CASE NO. 14-1717-GA-BLN
LON
AVON LAKE GAS ADDITION PROJECT
PROPOSED NATURAL GAS PIPELINE

ATTACHMENT K

EROSION AND SEDIMENT CONTROL PLAN

EROSION AND SEDIMENT CONTROL PLAN REVIEW APPLICATION FORM
LORAIN SOIL AND WATER CONSERVATION DISTRICT

ALL NECESSARY INFORMATION MUST BE PROVIDED ON THIS FORM. THE REVIEW AND INSPECTION FEE SHALL BE SUBMITTED WITH THE DEVELOPMENT PLAN. PLANS SHALL NOT BE APPROVED UNTIL THE FEE HAS BEEN PAID.

1. Owner Information

Name NRG Ohio Pipeline Company LLC Phone 609-524-4677

Address 211 Carnegie Center Fax/Email alan.sawyer@nrg.com

City Princeton State NJ Zip 08540

2. Agent/Engineer/Contractor/Builder Information

Name ERM Phone 847-258-8912

Contact Person Doni Murphy Phone 847-258-8912

Address 1701 Golf Road, Suite 1-1700 Fax/Email doni.murphy@erm.com

City Rolling Meadows State IL Zip 60008

3. Site Information

Site Name Avon Lake Gas Addition Project Township Eaton, LaGrange and Carlisle

Address See attached maps Project Type Natural Gas Pipeline

NPDES Permit # Pursuing Wetland Permit # Pursuing Sublot # _____ Phase # _____

Receiving Watershed 04110001

4. Soil Disturbing Activity Information

Total Project Area (acres) 235 acres Proposed Start Date July 2015

Total Contributing Drainage Area (acres) _____ Estimated Completion Date April 2016

Pre-Construction Site Conditions Existing utility corridor/agricultural fields/residential or commercial development

5. Payment Information **Make Checks Payable to Lorain County Commissioners**

Date of Check _____ Check # _____ Amount $ 1,300.00

6. Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision and are to the best of my knowledge and belief, true, accurate, and complete.

Printed Name NRG Ohio Pipeline Company LLC By Alan Sawyer, Vice President Affiliation NRG Ohio Pipeline Company LLC

I authorize the Lorain County Commissioners or its appointed agents to enter this property for the purposes of plan review, site inspection or compliance with the Lorain County Erosion & Sediment Control Rules for the duration of the project.

Signature Alan Sawyer Date 10 Dec 2014

7. Approval

Approved as submitted Y N By _____ Date _____

_____ Disapproved – Please Correct the following items: _____

Avon Lake Gas Addition Project

Lorain County, Ohio

Erosion and Sediment Control Plan

Prepared by
Environmental Resources Management
Hanover Engineering Associates

Prepared for
NRG Ohio Pipeline Company LLC

December 19, 2014

Signatory Requirement
(to be completed in advance of construction)

NRG Ohio Pipeline Company LLC

Avon Lake Gas Addition Project
Lorain County, Ohio

Erosion and Sediment Control Plan

Planned Construction Start Date: _____
Planned Construction Completion Date: _____

Construction Supervisor: _____
Phone: _____

Project Manager (signature): _____
Construction Contractor (signature): _____
Environmental Inspector (signature): _____

Prepared by
Environmental Resources Management
Hanover Engineering Associates

Prepared for
NRG Ohio Pipeline Company LLC

_____
(Signature)

_____
(Title)

_____
(Date)

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1.0 PROJECT OVERVIEW

Introduction

This Erosion and Sediment Control Plan ("ESCP or Plan") has been prepared for NRG Ohio Pipeline Company LLC for construction activities associated with the Avon Lake Gas Addition Project (the "Project") in Lorain County, Ohio. The purpose of this ESCP is to describe the planned methods, location and maintenance of erosion and sediment control to be implemented during construction of the Project, and methods of restoration following construction. The ESCP also documents planned best management practices ("BMPs") that will be implemented during construction of the Project to minimize adverse environmental impacts associated with storm water runoff and sedimentation by preventing sedimentation into aquatic features and the tracking of sediment and debris onto public roads. This Plan has been prepared pursuant to the Ohio Department of Natural Resources' pipeline construction standards, in conjunction with the most stringent of the collective requirements of the Ohio Environmental Protection Agency, Ohio Department of Natural Resources Division of Soil and Water Conservation, Lorain County Soil and Water Conservation District, City of Avon Lake, City of Avon, City of Elyria and the City of North Ridgeville.

Project Description

The Avon Lake Power Plant is a 734 MW coal-fired generating facility located in Avon Lake, Ohio ("Power Plant").[1] The Power Plant is owned by NRG Power Midwest LP ("NRG Midwest"), which is an indirect subsidiary of NRG Energy, Inc. ("NRG"). The Power Plant was slated for retirement by the facility's prior owner as a result of significant expenditures required to meet increasingly stringent environmental requirements. NRG Midwest has decided to move ahead with a gas addition project, which will keep the facility in operation on natural gas beyond its planned deactivation date (the "Avon Lake Gas Addition Project"). To add natural gas as a fuel supply for the Power Plant, the proposed natural gas pipeline must be designed, permitted and constructed. The Avon Lake Gas Addition Project will bring environmental, economic, employment and electric supply reliability benefits to the region as well as the State. The expected operation date for the pipeline is April 2016. The construction of the proposed pipeline is anticipated to begin as early as summer 2015. If NRG Ohio Pipeline receives the necessary permits and approvals to begin tree cutting in March of 2015, NRG Ohio Pipeline will do so.

The proposed 24-inch diameter high-grade steel pipeline will extend south from the Power Plant, which is located along the Lake Erie shoreline in the City of Avon Lake, to a proposed supply tap location southwest of the Village of Grafton (approximately 20 miles). The proposed pipeline will require siting approval from the Ohio Power Siting Board ("OPSB"), as well as permits and approvals from other local, State and federal authorities.

[1] The Power Plant also has one oil-fueled unit.

Approximately 3,922 feet of the proposed pipeline will be aboveground. The pipeline will require a permanent right-of-way ("ROW") typically 50-feet in width for operation and maintenance and a temporary ROW of 100-feet for construction. Both the permanent and temporary ROWs have been reduced in some areas to reduce the potential for environmental impacts. Additional temporary workspace areas outside of the temporary construction ROW will be needed for short durations during construction. Existing public and private roads will be utilized for access to most of the construction ROW; however, approximately 2.2-miles (or 11,806-feet) of new 25-foot-wide temporary access roads are anticipated. Finally, the required regulating station will occupy up to approximately one acre.

Route Selection

The evaluation or consideration of route alternatives was generally aimed at reducing proximity to existing buildings and other above and below-ground infrastructure or features, while also balancing trade-offs associated with other routing considerations (socioeconomic, ecological, engineering, construction and cost related). Various routing objectives served as the underlying basis of the identification and consideration of alternatives, namely including the following:

- Reducing the potential for impact to wetlands, waterways and other surface and ground waters, to the extent feasible—including minimizing the number of waterway crossings to the extent feasible;
- Minimizing the extent of tree removal required, to the extent feasible;
- Reducing the extent of construction in areas of steep slopes, to the extent feasible; and
- Locating and designing the pipeline such that the use of existing access can be maximized and construction eased, to the extent feasible, with steadfast attention to public safety.

A comprehensive routing study was conducted to identify a preferred alternative. Multiple potential route corridors or alternatives, or iterations thereof, were identified and comparatively evaluated. Route alternatives were removed from consideration where they would result in a greater potential for adverse impacts.

Route adjustments requested by landowners have been incorporated to the extent feasible, reasonable or appropriate. For example, route adjustments requested by landowners have been incorporated when those requested adjustments would not otherwise significantly and adversely compromise or conflict with any routing objectives, or to the extent that any adjacent landowners were not involuntarily and adversely impacted. The proposed location of the Project, as depicted on the maps provided in Appendix A, reflects the results of NRG Ohio Pipeline Company LLC's robust and comprehensive consideration of alternatives, as well as its willingness to work cooperatively with affected landowners.

General Description of Construction Activities and the Area to be Disturbed

Construction activities will occur within a newly acquired right-of-way though the majority of the area to be disturbed is either developed already (e.g. parking lot) or hosts existing crops or other herbaceous vegetation. Project construction activities (e.g. clearing/grubbing, grading, trench excavation, spoil storage, backfilling and restoration) will disturb soils within a corridor ranging from 50 to 100-feet in width, encompassing both the permanent and temporary ROWs. Both the permanent and temporary ROWs have been reduced in some areas to reduce the potential for environmental impacts. All work will be performed within the limit of disturbance described herein, and as depicted on the maps provided in Appendix A. Sediment controls must be installed within seven days of first clearing/grubbing or prior to any ground disturbing activity, whichever is first. Adherence to the erosion and sediment controls identified within this Plan will minimize the potential for soil erosion and sedimentation during construction and site restoration.

Typically, the trench will be excavated to allow three to five feet of cover over the new pipeline after installation and backfilling. The backfill material that will be returned to the trench will consist of the same material removed from the trench, to the extent practicable. Excess soil will be spread onsite, except in wetlands and waterways. Following the installation of the pipeline, all disturbed areas will be returned to their pre-construction slope and contour, to the extent feasible, stabilized and seeded. All vegetated areas that undergo Project-related soil disturbance will be seeded and re-vegetated to provide a permanent herbaceous cover to stabilize soils and prevent erosion. Other temporary erosion and sediment controls will be maintained until disturbed areas are stabilized.

Segmented construction is expected to ensure the Project is completed on schedule. Soil disturbing activities are anticipated to begin as early as June 2015 and be completed by April 2016. Some of the work will be performed during periods of frozen ground, to the extent feasible, to minimize impact to wetlands and other sensitive areas. A detailed sequence of construction activities can be found on page 83 of Appendix A.

The collective area of anticipated ground disturbance associated with the Project, including all permanent and temporary ROWs, temporary workspace areas, newly constructed temporary access roads, footprint of the regulating station, and BMP installation encompasses approximately 233 acres. Maps provided in Appendix A provide further detail as to the area or limit of disturbance associated with the Project.

New Impervious Areas and Runoff Coefficients

There will be no new impervious surfaces created as a result of the construction of the Project. As previously identified, the area to be disturbed is either developed already (e.g. parking lot) or hosts existing crops or other herbaceous vegetation. All areas disturbed by the Project will be restored to their

pre-construction material, condition or contours to the maximum extent feasible, unless they are restored to meadow condition.

Accordingly, post-construction runoff will remain essentially the same as pre-construction runoff. Therefore, the calculation of runoff coefficients for pre-construction vs. post-construction conditions is not warranted or applicable.

Delineation of Drainage Watersheds

Delineation of drainage watersheds traversed is not warranted or applicable for this Project because the temporary storm water control measures that will be implemented during construction are adaptable to any size watershed based on field conditions and professional judgment. No permanent storm water management systems will be developed for the Project. No permanent filling or relocation of wetlands or waters is planned, and no permanent bridges or culverts will be installed. Furthermore, there will be no permanent change to existing grade, ground surface material or waterway drainage or wetland contours, as all areas disturbed by the Project will be restored to their pre-construction condition, to the extent feasible, or restored to meadow condition.

Site Conditions

Soils

Based on review of U.S. Department of Agricultural National Resource Conservation Service soils data and the Lorain County Soil Survey, the following general soil series occur along the Project, as listed in Table 1.

Table 1. Soils along the Project

Soil Series	Description
Mahoning	Very deep somewhat poorly drained soils formed in low-lime till on till plains of Wisconsin age. The till is derived primarily from shale and siltstone, with minor amounts of limestone and crystalline erratics. Slope is primarily 0 to 6 percent, but ranges to 15 percent.
Udorthents	Moderately well drained to excessively drained soils that have been disturbed by filling, and areas that are disturbed or covered by development. Slopes range from 0 to 10 percent but are dominantly 0 to 5 percent.
Orrville	Very deep, somewhat poorly drained soils formed in loamy alluvium and are on flood plain steps on flood plains. They formed in alluvium from upland areas of low-lime drift, and from areas of sandstone, siltstone, shale, and limestone. They are in or bordering areas of Wisconsinan or Illinoian glaciation. Slope ranges from 0 to 3 percent.
Miner	Very deep, very poorly drained soils formed in low-lime glacial till principally derived from acid shale on lake plains which have been modified by lake action, and in shallow depressions and narrow drainages on till plains. They formed in till principally derived from acid shale. The slope gradient ranges from 0 to 2 percent.
Lorain	Very deep, very poorly drained soils that formed in Wisconsin age fine-textured glaciolacustrine sediments. These soils formed in Wisconsin age glaciolacustrine sediments in depressions on lake plains, terraces, and till plains. Slope ranges from 0 to 2 percent.
Fitchville	Very deep, somewhat poorly drained soils formed in stratified Wisconsinan age glaciolacustrine sediments that are derived mainly from materials high in sandstone and shale and are on summits and shoulders on lake plains and are on treads on terraces. Slope ranges from 0 to 12 percent.
Mermill	Very deep, very poorly drained soils on lake plains, and less commonly on till plains of late Wisconsinan age. They have a plane or concave surface with a slope gradient of 0 to 2 percent.
Oshtemo	Very deep, well drained soils formed in stratified loamy and sandy deposits on outwash plains, valley trains, moraines, and beach ridges. These soils formed in stratified loamy and sandy deposits that have a high content of quartz and contain variable amounts of material derived from igneous and metamorphic rocks, sandstone, limestone, and dolomite. Slope ranges from 0 to 55 percent.
Holly	Very deep, very poorly and poorly drained soils formed on broad flat areas and in slight depressions on flood plains receiving alluvium from upland areas of low-lime drift and noncalcareous sandstone and shale. Slope ranges from 0 through 3 percent.
Chili	Very deep, well drained soils on outwash plains, terraces, kames, and beach ridges. The soils formed in Wisconsinan age stratified outwash derived largely from noncalcareous sandstone and shale that contains a high amount of quartz gravel. Commonly, the outwash is mantled with silt. The slope gradient typically is 0 to 18 percent, but the range is up to 70 percent.
Haskins	Very deep, somewhat poorly drained soils that are moderately deep or deep to dense till on lake plains and on till plains of late Wisconsinan age. They formed in

Soil Series	Description
	loamy water-sorted or glaciolacustrine material and in the underlying till. These soils are on lake plains and till plains. Slope ranges from 0 to 6 percent.
Lobdell	Very deep, moderately well drained soils that formed in recent loamy alluvium. These soils are on nearly level flood plains receiving loamy alluvium from upland areas of sandstone, shale, and low lime glacial drift. Slope ranges from 0 to 3 percent.
Mentor	Very deep, well drained soils formed in silty lacustrine material. These soils are on threads and risers on terraces, dissected lake plains, and silty outwash plains. These soils are formed in stratified glaciolacustrine or terrace deposits derived from materials high in sandstone and shale. Slope ranges from 0 to 70 percent.
Luray	Very deep, very poorly drained soils formed in silty lacustrine material or slack water sediments. These soils are on slight depressions or on level areas on lake plains, terraces, outwash plains, and in small local areas on till plains. Slope ranges from 0 to 2 percent.
Sebring	Very deep, poorly drained soils formed in stratified Wisconsinan age glaciolacustrine sediments and are on broad flats and depressions on lake plains and slackwater terraces. Slope ranges from 0 to 2 percent.
Trumbull	Deep, poorly drained soils formed in low-lime glacial till. These soils are on level to gently sloping and depressional portions of till plains. Slopes are dominantly less than 4 percent but range to 6 percent.
Rawson	Very deep, moderately well drained soils that formed in loamy sediments and till on till plains, outwash plains and lake plains of Wisconsinan age. They are moderately deep or deep to dense till. Slope ranges from 0 to 12 percent.
Bogart	Very deep, moderately well drained soils that formed in Wisconsinan age stratified outwash deposits and are on convex slopes in areas of low relief on stream terraces, beach ridges, and outwash plains. Slopes range from 0 to 12 percent.
Tioga	Very deep, well drained soils formed in alluvium on higher positions in flood plains. These soils formed in recent alluvium, mainly from areas of sandstone, siltstone, and shale. Slope ranges from 0 to 3 percent.
Ellsworth	Very deep, moderately well drained soils formed in low-lime till on plains of Wisconsin age typically with a with a calcium carbonate equivalent of between 5 and 15 percent. The till is derived from shale and sandstone, with minor amounts of limestone and crystalline rocks. Slope ranges from 0 to 70 percent.
Allis	Moderately deep, poorly drained soils on bedrock controlled uplands. They are less frequently located on lake plains. They are on till plains and, less frequently, lake plains. The soils are formed in a thin mantle of glacial till dominated by, and underlain by, acid shale which, in some places is interbedded with siltstone and sandstone. Slope is 0 to 2 percent.
Jimtown	Very deep, somewhat poorly drained soils formed in Wisconsinan Age stratified outwash deposits on stream terraces, outwash terraces, outwash plains, and beach ridges. Slope ranges from 0 to 6 percent.

Land Use

Current land use along the Project area generally consists of industrial, mixed developed, undeveloped and varying densities of residential uses. Where the Project generally extends through the City of Avon Lake, the predominant land use crossed by the Project is industrial use. Where the Project generally extends through the City of Avon, the predominant land use is undeveloped with adjacent industrial, recreational, and residential uses from north to south through the City. Where the Project generally extends through the City of Elyria, the predominant land use is institutional (Lorain County Community College). Where the Project generally extends through the City of North Ridgeville, the predominant land use is undeveloped/wooded with adjacent residential and commercial uses. Proposed residential uses are known to occur in some areas along the Project. Some agricultural uses do occur along the Project, near its southern end, in the undeveloped portions of Eaton, Carlisle and LaGrange Townships. Because this Project mostly crosses lands already developed and parallels existing previously disturbed rights-of-way, there has already been prior ground disturbance and maintenance in the area of the Project. Once the Project is built, the permanent ROW will be maintained as an operational ROW. The ROW will be reseeded, though trees will not be allowed to regrow within the operational ROW.

Wetlands and Waters

Wetlands and streams will be crossed by the Project. There are three predominant types of wetlands that occur along the Project; palustrine forested ("PFO"), palustrine scrub-shrub ("PSS") and palustrine emergent ("PEM"). Construction of the Project will require the removal of trees in 41 acres of PFO wetlands. Forested wetlands along the Project are depressional in nature and located adjacent to agricultural areas that have been actively farmed and ditched. Seven acres of PSS wetlands will be affected by the Project and like the forested wetlands along the Project, these wetlands are also depressional in nature and typically located adjacent to agricultural areas that have been actively farmed and ditched. The Project will affect 11 acres of PEM wetlands, which are similar in nature to the PSS wetlands but located in wet meadows and areas that have endured past clear cutting and farming activities.

Vegetation along intermittent and perennial streams that will be crossed by the Project typically includes a mixture of forested, scrub-shrub and emergent vegetation. Typical substrate types include leaf pack/woody debris, clay or hardpan, muck, gravel, silt and sand. Maps provided in Appendix A depict the location and type of each wetland, in addition to streams, that are within 200-feet of the Project. A copy of the wetland delineation report prepared for the Project and submitted to both the U.S. Army Corps of Engineers and the Ohio Environmental Protection Agency ("OEPA") is included in Appendix D.

Receiving Waters

Surface waters along the Project that are potential receiving waters are identified in Appendix B. Thermal impacts, flow rate, runoff volume and runoff pollution will be minimized by restoring the entire limits of ground disturbance to pre-construction conditions, to the extent feasible, or converting to

meadow in good condition. The thick, vegetative cover will help minimize storm water impacts. Additionally, the permanent ROW will be restored to pre-construction grade, which will promote sheet flow where it currently occurs, across a vegetated area acting as a filter strip.

2.0 CONSTRUCTION ACTIVITIES

This section describes the environmental construction techniques that will be performed to install the pipeline. As previously identified, BMPs will be implemented throughout construction to minimize soil erosion and the transport of sediments from the construction area, and to protect surface waters and wetlands located in and adjacent to the Project area. Detail drawings of specific BMPs are included in Appendix A.

Sequence of Construction Activities

The following provides an overview of the typical activities performed during pipeline construction. Wherever practical, construction activities will occur simultaneously and some steps may not occur in the exact order in which they are listed below.

- Survey and stake proposed pipeline and limits of disturbance.
- Install rock entrances at ingress/egress points to the ROW.
- Flag/field mark wetland areas.
- Install perimeter and other sediment barriers, as required by this Plan.
- Begin clearing of the ROW.
- Grade the workspace if necessary.
- Install geotextile fabric, matting or plating, as required by this Plan.
- Install erosion control blankets on steep slopes.
- Implement BMPs for trench dewatering.
- Install temporary stream crossings (install sedimentation controls as necessary for retaining temporary spoil piles) and restore/stabilize stream banks.
- Excavate the pipeline trench.
- String new pipe along the ROW.
- Weld new pipe sections together.
- Lower pipeline into trench.
- Install clay trench plugs or anti-seep collars.
- Backfill trench.
- Restore grade to preconstruction contours.
- Apply lime and fertilizer as needed. Seed and mulch all disturbed upland areas, and only use the specified wetland seed mix, if required, in wetlands.
- Monitor adequacy of erosion control practices.
- After permanent stabilization is achieved, remove temporary erosion and sediment controls.

Timing of Certain Construction Activities

The special timing considerations that apply to construction activities and implementation of BMPs are described below.

Sediment controls such as siltsoxx will be installed before initial ground disturbance, or immediately following ground disturbance if the nature of the disturbance (e.g., grading) would affect the stability of preinstalled sediment controls. Disturbed areas must be stabilized (i.e., using vegetative or structural soil cover to control erosion, such as temporary or permanent seed and mulch) during construction as specified in Tables 2 and 3 below.

Table 2. Temporary Stabilization Requirements

Area Requiring Temporary Stabilization	Timeframe to Apply Erosion Controls
Disturbed areas within 50-feet of jurisdictional wetlands and waters and before final grade	Within two days of the most recent disturbance if the area will remain idle for >14 days
For all disturbed areas that will be idle for >21 days but <1 year, and not within 50-feet of a stream	Within two days of the most recent disturbance in the area
Disturbed areas that will be idle over the winter	Prior to November 1

Table 3. Permanent Stabilization Requirements

Area Requiring Permanent Stabilization	Timeframe to Apply Erosion Controls
Any areas that will lie dormant for one year or more	Within two days of the most recent disturbance
Any areas within 50-feet of a stream and at final grade	Within two days of reaching final grade
Any other areas at final grade	Within two days of reaching final grade within that area

Timing of Waterway Crossings

In-stream work will be scheduled to avoid high stream flow conditions, such as immediately following heavy periods of rain, to achieve a dry or low flow condition. The total length of excavated trench open at the stream crossing at any one time will not be greater than the total length of pipeline that can be placed in the trench and backfilled in one working day. Equipment associated with isolation crossing methods (i.e., sand bag dams, flume pipe, pumps, etc.), should they be employed, should not be left in the stream overnight. Every effort will be made to cross streams 10-feet in (bottom) width or less, including the trench backfilling, in one working day. Stream banks and the areas 50-feet from the top of each stream bank will be stabilized within 72 hours from the beginning of the stream crossing.

3.0 EROSION PREVENTION AND SEDIMENT CONTROL MEASURES

Construction activities will occur within a newly acquired right-of-way, though the area to be disturbed hosts existing vegetation. Project construction activities (e.g. clearing/grubbing, grading, trench excavation, spoil storage, backfilling and restoration) will disturb soils within a corridor ranging from 50 to 100-feet in width, encompassing both the permanent and temporary ROWs. Both the permanent and temporary ROWs have been reduced in some areas to reduce the potential for environmental impacts. All work will be performed within the limit of disturbance described herein, and as depicted on the maps provided in Appendix A. Sediment controls must be installed within seven days of first clearing/grubbing or prior to any ground disturbing activity, whichever is first. Adherence to the erosion and sediment controls identified within this Plan will minimize the potential for soil erosion and sedimentation during construction and site restoration.

In general, the measures in this ESCP are designed to minimize erosion and sedimentation by:

- Limiting construction activities to only approved areas identified in this Plan;
- Minimizing the extent and duration of exposed bare soil conditions;
- Stabilizing exposed bare soils;
- Installing and maintaining erosion and sediment control measures in appropriate locations;
- Protecting slopes;
- Establishing perimeter controls and sediment barriers;
- Utilizing specialized construction and restoration techniques for wetland and waterway crossings;
- Retaining sediment on-site;
- Implementing spill prevention and control measures;
- Establishing vegetation as soon as possible following construction activities;
- Continually inspecting the area of ground disturbance and ensuring all implemented BMPs are maintained and effective until final stabilization is achieved.

Temporary Sediment Barriers

Temporary sediment barriers, such as siltsoxx, shall be placed to intercept runoff from the construction area to prevent sediment from entering surface waters and off-ROW areas.

General Right-of-Way Area
Perimeter sediment control (i.e. siltsoxx) will be placed down-gradient of pipeline construction activities and staging areas, where effective and required to protect adjacent undisturbed wetlands and other surface water resources and road surfaces from sedimentation. Installation will be in accordance with the details depicted or described in Appendix A. Sediment will be removed when accumulations reach

1/2 the above ground height of the barrier. Perimeter sediment control barriers that have been undermined or topped will be immediately repaired.

Hillside Pipeline Construction

For pipeline construction parallel to the gradient of a hill (uphill/downhill), where the slope is greater than 1%, suitable sediment barriers may be installed across the ROW to divert runoff to well vegetated areas if runoff has the potential to adversely affect adjacent surface waters and road surfaces. For pipeline construction perpendicular to the gradient of a hill (sidehill areas), where the slope is greater than 1%, a perimeter sediment control barrier shall be installed to protect adjacent surface waters and road surfaces. Both ends of the barrier will be extended at least eight feet up slope at 45 degrees to the main barrier alignment. Installation will be in accordance with the details depicted or described in Appendix A.

Soil Stockpiles

A perimeter sediment control barrier will be installed adjacent to soils stockpiles to prevent sedimentation into streams and wetlands. Maps or drawings illustrating the locations of proposed BMPs are provided in Appendix A. Stockpiles will be placed at existing level grade with both ends of the barrier extending at least eight feet up slope at 45 degrees to the main barrier alignment. Sediment will be removed when accumulations reach 1/2 the aboveground height of the barrier.

Spoil piles from trench excavation will be placed outside of streams and stabilized in a way that will limit the extent of sedimentation entering any stream bed. Spoil piles located in wetlands may be temporarily side-cast into wetlands. However, side-cast material will be managed with appropriate BMPs (stacking spoils on geotextile fabric, timber matting or steel plating and installation of siltsoxx along the perimeter of the spoil pile area) to prevent sedimentation into wetlands and waters.

Road Crossings

The types and locations of control measures needed at roadway crossings will depend upon the slope of the land and the type of roadway drainage systems present at that location. Upslope runoff will be diverted around the work area, as appropriate. For this Project, upslope diversion is not anticipated since the terrain at the road crossings is flat. Sediment barriers will be located downslope of trench or boring pit storage piles. Such storage piles will not be located in any roadway swale or ditch. Runoff from existing roadway culverts, storm sewers, swales, and ditches will be safely conveyed over any open trench.

When entering any construction area from paved roads, all sediment tracked onto the road will be cleaned as soon as practical. If excessive tracking occurs or equipment will access an area for extended periods of time, a stabilized construction entrance constructed of stone will be installed. Installation of stone entrances will be in accordance with the details depicted or described in Appendix A.

Trench Dewatering

Excessive water that accumulates in the trench will be pumped from the trench and filtered prior to discharging onto the ground along the ROW. Filter bags, designed to trap particles larger than 150 microns, will be used to remove sediment from the water. The filter bags will be located on a relatively flat (< 5% slope), well-vegetated area. If the dewatering location is within 50 feet of a stream or wetland, a suitable barrier will be installed to prevent sedimentation into the stream or wetlands. The pump discharge hose will be inserted into the bags in the manner specified by the manufacturer and securely clamped. When the bag is filled to1/2 its total capacity, it will be replaced with a new bag and

properly disposed. If a well-vegetated area is not available, a geotextile underlayment will be placed under the discharge area. Installation of filter bags will be in accordance with the details depicted or described in Appendix A.

Permanent Sediment Barriers

Trench Plugs
Clay trench plugs or anti-seep collars are required for trenching in wetlands, regardless of trench slope. These requirements supplement the general construction practice of placement of plugs in trenches on steep slopes. Trench plugs will also be installed if it is determined that flooding at the low point elevation of a pipeline will adversely affect an adjacent property. Installation of trench plugs will be in accordance with the details depicted or described in Appendix A.

Wetland and Waterway Crossings

Proposed stream-crossing techniques have been selected in accordance with applicable permit requirements, the technical feasibility of the method at each site and the ability of the technique to minimize the potential for sediment release to downstream habitats. Contingency methods will be used if the preferred technique is assessed to be not practical or too high a risk at the time of construction as determined by stream flows and other on-site conditions.

Typically, minor streams, ≤ 10-feet wide at normal flow depth, will be crossed using “open cut” method. Intermediate streams, > 10-feet and ≤ 100-feet wide, and major streams, > 100-feet in width, will be crossed using the wet trench method or by horizontal directional drilling.

Hazardous materials, chemicals, fuels, and lubricating oils will not be stored, and concrete coating activities will not be conducted, within 100 feet of any waterway or wetland. Refueling of construction equipment will be conducted at least 100 feet away from waterways and wetlands.

Additional erosion and sediment control will be implemented near wetlands and waterways in the form of erosion control matting. Matting will be placed along the edges of wetlands and waterways within the construction ROW. Where construction equipment and vehicular traffic must cross wetlands, temporary timber matting or other suitable methods will be utilized to prevent sedimentation into wetlands.

The requirements of applicable federal (i.e. U.S. Army Corps of Engineers) and State (e.g. Ohio Environmental Protection Agency) regulatory approvals associated with jurisdictional wetlands and waters will otherwise be adhered to at wetland and waterway crossings. Typical drawings depicting wetland crossing methods, stream crossing methods, temporary equipment bridges and stream crossing BMPs are provided in Appendix A.

Stream Crossings
Prior to any construction activities within the stream channel, perimeter sediment control barriers will be installed on both sides of the stream banks. Spoil piles from the tie-in and trench excavations will be placed behind the barriers to protect the stream or waterway from sediment buildup. Assembly areas, temporary equipment and non-hazardous material storage areas will be located a minimum of 50 feet back from the top of the stream bank.

Perimeter sediment control barriers shall be installed parallel to the stream bank with both ends extending at least eight feet upslope at 45 degrees to the main barrier alignment. Sediment shall be removed when accumulations reach ½ the above ground height of the device. Any section of the sediment barrier that has been undermined, topped or damaged will be immediately repaired. The barriers shall remain in place until final stabilization of the area.

Open Cut Method
Open cutting is the standard method for pipe installation in dry watercourses well removed from fish bearing reaches. The pipeline trench is excavated in the bed and banks of the flowing or dry watercourse channel and is backfilled after the pipe is lowered in. The bed and banks of the channel are re-contoured to their original condition and stabilized with seed and mulch. Erosion control matting and/or rip-rap may also be used to further stabilize the watercourse.

After installation of the perimeter sediment control barrier, excavation activities may commence. The trench will be excavated to the minimum width necessary to accommodate installation of the pipe. The trench will be monitored to ensure proper depth and width. In most instances, streambed substrate should be separated from the subsoil and backfilled last to minimize impact. Excavated material that will be subsequently used as backfill shall be immediately removed from the stream crossing and placed behind the sediment barriers on the stream bank. The pipeline will then be lowered into the trench and backfilled. Trench plugs will be installed at the top of the stream bank as depicted on the maps or drawings provided in Appendix A**.** The stream bank will then be stabilized with seed and mulch. Erosion control matting and/or rip-rap may also be applied to further stabilize the stream banks.

Isolation Method
The isolation method is one in which a trench is excavated in the bed and banks of a water body while the surface water in the water body flows uninterrupted and isolated from the excavation area. Isolation techniques include, but are not limited to, fluming, pumped by-pass, and in-channel diversion.

After placement of the perimeter sediment control barrier, installation of the flume or pumped by-pass will commence. The structures for stream isolation methods will be installed and functioning prior to any trench excavation within the stream channel. Sand-filled bags may be stacked at least 12 inches above the level of the stream to create a dam. The trench will be excavated to the minimum width necessary to accommodate installation of the pipe. The trench will be monitored to ensure proper depth and width. Excavated material that will be subsequently used as backfill will be immediately removed from the stream crossing and placed behind the sediment barriers on the stream bank. The pipeline will then be lowered into the ditch and backfilled. (Pipe will be welded and bent prior to placement in the trench.) Trench plugs will be installed at the top of the stream bank as provided in Appendix A**.** The stream banks will be restored to original contour and stabilized with either riprap or erosion control matting. The sand bag dams will be removed following complete restoration of the stream channel and banks.

Horizontal Directional Drill Method
Horizontal directional drilling has been identified as the preferred crossing method for some waterways, particularly larger waterways that will be crossed by the Project. After placement of the perimeter sediment barrier, the launching and receiving holes on both sides of the waterway will be excavated. These excavations will be at least ten feet or more from the stream bank.

Wetland Crossings
Prior to construction, wetlands will be identified and flagged within the ROW. Extra work and staging areas will be located at least 50 feet from the edge of the wetland, where possible. The width of the disturbance will be limited to the minimum necessary for the actual crossing. Movement of vehicles and equipment across the wetland will be minimized. Where equipment and vehicles must traverse saturated wetlands, the use of pads, mats or other suitable methods will be used to minimize disturbance.

During trench excavation, the top six to 12 inches of topsoil (with the vegetative root mass) will be carefully removed from over the trenchline and stockpiled separately from the trench subsoil (unless standing water or saturated soils make this impracticable to effectively segregate). Topsoil piles should be differentiated from subsoil piles with flagging, ribbons or other effective devices. The pipeline will be installed and trench plugs will be placed as identified in this Plan, to prevent the trench from draining the wetland or changing its hydrology. The trench will be backfilled with subsoil first and topsoil on top, and the preconstruction contours will be restored. Excess material, if any, will be removed from the wetland upon completion. Unless required by local agencies, seeding, mulching and fertilization will not be done in wetlands. Restoration of the previously salvaged topsoil will allow the wetland vegetation indigenous to the wetland to re-vegetate naturally. Disturbed slopes adjacent to the wetland will be stabilized immediately upon pipeline installation.

4.0 POST-CONSTRUCTION EROSION CONTROL PRACTICES

Permanent or temporary soil stabilization shall be applied to disturbed areas within two (2) days after final grade has been reached at any location along the Project. Seeding will take place once construction has been completed and the soil has been returned to its pre-construction grade. Recommended seed mixtures and seed rates are found in Appendix A (see page 84). Any removed topsoil in wetlands will be returned to where it was removed and the natural seed allowed to re-establish. If landowner specific requests for restoration measures or seed mixes are received, they will be evaluated on a case by case basis and only implemented if such request(s) adheres to all applicable regulatory requirements. When seasonal conditions prohibit the application of temporary or permanent seeding, dormant seeding (applying seed at 1.5 times the permanent seeding rate) or non-vegetative soil stabilization practices such as mulching or matting will be used.

