER

DRAWN BY: JACKSEF
CHECKED: RAMACB
DATE: 10/14/2021
APPROVED: JONESAR

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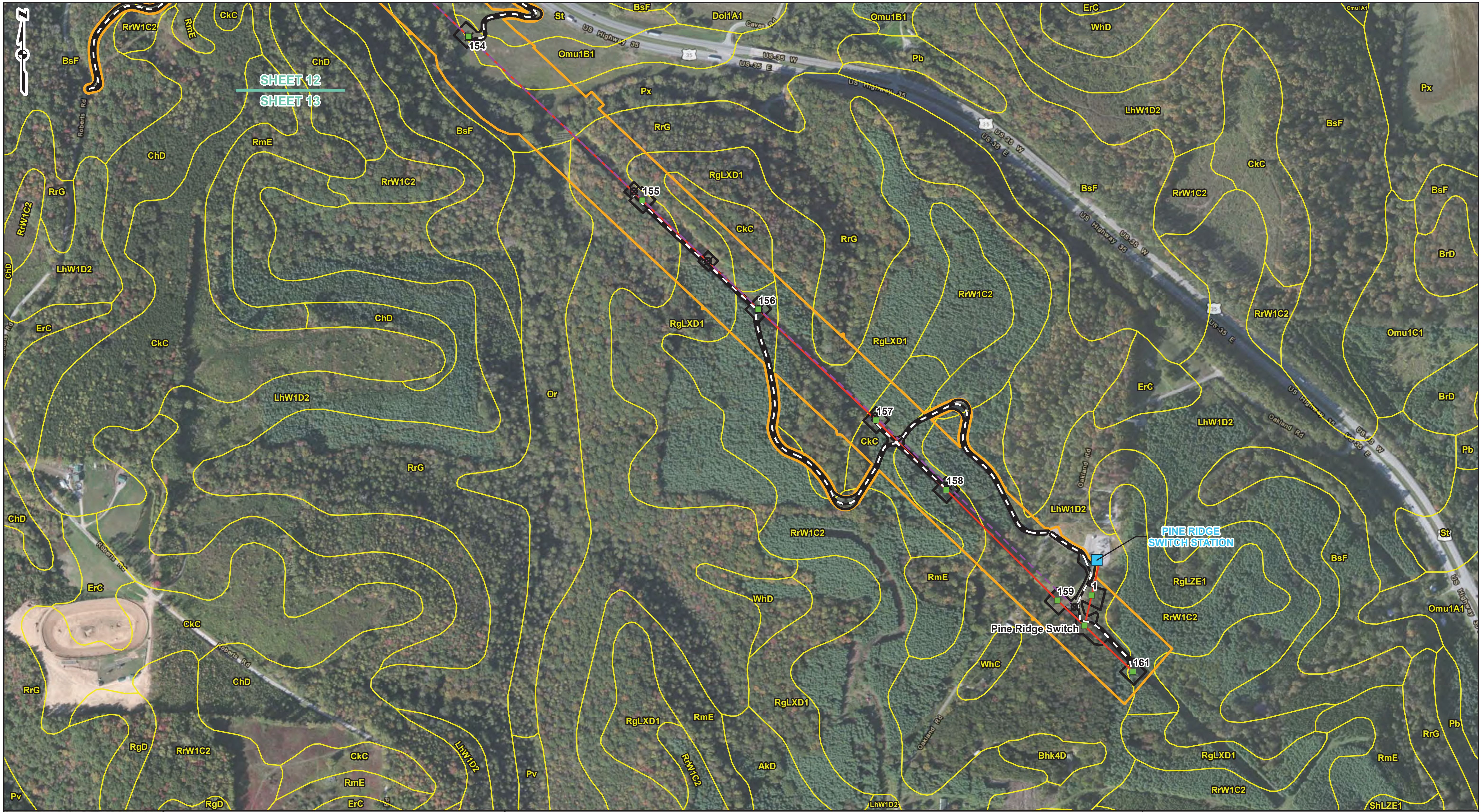