All disturbed areas will be seeded with plant species that have a high germination capacity. Seeding will be performed with broadcast seeding equipment followed by mulch covering in accordance with the application rates provided in Appendix A. Similarly, lime and fertilizer will be applied at the amounts identified in Appendix A. Final stabilization must be achieved where grass growth has achieved, at a minimum, an 85% even perennial coverage in all disturbed areas. At the end of construction/restoration activities, final site inspection to identify any remaining items to be completed to ensure long-term soil stability will be completed.

5.0 ADDITIONAL POLLUTION CONTROL MEASURES

NRG Ohio Pipeline Company LLC will implement a Spill Prevention, Control and Countermeasure Plan ("SPCC Plan") for the Project (see Appendix A; pages 83-88). The SPCC Plan describes planning, prevention and control measures to minimize impacts resulting from spills of fuels, petroleum products or other regulated substances as a result of pipeline construction. Mixing, pumping, transferring or other handling of construction chemicals or compounds such as fertilizer, lime, any concrete drying compounds, and all other potentially hazardous materials shall be performed in an area away from any water source or ditch. Equipment fueling and maintenance shall be performed away from surface waters, in areas designated specifically for this purpose. The designated areas shall be equipped for recycling oil and catching spills.

If substances such as oil, diesel fuel, hydraulic fluid, antifreeze, etc., are spilled, leaked or released onto the soil, the soil should be dug up and disposed of at a licensed sanitary landfill or other approved petroleum contaminated soil remediation facility (not a construction /demolition debris landfill). In the event that there are areas of contaminated soils encountered during construction, additional measures may be required. The soils shall be dug up and disposed of at a licensed facility (not a construction/demolition debris landfill). Depending on the extent of contamination, additional treatment and/or collection and disposal may be required. All storm water discharge associated with any contaminated soils must be permitted.

Spills on pavement shall be absorbed with appropriate absorbent materials and disposed of with the trash at a licensed sanitary landfill. Hazardous or industrial wastes such as most solvents, gasoline, oil-based paints and any cement curing compounds require special handling. Spills shall be reported to the Ohio Environmental Protection Agency ("OEPA") at (1-800-282-9378). Spills of 25-gallons or more of petroleum products shall be reported to the OEPA, the local fire department and the Local Emergency Planning Committee within 30 minutes of discovery of the release. All spills which result in contact with any State jurisdictional waters must be reported to the OEPA.

Waste disposal containers shall be provided for the proper collection of all waste materials including construction debris, sanitary garbage, petroleum products, and any hazardous materials to be used on-site. Containers shall be covered and not leaking. All waste material shall be disposed of at facilities approved for that material. Construction wastes will be disposed of in a timely manner. Dumpsters will be emptied on an as-needed basis. No construction wastes or unused materials will be buried, dumped or discharged at or near the area of construction.

Open burning is not allowed within restricted areas such as within municipal corporation limits.

No materials containing rubber, grease, asphalt, or petroleum products (such as tires, auto parts, plastic, or plastic coated wire) may be burned (see OAC 3745-19) at any location.

Dust control is required to prevent nuisance conditions. Dust controls must be used in accordance with the manufacturer's specifications and not be applied in a manner, which would result in a discharge to waters of the state. Isolation distances from bridges, catch basins, and other drainages must be observed. Application (excluding water) may not occur when precipitation is imminent as noted in the short term forecast. Used oil may not be used as dust control.

External washing of wheels, trucks or other construction equipment will be confined to designated washing locations. Wash water from these areas must be directed to a designated sediment trap, settling pool or a sump pump. Sediments deposited on roadways will be removed and returned to the construction site on a daily basis. Discharges such as vehicle and or equipment washing are considered process wastewaters. All process wastewaters must be collected and properly disposed at an approved disposal facility. In the event of an unintended discharge of process wastewaters to any jurisdictional surface waters, it must be isolated for collection and proper disposal and corrective actions taken to eliminate the source of waste water.

Portable sanitary facilities will be kept on-site during construction. These facilities will be emptied on an as-needed basis and will be left empty if a break in construction occurs. A licensed sanitary waste sub-contractor will be used for managing the sanitary facilities.

6.0 MAINTENANCE AND INSPECTION

NRG Ohio Pipeline Company LLC will ensure inspection and maintenance on erosion prevention and sediment control measures occurs on a weekly basis and after each rainfall event greater than 0.5-inches. All necessary repairs must be made immediately to ensure effective and efficient operation. A copy of the inspection form is found in Appendix C.

Maintenance

All protective measures identified in this ESCP must be maintained in effective operating condition. If, through inspection or other means, it is determined that BMPs are not operating effectively, then maintenance shall be performed as necessary to maintain the continued effectiveness of stormwater controls, within three (3) days. Erosion and sediment controls that have been intentionally disabled, run-over, removed or otherwise rendered ineffective must be replaced or corrected immediately upon discovery. If periodic inspections or other information indicate a control has been used incorrectly, is performing inadequately or is damaged, then it must be replaced or modified within ten days following the discovery.

Inspection

The disturbed area will be regularly inspected during construction, as will areas of temporary and permanent stabilization. Personnel conducting these inspections must be familiar with the construction area and knowledgeable of this ESCP. Sediment and erosion control measures identified in this ESCP will be inspected to ensure that they are operating correctly. Inspection of the entire area of disturbance must be conducted at least once every seven (7) days during active construction and within 24 hours after a rainfall event greater than 0.5-inches. Following an inspection which occurs within 24 hours after a rainfall event greater than 0.5-inches, the next inspection must be conducted within seven (7) days.

This ESCP will be modified based on the results of the inspections, as necessary, to ensure adequate erosion and sediment control. Any revisions to the Plan will be completed within seven (7) days following each inspection, and provided to the appropriate administering parties in accordance with State and local requirements. If existing BMPs are modified or if additional BMPs are necessary, an implementation schedule will be provided at the time that the Plan is revised. Inspection and maintenance forms are provided in Appendix C.

7.0 TRAINING

Since the training of staff and subcontractors can act as an effective BMP, a construction personnel training program is recommended to educate personnel responsible for implementing any component of the ESCP, or personnel otherwise responsible for storm water pollution prevention in accordance with the ESCP.

8.0 HYDROSTATIC DISCHARGE

After installation, most pipelines require testing using hydrostatic pressure to ensure integrity of the welds and seams. The subsequent test water is typically discharged onsite or into a sanitary sewer. If discharge into any jurisdictional surface waters is anticipated, NRG Ohio Pipeline Company LLC will obtain the required regulatory approvals for such discharge.

BMPs must be implemented during the hydrostatic discharge test. Every effort will be made to discharge onto a large, well vegetated, non-sloping upland area. The water will be regulated at the discharge point to prevent excessive flow and scouring. Test water is typically obtained from a municipal water source and no chemicals or additives are to be used in the test water. If the discharge conditions require releasing water near any jurisdictional surface water or if high levels of iron or total suspended solids are anticipated, BMPs such as slowing the velocity of the release and/or using treated filters to remove suspended solids and metals may be considered.

9.0 ENVIRONMENTAL APPROVALS

NRG Ohio Pipeline Company LLC will obtain all permits and approvals required to construct the Project. Table 4 lists the major federal and state environmental permits required for the Project and the status of each permit or approval.

Table 4. Required Permits and Approvals

Agency	Permit or Approval Required	Status
Federal		
U.S. Army Corps of Engineers	Section 404 Clean Water Act Authorization	Being submitted in December 2014
U.S. Fish and Wildlife Service	Threatened and Endangered Species Consultation	Pending
State		
Ohio Environmental Protection Agency	General Construction Permit, Notice of Intent/Storm Water Pollution Prevention Plan	To be submitted in advance of construction
	Hydrostatic Test Water General Permit	To be submitted in advance of testing
	Section 401 Water Quality Certification	Submitted
Ohio Department of Natural Resources	State Protected Species Consultation	Pending
Ohio Historic Preservation Office	Historic Preservation Consultation	Pending
Ohio Power Siting Board	Letter of Notification	Being submitted in December 2014

Appendix A

Project Erosion and Sediment Control Plans

AVON LAKE GAS ADDITION PROJECT

E&SC PLAN
CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA & NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

PLANS PREPARED BY:

Hanover
Engineering Associates Inc
3355 ROUTE 611, SUITE 1
BARTONSVILLE, PA 18321-7822
PHONE: 570.688.9550
FAX: 570.688.9768

PROJECT OWNER/APPLICANT:

NRG OHIO PIPELINE COMPANY LLC
211 CARNEGIE CENTER
PRINCETON, NEW JERSEY 08540
CONTACT: NATHAN J. ROZIC
PHONE: 724.597.8630
FAX: 724.554.6208
EMAIL: Nathan.Rozic@nrg.com

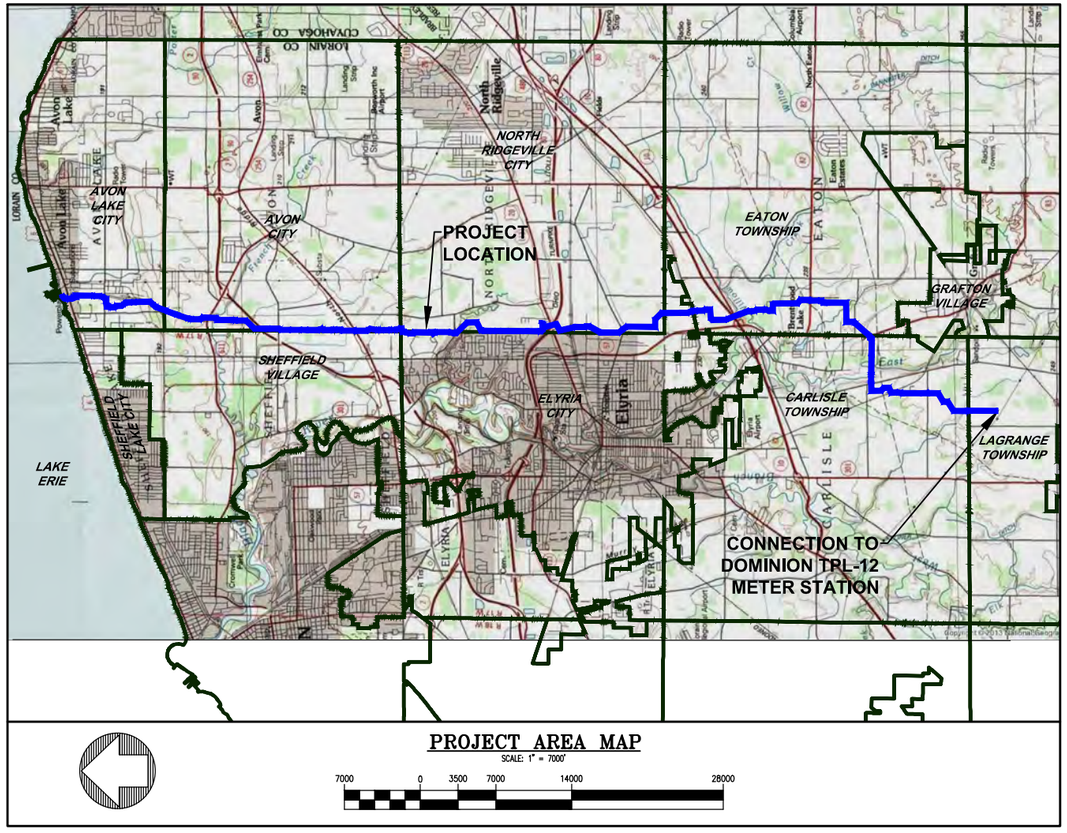
"CALL BEFORE YOU DIG"

BY LAW, EVERYONE MUST CONTACT THE OHIO UTILITIES PROTECTION SERVICE, 8-1-1 OR 1-800-362-2764, AT LEAST 48 HOURS BUT NO MORE THAN 10 WORKING DAYS (EXCLUDING WEEKENDS AND LEGAL HOLIDAYS) BEFORE BEGINNING ANY DIGGING PROJECT.

1. Serial Number XXXXXXXXXX – XXXX to XXXX (nearest intersection)

	HORZ. LENGTH	SLOPE LENGTH
MAIN LINE R.O.W.	103,505 L.F.	103,724 L.F.

LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE – 235 AC.



PROJECT AREA MAP
SCALE: 1" = 7000'
7000 0 3500 7000 14000 28000

SHEET INDEX

SHEET 1	OF	88	COVER SHEET
SHEETS 2-3	OF	88	CONTOUR INDEX MAP
SHEETS 4-5	OF	88	AERIAL INDEX MAP
SHEETS 6-44	OF	88	E&SPC LAYOUT PLANS
SHEETS 45-82	OF	88	E&SPC SITE DETAILS
SHEETS 83-88	OF	88	E&SPC TYPICAL DETAILS

RECEIVING WATERS

LAKE ERIE
UNNAMED TRIBUTARY TO LAKE ERIE
BLACK RIVER
UNNAMED TRIBUTARY TO BLACK RIVER
UNNAMED TRIBUTARY TO EAST BRANCH OF BLACK RIVER
FRENCH CREEK
UNNAMED TRIBUTARY TO FRENCH CREEK
JUNGBLUTH DITCH
WILLOW CREEK
JACKSON DITCH
ALEXANDER DITCH
DENT DITCH

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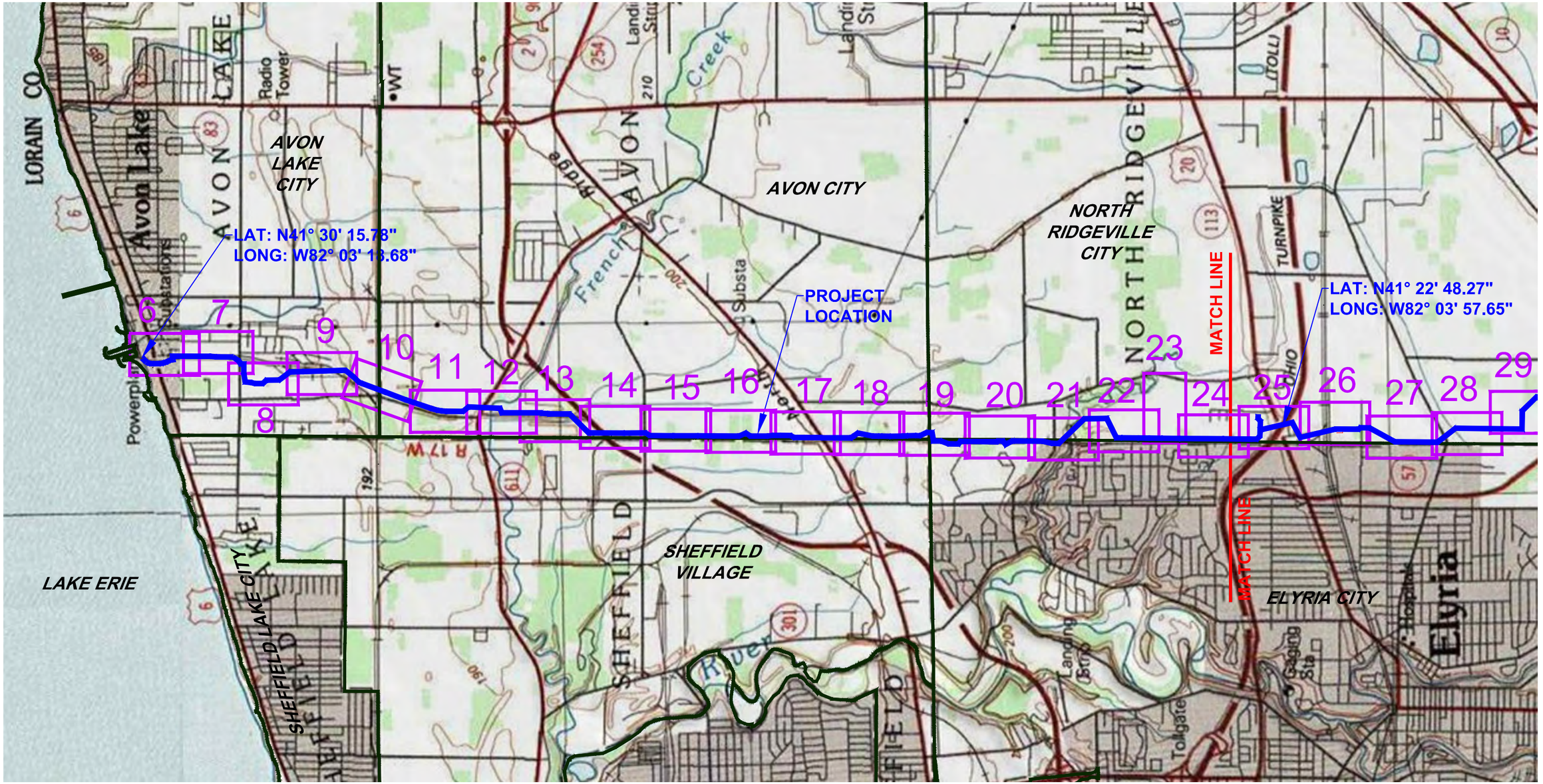
COVER SHEET

AVON LAKE GAS ADDITION PROJECT
CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: 1"=7000'
PROJECT NO. NRG-1007
SHEET NO. 1 OF 88

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LEGEND

CENTERLINE OF AVON LAKE GAS ADDITION PIPELINE R.O.W.

GRAPHIC SCALE

2000 0 1000 2000 4000 8000

(IN FEET)

1 inch = 2000ft.

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SEAL

NO.	REVISIONS	DATE

CONTOUR INDEX MAP

AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: 1"=2000'

PROJECT NO. NRG-1007

SHEET NO. 2 OF 88

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NORTH RIDGEVILLE CITY

EATON TOWNSHIP

ELYRIA CITY

CARLISLE TOWNSHIP

LAGRANGE TOWNSHIP

GRAFTON VILLAGE

MATCH LINE

MATCH LINE

LAT: N41° 22' 48.27"
LONG: W82° 03' 57.65"

LAT: N41° 20' 04.06"
LONG: W82° 03' 49.18"

LAT: N41° 17' 59.61"
LONG: W82° 04' 12.38"

LAT: N41° 16' 02.28"
LONG: W82° 05' 44.38"

PROJECT LOCATION

CONNECTION TO DOMINION TPL-12 METER STATION

20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44

TURNPIKE

OHIO

Elyria

Elyria Airport

Brentwood Lake

Grafton

Sandpit

Landing Strip

Gasing Sta

Tolgate

Branch

EARLISLE

LEGEND

CENTERLINE OF AVON LAKE GAS ADDITION PIPELINE R.O.W.

GRAPHIC SCALE

2000 0 1000 2000 4000 8000

(IN FEET)
1 inch = 2000ft.

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CONTOUR INDEX MAP

SEAL

NO.	REVISIONS	DATE

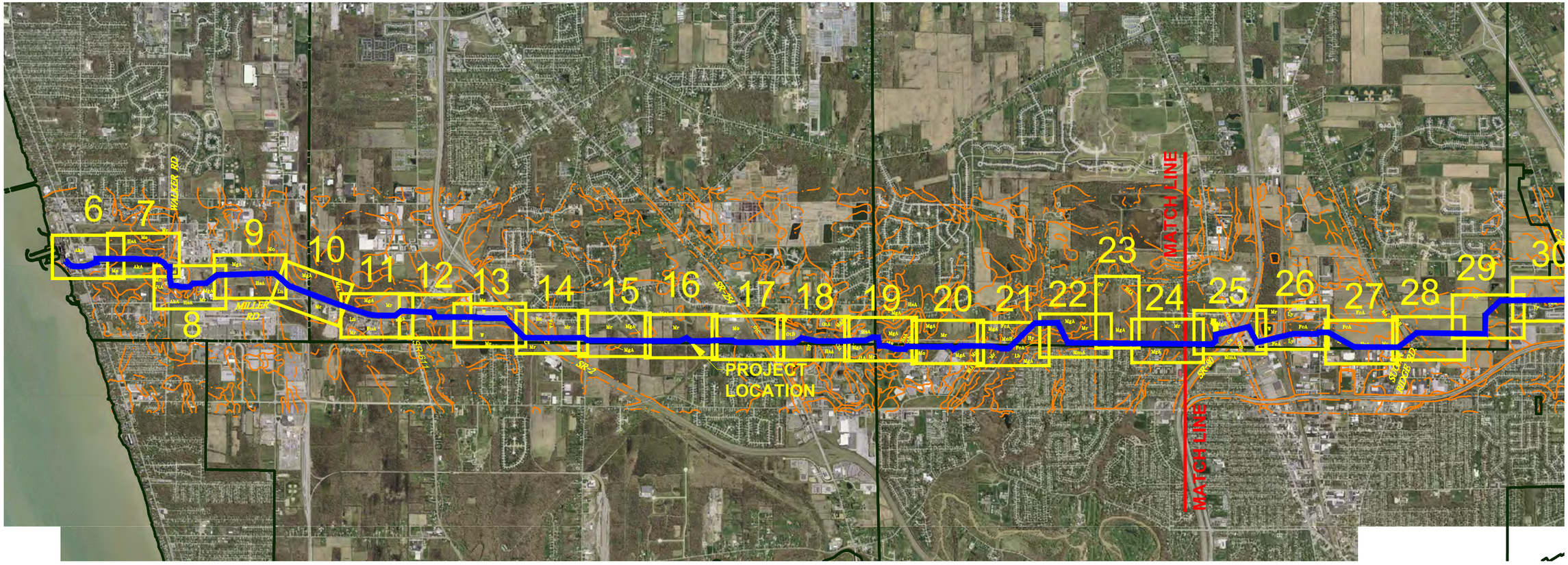
AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

DRAWN BY: AEJ	PROJECT NO. NRG-1007
CHECKED BY: SJC	
DATE: 12.15.14	SHEET NO. 3 OF 88
SCALE: 1"=2000'	

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Soil Chart

SYMBOL	SOIL TYPE
AkA	ALLIS LOAM, 0 TO 2 PERCENT SLOPES
BtA	BOGART LOAM, 0 TO 2 PERCENT SLOPES
ClA	CHILI LOAM, 0 TO 2 PERCENT SLOPES
ClB	CHILI LOAM, 2 TO 6 PERCENT SLOPES
ClD2	CHILI LOAM, 6 TO 18 PERCENT SLOPES, MODERATELY ERODED
DkB	DEKALB VERY CHANNERY LOAM, 1 TO 6 PERCENT SLOPES
ElB2	ELLSWORTH SILT LOAM, 2 TO 6 PERCENT SLOPES, MODERATELY ERODED
ElC2	ELLSWORTH SILT LOAM, 6 TO 12 PERCENT SLOPES, MODERATELY ERODED
ElD2	ELLSWORTH SILT LOAM, 12 TO 18 PERCENT SLOPES, MODERATELY ERODED
FcA	FITCHVILLE SILT LOAM, 0 TO 2 PERCENT SLOPES
FdA	FITCHVILLE SILT LOAM, LOW TERRACE, 0 TO 2 PERCENT SLOPES
FeA	FITCHVILLE-URBAN LAND COMPLEX, NEARLY LEVEL
FuA	FULTON SILT LOAM, 0 TO 2 PERCENT SLOPES
HsA	HASKINS LOAM, 0 TO 2 PERCENT SLOPES
Hy	HOLLY SILT LOAM
JtA	JIMTOWN LOAM, 0 TO 2 PERCENT SLOPES
Lb	LOBDELL SILT LOAM
Ln	LORAIN SILTY CLAY LOAM
Ly	LURAY SILTY CLAY LOAM
MgA	MAHONING SILT LOAM, 0 TO 2 PERCENT SLOPES
MgB	MAHONING SILT LOAM, 2 TO 6 PERCENT SLOPES
MgB2	MAHONING SILT LOAM, 2 TO 6 PERCENT SLOPES, MODERATELY ERODED
MkA	MAHONING-TIRO SILT LOAMS, 0 TO 2 PERCENT SLOPES
MmA	MAHONING-URBAN LAND COMPLEX, NEARLY LEVEL
MnB	MENTOR SILT LOAM, 2 TO 6 PERCENT SLOPES
Mo	MERRILL LOAM
Mr	MINER SILTY CLAY LOAM
Ms	MINER SILTY CLAY LOAM, SHALE SUBSTRATUM
Or	ORRVILLE SILT LOAM
OtA	OSHTEMO SANDY LOAM, 0 TO 2 PERCENT SLOPES
OtB	OSHTEMO SANDY LOAM, 2 TO 6 PERCENT SLOPES
OtC	OSHTEMO SANDY LOAM, 6 TO 12 PERCENT SLOPES
RdA	RAWSON LOAM, 0 TO 2 PERCENT SLOPES
RdB	RAWSON LOAM, 2 TO 6 PERCENT SLOPES
Sb	SEBRING SILT LOAM
Tg	TIOGA FINE SANDY LOAM
TrA	TRUMBULL SILTY CLAY LOAM, 0 TO 2 PERCENT SLOPES

LEGEND

CENTERLINE OF AVON LAKE GAS ADDITION PIPELINE R.O.W.

SOIL BOUNDARY

GRAPHIC SCALE

2000 0 1000 2000 4000 8000

(IN FEET)

1 inch = 2000ft.

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NO.	REVISIONS	DATE

AERIAL INDEX MAP

AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

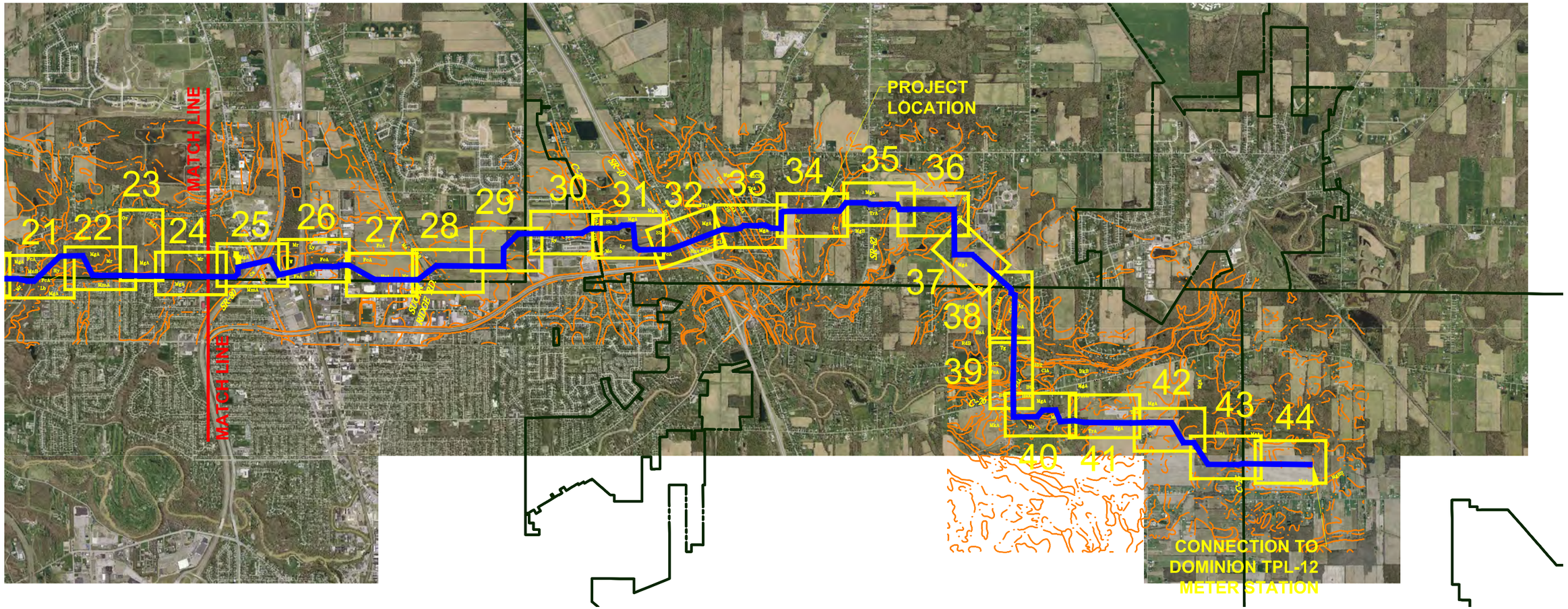
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PROJECT NO. NRG-1007

SHEET NO. 4 OF 88

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Soil Chart

SYMBOL	SOIL TYPE
AkA	ALLIS LOAM, 0 TO 2 PERCENT SLOPES
BtA	BOGART LOAM, 0 TO 2 PERCENT SLOPES
ClA	CHILI LOAM, 0 TO 2 PERCENT SLOPES
ClB	CHILI LOAM, 2 TO 6 PERCENT SLOPES
ClD2	CHILI LOAM, 6 TO 18 PERCENT SLOPES, MODERATELY ERODED
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ElB2	ELLSWORTH SILT LOAM, 2 TO 6 PERCENT SLOPES, MODERATELY ERODED
ElC2	ELLSWORTH SILT LOAM, 6 TO 12 PERCENT SLOPES, MODERATELY ERODED
ElD2	ELLSWORTH SILT LOAM, 12 TO 18 PERCENT SLOPES, MODERATELY ERODED
FcA	FITCHVILLE SILT LOAM, 0 TO 2 PERCENT SLOPES
FdA	FITCHVILLE SILT LOAM, LOW TERRACE, 0 TO 2 PERCENT SLOPES
FeA	FITCHVILLE-URBAN LAND COMPLEX, NEARLY LEVEL
FuA	FULTON SILT LOAM, 0 TO 2 PERCENT SLOPES
HsA	HASKINS LOAM, 0 TO 2 PERCENT SLOPES
Hy	HOLLY SILT LOAM
JtA	JIMTOWN LOAM, 0 TO 2 PERCENT SLOPES
Lb	LOBDELL SILT LOAM
Ln	LORAIN SILTY CLAY LOAM
Ly	LURAY SILTY CLAY LOAM
MgA	MAHONING SILT LOAM, 0 TO 2 PERCENT SLOPES
MgB	MAHONING SILT LOAM, 2 TO 6 PERCENT SLOPES
MgB2	MAHONING SILT LOAM, 2 TO 6 PERCENT SLOPES, MODERATELY ERODED
MkA	MAHONING-TIRO SILT LOAMS, 0 TO 2 PERCENT SLOPES
MmA	MAHONING-URBAN LAND COMPLEX, NEARLY LEVEL
MnB	MENTOR SILT LOAM, 2 TO 6 PERCENT SLOPES
Mo	MERRILL LOAM
Mr	MINER SILTY CLAY LOAM
Ms	MINER SILTY CLAY LOAM, SHALE SUBSTRATUM
Or	ORRVILLE SILT LOAM
OtA	OSHTEMO SANDY LOAM, 0 TO 2 PERCENT SLOPES
OtB	OSHTEMO SANDY LOAM, 2 TO 6 PERCENT SLOPES
OtC	OSHTEMO SANDY LOAM, 6 TO 12 PERCENT SLOPES
RdA	RAWSON LOAM, 0 TO 2 PERCENT SLOPES
RdB	RAWSON LOAM, 2 TO 6 PERCENT SLOPES
Sb	SEBRING SILT LOAM
Tg	TIOGA FINE SANDY LOAM
TrA	TRUMBULL SILTY CLAY LOAM, 0 TO 2 PERCENT SLOPES

LEGEND

CENTERLINE OF AVON LAKE GAS ADDITION PIPELINE R.O.W.

SOIL BOUNDARY

GRAPHIC SCALE

2000 0 1000 2000 4000 8000

(IN FEET)

1 inch = 2000ft.

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SEAL

NO.	REVISIONS	DATE

AERIAL INDEX MAP

AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

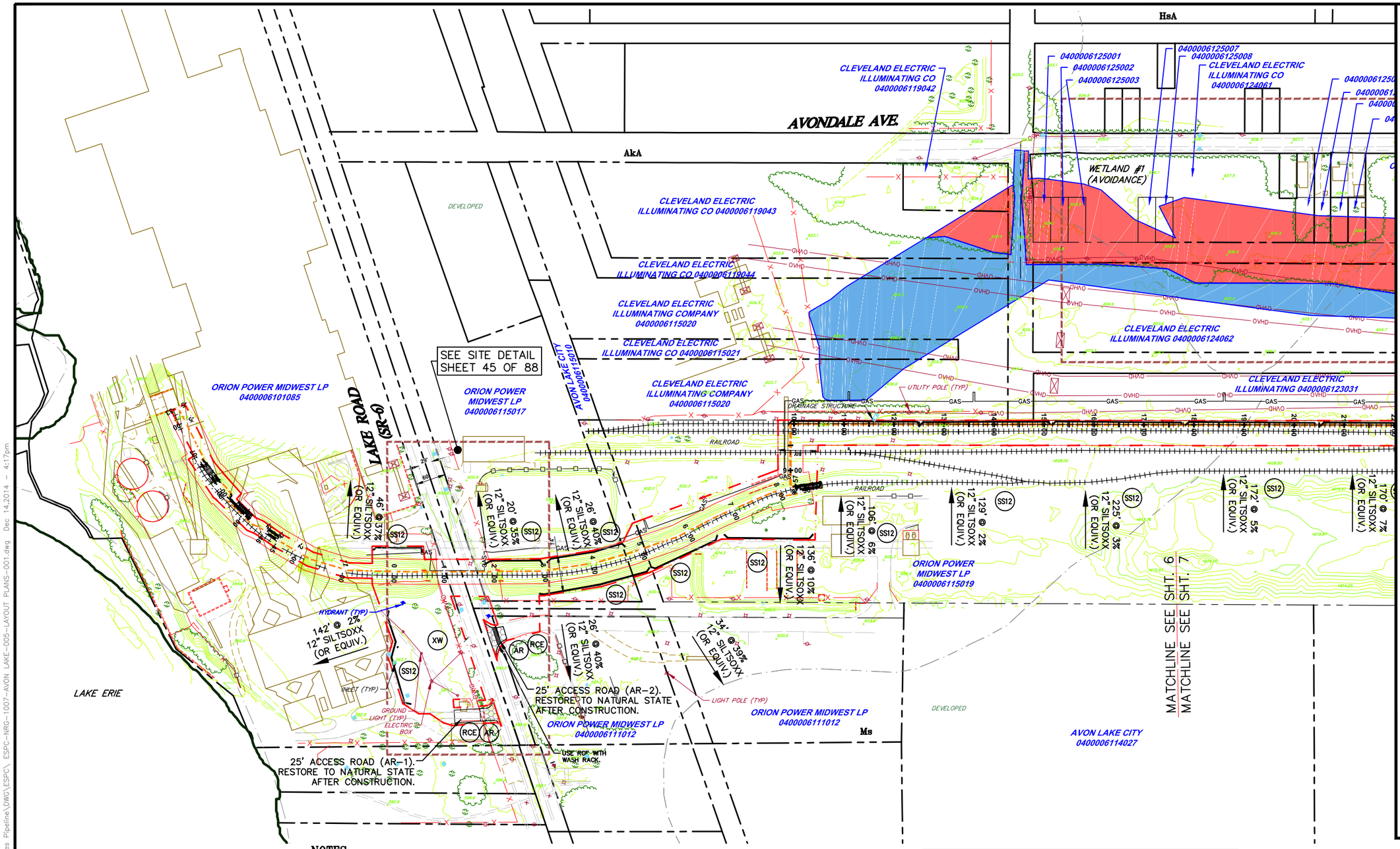
DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: 1"=2000'

PROJECT NO. NRG-1007

SHEET NO. 5 OF 88

Hanover Engineering Associates Inc
3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768

Y:\Projects\Energy\NRG Energy\NRG-1007-Avon Lakes Pipeline\DWG\ESPC\ ESPC-NRG-1007-AVON LAKE-004-005-AERIAL INDEX.dwg Dec 14,2014 - 3:12pm



LEGEND

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LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE – 235 AC.

NOTES:

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SEAL

NO.	REVISIONS	DATE

E&SPC LAYOUT PLAN

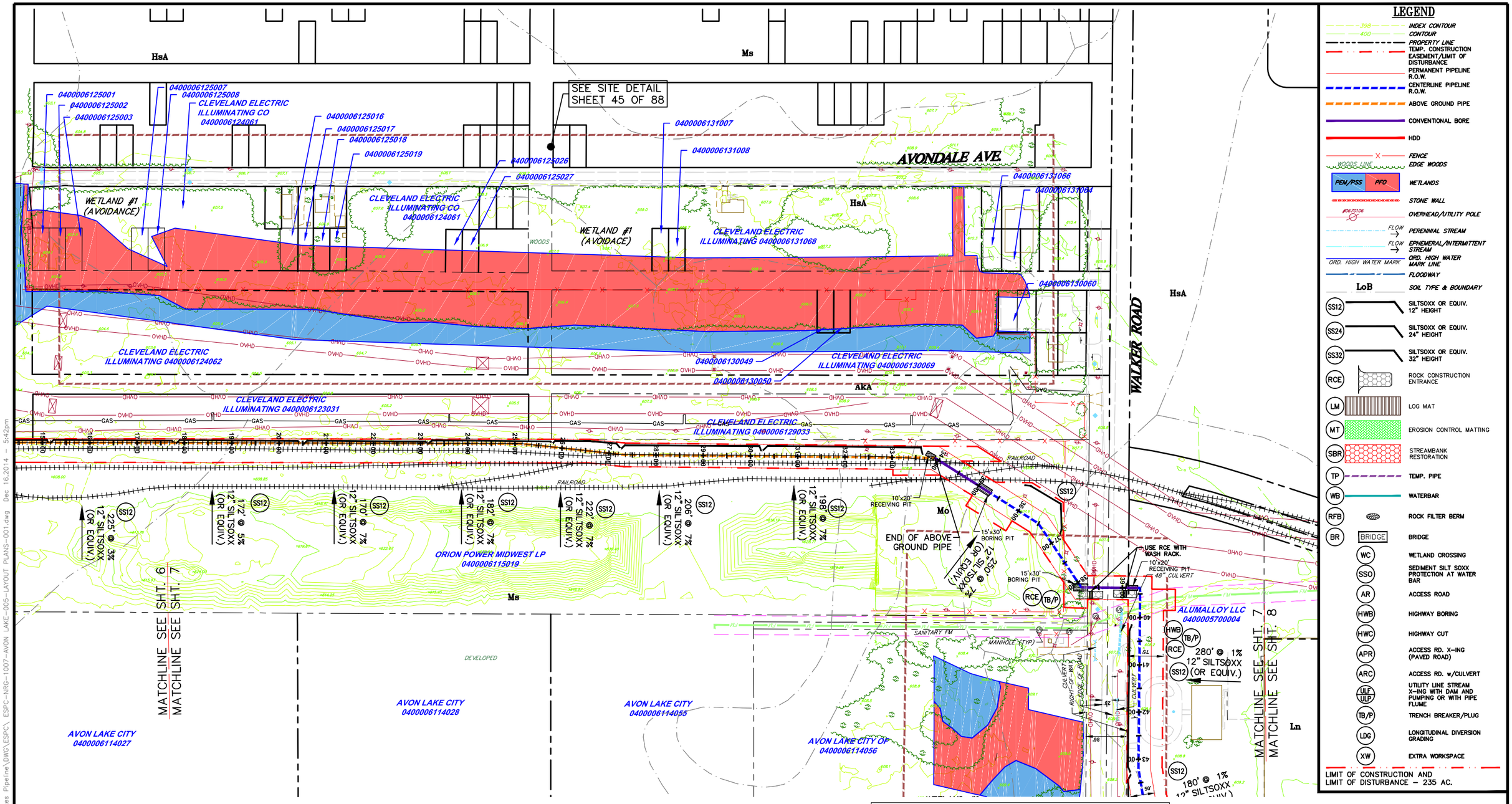
AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: 1"=100'
PROJECT NO. NRG-1007
SHEET NO. 6 OF 88

Hanover Engineering Associates Inc
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Y:\Projects\Energy\NRG Energy\NRG-1007-Avon Lakes Pipeline\DWG\ESPC\ ESPC-NRG-1007-AVON LAKE-005-LAYOUT PLANS-001.dwg Dec 14,2014 - 4:17pm



LEGEND

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NO.	REVISIONS	DATE

E&SPC LAYOUT PLAN

AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

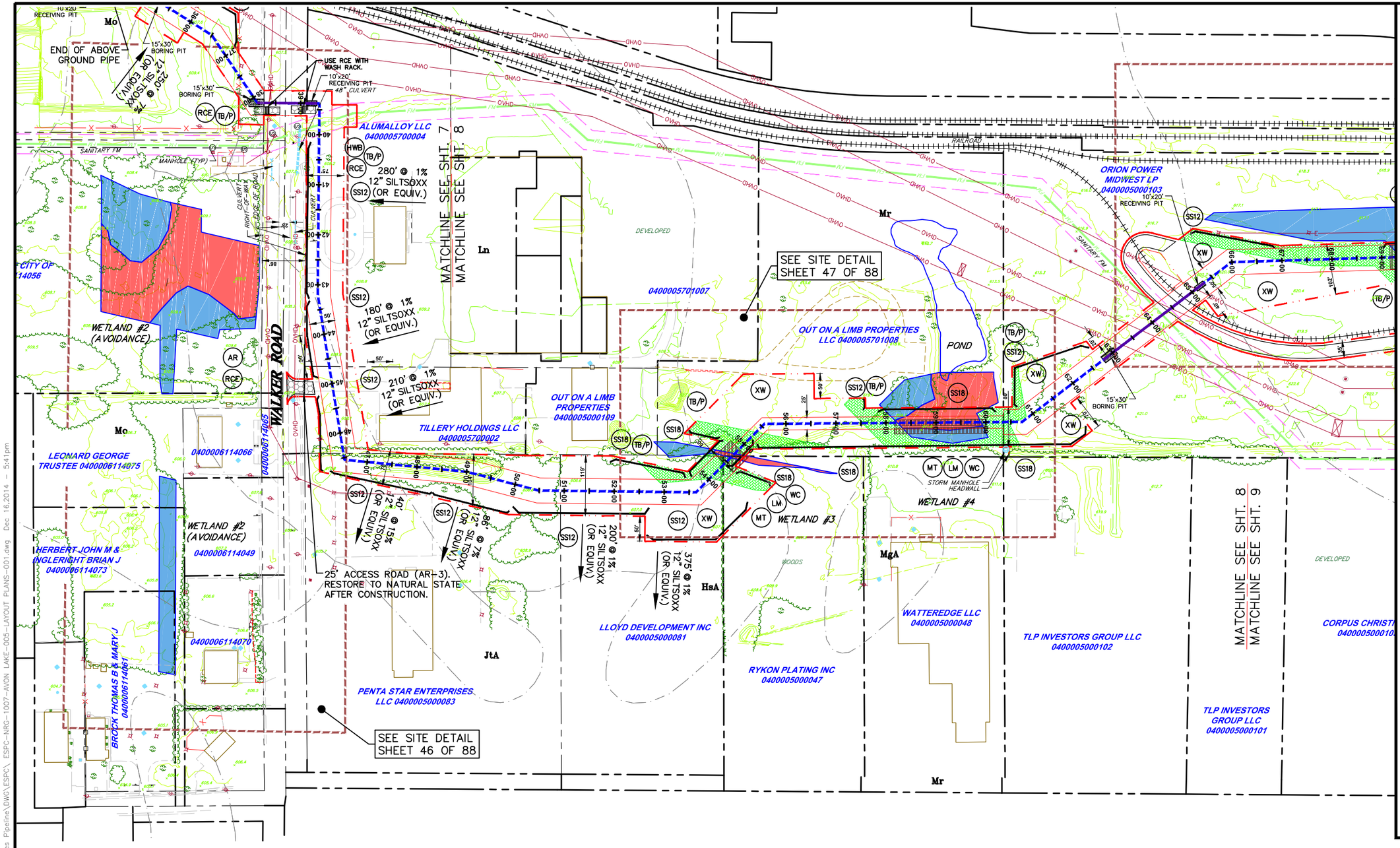
DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: 1"=100'

PROJECT NO. NRG-1007

SHEET NO. 7 OF 88

Hanover
Engineering Associates Inc
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Fax 570.688.9768

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LEGEND

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E&SPC LAYOUT PLAN

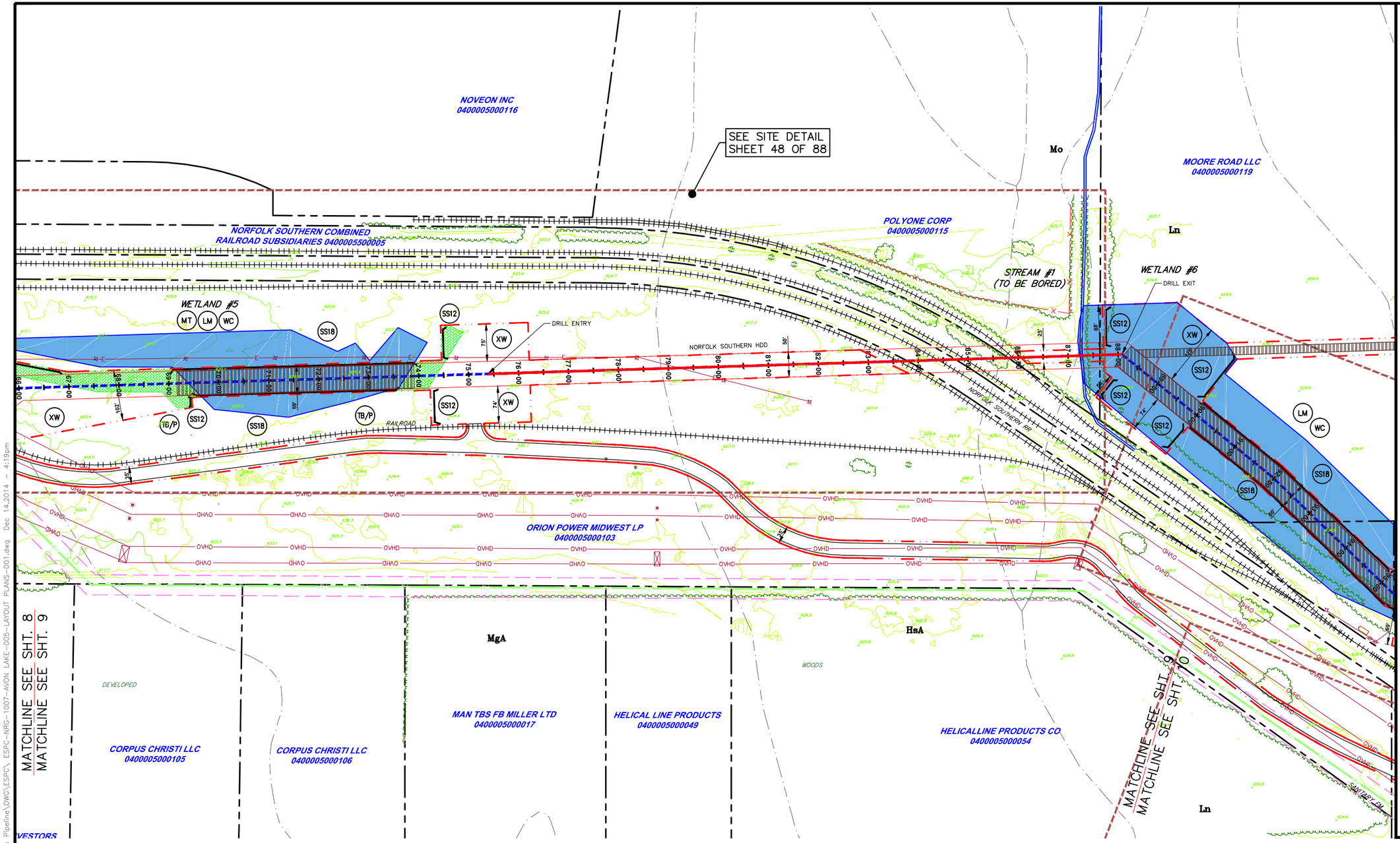
AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

DRAWN BY: AEJ	PROJECT NO. NRG–1007
CHECKED BY: SJC	
DATE: 12.15.14	SHEET NO. 8 OF 88
SCALE: 1"=100'	

Hanover
Engineering Associates Inc
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Bartonsville, PA 18321-7822
570.688.9550
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E&SPC LAYOUT PLAN

AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

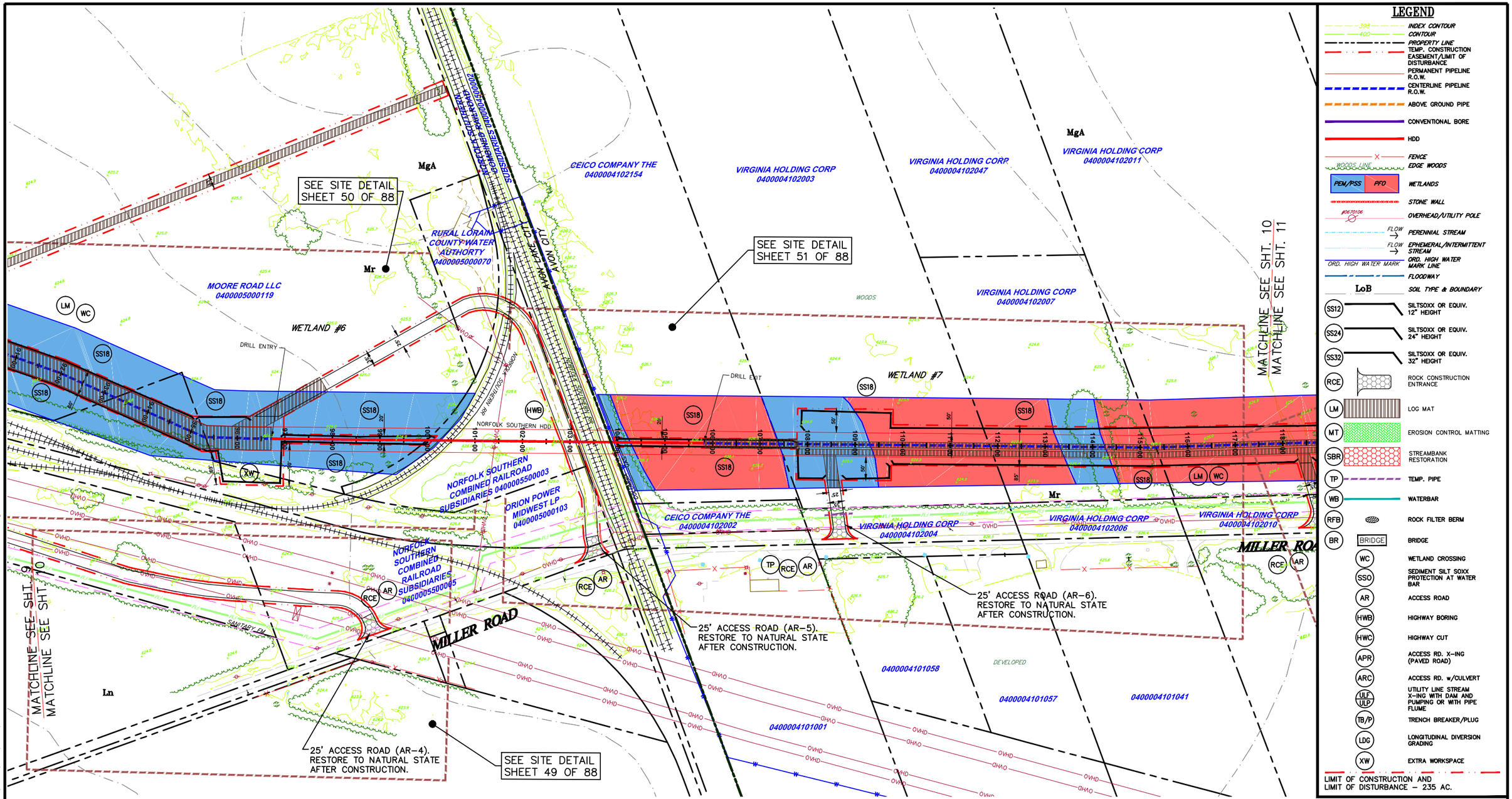
DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: 1"=100'

PROJECT NO. NRG–1007

SHEET NO. 9 OF 88

Hanover Engineering Associates Inc
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Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768

Y:\Projects\Energy\NRG Energy\NRG-1007-Avon Lakes Pipeline\DWG\ESPC\ ESPC-NRG-1007-AVON LAKE-005-LAYOUT PLANS-001.dwg Dec 14,2014 - 4:19pm



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GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

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SEAL

NO.	REVISIONS	DATE

E&SPC LAYOUT PLAN

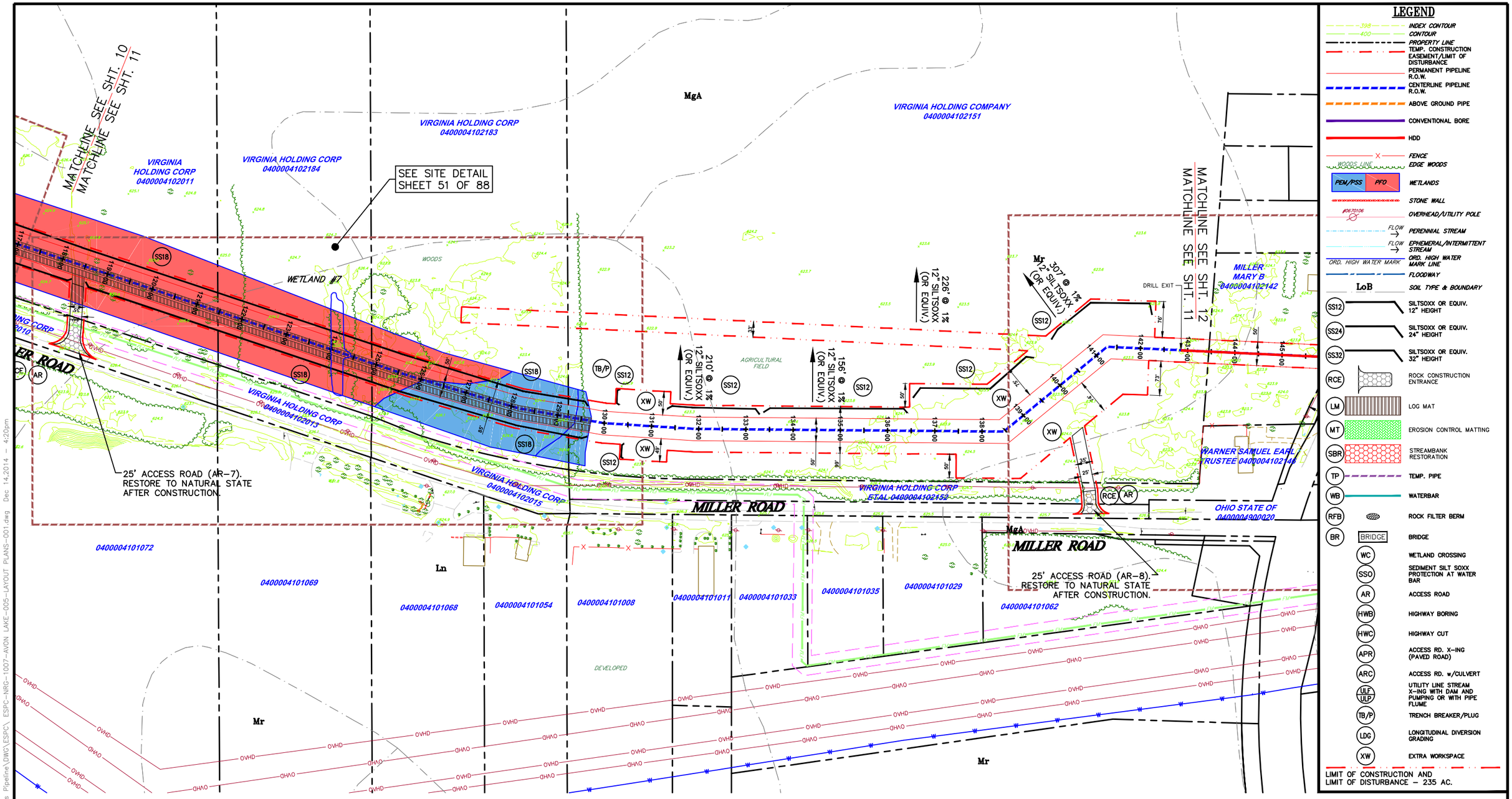
AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

DRAWN BY: AEJ	PROJECT NO. NRG-1007
CHECKED BY: SJC	
DATE: 12.15.14	SHEET NO. 10 OF 88
SCALE: 1"=100'	

Hanover
Engineering Associates Inc
3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768

Y:\Projects\Energy\NRG_Energy\NRG-1007-Avon Lakes Pipeline\DWG\ESPC\ ESPC-NRG-1007-AVON LAKE-005-LAYOUT PLANS-001.dwg Dec 14,2014 - 4:19pm



LEGEND

- INDEX CONTOUR
- CONTOUR
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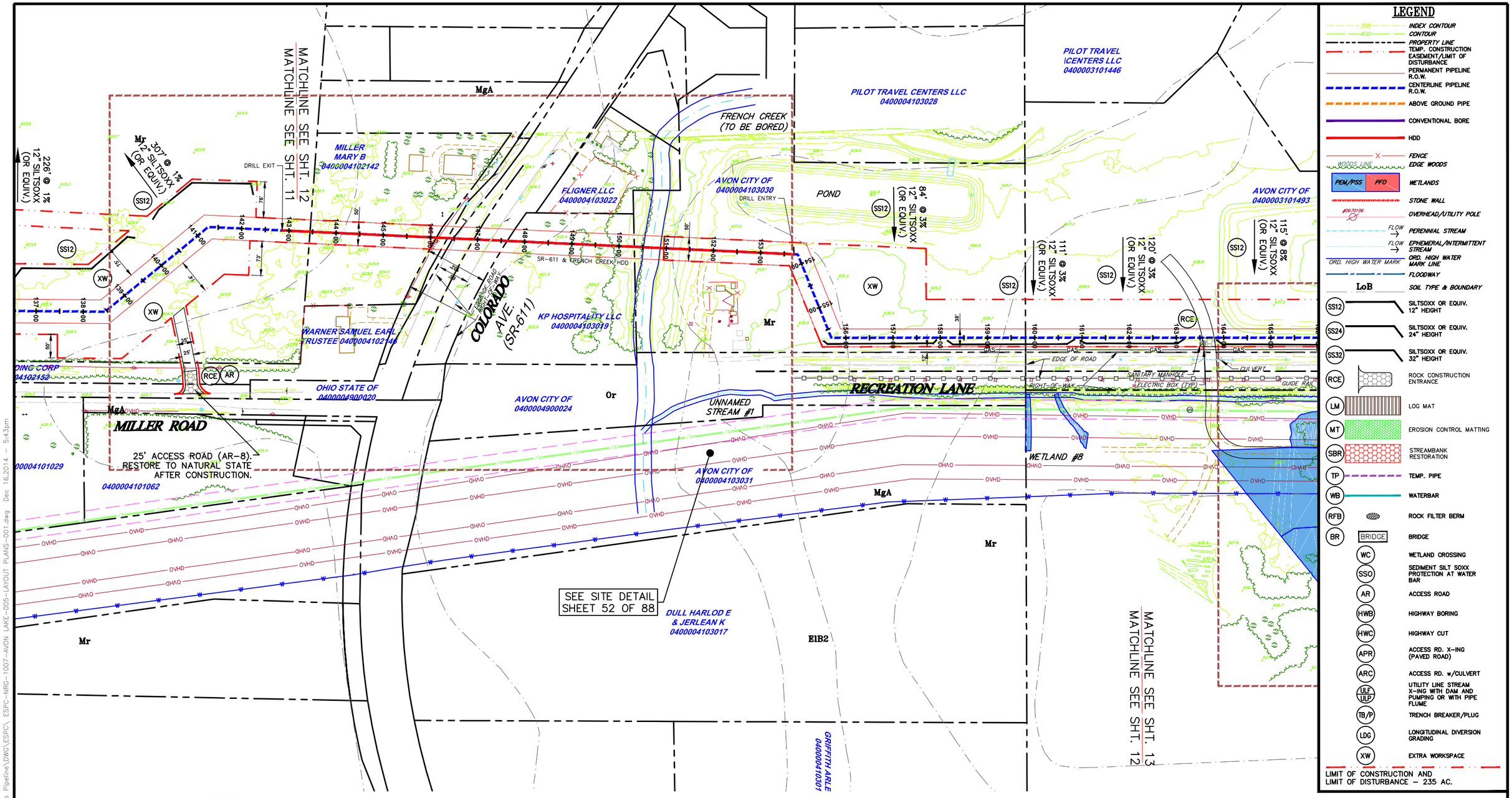
AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
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LORAIN COUNTY
OHIO

DRAWN BY: AEJ	PROJECT NO. NRG-1007
CHECKED BY: SJC	
DATE: 12.15.14	SHEET NO. 11 OF 88
SCALE: 1"=100'	

Hanover Engineering Associates Inc
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Bartonsville, PA 18321-7822
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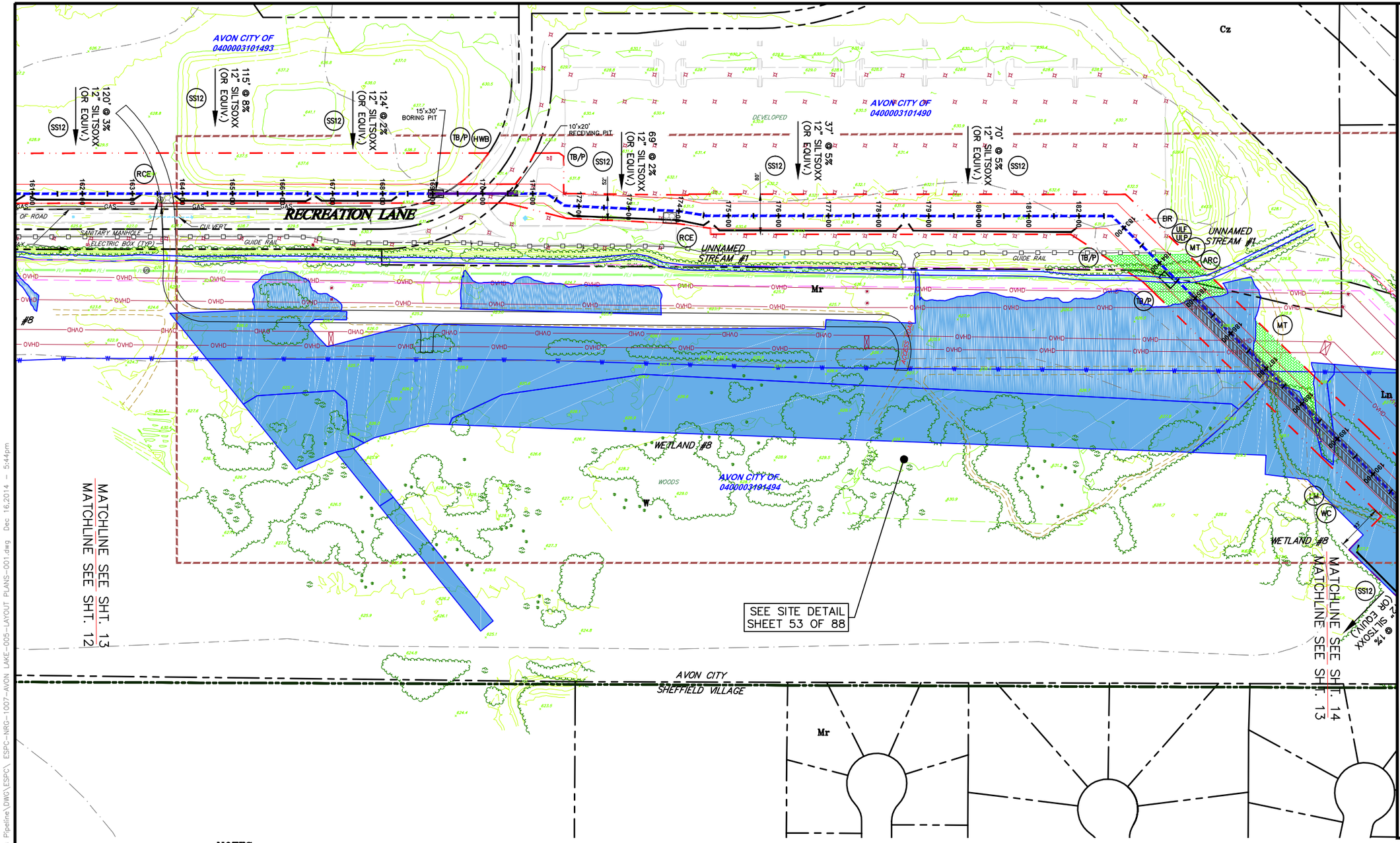
AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

DRAWN BY:	AEJ
CHECKED BY:	SJC
DATE:	12.15.14
SCALE:	1"=100'
PROJECT NO.	NRG-1007
SHEET NO.	12 OF 88

Hanover
Engineering Associates Inc
3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768

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E&SPC LAYOUT PLAN

AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
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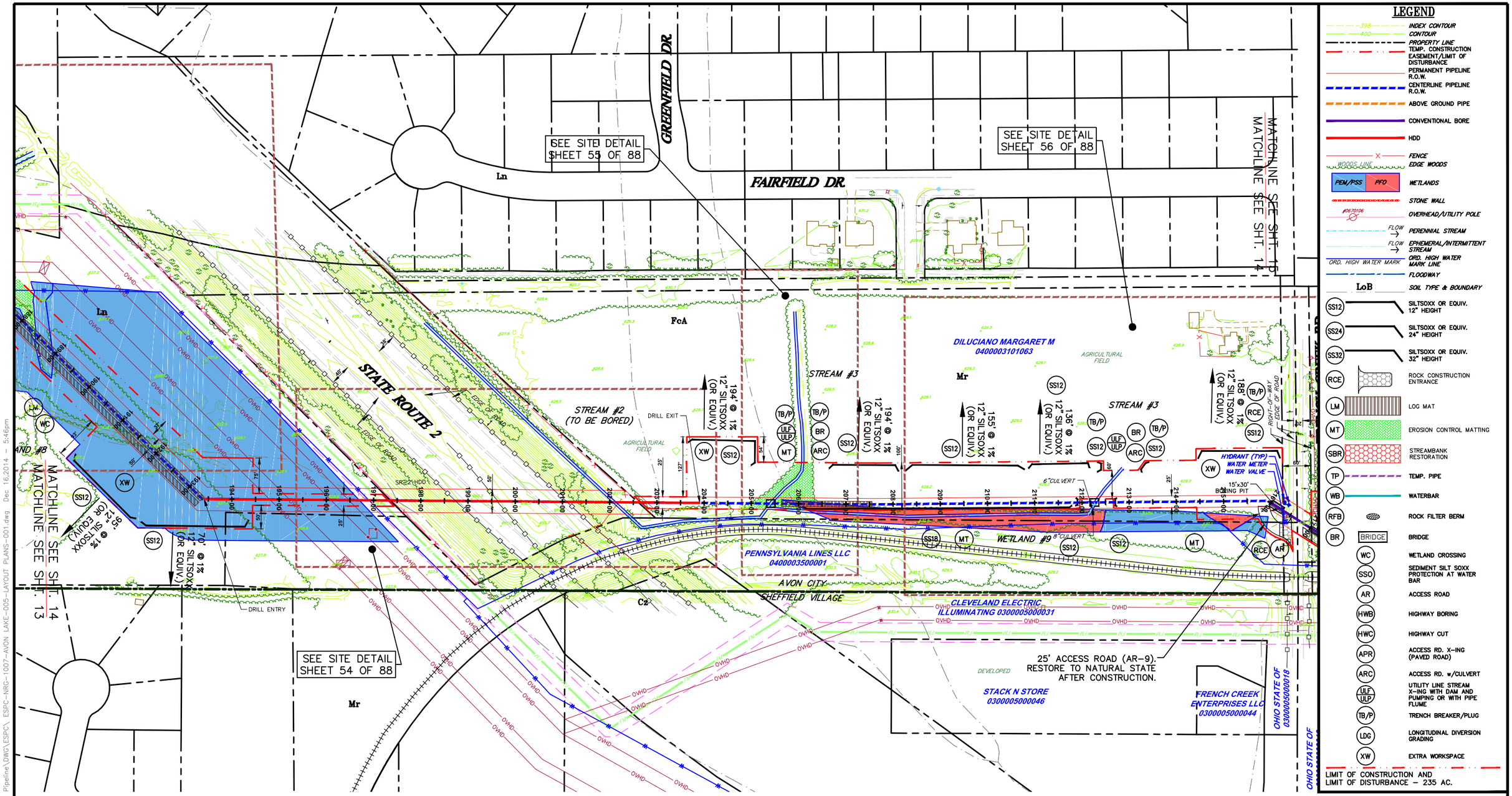
DRAWN BY: AEJ
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DATE: 12.15.14
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PROJECT NO. NRG-1007

SHEET NO. 13 OF 88

Hanover Engineering Associates Inc
3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
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LEGEND