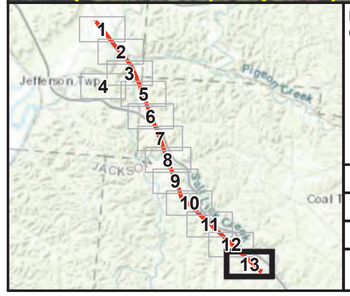

REFERENCE: ESRI WORLD IMAGERY, CLARITY, ARCGIS ONLINE, ACCESSED 10/2021. SOIL SURVEY GEOGRAPHIC (SSURGO) DATABASE FOR ROSS COUNTY, OHIO, USDA/NRCS, 2020.

NO.:	DATE:	DWN:	CHKD:	APPD:	DESCRIPTION:

REVISIONS:

LEGEND

- EXISTING SUBSTATION
- PROPOSED CONCRETE FOUNDATION STRUCTURE
- EXISTING STRUCTURE TO BE REMOVED
- PROPOSED 138kV TRANSMISSION LINE
- EXISTING 69kV TRANSMISSION LINE
- PROPOSED ACCESS ROAD
- ENVIRONMENTAL STUDY AREA
- PROPOSED LIMIT OF DISTURBANCE (LOD)
- SOIL TYPE BOUNDARY

0 250 500 1,000 Feet

FIGURE 3
SOILS MAP
SHEET 13 OF 13

VIGO-PINE RIDGE
LINE REBUILD PROJECT
AMERICAN ELECTRIC POWER

gai consultants

AMERICAN ELECTRIC POWER

DRAWN BY: JACKSEF
DATE: 10/14/2021
CHECKED: RAMACB
APPROVED: JONESAR

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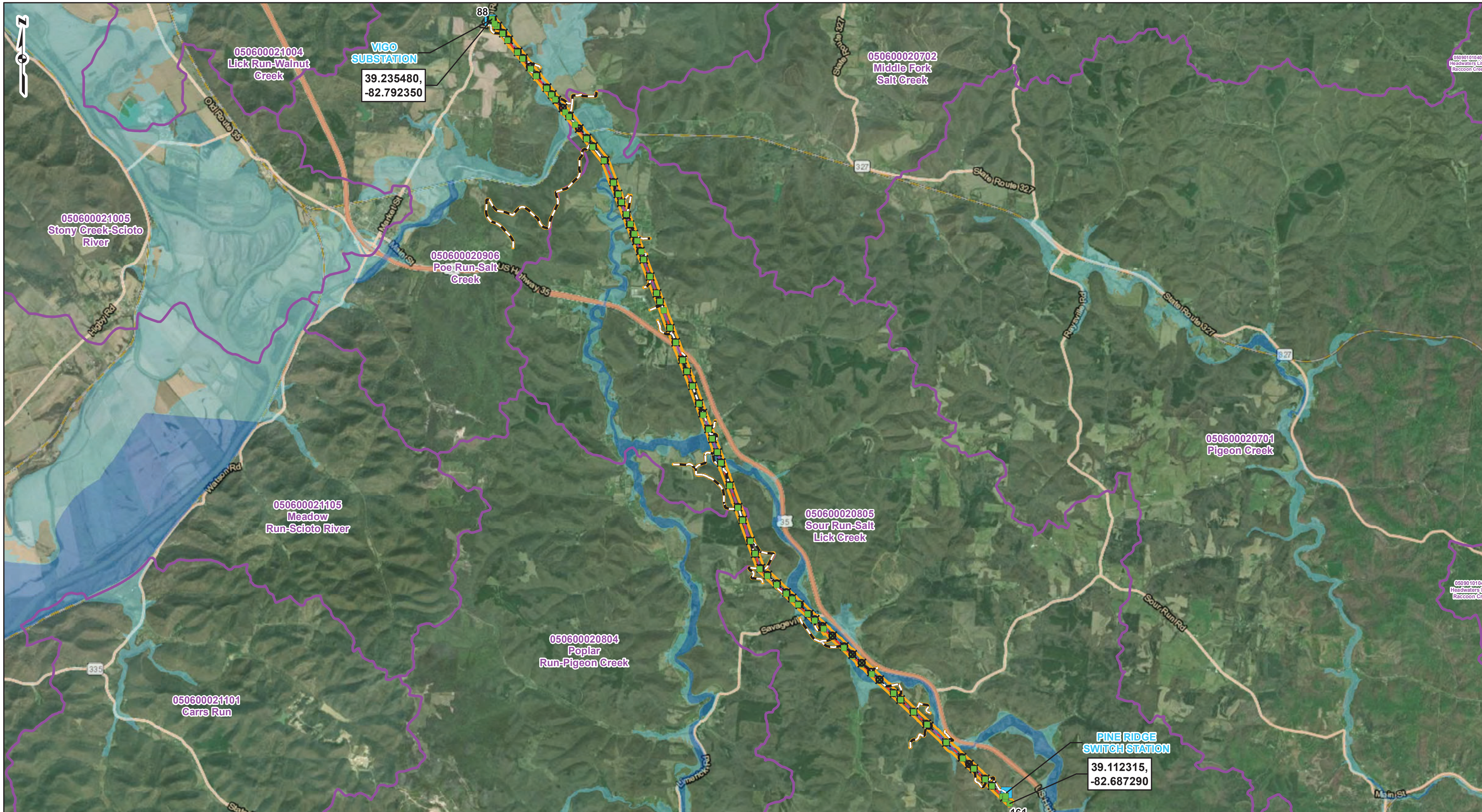