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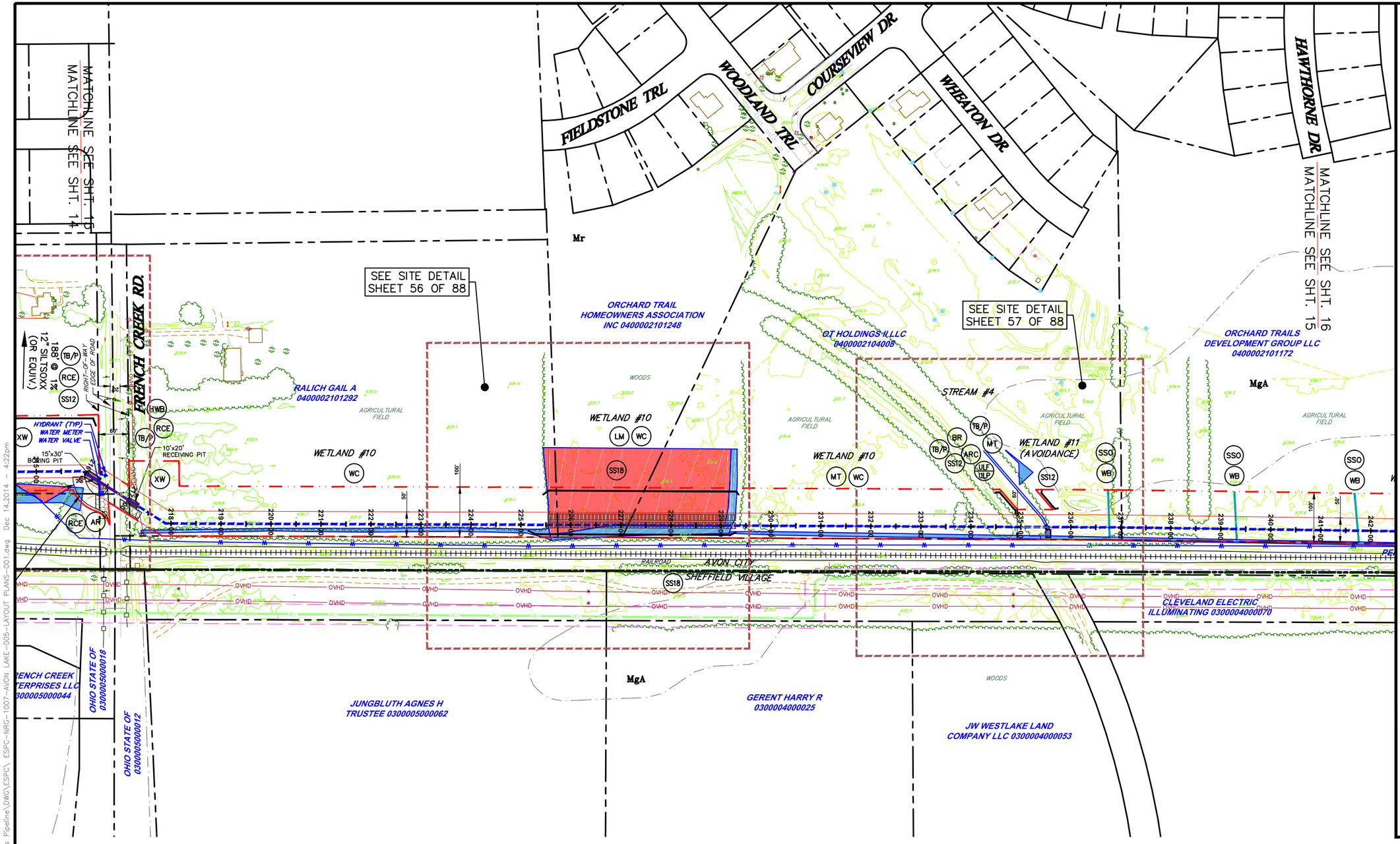
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Y:\Projects\Energy\NRG_Energy\NRG-1007-Avon Lakes Pipeline\DWG\ESPC\ ESPC-NRG-1007-AVON LAKE-005-LAYOUT PLANS-001.dwg Dec 16,2014 - 5:46pm



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GRAPHIC SCALE

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(IN FEET)

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NO.	REVISIONS	DATE

E&SPC LAYOUT PLAN

AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA & NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

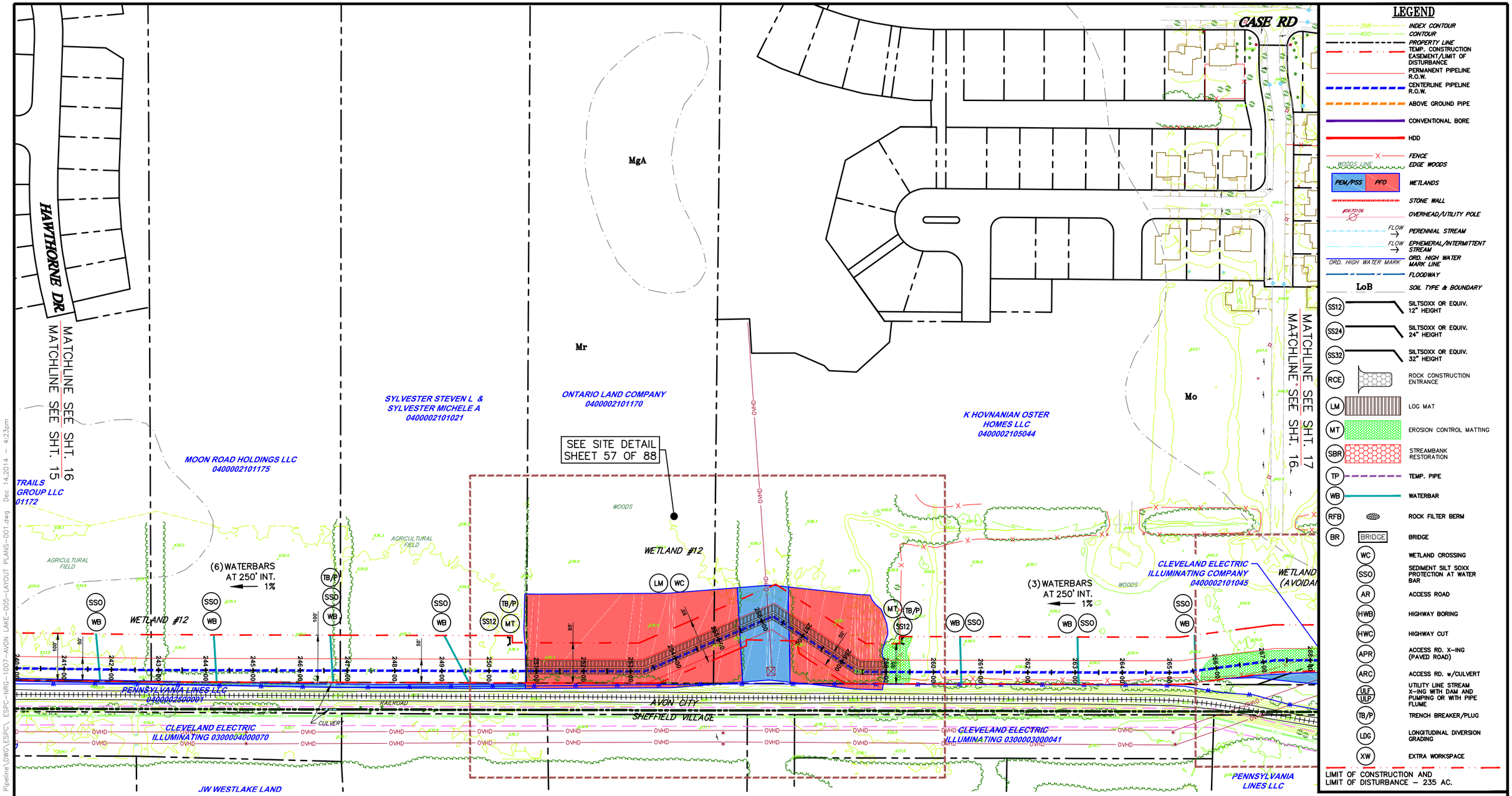
DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: 1"=100'

PROJECT NO. NRG-1007

SHEET NO. 15 OF 88

Hanover Engineering Associates Inc
3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768

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LEGEND

- INDEX CONTOUR
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LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE – 235 AC.

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E&SPC LAYOUT PLAN

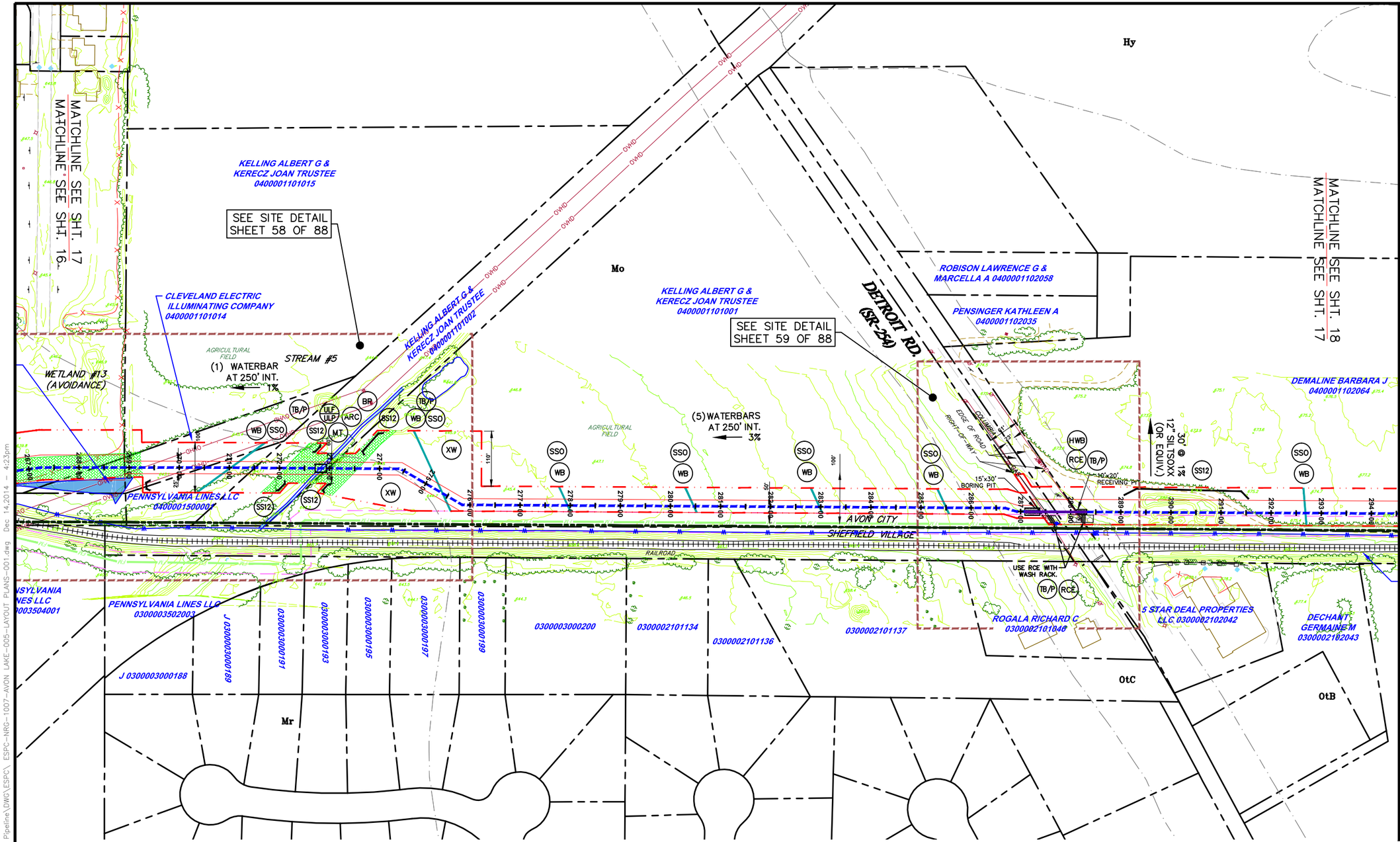
AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

DRAWN BY: AEJ	PROJECT NO. NRG–1007
CHECKED BY: SJC	
DATE: 12.15.14	SHEET NO. 16 OF 88
SCALE: 1"=100'	

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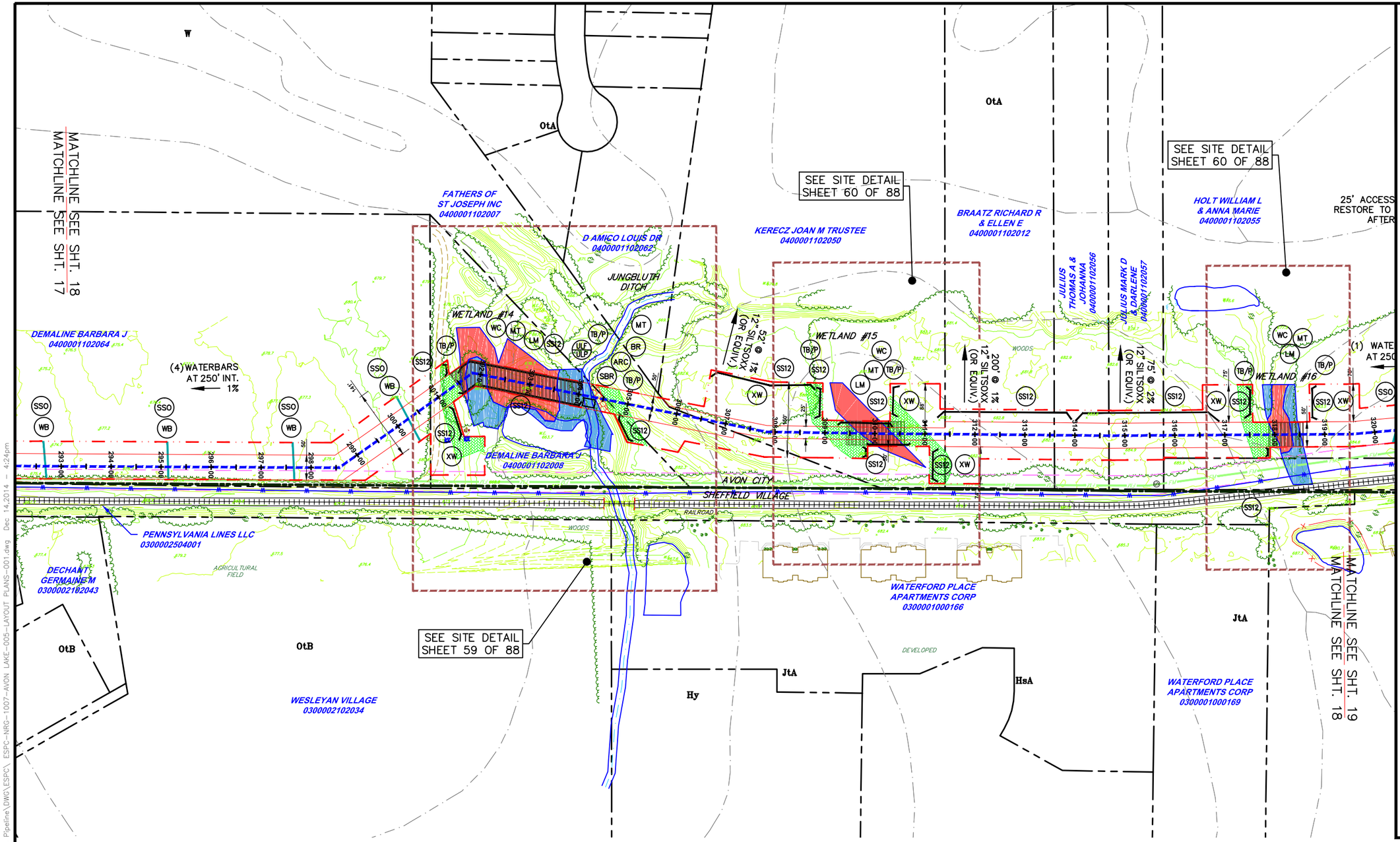
AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

DRAWN BY: AEJ	PROJECT NO. NRG-1007
CHECKED BY: SJC	
DATE: 12.15.14	SHEET NO. 17 OF 88
SCALE: 1"=100'	

Hanover
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E&SPC LAYOUT PLAN

AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: 1"=100'

PROJECT NO. NRG–1007

SHEET NO. 18 OF 88

Hanover
Engineering Associates Inc
3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
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Fax 570.688.9768

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SEE SITE DETAIL SHEET 60 OF 88

HOLT WILLIAM L & ANNA MARIE 0400001102055

CAMELOT WAY

25' ACCESS ROAD (AR-10). RESTORE TO NATURAL STATE AFTER CONSTRUCTION.

0400001102103

0400001102102

0400001102101

0400001102100

0400001102099

0400001102098

KAULINS IRENE T 0400001102022

SCHAFER DEVELOPMENT COMPANY INC 0400001102104

AGRICULTURAL FIELD

(2) WATERBARS AT 150' INT. 1%

PETERSEN RICHARD & CAROL 0400001102021

AVON CITY

NORTH RIDGEVILLE CITY

BETZEL LOUIS F & GAIL E 0700043101002

LLADO CARLOS A & SONIA B 0700043101005

OHIO EDISON CO 0700043101004

SAS TIMOTHY J 0700043101006

SAS DOROTHY 0700043101008

TALEFF CHRIS 0700043101010

FEDERAL NATIONAL MORTGAGE ASSOCIATION 0700043101012

BALOG SALLY A 0700043101013

SEE SITE DETAIL SHEET 61 OF 88

MATCHLINE SEE SHT. 20

MATCHLINE SEE SHT. 19

HsA

MgA

Mo

OtA

(1) WATERBAR AT 250' INT. 1%

AGRICULTURAL FIELD

159' @ 2% 12" SILTSOXX (OR EQUIV.)

FLAND #16

15'x30' BORING PIT

10'x20' RECEIVING PIT

RAILROAD

PENNSYLVANIA LINES MR

PENNSYLVANIA LINES LLC 0400001500002

134' @ 5% 12" SILTSOXX (OR EQUIV.)

47' @ 8% 12" SILTSOXX (OR EQUIV.)

LORAIN COUNTY COMMUNITY COLLEGE 0300001000050

VILLAGE MEADOWS 0300001000106

DEVELOPED

SHEFFIELD VILLAGE

ELYRIA CITY

OHIO EDISON CO 0700043101001

(2) WATERBARS AT 250' INT. 1%

AGRICULTURAL FIELD

180' @ 14% 12" SILTSOXX (OR EQUIV.)

190' @ 17% 24" SILTSOXX (OR EQUIV.)

72' @ 23% 12" SILTSOXX (OR EQUIV.)

WETLAND #17

LORAIN COUNTY COMMUNITY COLLEGE 0622003000007

25' ACCESS ROAD (AR-11). RESTORE TO EXISTING CONDITIONS AFTER CONSTRUCTION.

OHIO EDISON CO 0700043101009

OHIO EDISON CO 0700043101011

MATCHLINE SEE SHT. 19

MATCHLINE SEE SHT. 18

LEGEND

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LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE – 235 AC.

SPECIAL NOTE:

REFER TO TREE PRESERVATION PLAN FOR SPECIAL RESTRICTIONS/REQUIREMENTS ON LORAIN COUNTY COMMUNITY COLLEGE PROPERTIES.

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AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
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LORAIN COUNTY
OHIO

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PROJECT NO. NRG-1007

SHEET NO. 19 OF 88

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MATCHLINE SEE SHT. 19

MATCHLINE SEE SHT. 20

MATCHLINE SEE SHT. 20

MATCHLINE SEE SHT. 21

SEE SITE DETAIL SHEET 61 OF 88

SEE SITE DETAIL SHEET 62 OF 88

MgA

Mr

Mo

MANNING MARYANN & MANNING ROBERT G 0700043101017

KUENZEL DAVID K 0700043101015

MARSICO DOROTHY I TRUSTEE 0700043101025

WALLACE JULIET J 0700043101026

DUDIK DAVID 0700044101008

OHIO EDISON CO 0700043101014

OHIO EDISON CO 0700043101016

PENNSYLVANIA LINES LLC 0700043300001

AVON LAKE

NORTH RIDGEVILLE CITY

ELYRIA CITY

CULVERT

RAILROAD

WETLAND #18

WETLAND #19

WETLAND #20

WETLAND #21

20" CONC. PIPE

STREAM #6

WOODS

DEVELOPED

LORAIN COUNTY COMMUNITY COLLEGE 0622001000003

LORAIN COUNTY COMMUNITY COLLEGE 0623028000002

LORAIN COUNTY COMMUNITY COLLEGE 0622001000010

LORAIN COUNTY COMMUNITY COLLEGE 0623028000029

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LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE – 235 AC.

SPECIAL NOTE:

REFER TO TREE PRESERVATION PLAN FOR SPECIAL RESTRICTIONS/REQUIREMENTS ON LORAIN COUNTY COMMUNITY COLLEGE PROPERTIES.

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GRAPHIC SCALE

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(IN FEET)

1 inch = 100 ft.

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NO.	REVISIONS	DATE

E&SPC LAYOUT PLAN

AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

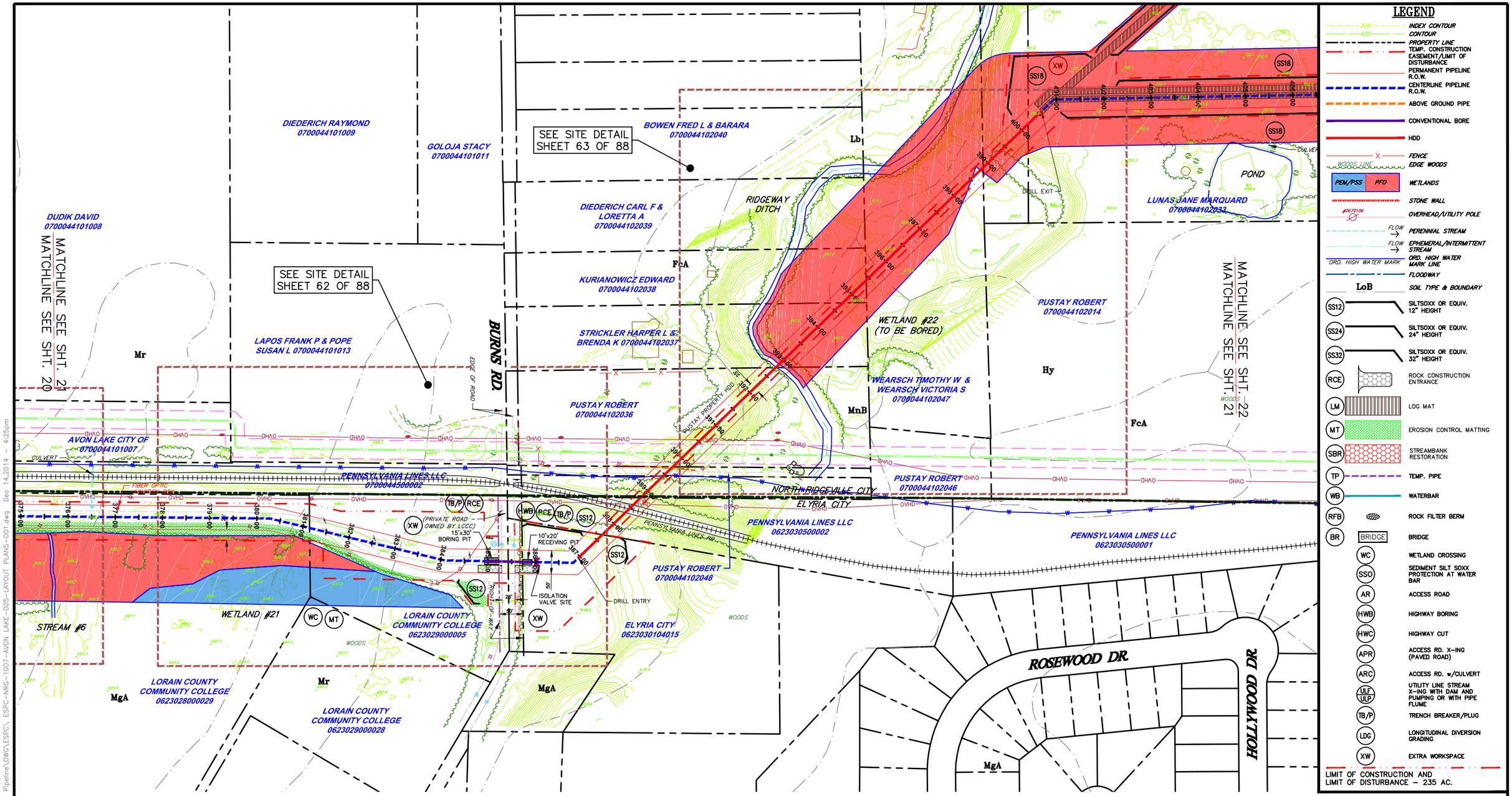
DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: 1"=100'

PROJECT NO. NRG-1007

SHEET NO. 20 OF 88

Hanover Engineering Associates Inc
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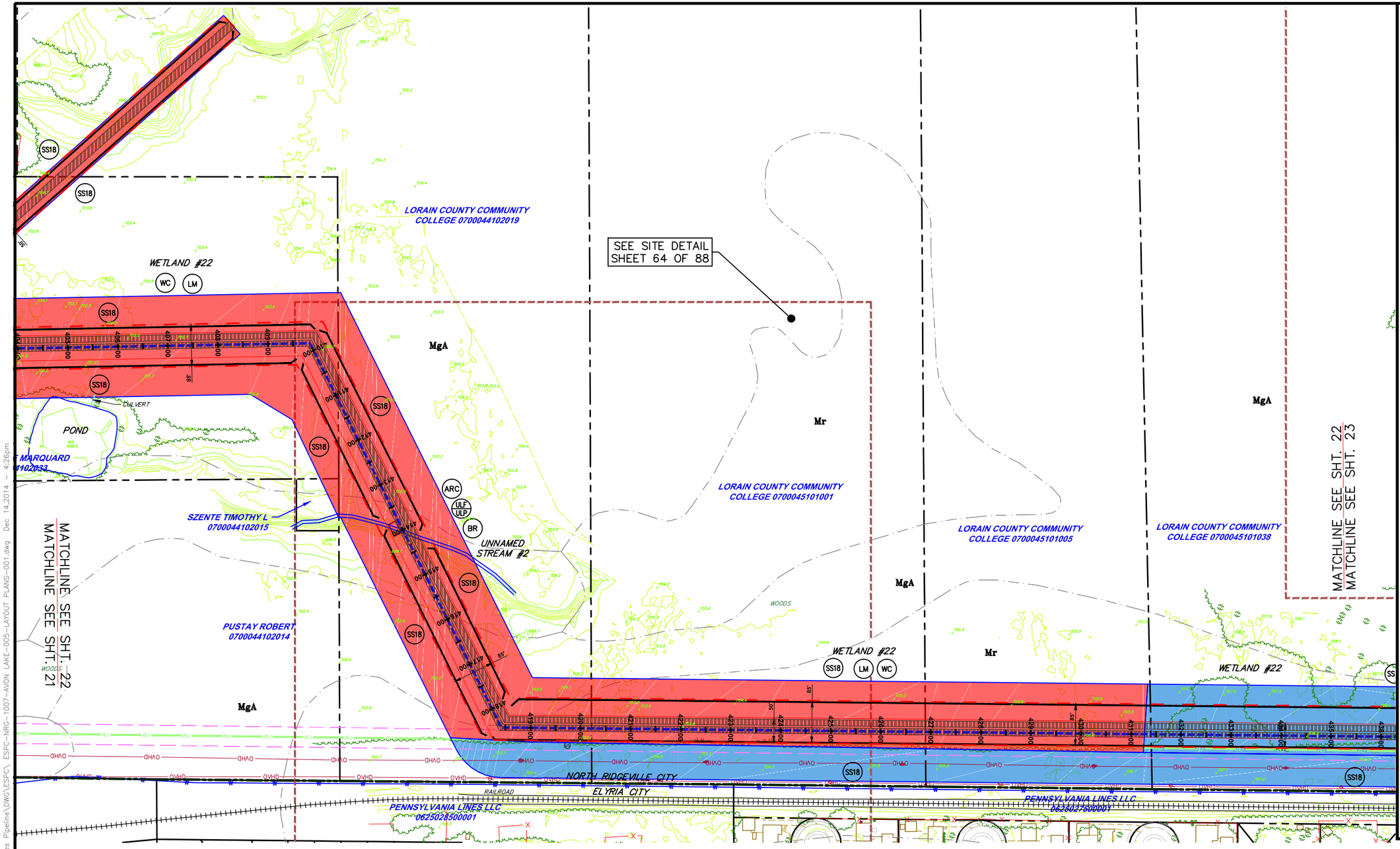
AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

DRAWN BY: AEJ	PROJECT NO. NRG–1007
CHECKED BY: SJC	
DATE: 12.15.14	SHEET NO. 21 OF 88
SCALE: 1"=100'	

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LEGEND

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E&SPC LAYOUT PLAN

AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
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LORAIN COUNTY
OHIO

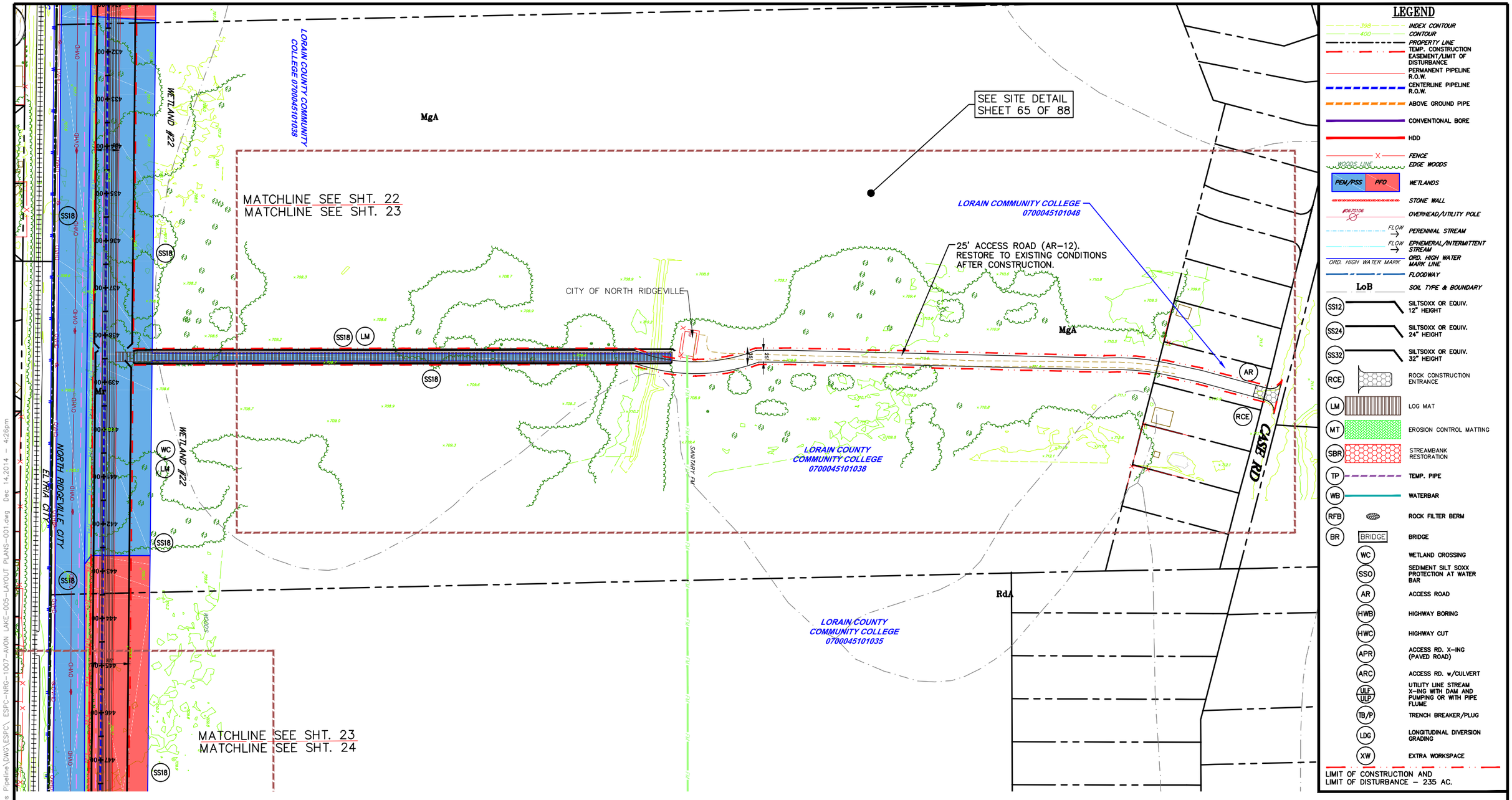
DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: 1"=100'

PROJECT NO. NRG-1007

SHEET NO. 22 OF 88

Hanover Engineering Associates Inc
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570.688.9550
Fax 570.688.9768

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LEGEND

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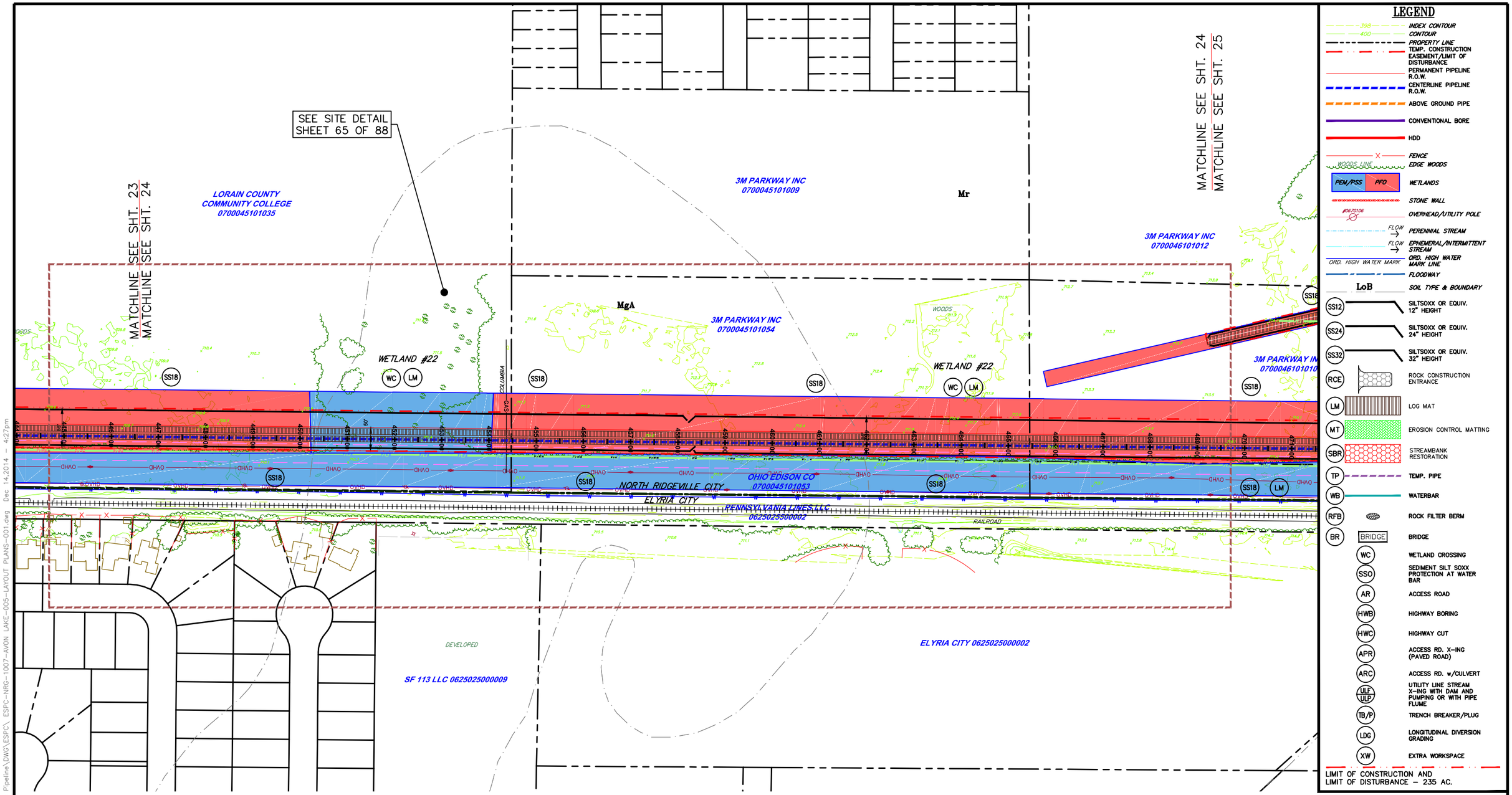
AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

DRAWN BY:	AEJ
CHECKED BY:	SJC
DATE:	12.15.14
SCALE:	1"=100'
PROJECT NO.	NRG-1007
SHEET NO.	23 OF 88

Hanover
Engineering Associates Inc
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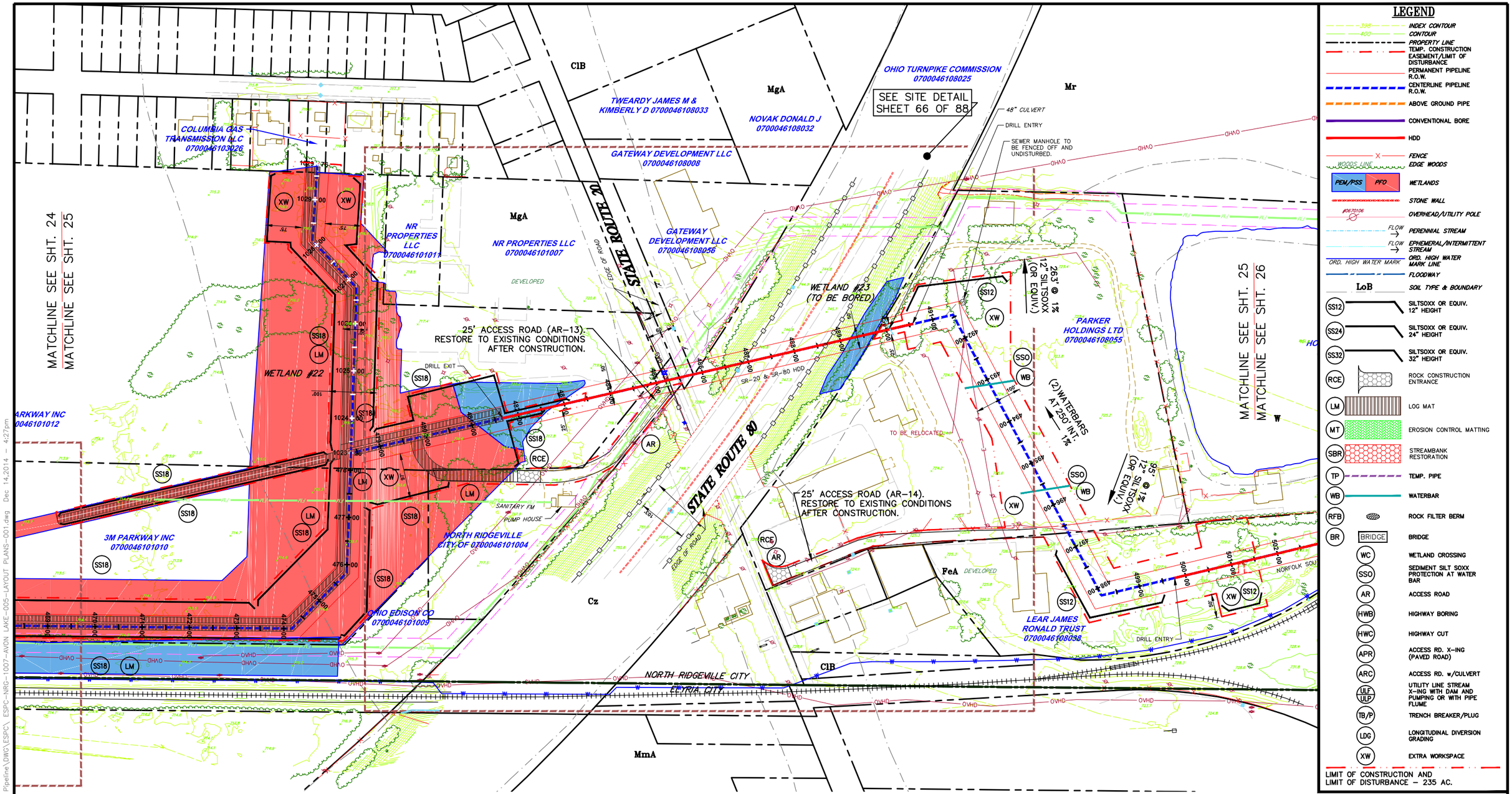
DRAWN BY: AEJ
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PROJECT NO. NRG–1007

SHEET NO. 24 OF 88

Hanover
Engineering Associates Inc
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AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
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LORAIN COUNTY
OHIO

DRAWN BY: AEJ	PROJECT NO. NRG-1007
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Hanover Engineering Associates Inc
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INC 0700046108029

PENNSYLVANIA LINES LLC
0700046500010

EAGLE PROPERTIES LTD AN OHIO LMTD LIABILITY CO
0700047000070

EAGLE PROPERTIES LTD AN OHIO LMT LIABILITY CO
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EAGLE PROPERTIES LTD AN OHIO LMT LIABILITY CO
0700047000069

EAGLE PROPERTIES LTD AN OHIO LIABILITY CO
0700047000067

TAYLOR WOODS PROPERTIES
0700047000086

SEE SITE DETAIL
SHEET 67 OF 88

INVACARE CORPORATION
0700047000083

TAYLOR PKY

TAYLOR WOODS PROPERTIES LLC
0700047000084

MATCHLINE SEE SHT. 25
MATCHLINE SEE SHT. 26

MATCHLINE SEE SHT. 26
MATCHLINE SEE SHT. 27

HORVATH DANIEL E
0700046108005

WETLAND #24

WETLAND #25

15'x30' BORING PIT

10'x20' RECEIVING PIT

DRILL EXIT

UNDERGROUND ELECTRIC

NORFOLK SOUTHERN HDD

NORFOLK SOUTHERN RR

NORFOLK SOUTHERN MILEPOST 205

INVACARE CORPORATION
0700047000082

DEVELOPED

DATO LTD
0700047000108

VARIGROUP LTD
0700047000109

NORTH RIDGEVILLE CITY
ELYRIA CITY

FcA

Mr

Ly

WOODS

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- EPHEMERAL/INTERMITTENT STREAM
- ORD. HIGH WATER MARK LINE
- FLOODWAY
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LIMIT OF CONSTRUCTION AND
LIMIT OF DISTURBANCE – 235 AC.

NOTES:

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GRAPHIC SCALE

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(IN FEET)
1 inch = 100 ft.

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NO.	REVISIONS	DATE

E&SPC LAYOUT PLAN

AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

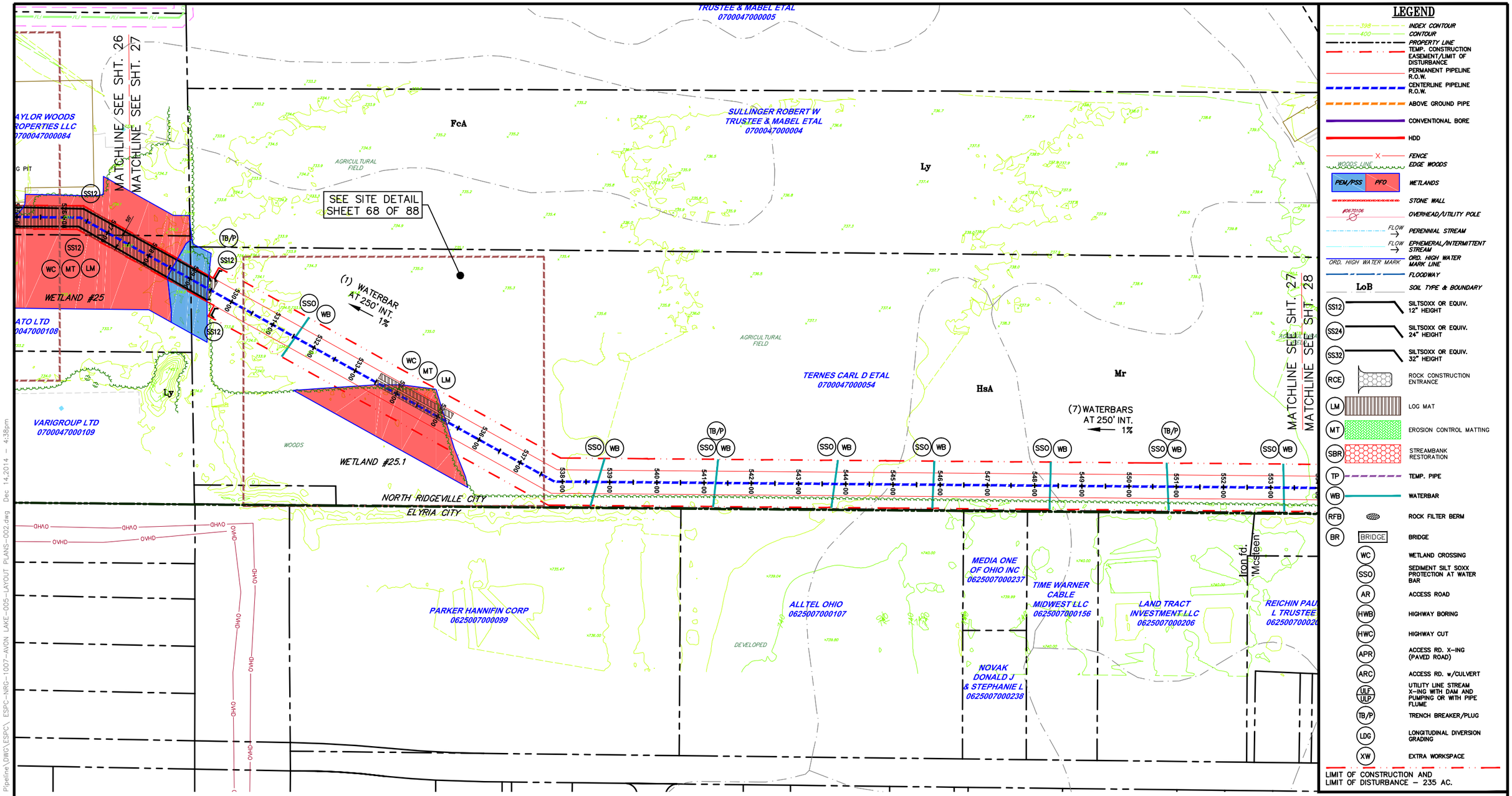
DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: 1"=100'

PROJECT NO. NRG-1007

SHEET NO. 26 OF 88

Hanover
Engineering Associates Inc
3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768

Y:\Projects\Energy\NRG Energy\NRG-1007-Avon Lakes Pipeline\DWG\ESPC\ ESPC-NRG-1007-AVON LAKE-005-LAYOUT PLANS-001.dwg Dec 14,2014 - 4:28pm



LEGEND

- INDEX CONTOUR
- CONTOUR
- PROPERTY LINE
- TEMP. CONSTRUCTION EASEMENT/LIMIT OF DISTURBANCE
- PERMANENT PIPELINE R.O.W.
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E&SPC LAYOUT PLAN

AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA & NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

DRAWN BY: AEJ	PROJECT NO. NRG–1007
CHECKED BY: SJC	
DATE: 12.15.14	SHEET NO. 27 OF 88
SCALE: 1"=100'	

Hanover Engineering Associates Inc
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Bartonsville, PA 18321-7822
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Y:\Projects\Energy\NRG Energy\NRG-1007-Avon Lakes Pipeline\DWG\ESPC\ ESPC-NRG-1007-AVON LAKE-005-LAYOUT PLANS-002.dwg Dec 14,2014 - 4:38pm

SMITH STEVEN F & FRANTZ VICTORIA I 0700047000015

SULLINGER ROBERT W TRUSTEE & MABEL ETAL 0700048000004

SEE SITE DETAIL SHEET 68 OF 88

STREAM #2

MATCHLINE SEE SHT. 28

FEES DOROTHY 0700048000005

FARM LANE

UNNAMED STREAM #3

AGRICULTURAL FIELD

LEONOWICH JOHN D TRUSTEE 0700048000002

(10) WATERBARS AT 250' INT. 1%

SUGAR RIDGE RD.

RIGHT-OF-WAY

EDGE OF ROAD

10'x20' RECEIVING PIT

15'x30' BORING PIT

(2) WATERBARS AT 250' INT. 1%

MATCHLINE SEE SHT. 27

MATCHLINE SEE SHT. 28

WILLS DEBRA J 0700048000023

KILBY CAROLE 0700048000036

LEONOWICH FAMILY LIMITED PARTNERSHIP 0700048000033

CUBERO DELIA L 0700048000035

NORTH RIDGEVILLE CITY OF 0700047000003

EDWARDS ROGER D & BRENDA S 0700048000029

HARMON STEPHEN O & JENNIFER R 0700048000021

ASHTON THOMAS 0700048000015

BLAYLOCK SCOTT L & ROCHELLE S 0700048000017

ROSS RICKY A 0700048000031

NORTH RIDGEVILLE CITY

ELYRIA CITY

OVERBROOK FARMS 0625007000013

REICHIN PAUL L TRUSTEE 0625007000204

DIAMOND PRODUCTS LIMITED 0625007000207

TOWN OF Mosteen

WOODS

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E&SPC LAYOUT PLAN

AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

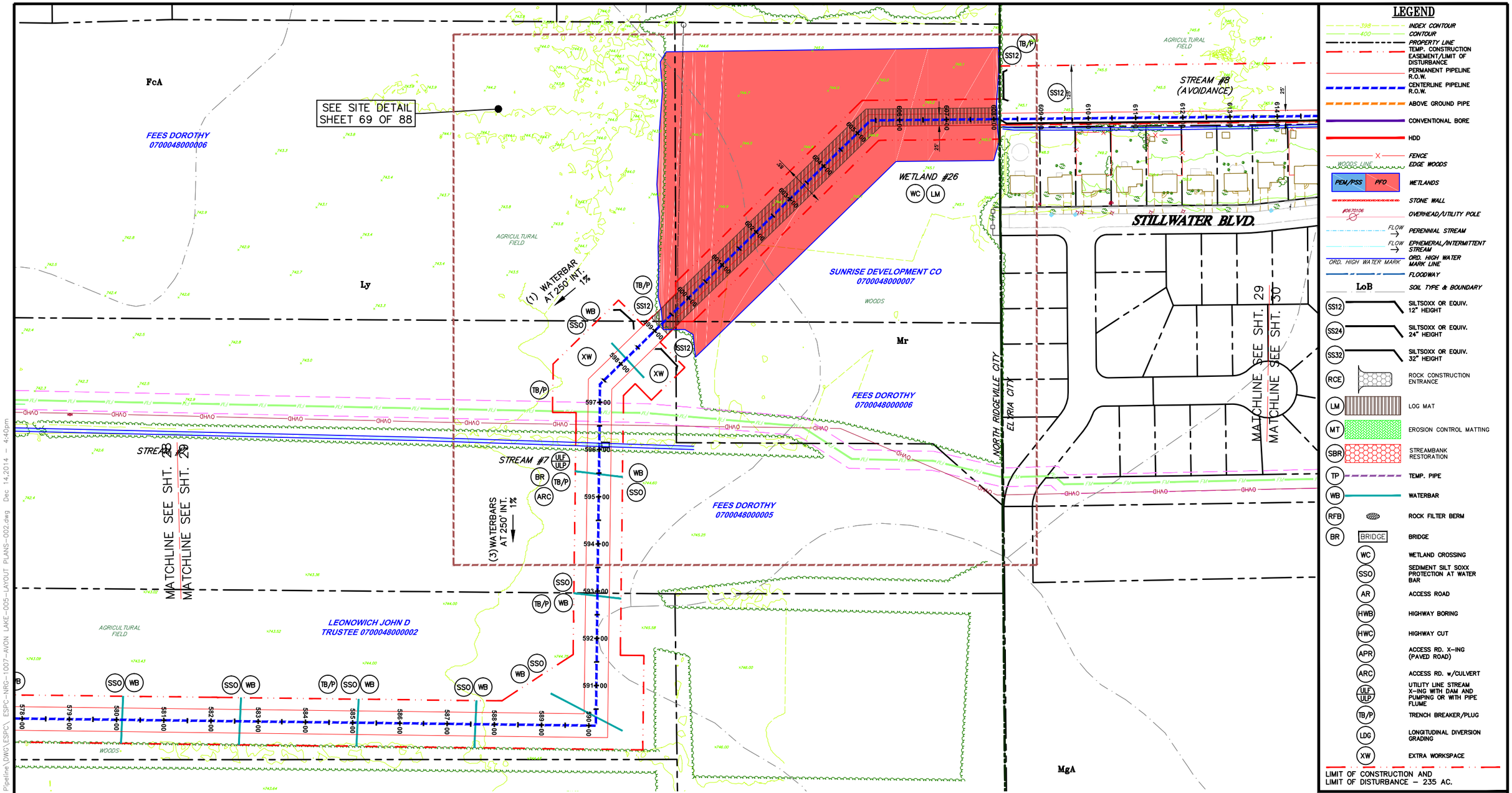
DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: 1"=100'

PROJECT NO. NRG-1007

SHEET NO. 28 OF 88

Hanover Engineering Associates Inc
3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768

Y:\Projects\Energy\NRG Energy\NRG-1007-Avon Lakes Pipeline\DWG\ESPC\ ESPC-NRG-1007-AVON LAKE-005-LAYOUT PLANS-002.dwg Dec 14,2014 - 4:39pm



LEGEND

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SEAL

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E&SPC LAYOUT PLAN

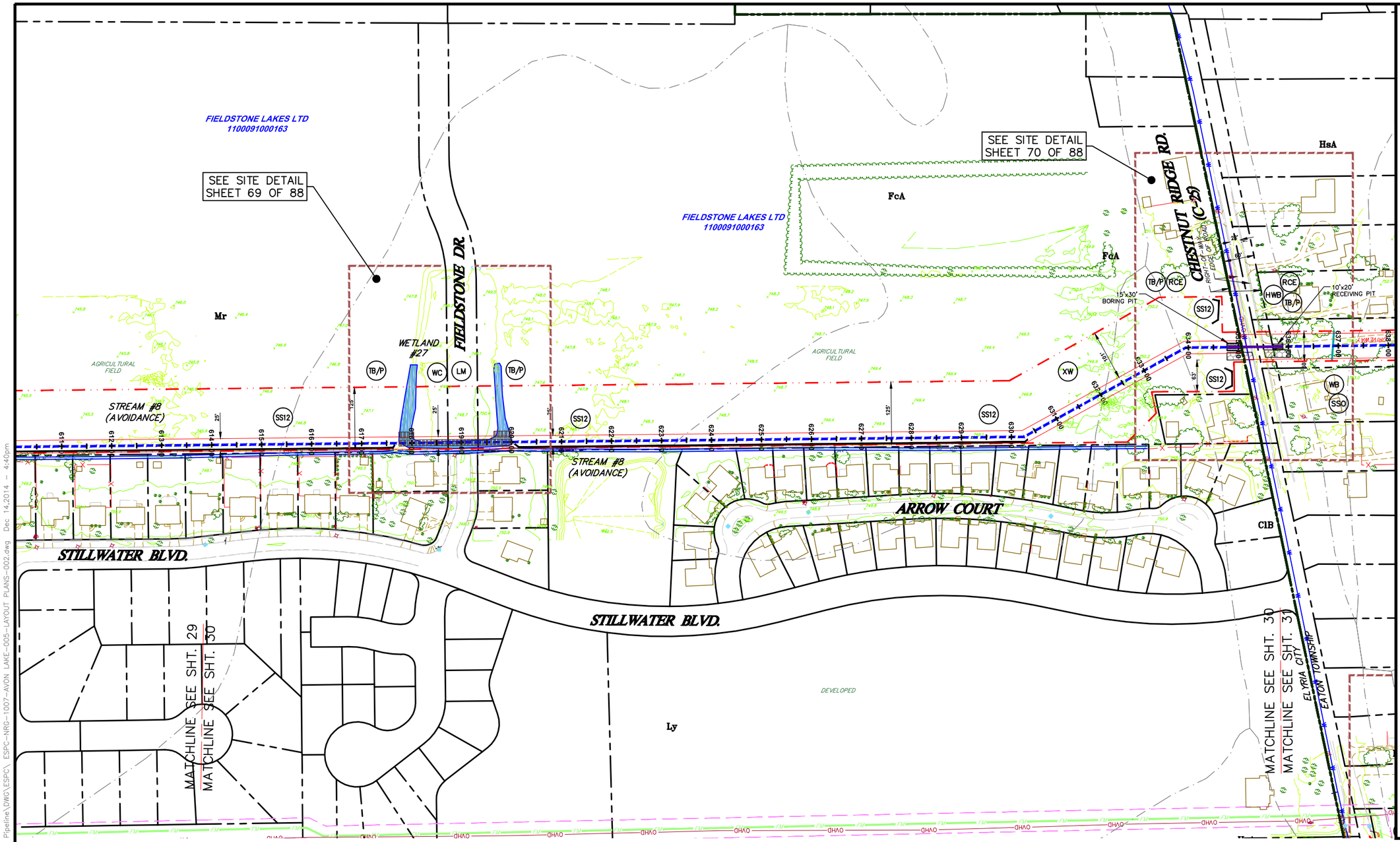
AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: 1"=100'
PROJECT NO. NRG-1007
SHEET NO. 29 OF 88

Hanover Engineering Associates Inc
3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768

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LEGEND

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E&SPC LAYOUT PLAN

AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
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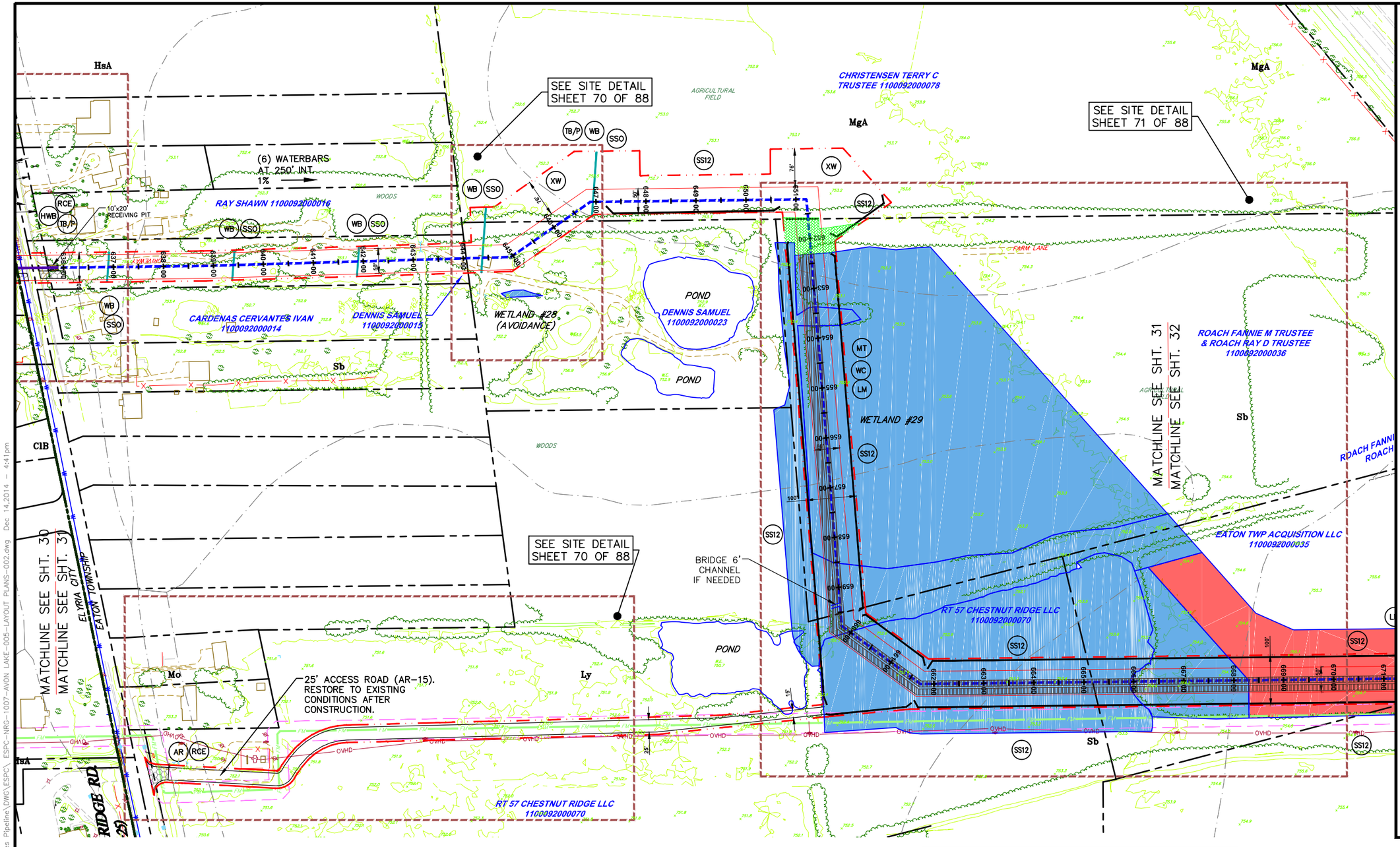
DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
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PROJECT NO. NRG-1007

SHEET NO. 30 OF 88

Hanover Engineering Associates Inc
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4. SILT SOCK OR CONSTRUCTION FENCE SHALL BE INSTALLED ON BOTH SIDES OF WORKSPACE.

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)

1 inch = 100 ft.

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SEAL

NO.	REVISIONS	DATE

E&SPC LAYOUT PLAN

AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

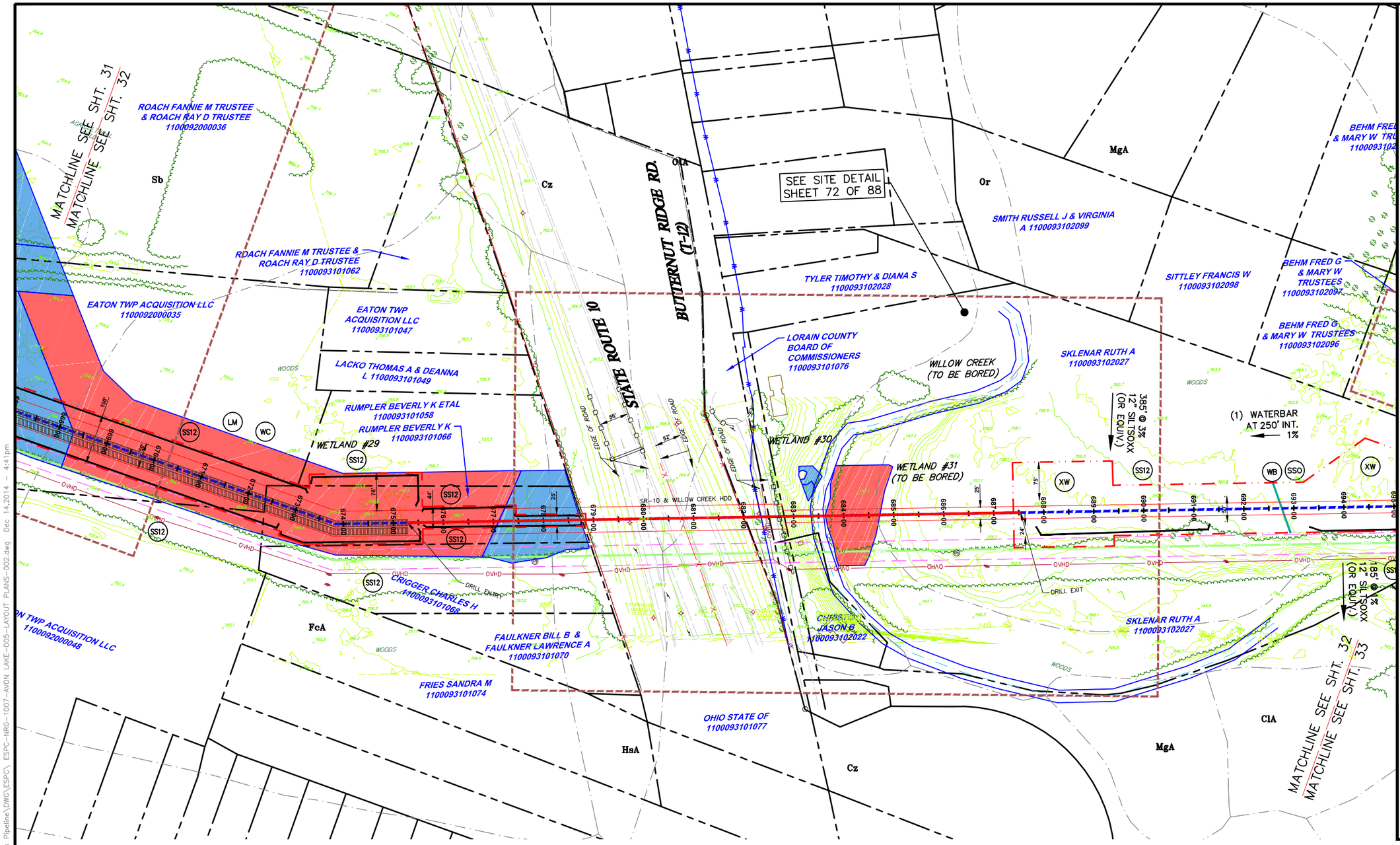
DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: 1"=100'

PROJECT NO. NRG-1007

SHEET NO. 31 OF 88

Hanover Engineering Associates Inc
3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768

X:\Projects\Energy\NRG Energy\NRG-1007-Avon Lakes Pipeline\DWG\ESPC\ ESPC-NRG-1007-AVON LAKE-005-LAYOUT PLANS-002.dwg Dec 14,2014 - 4:41pm



LEGEND

- INDEX CONTOUR
- CONTOUR
- PROPERTY LINE
- TEMP. CONSTRUCTION EASEMENT/LIMIT OF DISTURBANCE
- PERMANENT PIPELINE R.O.W.
- CENTERLINE PIPELINE R.O.W.
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- HDD
- FENCE
- EDGE WOODS
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LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE – 235 AC.

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E&SPC LAYOUT PLAN

AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA & NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

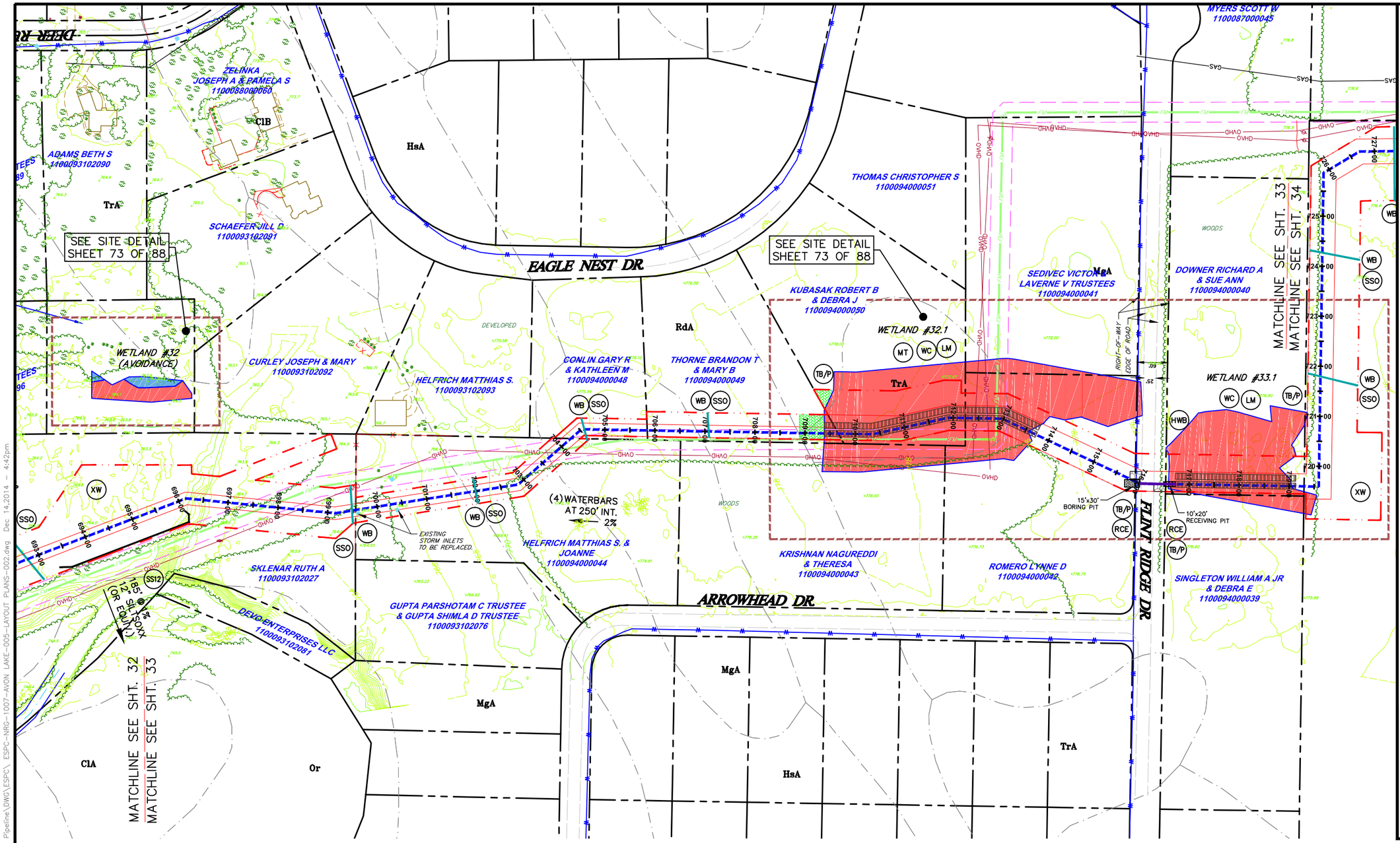
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PROJECT NO. NRG–1007