PROJECT LOCATION

ROSS AND JACKSON COUNTIES, OHIO

REFERENCE: ESRI WORLD IMAGERY, DIGITALGLOBE, 2015, ACCESSED 10/2021. HUC 12 WATERSHED BOUNDARY, USGS, 2016. NATIONAL FLOOD HAZARD LAYER, FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA), OHIO, 2020.

NO.:	DATE:	DWN:	CHKD:	APPD:	DESCRIPTION:

REVISIONS:

LEGEND

- EXISTING SUBSTATION
- PROPOSED CONCRETE FOUNDATION STRUCTURE (###)
- EXISTING STRUCTURE TO BE REMOVED
- PROPOSED 138kV TRANSMISSION LINE
- EXISTING 69kV TRANSMISSION LINE
- PROPOSED ACCESS ROAD
- ENVIRONMENTAL STUDY AREA
- HUC 12 WATERSHED BOUNDARY
- FEMA 100-YEAR FLOODPLAIN
- FEMA FLOODWAY

0 0.5 1 2 Miles

FIGURE 4
WATERSHED (HUC12) MAP

gai consultants

VIGO-PINE RIDGE
LINE REBUILD PROJECT
AMERICAN ELECTRIC POWER

DRAWN BY: JACKSEF | DATE: 10/14/2021
CHECKED: RAMACB | APPROVED: JONESAR

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APPENDIX 3

SWP3 Inspection Forms and SWP3
Amendments, Grading, and Stabilization Log

AEP OHIO TRANSMISSION COMPANY, INC.
VIGO-PINE RIDGE LINE REBUILD PROJECT
STORM WATER POLLUTION PREVENTION PLAN (SWP3) INSPECTION FORM

Date: ________________ Inspector's Name/Title: ____

Inspector's Company: ____

Inspector Qualified in accordance with Part VII.BB of Permit: ☐ Yes ☐ No (Document Qualifications in Appendix 3 of SWP3)

Inspection Type: ☐ Weekly (once every seven calendar days)

☐ Storm Event (0.5 inch or greater) Date: ____________ Amount: ____________ Duration: ____________

Rain Event(s) Since Last Inspection:

Date: __________ Amount: __________ Duration: ________	Date: __________ Amount: __________ Duration: ________
Date: __________ Amount: __________ Duration: ________	Date: __________ Amount: __________ Duration: ________