SHEET NO. 32 OF 88

Hanover Engineering Associates Inc
3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
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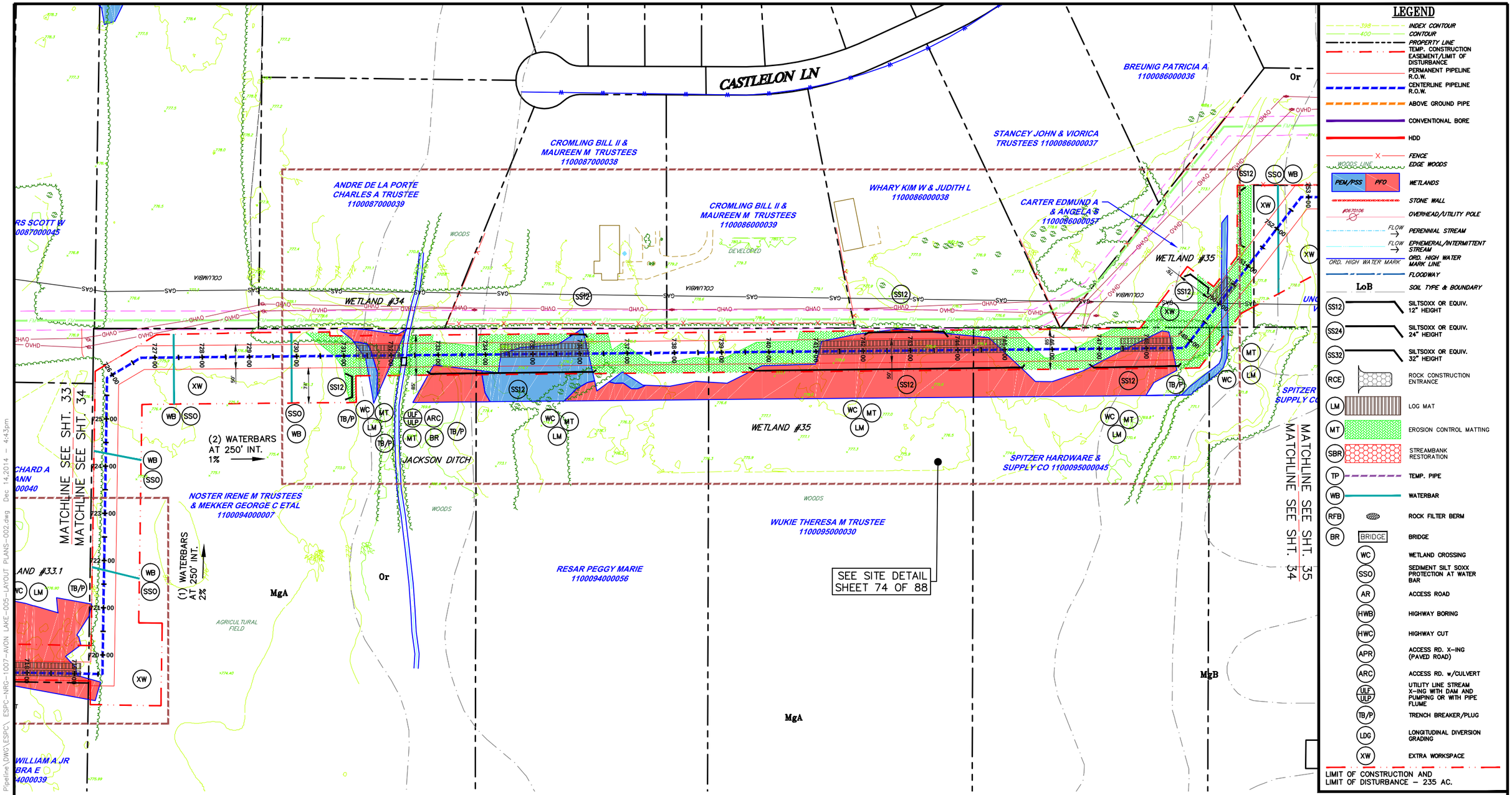
AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

DRAWN BY: AEJ	PROJECT NO. NRG-1007
CHECKED BY: SJC	
DATE: 12.15.14	SHEET NO. 33 OF 88
SCALE: 1"=100'	

Hanover
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LEGEND

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E&SPC LAYOUT PLAN

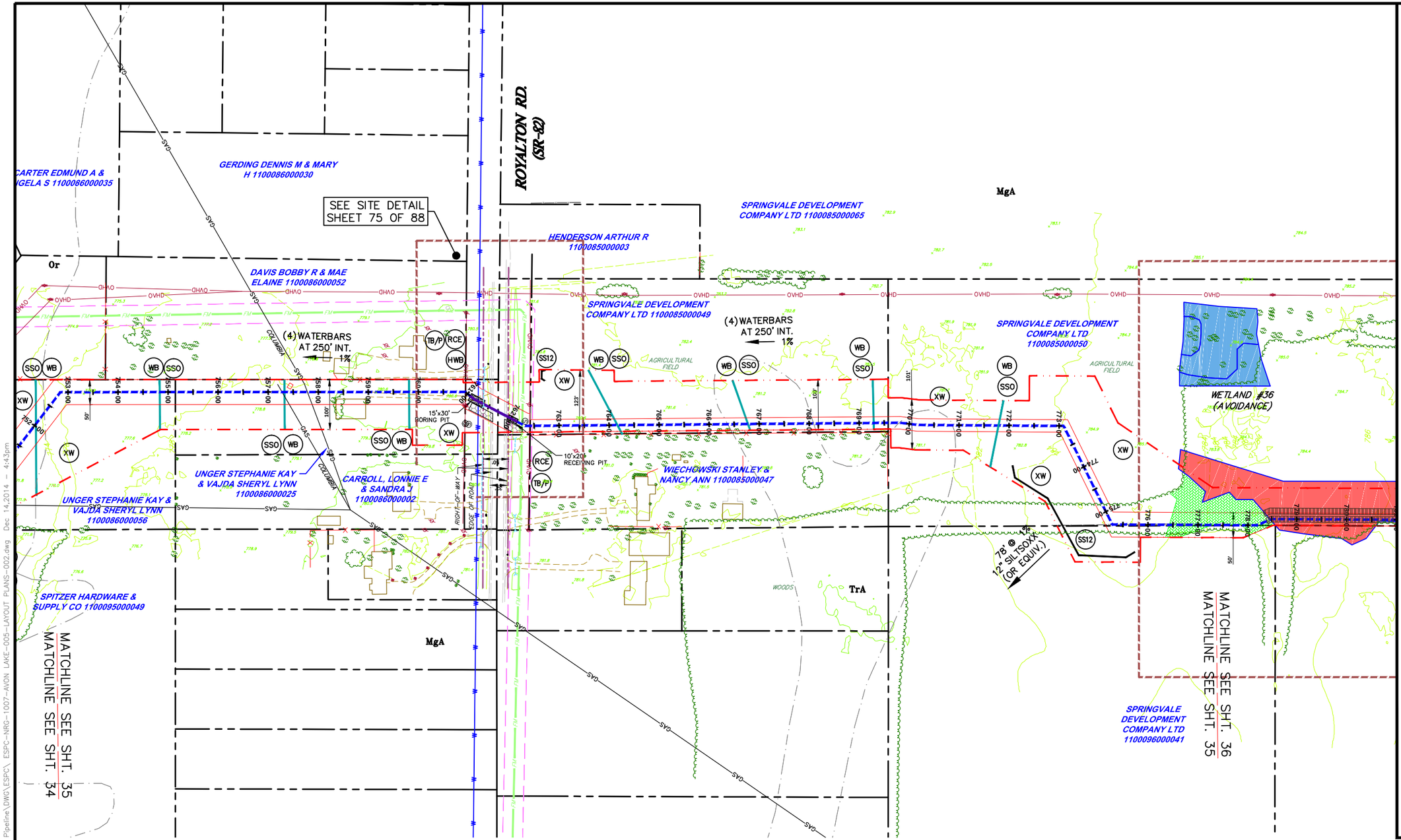
AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
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LORAIN COUNTY
OHIO

DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: 1"=100'
PROJECT NO. NRG-1007
SHEET NO. 34 OF 88

Hanover Engineering Associates Inc
3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768

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LEGEND

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LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE – 235 AC.

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E&SPC LAYOUT PLAN

AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: 1"=100'

PROJECT NO. NRG-1007

SHEET NO. 35 OF 88

Hanover Engineering Associates Inc
3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768

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SPRINGVALE DEVELOPMENT COMPANY LTD 1100085000065

WETLAND #36 (AVOIDANCE)

WETLAND #37 (AVOIDANCE)

WETLAND #37.1

WOODS

AGRICULTURAL FIELD

SEE SITE DETAIL SHEET 76 OF 88

SEE SITE DETAIL SHEET 75 OF 88

(2) WATERBARS AT 25% @50' INTV.

SAYLES, DAVID & DEBRA 1000097000005

KISTNER, MICHAEL A & LANA K 1000097000004

ALEXANDER DITCH

WETLAND #38

MATCHLINE SEE SHT. 36

MATCHLINE SEE SHT. 37

MATCHLINE SEE SHT. 35

SPRINGVALE DEVELOPMENT COMPANY LTD 1100096000041

BRENTWOOD GOLF CLUB INC 1100096000043

MgA

RdA

HsA

ElB2

Or

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E&SPC LAYOUT PLAN

AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
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LORAIN COUNTY
OHIO

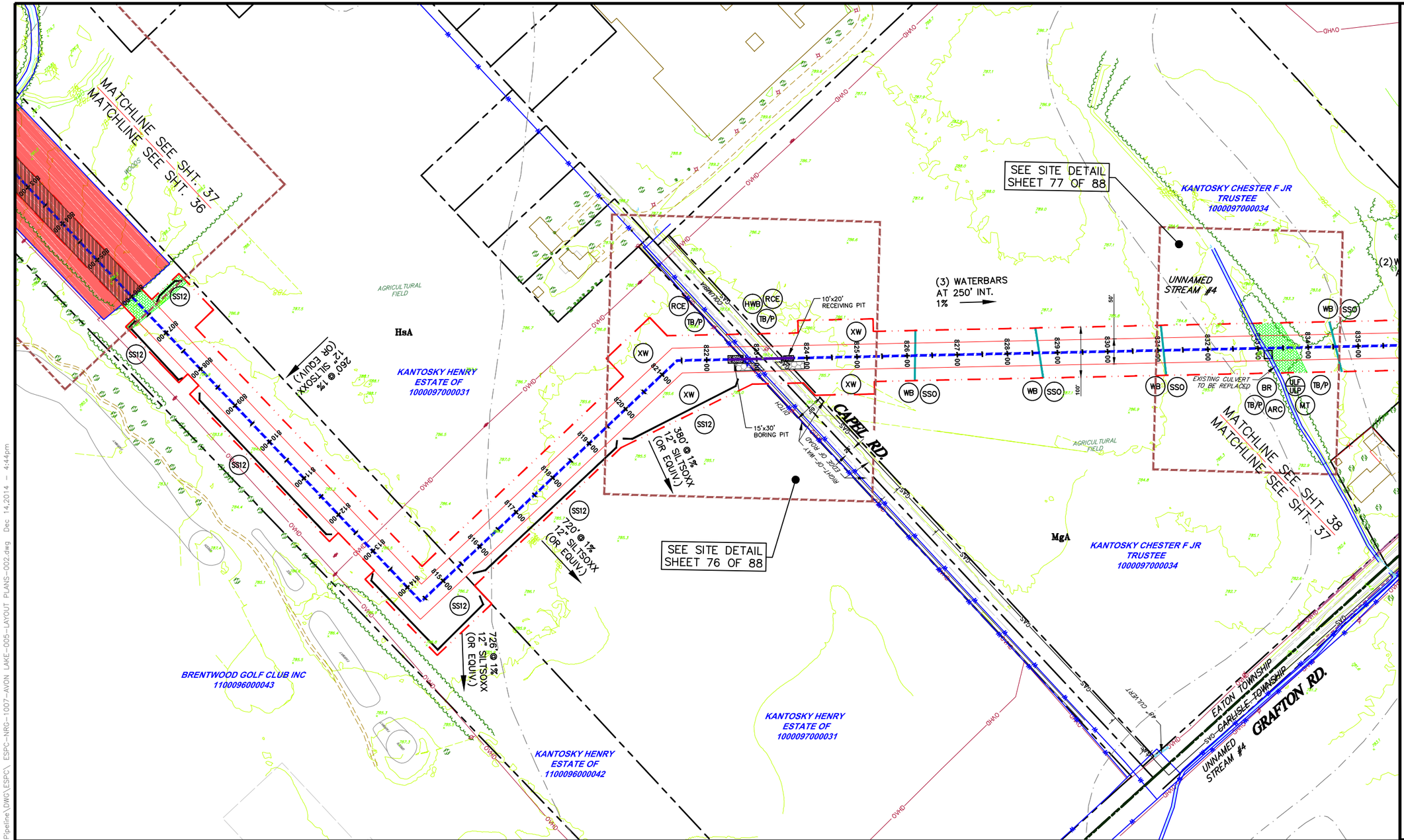
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PROJECT NO. NRG-1007

SHEET NO. 36 OF 88

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SEAL

NO.	REVISIONS	DATE

E&SPC LAYOUT PLAN

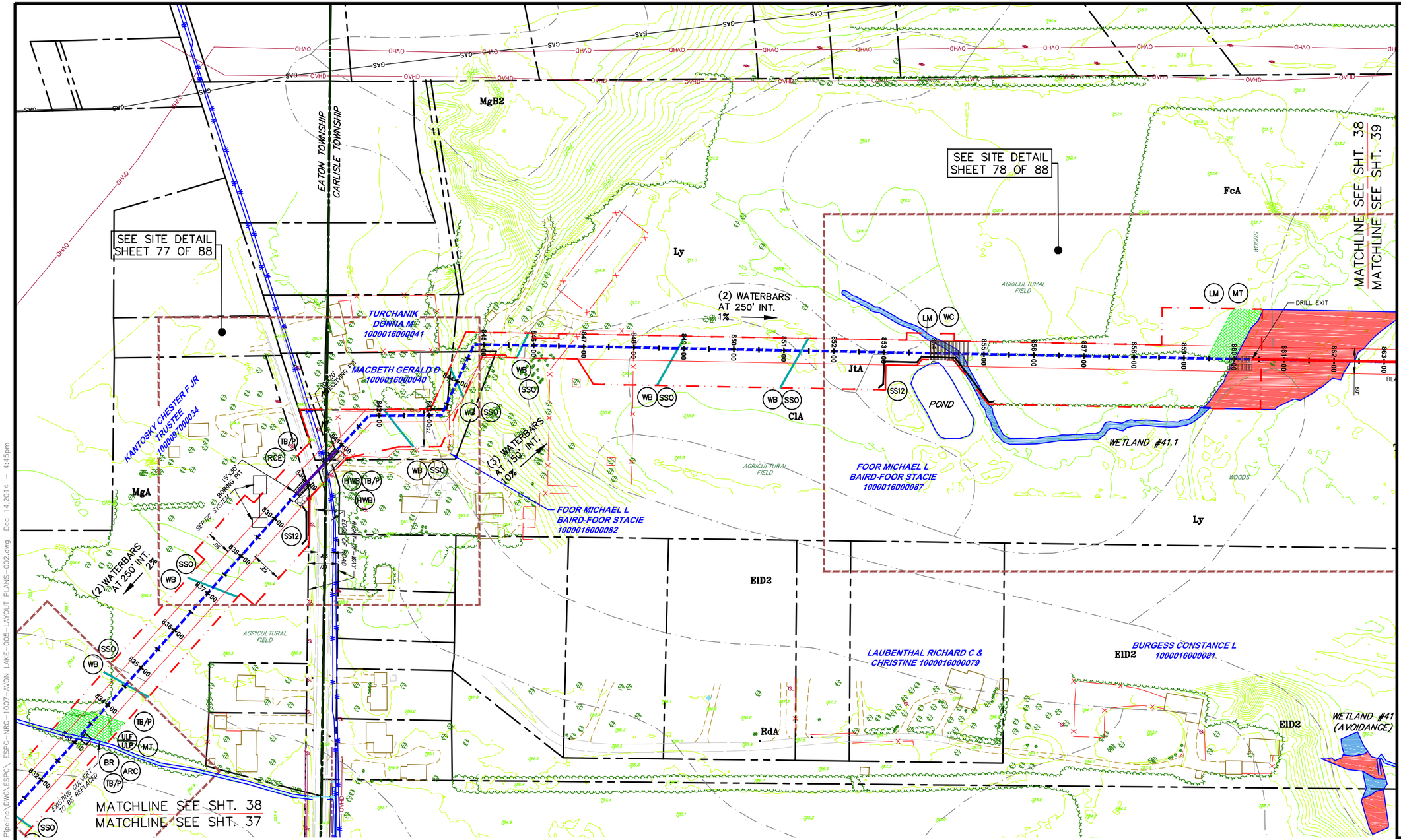
AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

DRAWN BY: AEJ	PROJECT NO. NRG–1007
CHECKED BY: SJC	
DATE: 12.15.14	SHEET NO. 37 OF 88
SCALE: 1"=100'	

Hanover
Engineering Associates Inc
3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
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LEGEND

- INDEX CONTOUR
- CONTOUR
- PROPERTY LINE
- TEMP. CONSTRUCTION EASEMENT/LIMIT OF DISTURBANCE
- PERMANENT PIPELINE R.O.W.
- CENTERLINE PIPELINE R.O.W.
- ABOVE GROUND PIPE
- CONVENTIONAL BORE
- HDD
- FENCE
- EDGE WOODS
- WETLANDS (PEM/PSS, PFO)
- STONE WALL
- OVERHEAD/UTILITY POLE
- PERENNIAL STREAM
- EPHEMERAL/INTERMITTENT STREAM
- ORD. HIGH WATER MARK LINE
- FLOODWAY
- LoB SOIL TYPE & BOUNDARY
- SS12 SILTSOXX OR EQUIV. 12" HEIGHT
- SS24 SILTSOXX OR EQUIV. 24" HEIGHT
- SS32 SILTSOXX OR EQUIV. 32" HEIGHT
- RCE ROCK CONSTRUCTION ENTRANCE
- LM LOG MAT
- MT EROSION CONTROL MATTING
- SBR STREAMBANK RESTORATION
- TP TEMP. PIPE
- WB WATERBAR
- RFB ROCK FILTER BERM
- BR BRIDGE
- WC WETLAND CROSSING
- SSO SEDIMENT SILT SOXX PROTECTION AT WATER BAR
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- ULF/ULP UTILITY LINE STREAM X-ING WITH DAM AND PUMPING OR WITH PIPE FLUME
- TB/P TRENCH BREAKER/PLUG
- LDG LONGITUDINAL DIVERSION GRADING
- XW EXTRA WORKSPACE

LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE – 235 AC.

NOTES:

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E&SPC LAYOUT PLAN

AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA & NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

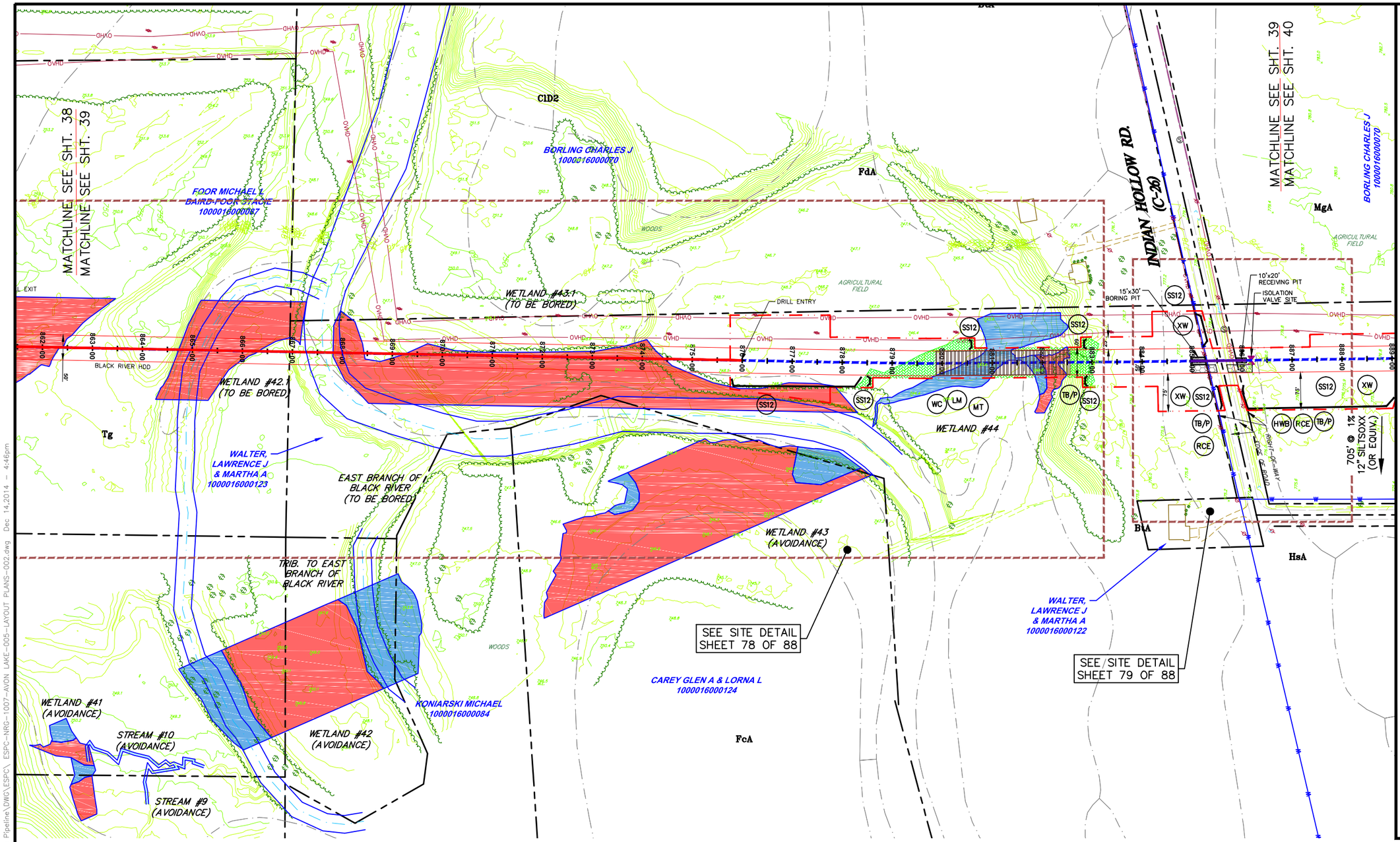
DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: 1"=100'

PROJECT NO. NRG–1007

SHEET NO. 38 OF 88

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LEGEND

- 398 — INDEX CONTOUR
- 400 — CONTOUR
- PROPERTY LINE
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- CENTERLINE PIPELINE R.O.W.
- ABOVE GROUND PIPE
- CONVENTIONAL BORE
- HDD
- FENCE
- WOODS LINE — EDGE WOODS
- PEM/PSS / PFO — WETLANDS
- STONE WALL
- #0670106 — OVERHEAD/UTILITY POLE
- FLOW — PERENNIAL STREAM
- FLOW — EPHEMERAL/INTERMITTENT STREAM
- ORD. HIGH WATER MARK — ORD. HIGH WATER MARK LINE
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E&SPC LAYOUT PLAN

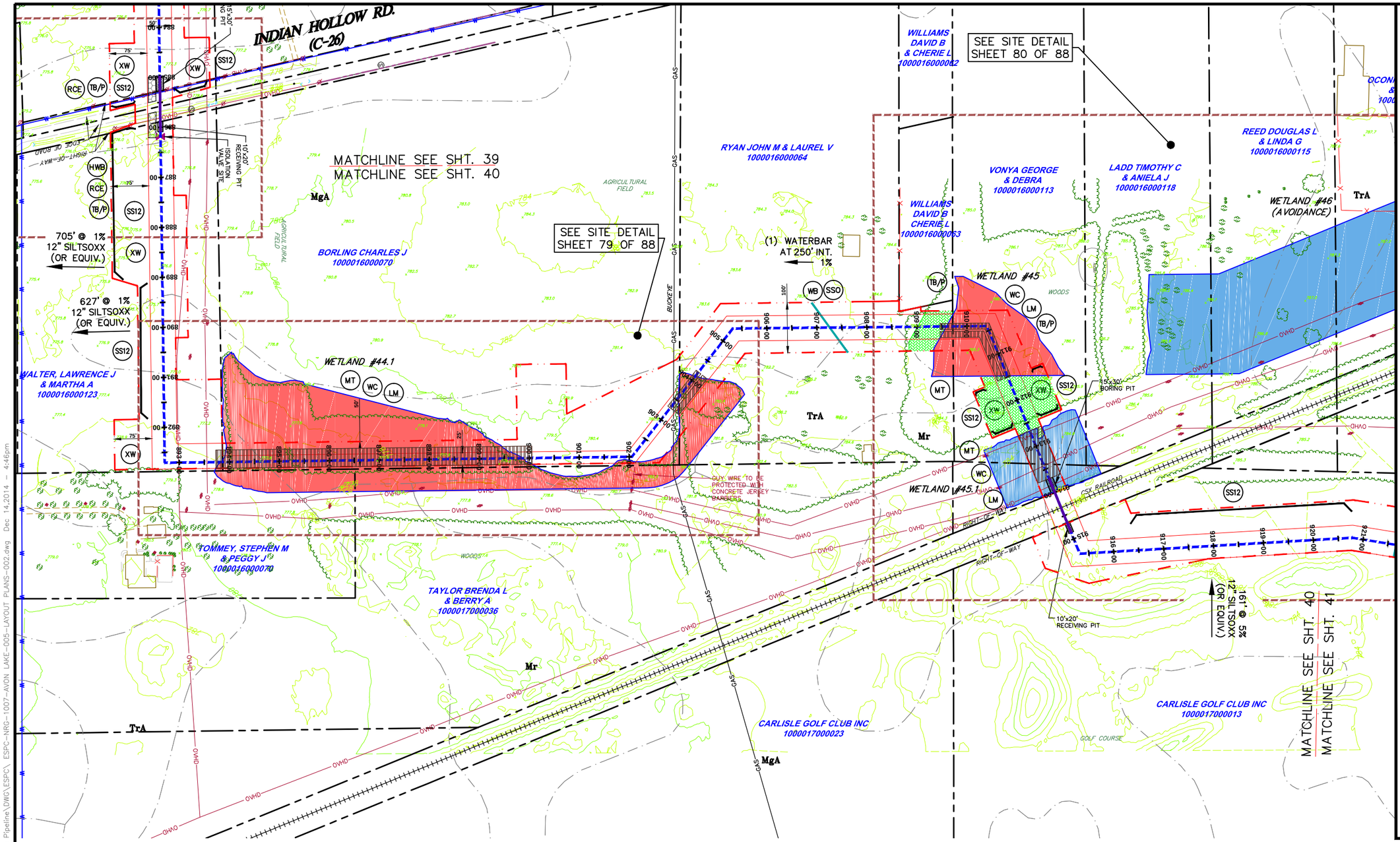
AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

DRAWN BY:	AEJ
CHECKED BY:	SJC
DATE:	12.15.14
SCALE:	1"=100'
PROJECT NO.	NRG–1007
SHEET NO.	39 OF 88

Hanover
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LEGEND

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E&SPC LAYOUT PLAN

AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

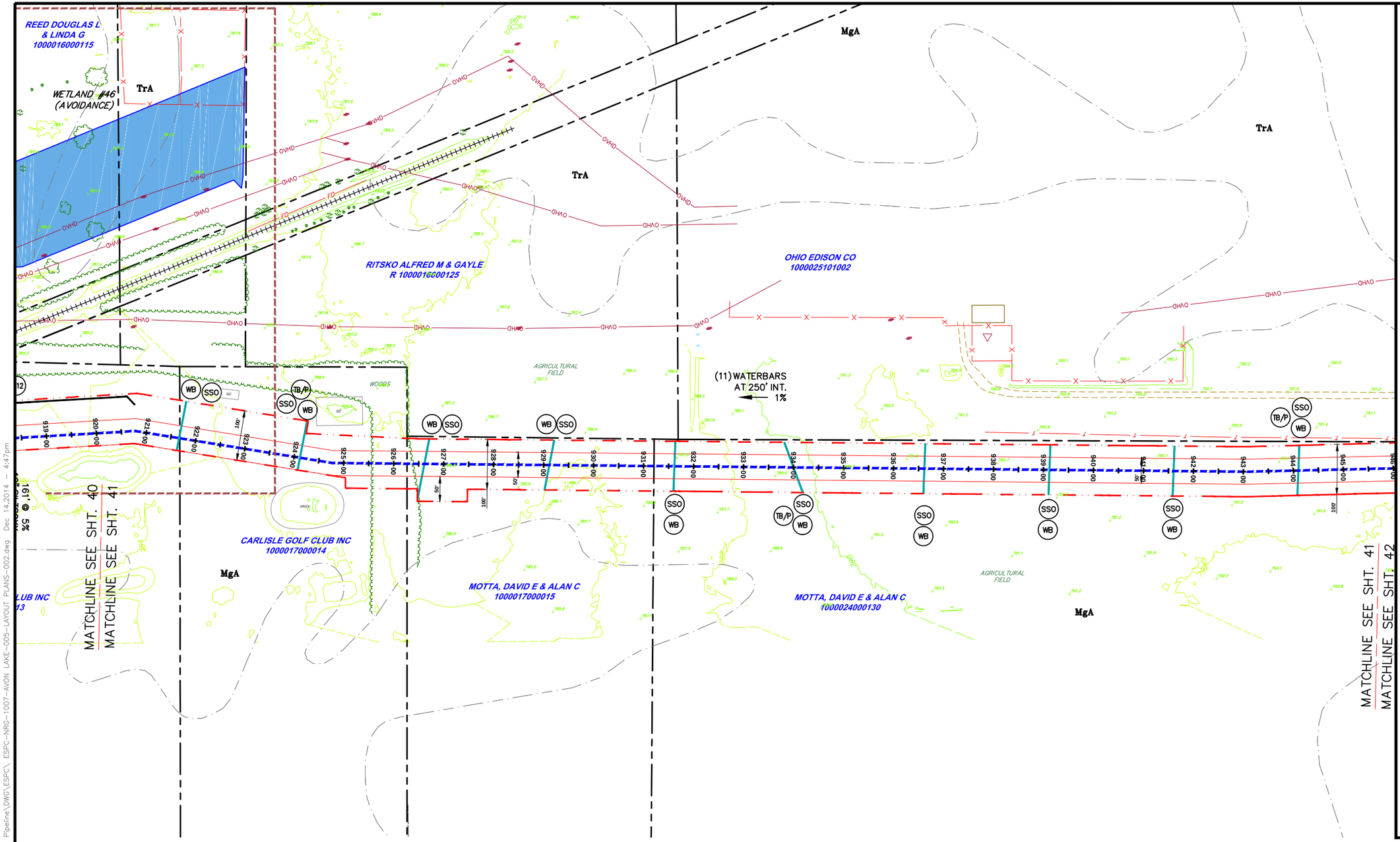
DRAWN BY: AEJ
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DATE: 12.15.14
SCALE: 1"=100'

PROJECT NO. NRG–1007

SHEET NO. 40 OF 88

Hanover Engineering Associates Inc
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Bartonsville, PA 18321-7822
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Fax 570.688.9768

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LEGEND

- INDEX CONTOUR
- CONTOUR
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- TEMP. CONSTRUCTION EASEMENT/LIMIT OF DISTURBANCE
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- CENTERLINE PIPELINE R.O.W.
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- SOIL TYPE & BOUNDARY (LoB)
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LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE – 235 AC.

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E&SPC LAYOUT PLAN

AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

DRAWN BY: AEJ
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PROJECT NO. NRG-1007

SHEET NO. 41 OF 88

Hanover Engineering Associates Inc
3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
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OHIO EDISON CO
1000025101002

OHIO EDISON CO
1000025101050

MOTTA, DAVID E & ALAN C
1000024000130

TWIN CREEK FARMS INC.
1000024000200

BANKS RD. (T-167)

MATCHLINE SEE SHT. 41

MATCHLINE SEE SHT. 42

MATCHLINE SEE SHT. 42

MATCHLINE SEE SHT. 43

SEE SITE DETAIL SHEET 81 OF 88

316' @ 1% 12" SILTSOXX (OR EQUIV.)

438' @ 1% 12" SILTSOXX (OR EQUIV.)

(4) WATERBARS AT 250' INT. 1%

(2) WATERBARS AT 250' INT. 1%

10'x20' RECEIVING PIT

15'x30' BORING PIT
ISOLATION VALVE SITE

8" CULVERT

CULVERT

AGRICULTURAL FIELD

WOODS

EDGE OF ROAD

RIGHT-OF-WAY

TrA

MgA

HsA

LEGEND

- INDEX CONTOUR
- CONTOUR
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- TEMP. CONSTRUCTION EASEMENT/LIMIT OF DISTURBANCE
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E&SPC LAYOUT PLAN

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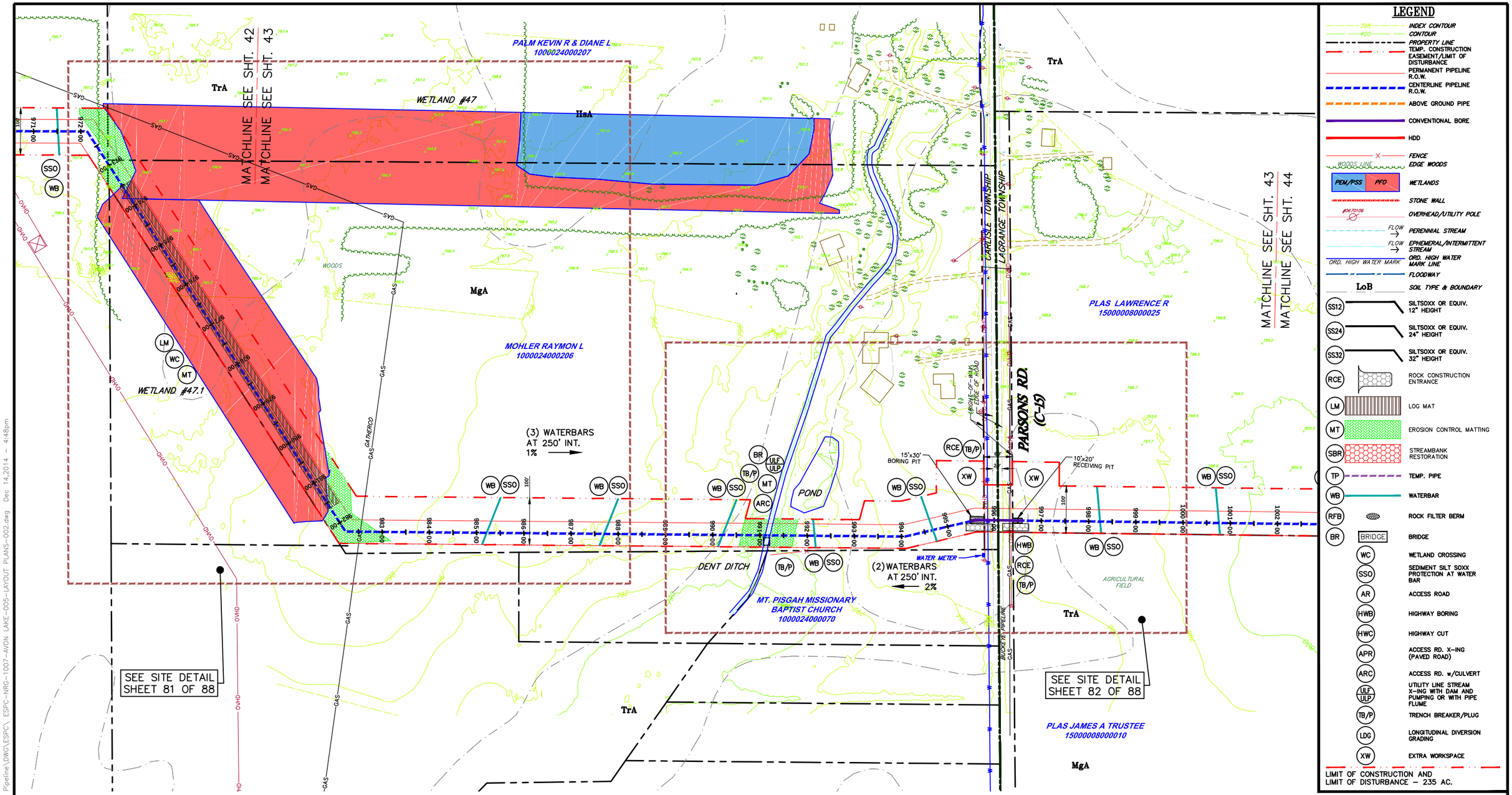
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3. THE ENTIRE PROJECT AREA WILL BE RESTORED TO EXISTING CONDITIONS OR MEADOW CONDITIONS, UNLESS IT IS CURRENTLY USED AS AN AGRICULTURAL USE. THE THICK, VEGETATIVE COVER WILL HELP MINIMIZE THERMAL IMPACTS. THE PIPELINE R.O.W. WILL BE RESTORED TO ORIGINAL GRADE, WHICH WILL PROMOTE SHEET FLOW WHERE IT CURRENTLY OCCURS, ACROSS A VEGETATED AREA, ACTING AS A FILTER STRIP.
4. SILT SOCK OR CONSTRUCTION FENCE SHALL BE INSTALLED ON BOTH SIDES OF WORKSPACE.

ALL BMP'S SHOULD BE INSPECTED AFTER EACH RUNOFF EVENT EXCEEDING 0.5" IN DEPTH AND ON A WEEKLY BASIS. ANY NECESSARY REPAIRS MUST BE MADE IMMEDIATELY TO ENSURE EFFECTIVE AND EFFICIENT OPERATION.

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

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SEAL

NO.	REVISIONS	DATE

E&SPC LAYOUT PLAN

AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

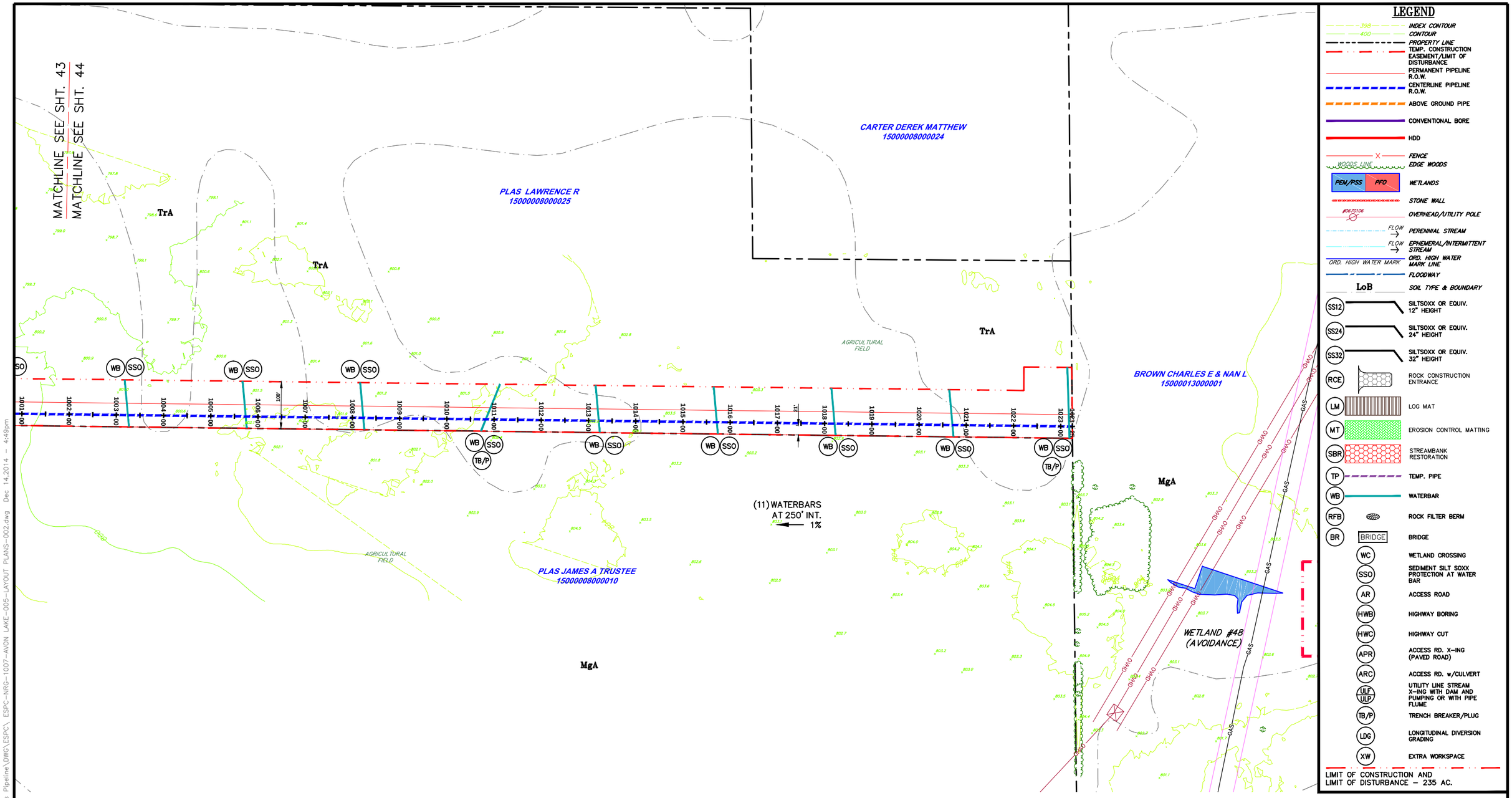
DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: 1"=100'

PROJECT NO. NRG-1007

SHEET NO. 43 OF 88

Hanover Engineering Associates Inc
3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768

X:\Projects\Energy\NRG Energy\NRG-1007-Avon Lakes Pipeline\DWG\ESPC\ ESPC-NRG-1007-AVON LAKE-005-LAYOUT PLANS-002.dwg Dec 14,2014 - 4:48pm



NOTES:

1. FLOW LENGTH SHOULD BE VERIFIED PRIOR TO CONSTRUCTION. IF FLOW LENGTH EXCEEDS SILT SOCKS LIMITS, SILT SOCKS OF APPROPRIATE SIZE SHALL BE USED.
2. SHALLOW EXCAVATIONS SHOULD NOT CREATE ANY ISSUES FOR GEOLOGICAL FORMATIONS.
3. THE ENTIRE PROJECT AREA WILL BE RESTORED TO EXISTING CONDITIONS OR MEADOW CONDITIONS, UNLESS IT IS CURRENTLY USED AS AN AGRICULTURAL USE. THE THICK, VEGETATIVE COVER WILL HELP MINIMIZE THERMAL IMPACTS. THE PIPELINE R.O.W. WILL BE RESTORED TO ORIGINAL GRADE, WHICH WILL PROMOTE SHEET FLOW WHERE IT CURRENTLY OCCURS, ACROSS A VEGETATED AREA, ACTING AS A FILTER STRIP.
4. SILT SOCK OR CONSTRUCTION FENCE SHALL BE INSTALLED ON BOTH SIDES OF WORKSPACE.

ALL BMP'S SHOULD BE INSPECTED AFTER EACH RUNOFF EVENT EXCEEDING 0.5" IN DEPTH AND ON A WEEKLY BASIS. ANY NECESSARY REPAIRS MUST BE MADE IMMEDIATELY TO ENSURE EFFECTIVE AND EFFICIENT OPERATION.

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

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SEAL

NO.	REVISIONS	DATE

E&SPC LAYOUT PLAN

AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

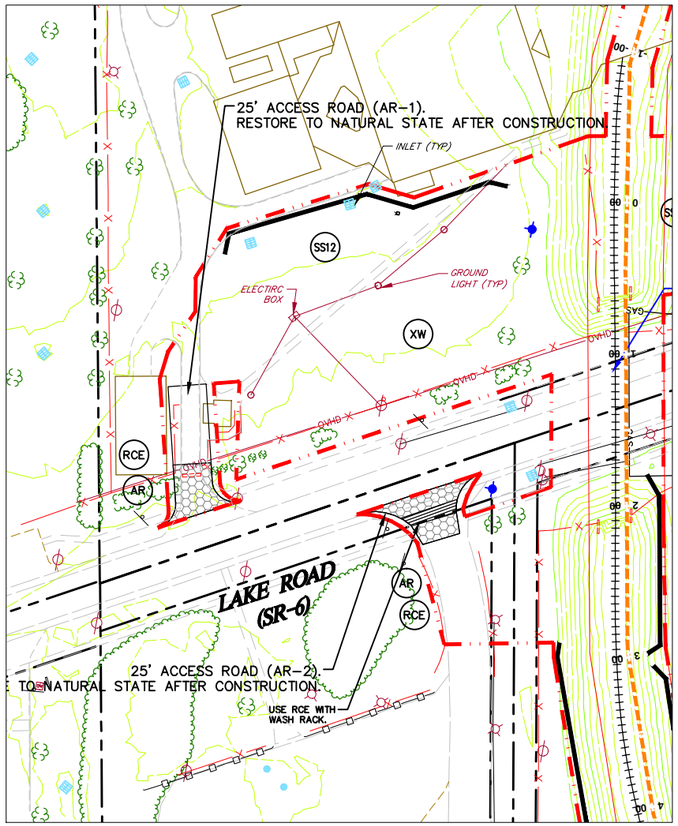
DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: 1"=100'

PROJECT NO. NRG–1007

SHEET NO. 44 OF 88

Hanover
Engineering Associates Inc
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Bartonsville, PA 18321-7822
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Fax 570.688.9768

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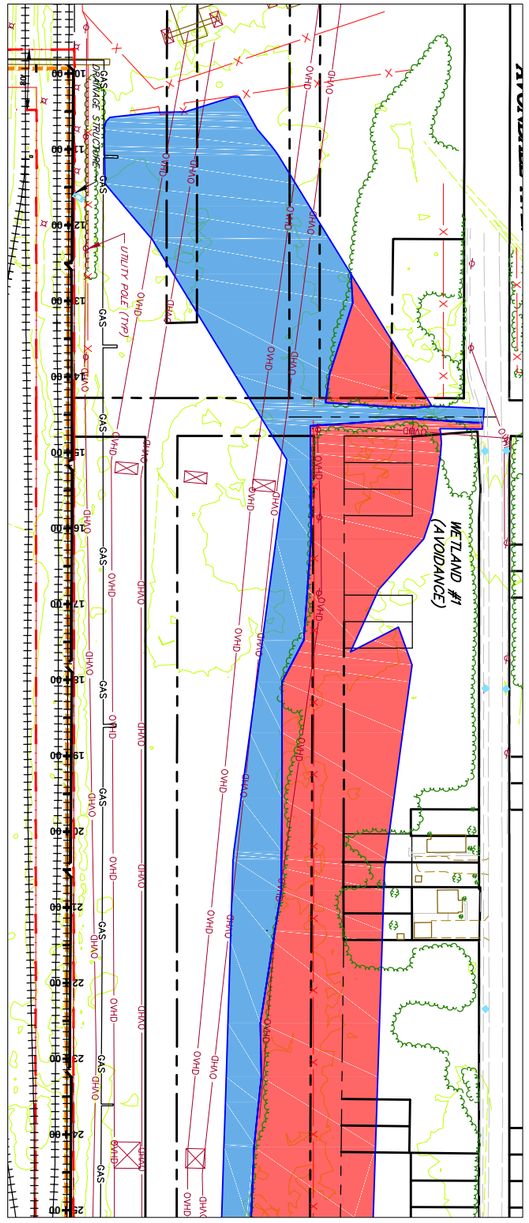


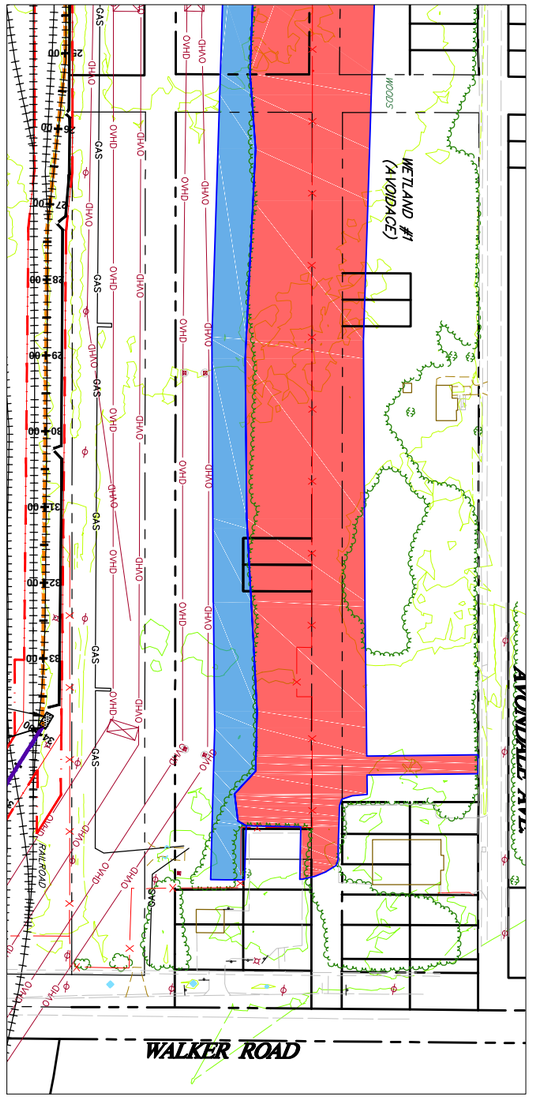
ACCESS ROAD (AR-1) TO LAKE ROAD (SR-6), ACCESS ROAD (AR-2) TO LAKE ROAD (SR-6), & LAKE ROAD (SR-6)

SCALE: 1" = 50'

NOTES:

1.. REFER TO DETAIL SHEET 5 FOR "RCE" DETAIL.
2. REFER TO DETAIL SHEET 5 FOR "AR" DETAIL.
3. REFER TO DETAIL SHEET 3 FOR "HWC" OR "HWB" DETAIL. PLACE TRENCH BREAKERS ON EITHER SIDE OF THE EXISTING ROAD.
4. SEE ODOT PERMITS FOR STATE REQUIREMENTS.
5. REFER TO DETAIL SHEET 3 FOR "TB" DETAIL.
6. REFER TO DETAIL SHEET 6 FOR INLET PROTECTION DETAIL.





WETLAND #1 (AVOIDANCE)

SCALE: 1" = 100'

LEGEND

- 398 — INDEX CONTOUR
- 400 — CONTOUR
- PROPERTY LINE
- TEMP. CONSTRUCTION EASEMENT/LIMIT OF DISTURBANCE
- PERMANENT PIPELINE R.O.W.
- CENTERLINE PIPELINE R.O.W.
- ABOVE GROUND PIPE
- CONVENTIONAL BORE
- HDD
- FENCE
- WOODS LINE — EDGE WOODS
- PEM/PSS / PFO — WETLANDS
- STONE WALL
- #0670106 — OVERHEAD/UTILITY POLE
- FLOW — PERENNIAL STREAM
- FLOW — EPHEMERAL/INTERMITTENT STREAM
- ORD. HIGH WATER MARK — ORD. HIGH WATER MARK LINE
- FLOODWAY
- LoB — SOIL TYPE & BOUNDARY
- SS12 — SILTSOXX OR EQUIV. 12" HEIGHT
- SS24 — SILTSOXX OR EQUIV. 24" HEIGHT
- SS32 — SILTSOXX OR EQUIV. 32" HEIGHT
- RCE — ROCK CONSTRUCTION ENTRANCE
- LM — LOG MAT
- MT — EROSION CONTROL MATTING
- SBR — STREAMBANK RESTORATION
- TP — TEMP. PIPE
- WB — WATERBAR
- RFB — ROCK FILTER BERM
- BR — BRIDGE
- WC — WETLAND CROSSING
- SSO — SEDIMENT SILT SOXX PROTECTION AT WATER BAR
- AR — ACCESS ROAD
- HWB — HIGHWAY BORING
- HWC — HIGHWAY CUT
- APR — ACCESS RD. X-ING (PAVED ROAD)
- ARC — ACCESS RD. w/CULVERT
- ULF / ULP — UTILITY LINE STREAM X-ING WITH DAM AND PUMPING OR WITH PIPE FLUME
- TB/P — TRENCH BREAKER/PLUG
- LDG — LONGITUDINAL DIVERSION GRADING
- XW — EXTRA WORKSPACE

LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE – 235 AC.

GENERAL NOTES:

1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
2. STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

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SEAL

NO.	REVISIONS	DATE

E&SPC SITE DETAIL

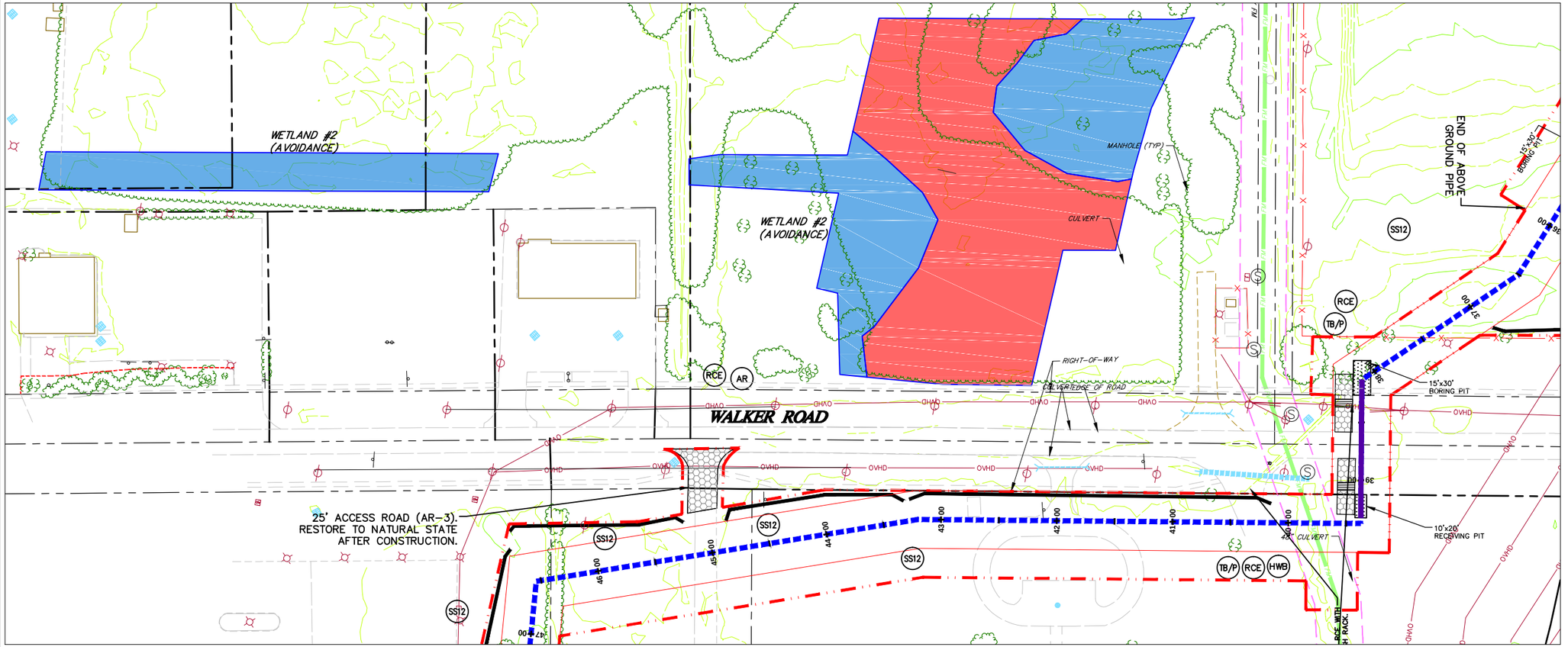
AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

DRAWN BY: AEJ	PROJECT NO. NRG–1007
CHECKED BY: SJC	
DATE: 12.15.14	SHEET NO. 45 OF 88
SCALE: AS NOTED	

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Fax 570.688.9768

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WETLAND #2(AVOIDANCE), WALKER ROAD, & ACCESS ROAD (AR-3) TO WALKER ROAD

SCALE: 1" = 50'

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. PLACE SEDIMENT BARRIER/SIGNAGE AROUND PERIMETER OF WETLAND PRIOR TO ANY EARTHWORK. IF THE CONTRACTOR IS NOT SURE WHERE THE WETLAND "LIMIT" IS, HE SHALL CONTACT THE OWNER TO HAVE THE WETLAND REMARKED.
3. REFER TO DETAIL SHEET 5 FOR "RCE" DETAIL.
4. REFER TO DETAIL SHEET 5 FOR "AR" DETAIL.
5. REFER TO DETAIL SHEET 3 FOR "HWB" DETAIL. PLACE TRENCH BREAKERS ON EITHER SIDE OF THE EXISTING ROAD.
6. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.
7. REFER TO DETAIL SHEET 6 FOR INLET PROTECTION DETAIL.

GENERAL NOTES:

1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
2. STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

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LEGEND

- 398 — INDEX CONTOUR
- 400 — CONTOUR
- PROPERTY LINE
- TEMP. CONSTRUCTION EASEMENT/LIMIT OF DISTURBANCE
- PERMANENT PIPELINE R.O.W.
- CENTERLINE PIPELINE R.O.W.
- ABOVE GROUND PIPE
- CONVENTIONAL BORE
- HDD
- FENCE
- WOODS LINE — EDGE WOODS
- PEM/PSS / PFO — WETLANDS
- STONE WALL
- #0670106 — OVERHEAD/UTILITY POLE
- FLOW — PERENNIAL STREAM
- FLOW — EPHEMERAL/INTERMITTENT STREAM
- ORD. HIGH WATER MARK — ORD. HIGH WATER MARK LINE
- FLOODWAY
- LoB — SOIL TYPE & BOUNDARY
- SS12 — SILTSOXX OR EQUIV. 12" HEIGHT
- SS24 — SILTSOXX OR EQUIV. 24" HEIGHT
- SS32 — SILTSOXX OR EQUIV. 32" HEIGHT
- RCE — ROCK CONSTRUCTION ENTRANCE
- LM — LOG MAT
- MT — EROSION CONTROL MATTING
- SBR — STREAMBANK RESTORATION
- TP — TEMP. PIPE
- WB — WATERBAR
- RFB — ROCK FILTER BERM
- BR — BRIDGE
- WC — WETLAND CROSSING
- SSO — SEDIMENT SILT SOXX PROTECTION AT WATER BAR
- AR — ACCESS ROAD
- HWB — HIGHWAY BORING
- HWC — HIGHWAY CUT
- APR — ACCESS RD. X-ING (PAVED ROAD)
- ARC — ACCESS RD. w/CULVERT
- ULF / ULP — UTILITY LINE STREAM X-ING WITH DAM AND PUMPING OR WITH PIPE FLUME
- TB/P — TRENCH BREAKER/PLUG
- LDG — LONGITUDINAL DIVERSION GRADING
- XW — EXTRA WORKSPACE

LIMIT OF CONSTRUCTION AND
LIMIT OF DISTURBANCE – 235 AC.

E&SPC SITE DETAIL

NO.	REVISIONS	DATE

AVON LAKE GAS ADDITION PROJECT

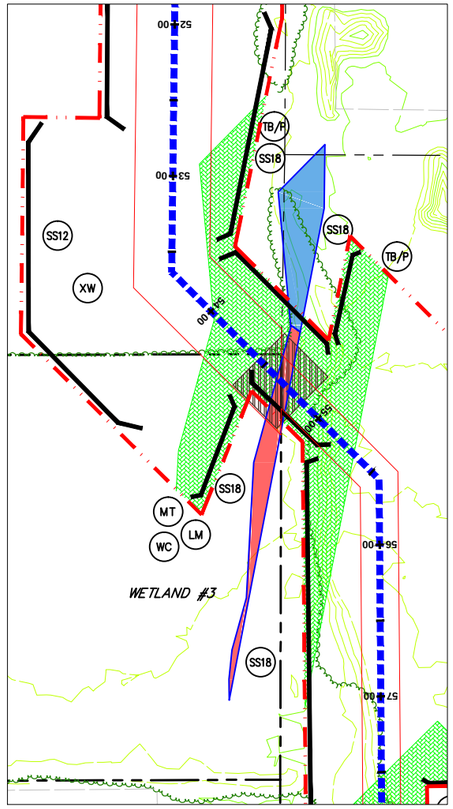
CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

DRAWN BY: AEJ	PROJECT NO. NRG-1007
CHECKED BY: SJC	
DATE: 12.15.14	SHEET NO. 46 OF 88
SCALE: AS NOTED	

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Bartonsville, PA 18321-7822
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SEAL

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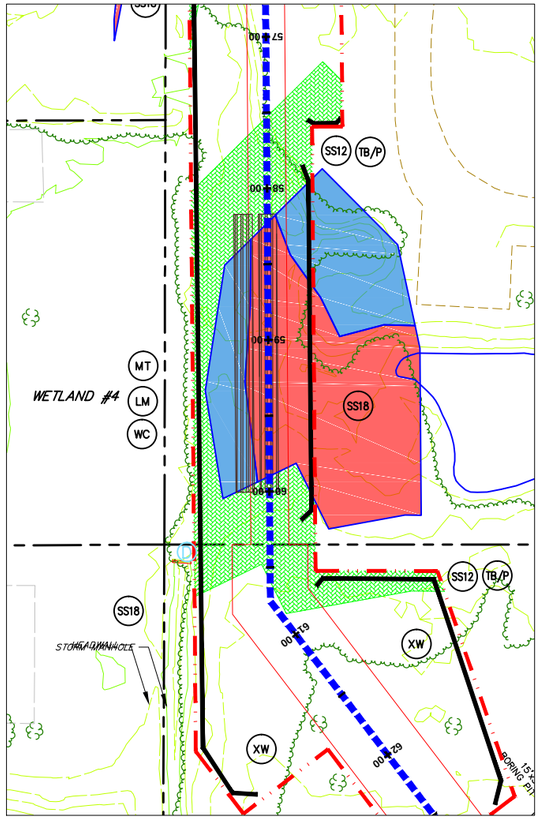


WETLAND #3

SCALE: 1" = 50'

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 3 FOR "WC" DETAIL.
3. PLACE SEDIMENT BARRIER/SIGNAGE AROUND PERIMETER OF WETLAND PRIOR TO ANY EARTHWORK. IF THE CONTRACTOR IS NOT SURE WHERE THE WETLAND "LIMIT" IS, HE SHALL CONTACT THE OWNER TO HAVE THE WETLAND REMARKED.
4. THE CONTRACTOR SHALL PLACE LOG MATS TO CROSS THE WETLAND AREA. ALL APPLICABLE WETLAND AREA WITHIN THE LIMITS OF CONSTRUCTION/DISTURBANCE SHALL BE COVERED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY FINES AND/OR REPAIRS REQUIRED AS A RESULT OF DAMAGE TO WETLANDS AND WATERCOURSES AT NO COST TO THE FACILITY OWNER.
5. REFER TO DETAIL SHEET 6 FOR "MT" DETAIL:
   a) WETLAND #3 USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "C".
6. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.



WETLAND #4

SCALE: 1" = 50'

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 3 FOR "WC" DETAIL.
3. PLACE SEDIMENT BARRIER/SIGNAGE AROUND PERIMETER OF WETLAND PRIOR TO ANY EARTHWORK. IF THE CONTRACTOR IS NOT SURE WHERE THE WETLAND "LIMIT" IS, HE SHALL CONTACT THE OWNER TO HAVE THE WETLAND REMARKED.
4. THE CONTRACTOR SHALL PLACE LOG MATS TO CROSS THE WETLAND AREA. ALL APPLICABLE WETLAND AREA WITHIN THE LIMITS OF CONSTRUCTION/DISTURBANCE SHALL BE COVERED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY FINES AND/OR REPAIRS REQUIRED AS A RESULT OF DAMAGE TO WETLANDS AND WATERCOURSES AT NO COST TO THE FACILITY OWNER.
5. REFER TO DETAIL SHEET 6 FOR "MT" DETAIL:
   a) WETLAND #4 USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "C".
6. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.

LEGEND

- INDEX CONTOUR (398)
- CONTOUR (400)
- PROPERTY LINE
- TEMP. CONSTRUCTION EASEMENT/LIMIT OF DISTURBANCE
- PERMANENT PIPELINE R.O.W.
- CENTERLINE PIPELINE R.O.W.
- ABOVE GROUND PIPE
- CONVENTIONAL BORE
- HDD
- FENCE
- EDGE WOODS (WOODS LINE)
- WETLANDS (PEM/PSS, PFO)
- STONE WALL
- OVERHEAD/UTILITY POLE (#0670106)
- PERENNIAL STREAM (FLOW)
- EPHEMERAL/INTERMITTENT STREAM (FLOW)
- ORD. HIGH WATER MARK LINE (ORD. HIGH WATER MARK)
- FLOODWAY
- SOIL TYPE & BOUNDARY (LoB)
- SS12 — SILTSOXX OR EQUIV. 12" HEIGHT
- SS24 — SILTSOXX OR EQUIV. 24" HEIGHT
- SS32 — SILTSOXX OR EQUIV. 32" HEIGHT
- RCE — ROCK CONSTRUCTION ENTRANCE
- LM — LOG MAT
- MT — EROSION CONTROL MATTING
- SBR — STREAMBANK RESTORATION
- TP — TEMP. PIPE
- WB — WATERBAR
- RFB — ROCK FILTER BERM
- BR — BRIDGE (BRIDGE)
- WC — WETLAND CROSSING
- SSO — SEDIMENT SILT SOXX PROTECTION AT WATER BAR
- AR — ACCESS ROAD
- HWB — HIGHWAY BORING
- HWC — HIGHWAY CUT
- APR — ACCESS RD. X-ING (PAVED ROAD)
- ARC — ACCESS RD. w/CULVERT
- ULF / ULP — UTILITY LINE STREAM X-ING WITH DAM AND PUMPING OR WITH PIPE FLUME
- TB/P — TRENCH BREAKER/PLUG
- LDG — LONGITUDINAL DIVERSION GRADING
- XW — EXTRA WORKSPACE

LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE – 235 AC.

GENERAL NOTES:

1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
2. STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)

1 inch = 50 ft.

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SEAL

NO.	REVISIONS	DATE

E&SPC SITE DETAIL

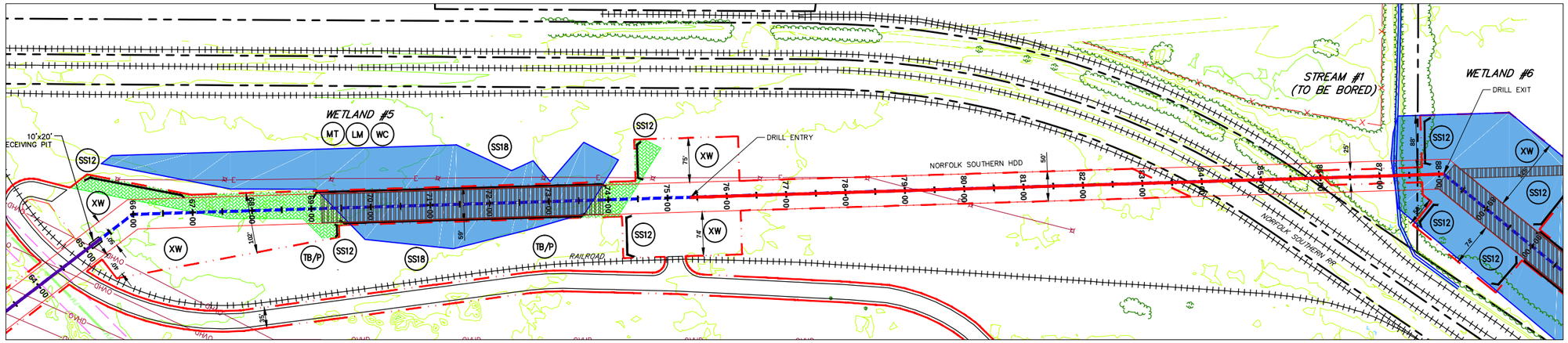
AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

DRAWN BY: AEJ	PROJECT NO. NRG–1007
CHECKED BY: SJC	
DATE: 12.15.14	SHEET NO. 47 OF 88
SCALE: AS NOTED	

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3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
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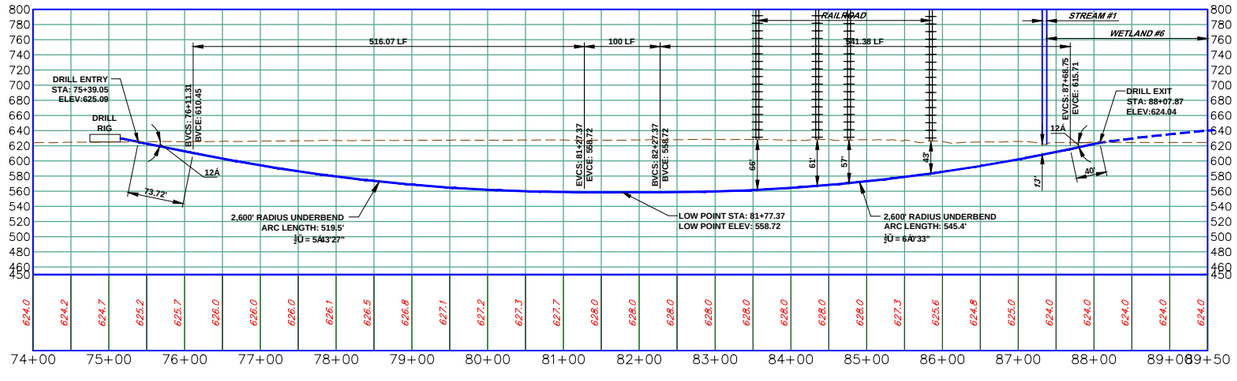


WETLAND #5 & STREAM #1 (TO BE BORED)

SCALE: 1" = 100'

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 3 FOR "WC" DETAIL.
3. PLACE SEDIMENT BARRIER/SIGNAGE AROUND PERIMETER OF WETLAND PRIOR TO ANY EARTHWORK. IF THE CONTRACTOR IS NOT SURE WHERE THE WETLAND "LIMIT" IS, HE SHALL CONTACT THE OWNER TO HAVE THE WETLAND REMARKED.
4. THE CONTRACTOR SHALL PLACE LOG MATS TO CROSS THE WETLAND AREA. ALL APPLICABLE WETLAND AREA WITHIN THE LIMITS OF CONSTRUCTION/DISTURBANCE SHALL BE COVERED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY FINES AND/OR REPAIRS REQUIRED AS A RESULT OF DAMAGE TO WETLANDS AND WATERCOURSES AT NO COST TO THE FACILITY OWNER.
5. REFER TO DETAIL SHEET 6 FOR "MT" DETAIL:
   a) WETLAND #5 USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "C".
6. REFER TO DETAIL SHEET 3 FOR "TB" DETAIL.



NORFOLK SOUTHERN HDD

LEGEND

- INDEX CONTOUR
- CONTOUR
- PROPERTY LINE
- TEMP. CONSTRUCTION EASEMENT/LIMIT OF DISTURBANCE
- PERMANENT PIPELINE R.O.W.
- CENTERLINE PIPELINE R.O.W.
- ABOVE GROUND PIPE
- CONVENTIONAL BORE
- HDD
- FENCE
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- PEM/PSS / PFO — WETLANDS
- STONE WALL
- OVERHEAD/UTILITY POLE
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LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE – 235 AC.

GENERAL NOTES:

1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
2. STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)

1 inch = 100ft.