Did any discharges occur during these events? ☐ No ☐ Yes, Location: ______________________________

Current Weather: ☐ Clear ☐ Cloudy ☐ Fog ☐ Rain ☐ Snow ☐ Sleet ☐ High Winds ☐ Other: __________ Temp: __________

Current Discharges: ☐ No ☐ Yes, Location: ______________________________

Evidence of Sediment/Pollutants Leaving the Site? ☐ No ☐ Yes, Location: ______________________________

Has Seeding Taken Place? ☐ No ☐ Yes, Location/Seed tag photo included: ______________________________

Erosion and Sediment Control Features / BMPs Inspected:

☐ **Silt Fence / Filter Sock (Mark which one applies)**

Location(s) (Structure # (STR#)): ______________________________

Properly anchored/installed: ☐ Yes ☐ No Repairs Needed: ☐ Yes ☐ No

Sediment Removal Required (Sediment one-half height for fence & one-third height for sock): ☐ Yes ☐ No

Action Required/Taken/Location(s): ______________________________

____

☐ **Orange Barrier Fence**

Location(s) (Wetland / Access Road / STR#): ______________________________

Properly anchored/installed: ☐ Yes ☐ No Repairs Needed: ☐ Yes ☐ No

Action Required/Taken/Location(s): ______________________________

____

☐ **Construction Entrance**

Location(s) (Reference intersection of road and nearest STR#): ______________________________

Entrance Stabilized: ☐ Yes ☐ No Evidence of mud tracked on roadway: ☐ Yes ☐ No

Action Required/Taken/Location(s): ______________________________

____

☐ **Material Storage Areas (Including waste containers, fuel areas)**

Material Storage Areas located on site: ☐ Yes ☐ No Materials properly contained and labeled: ☐ Yes ☐ No

Evidence of spills or releases: ☐ Yes ☐ No

Action Required/Taken/Location(s): ______________________________

____

☐ **Concrete Washouts**

Location(s) (Access Road / STR#): ____

Properly installed and located at least 50 feet from wetlands/streams/ditches/storm drains: ☐ Yes ☐ No

Replacement needed (concrete reaches 50 percent of the system): ☐ Yes ☐ No

Action Required/Taken/Location(s): ____

____

<u>Comments / Additional Control Measures Recommended</u>: ____

____

____

<u>If BMP modifications are made, you must update the SWP3 drawings and document changes on the SWP3 amendment log.</u>

Inspector’s Signature: ____ Date: ______________________________

AEP OHIO TRANSMISSION COMPANY, INC.
VIGO-PINE RIDGE LINE REBUILD PROJECT

STORM WATER POLLUTION PREVENTION PLAN
AMENDMENTS, GRADING, AND STABILIZATION LOG

Date: ____________________ Inspector's Name/Title: ____

Location and Description of Grading and Stabilization Activities

____

____

____

____

Amendments to SWP3:

____

____

____

Date: ____________________ Inspector's Name/Title: ____

Location and Description of Grading and Stabilization Activities

____

____

____

____

Amendments to SWP3:

____

____

____

Date: ____________________ Inspector's Name/Title: ____

Location and Description of Grading and Stabilization Activities

____

____

____

____

Amendments to SWP3:

____

____

____

AEP OHIO TRANSMISSION COMPANY, INC.
VIGO-PINE RIDGE LINE REBUILD PROJECT
SUMMARY SWP3 INSPECTION RECORDS - FOR TCRs

I have completed a review of the SWP3 inspections completed on the project for the period of ____________ to ____________.

The following major observations were made relating to the implementation of the SWP3 and review of the inspection log.

Inspector Qualifications:

☐ The inspections were performed by "qualified inspection personnel" knowledgeable in the principles of erosion and sediment control and skilled in assessing the effectiveness of control measures.

☐ The inspections were NOT performed by "qualified inspection personnel" knowledgeable in the principles of erosion and sediment control and skilled in assessing the effectiveness of control measures.

  ☐ Corrective Measures were taken on ____________________ to provide "qualified inspection personnel" at the site.

Permit Compliance Observations:

☐ The project was in compliance with the SWP3 and permit during the review period.

☐ The project was NOT in compliance with the SWP3 and permit during the review period as noted below:

  ☐ Non-compliance issues included:

  ____
  ____
  ____
  ____
  ____
  ____
  ____

  ☐ Corrective Measures were taken on _____________ to correct the above non-compliance issues.

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

Name: ____
Title: ____
Signature: ____
Date: ____

APPENDIX 4

Duty to Inform Contractors and Subcontractors Signature Form

AEP OHIO TRANSMISSION COMPANY, INC.
VIGO-PINE RIDGE LINE REBUILD PROJECT

DUTY TO INFORM CONTRACTORS AND SUBCONTRACTORS SIGNATURE FORM

By signing below, I acknowledge that I have been informed of the terms and conditions of the Ohio Environmental Protection Agency's General NPDES Permit for Storm Water Associated with Construction Activity, and have reviewed and understand the conditions and responsibilities of the Storm Water Pollution Prevention Plan for the AEP Ohio Transmission Company, Inc. Vigo-Pine Ridge Line Rebuild Project. I understand that Inspectors shall meet the qualifications outlined in Part VII.BB. of Ohio EPA Permit No.: OHC000005.

Printed Name	Company	Signature	Date

APPENDIX 5

Storm Water Calculations Report

Vigo - Pine Ridge Line Rebuild Project -- Water Quality Volume Calculations

The proposed permanent 25-foot by 100-foot gravel parking area and permanent gravel access road near the Vigo Station falls within one drainage area that ultimately drains to a stream southeast of the parking area and access road. See the following report from USGS StreamStats for more detail.

Pre-Construction Calculations:

$P = 0.9$ in	Precipitation depth
$A_{pre} = 4.56\ mi^2 = 2{,}918.4$ acres	Area draining to discharge point, determined from USGS StreamStats
$i_{pre} = 0.98\%$	Pre-construction fraction of impervious surface
$RV_{pre} = 0.05 + (0.9)(i_{pre}) = 0.059$	Volumetric runoff coefficient
$WQv_{pre} = (RV_{pre})(P)(A_{pre}/12) = 12.9$ acre-ft	Water quality volume for the drainage area
$WQv_{pre} = 561{,}924.0\ ft^3$	

Post-Construction Calculations:

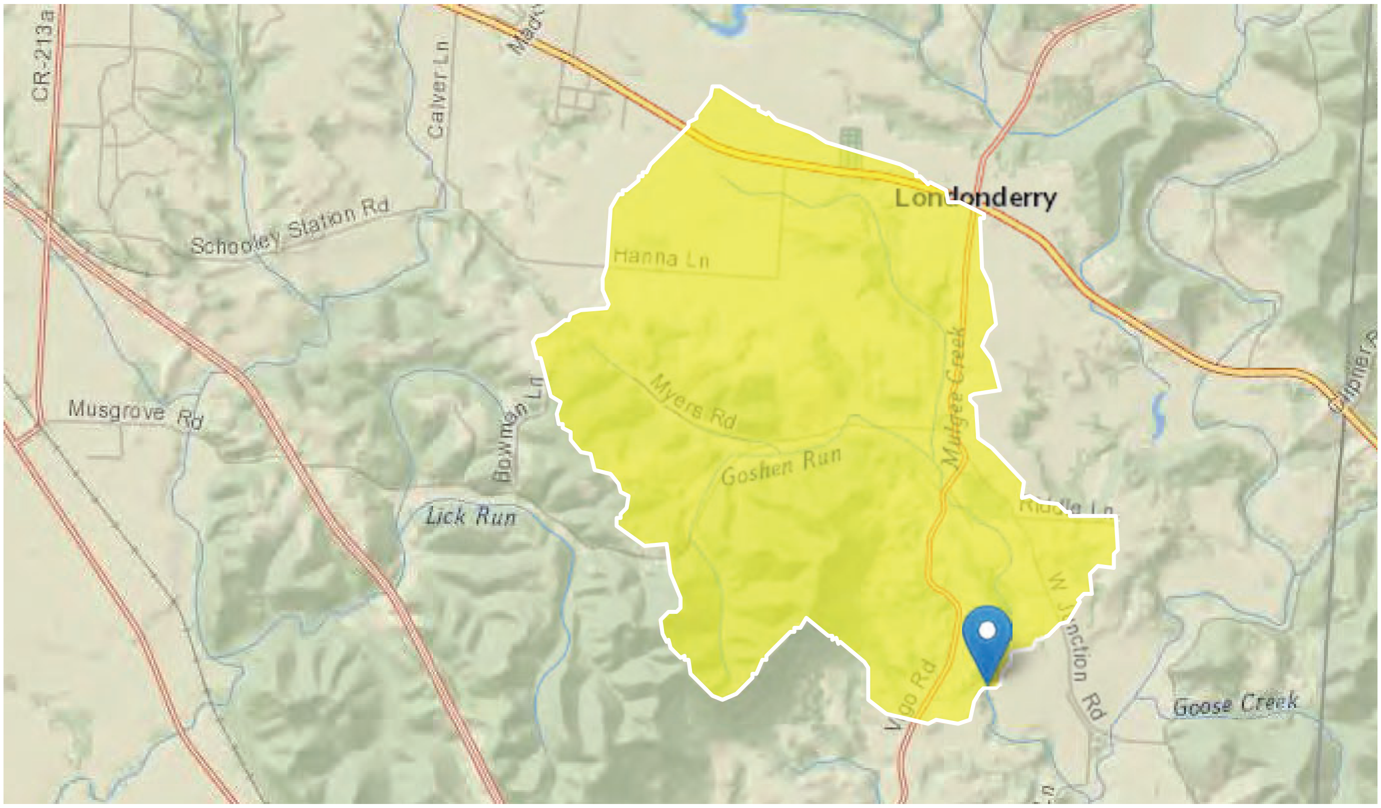
$P = 0.9$ in	Precipitation depth
$A_{post} = 4.56\ mi^2 = 2{,}918.4$ acres	Area draining to discharge point, determined from USGS StreamStats
$A_{dev} = 0.22$ acres	Area developed for this project that is part of the drainage area
$i_{post} = i_{pre} + (A_{dev}/A_{post}) = 0.98\%$	Post-construction fraction of impervious surface
$RV_{post} = 0.05 + (0.9)(i_{post}) = 0.059$	Volumetric runoff coefficient
$WQv_{post} = (RV_{post})(P)(A_{post}/12) = 12.9$ acre-ft	Water quality volume
$WQv_{post} = 561{,}924.0\ ft^3$	

Runoff Change Calculations:

Change = $(WQv_{post} - WQv_{pre})/WQv_{pre} = 0\%$	**Percent water quality volume change due to development of drainage area**

StreamStats Report

Region ID: OH
Workspace ID: OH20200805173858296000
Clicked Point (Latitude, Longitude): 39.23444, -82.78929
Time: 2020-08-05 13:39:15 -0400



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	4.56	square miles
LC92STOR	Percentage of water bodies and wetlands determined from the NLCD	0.18	percent
STREAM_VARG	Streamflow variability index as defined in WRIR 02-4068, computed from regional grid	0.61	dimensionless
LAT_CENT	Latitude of Basin Centroid	39.2524	decimal degrees
LC11IMP	Average percentage of impervious area determined from NLCD 2011 impervious dataset	0.98	percent

General Flow Statistics Parameters[Low Flow LatLE 41.2 wri02 4068]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	4.56	square miles	0.12	7422
LC92STOR	Percent Storage from NLCD1992	0.18	percent	0	19
STREAM_VARG	Streamflow Variability Index from Grid	0.61	dimensionless	0.25	1.13
LAT_CENT	Latitude of Basin Centroid	39.2524	decimal degrees	38.68	41.2

General Flow Statistics Flow Report[Low Flow LatLE 41.2 wri02 4068]

PIl: Prediction Interval-Lower, PIu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	SEp
Harmonic Mean Streamflow	0.492	ft^3/s	65.9	65.9

General Flow Statistics Citations

Koltun, G. F., and Whitehead, M. T.,2002, Techniques for Estimating Selected Streamflow Characteristics of Rural, Unregulated Streams in Ohio: U. S. Geological Survey Water-Resources Investigations Report 02-4068, 50 p (https://pubs.er.usgs.gov/publication/wri024068)

Application Version: 4.3.11

Vigo - Pine Ridge Line Rebuild Project -- Water Quality Volume Calculations

The proposed permanent 40-foot by 40-foot gravel pad and permanent gravel access road to the Pine Ridge Switch fall within one drainage area that ultimately drains to a stream northwest of the pad and access road. See the following report from USGS StreamStats for more detail.

Pre-Construction Calculations:

$P = 0.9$ in	Precipitation depth
$A_{pre} = 0.12\ mi^2 = 77$ acres	Area draining to discharge point, determined from USGS StreamStats
$i_{pre} = 0.15\%$	Pre-construction fraction of impervious surface
$RV_{pre} = 0.05 + (0.9)(i_{pre}) = 0.051$	Volumetric runoff coefficient
$WQv_{pre} = (RV_{pre})(P)(A_{pre}/12) = 0.29$ acre-ft	Water quality volume for the drainage area
$WQv_{pre} = 12{,}632\ ft^3$	

Post-Construction Calculations:

$P = 0.9$ in	Precipitation depth
$A_{post} = 0.12\ mi^2 = 77$ acres	Area draining to discharge point, determined from USGS StreamStats
$A_{dev} = 0.08$ acres	Area developed for this project that is part of the drainage area
$i_{post} = i_{pre} + (A_{dev}/A_{post}) = 0.15\%$	Post-construction fraction of impervious surface
$RV_{post} = 0.05 + (0.9)(i_{post}) = 0.051$	Volumetric runoff coefficient
$WQv_{post} = (RV_{post})(P)(A_{post}/12) = 0.29$ acre-ft	Water quality volume
$WQv_{post} = 12{,}632\ ft^3$	

Runoff Change Calculations:

Change = $(WQv_{post} - WQv_{pre})/WQv_{pre} = 0\%$	**Percent water quality volume change due to development of drainage area**

StreamStats Report

Region ID:	OH
Workspace ID:	OH20200226161028406000
Clicked Point (Latitude, Longitude):	39.11838, -82.68800
Time:	2020-02-26 11:10:47 -0500

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.12	square miles
LC92STOR	Percentage of water bodies and wetlands determined from the NLCD	0	percent
STREAM_VARG	Streamflow variability index as defined in WRIR 02-4068, computed from regional grid	0.64	dimensionless
LAT_CENT	Latitude of Basin Centroid	39.1142	decimal degrees
LC11IMP	Average percentage of impervious area determined from NLCD 2011 impervious dataset	0.15	percent

General Flow Statistics Parameters[Low Flow LatLE 41.2 wri02 4068]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.12	square miles	0.12	7422
LC92STOR	Percent Storage from NLCD1992	0	percent	0	19
STREAM_VARG	Streamflow Variability Index from Grid	0.64	dimensionless	0.25	1.13
LAT_CENT	Latitude of Basin Centroid	39.1142	decimal degrees	38.68	41.2

General Flow Statistics Flow Report[Low Flow LatLE 41.2 wri02 4068]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	SEp
Harmonic Mean Streamflow	0.0103	ft^3/s	65.9	65.9

General Flow Statistics Citations

Koltun, G. F., and Whitehead, M. T.,2002, Techniques for Estimating Selected Streamflow Characteristics of Rural, Unregulated Streams in Ohio: U. S. Geological Survey Water-Resources Investigations Report 02-4068, 50 p (https://pubs.er.usgs.gov/publication/wri024068)

Application Version: 4.3.11