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SEAL

NO.	REVISIONS	DATE

E&SPC SITE DETAIL

AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

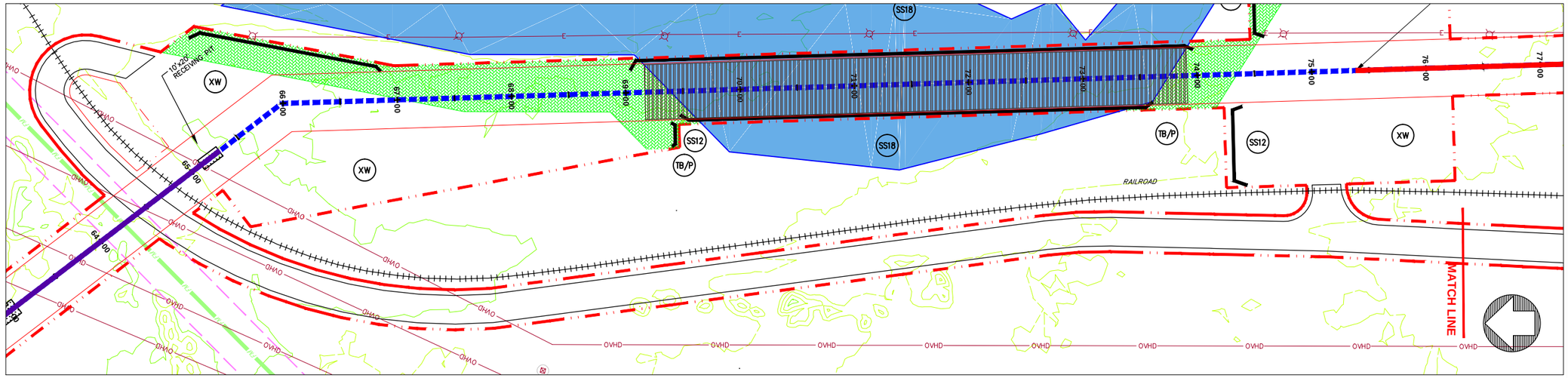
DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: AS NOTED

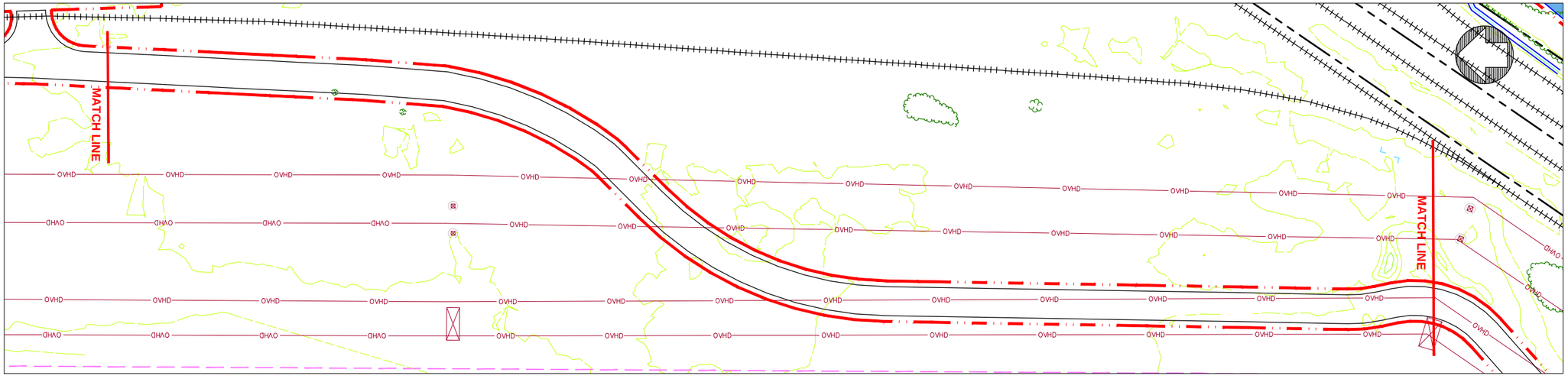
PROJECT NO. NRG-1007

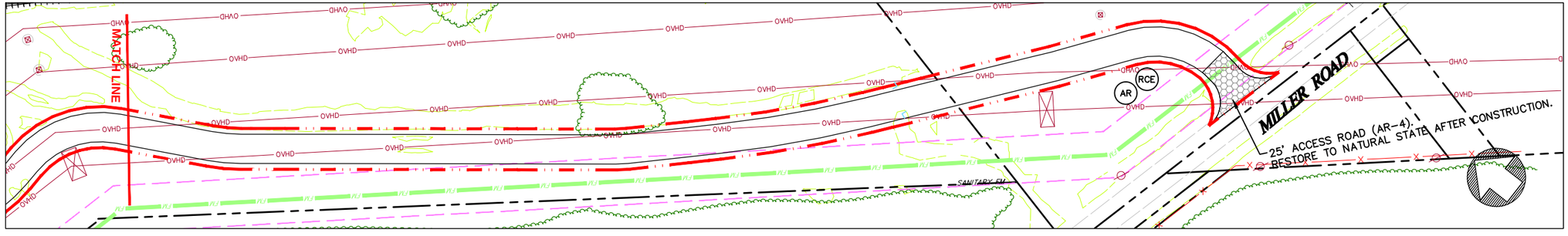
SHEET NO. 48 OF 88

Hanover Engineering Associates Inc
3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768

X:\Projects\Energy\NRG Energy\NRG-1007-Avon Lakes Pipeline\DWG\ESPC\ ESPC-NRG-1007-AVON LAKE-006-SITE DETAILS-1.dwg Dec 14,2014 - 5:41pm







ACCESS ROAD (AR-6) TO MILLER ROAD

SCALE: 1" = 50'

NOTES:

1. REFER TO DETAIL SHEET 5 FOR "RCE" OR "BRCE" DETAIL.
2. REFER TO DETAIL SHEET 5 FOR "AR" DETAIL.
3. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.

GENERAL NOTES:

1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
2. STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

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LEGEND

- 398 — INDEX CONTOUR
- 400 — CONTOUR
- PROPERTY LINE
- TEMP. CONSTRUCTION EASEMENT/LIMIT OF DISTURBANCE
- PERMANENT PIPELINE R.O.W.
- CENTERLINE PIPELINE R.O.W.
- ABOVE GROUND PIPE
- CONVENTIONAL BORE
- HDD
- FENCE
- WOODS LINE — EDGE WOODS
- PEM/PSS / PFO — WETLANDS
- STONE WALL
- #0670106 — OVERHEAD/UTILITY POLE
- FLOW — PERENNIAL STREAM
- FLOW — EPHEMERAL/INTERMITTENT STREAM
- ORD. HIGH WATER MARK — ORD. HIGH WATER MARK LINE
- FLOODWAY
- LoB — SOIL TYPE & BOUNDARY
- SS12 — SILTSOXX OR EQUIV. 12" HEIGHT
- SS24 — SILTSOXX OR EQUIV. 24" HEIGHT
- SS32 — SILTSOXX OR EQUIV. 32" HEIGHT
- RCE — ROCK CONSTRUCTION ENTRANCE
- LM — LOG MAT
- MT — EROSION CONTROL MATTING
- SBR — STREAMBANK RESTORATION
- TP — TEMP. PIPE
- WB — WATERBAR
- RFB — ROCK FILTER BERM
- BR — BRIDGE
- WC — WETLAND CROSSING
- SSO — SEDIMENT SILT SOXX PROTECTION AT WATER BAR
- AR — ACCESS ROAD
- HWB — HIGHWAY BORING
- HWC — HIGHWAY CUT
- APR — ACCESS RD. X-ING (PAVED ROAD)
- ARC — ACCESS RD. w/CULVERT
- ULF / ULP — UTILITY LINE STREAM X-ING WITH DAM AND PUMPING OR WITH PIPE FLUME
- TB/P — TRENCH BREAKER/PLUG
- LDG — LONGITUDINAL DIVERSION GRADING
- XW — EXTRA WORKSPACE

LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE – 235 AC.

E&SPC SITE DETAIL

NO.	REVISIONS	DATE

AVON LAKE GAS ADDITION PROJECT

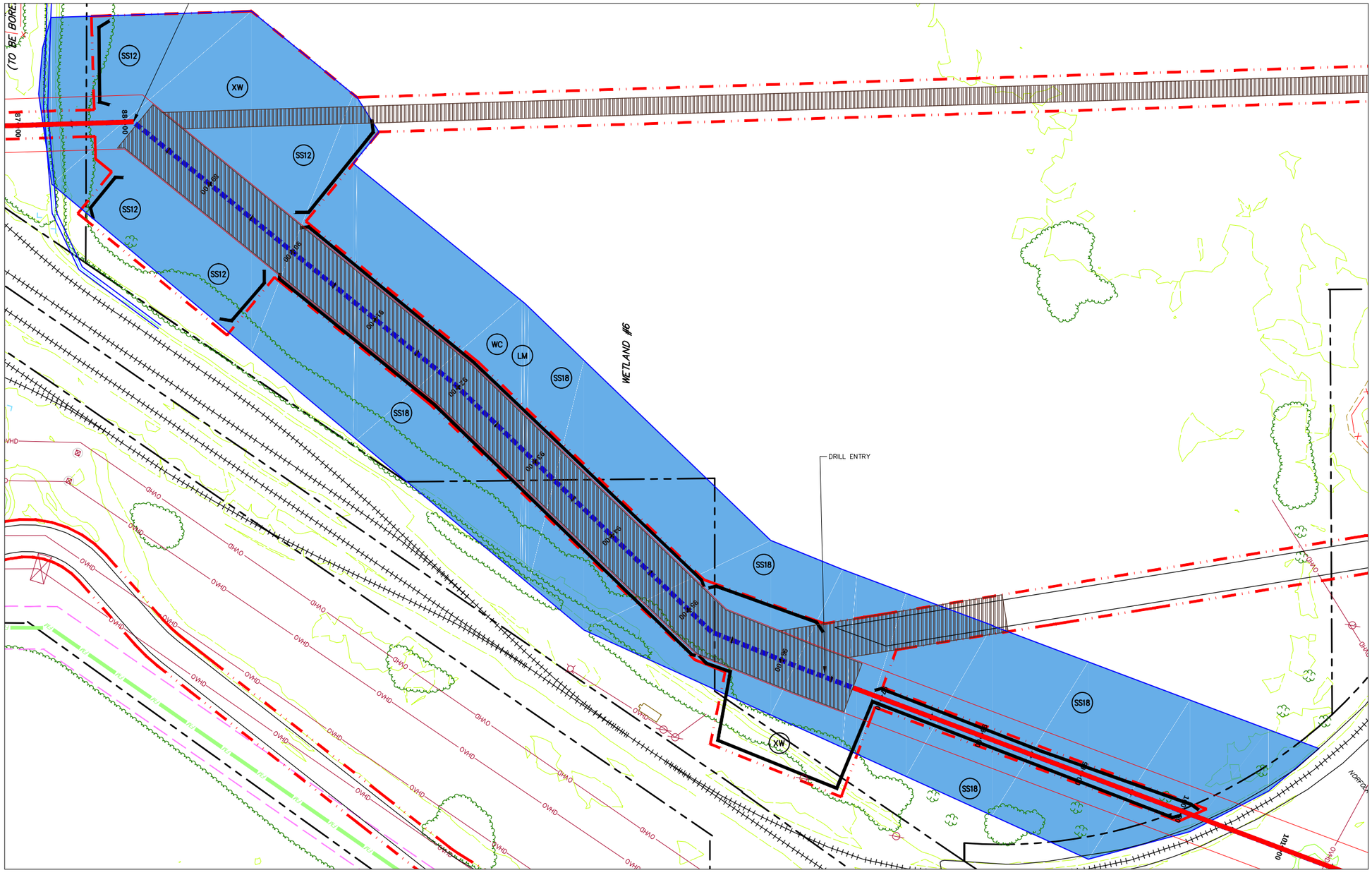
CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: AS NOTED
PROJECT NO. NRG-1007
SHEET NO. 49 OF 88

SEAL

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WETLAND #6

SCALE: 1" = 50'

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 3 FOR "WC" DETAIL.
3. PLACE SEDIMENT BARRIER/SIGNAGE AROUND PERIMETER OF WETLAND PRIOR TO ANY EARTHWORK. IF THE CONTRACTOR IS NOT SURE WHERE THE WETLAND "LIMIT" IS, HE SHALL CONTACT THE OWNER TO HAVE THE WETLAND REMARKED.
4. THE CONTRACTOR SHALL PLACE LOG MATS TO CROSS THE WETLAND AREA. ALL APPLICABLE WETLAND AREA WITHIN THE LIMITS OF CONSTRUCTION/DISTURBANCE SHALL BE COVERED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY FINES AND/OR REPAIRS REQUIRED AS A RESULT OF DAMAGE TO WETLANDS AND WATERCOURSES AT NO COST TO THE FACILITY OWNER.
5. REFER TO DETAIL SHEET 6 FOR "MT" DETAIL:
   a) WETLAND #3 USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "C".
6. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.

GENERAL NOTES:

1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
2. STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

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LEGEND

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- 400 — CONTOUR
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- ABOVE GROUND PIPE
- CONVENTIONAL BORE
- HDD
- FENCE
- WOODS LINE — EDGE WOODS
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- STONE WALL
- #0670106 — OVERHEAD/UTILITY POLE
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- LDG — LONGITUDINAL DIVERSION GRADING
- XW — EXTRA WORKSPACE

LIMIT OF CONSTRUCTION AND
LIMIT OF DISTURBANCE – 235 AC.

E&SPC SITE DETAIL

NO.	REVISIONS	DATE

SEAL

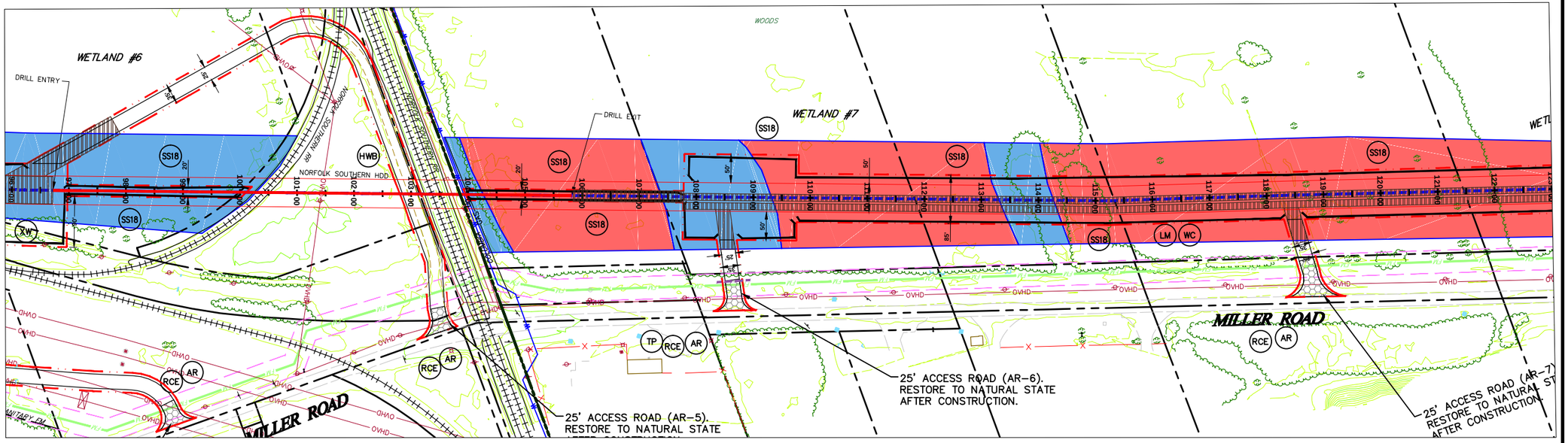
AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: AS NOTED
PROJECT NO. NRG-1007
SHEET NO. 50 OF 88

Hanover
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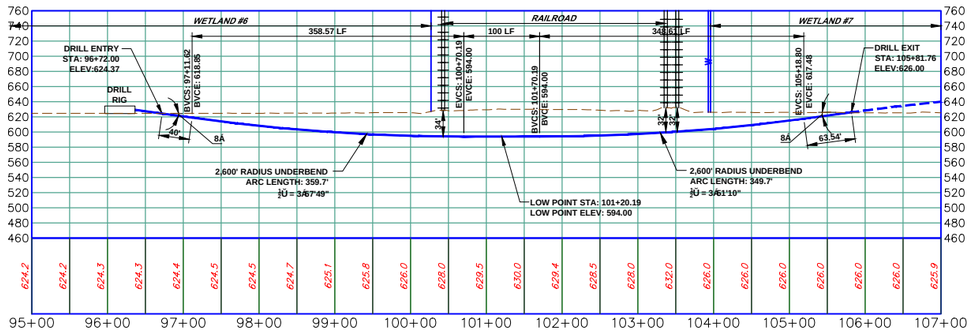


ACCESS ROAD (AR-5) TO MILLER ROAD, ACCESS ROAD (AR-6) TO MILLER ROAD, ACCESS ROAD (AR-7) TO MILLER ROAD, & WETLAND #7

SCALE: 1" = 100'

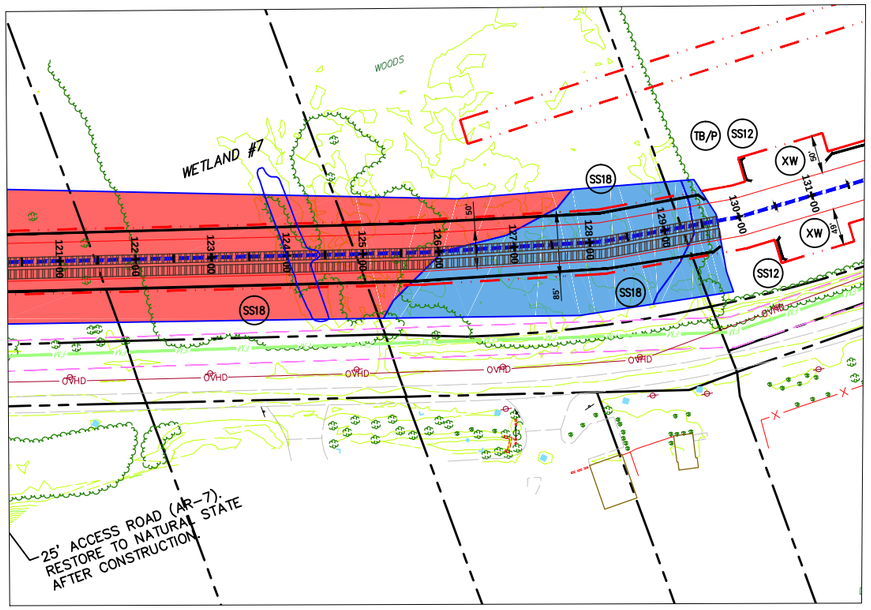
NOTES:

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2. REFER TO DETAIL SHEET 3 FOR "WB" DETAIL.
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4. REFER TO DETAIL SHEET 3 FOR "WC" DETAIL.
5. PLACE SEDIMENT BARRIER/SIGNAGE AROUND PERIMETER OF WETLAND PRIOR TO ANY EARTHWORK. IF THE CONTRACTOR IS NOT SURE WHERE THE WETLAND "LIMIT" IS, HE SHALL CONTACT THE OWNER TO HAVE THE WETLAND REMARKED.
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7. REFER TO DETAIL SHEET 6 FOR "MT" DETAIL:
   a) WETLAND #6 USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "C".
8. REFER TO DETAIL SHEET 5 FOR "RCE" DETAIL.
9. REFER TO DETAIL SHEET 5 FOR "AR" DETAIL.
10. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.



NORFOLK SOUTHERN HDD

SCALE: 1" = 100'



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- XW — EXTRA WORKSPACE

LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE – 235 AC.

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100ft.

GENERAL NOTES:

1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
2. STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.

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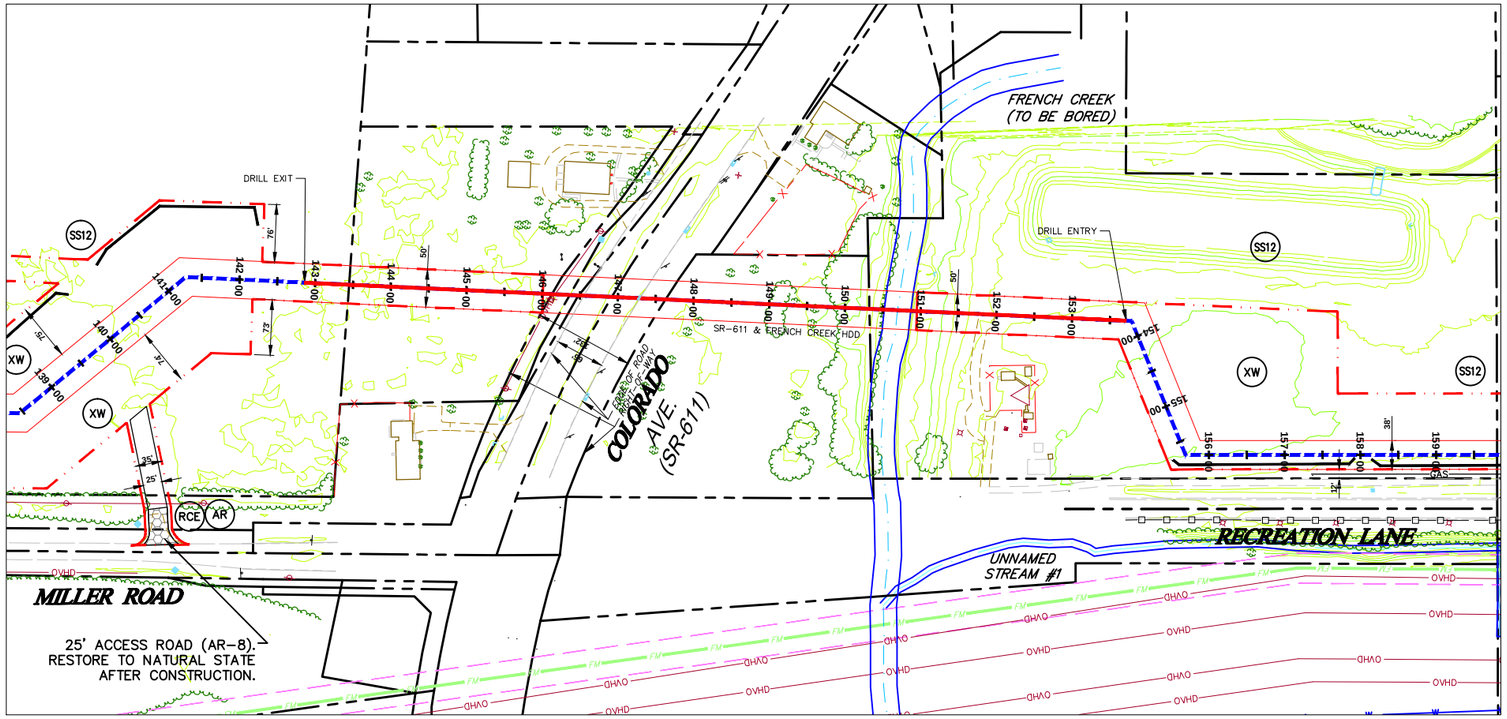
AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: AS NOTED
PROJECT NO. NRG-1007
SHEET NO. 51 OF 88

Hanover Engineering Associates Inc
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Bartonsville, PA 18321-7822
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Fax 570.688.9768

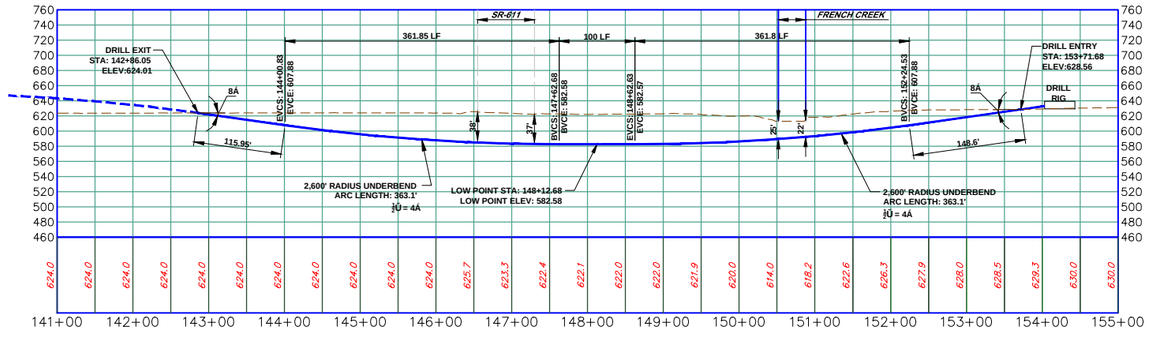
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COLORADO AVE. (SR-611) & FRENCH CREEK (TO BE BORED)

SCALE: 1" = 100'

1. REFER TO DETAIL SHEET 5 FOR "RCE" DETAIL.
2. REFER TO DETAIL SHEET 5 FOR "AR" DETAIL.
6. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.



FRENCH CREEK HDD

(ON 22x34 SHEET)
HORIZONTAL & VERTICAL

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100ft.

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LIMIT OF CONSTRUCTION AND
LIMIT OF DISTURBANCE – 235 AC.

GENERAL NOTES:

1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
2. STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.

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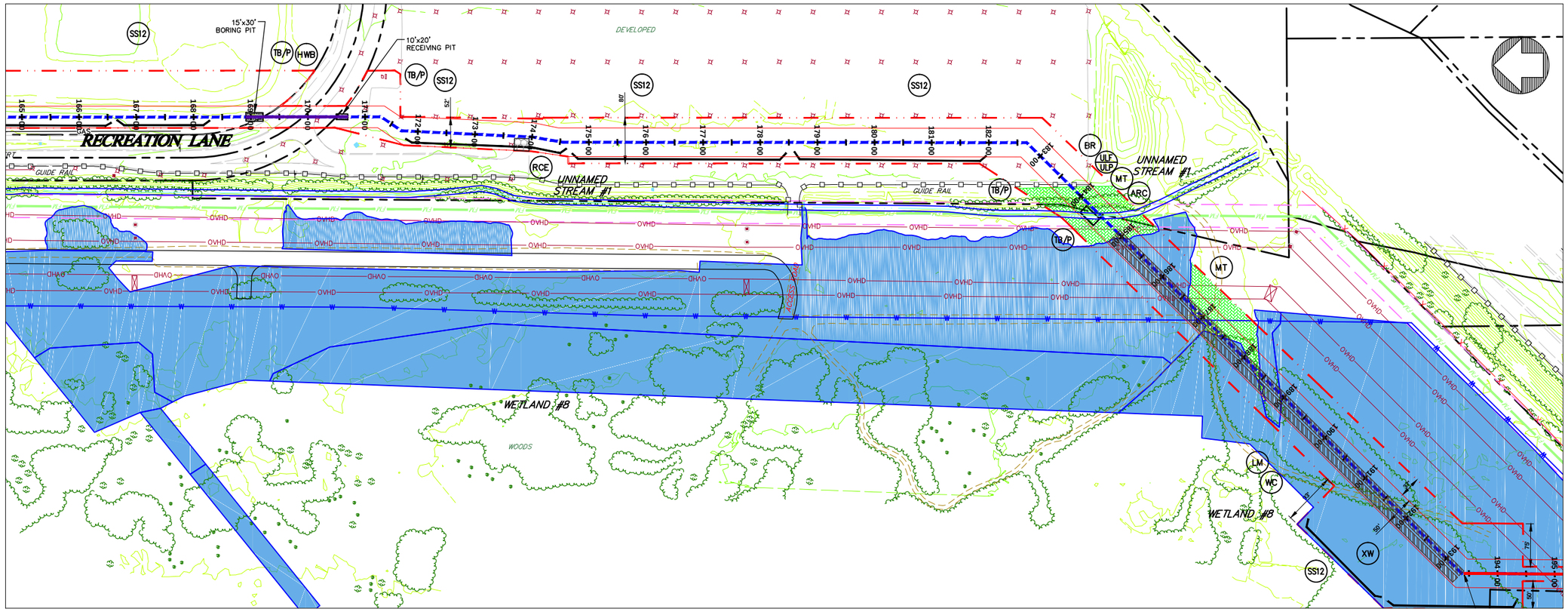
AVON LAKE GAS ADDITION PROJECT

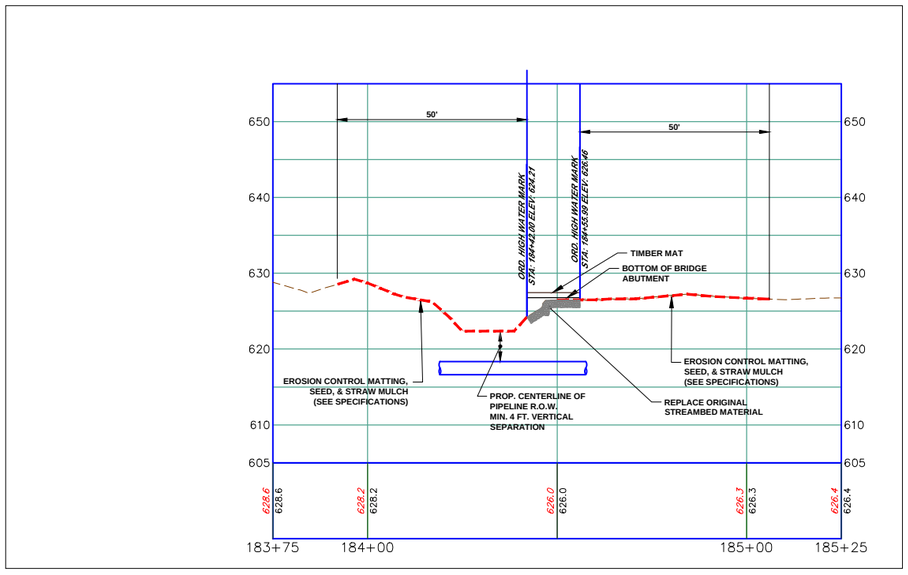
CARLISLE, EATON & LAGRANGE TOWNSHIPS
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LORAIN COUNTY
OHIO

DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: AS NOTED
PROJECT NO. NRG-1007
SHEET NO. 52 OF 88

Hanover
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Bartonsville, PA 18321-7822
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UNNAMED STREAM #1 PROFILE

(ON 22x34 SHEET)
HORIZONTAL
GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

(ON 22x34 SHEET)
VERTICAL
GRAPHIC SCALE

10 0 5 10 20 40

(IN FEET)
1 inch = 10 ft.

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100ft.

RECREATION LANE, WETLAND #8 & UNNAMED STREAM #1

SCALE: 1" = 100'

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 3 FOR "WB" DETAIL.
3. REFER TO DETAIL SHEET 3 FOR "SSO" DETAIL.
4. REFER TO DETAIL SHEET 3 FOR "WC" DETAIL.
5. PLACE SEDIMENT BARRIER/SIGNAGE AROUND PERIMETER OF WETLAND PRIOR TO ANY EARTHWORK. IF THE CONTRACTOR IS NOT SURE WHERE THE WETLAND "LIMIT" IS, HE SHALL CONTACT THE OWNER TO HAVE THE WETLAND REMARKED.
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7. REFER TO DETAIL SHEET 6 FOR "MT" DETAIL:
   a) WETLAND #8 USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "C".
   b) UNNAMED STREAM #1 USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "C".
8. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.
9. REFER TO DETAIL SHEET 6 FOR INLET PROTECTION DETAIL.

GENERAL NOTES:

1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
2. STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.

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- #0670106 — OVERHEAD/UTILITY POLE
- FLOW — PERENNIAL STREAM
- FLOW — EPHEMERAL/INTERMITTENT STREAM
- ORD. HIGH WATER MARK — ORD. HIGH WATER MARK LINE
- FLOODWAY
- LoB — SOIL TYPE & BOUNDARY
- SS12 — SILTSOXX OR EQUIV. 12" HEIGHT
- SS24 — SILTSOXX OR EQUIV. 24" HEIGHT
- SS32 — SILTSOXX OR EQUIV. 32" HEIGHT
- RCE — ROCK CONSTRUCTION ENTRANCE
- LM — LOG MAT
- MT — EROSION CONTROL MATTING
- SBR — STREAMBANK RESTORATION
- TP — TEMP. PIPE
- WB — WATERBAR
- RFB — ROCK FILTER BERM
- BR — BRIDGE
- WC — WETLAND CROSSING
- SSO — SEDIMENT SILT SOXX PROTECTION AT WATER BAR
- AR — ACCESS ROAD
- HWB — HIGHWAY BORING
- HWC — HIGHWAY CUT
- APR — ACCESS RD. X-ING (PAVED ROAD)
- ARC — ACCESS RD. w/CULVERT
- ULF / ULP — UTILITY LINE STREAM X-ING WITH DAM AND PUMPING OR WITH PIPE FLUME
- TB/P — TRENCH BREAKER/PLUG
- LDG — LONGITUDINAL DIVERSION GRADING
- XW — EXTRA WORKSPACE

LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE – 235 AC.

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SEAL

NO.	REVISIONS	DATE

E&SPC SITE DETAIL

AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

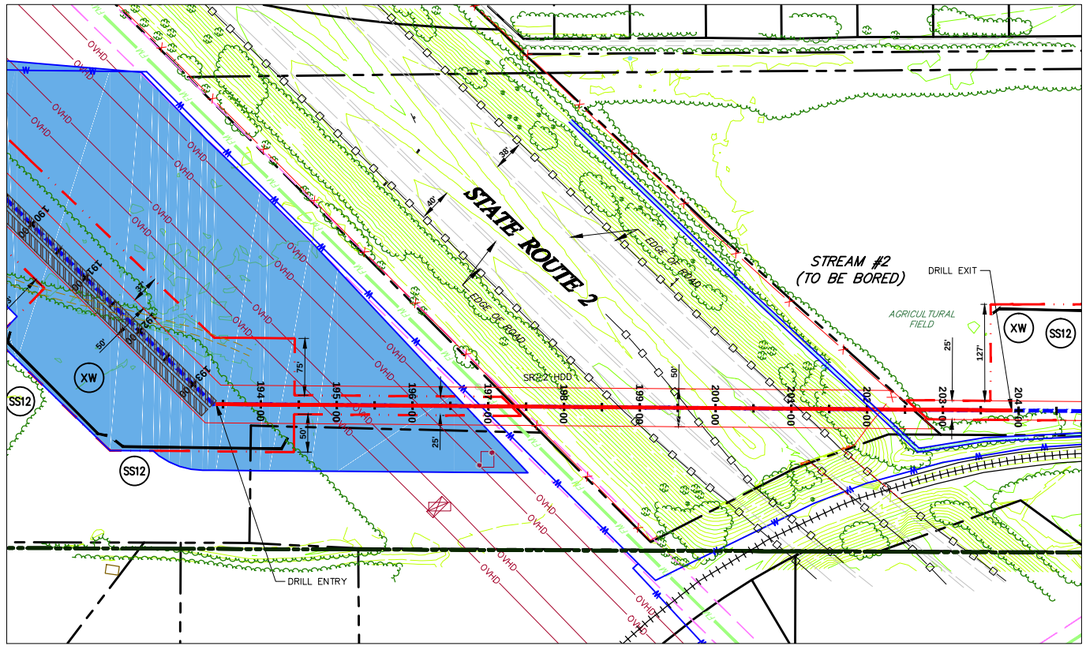
DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: AS NOTED

PROJECT NO. NRG-1007

SHEET NO. 53 OF 88

Hanover Engineering Associates Inc
3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768

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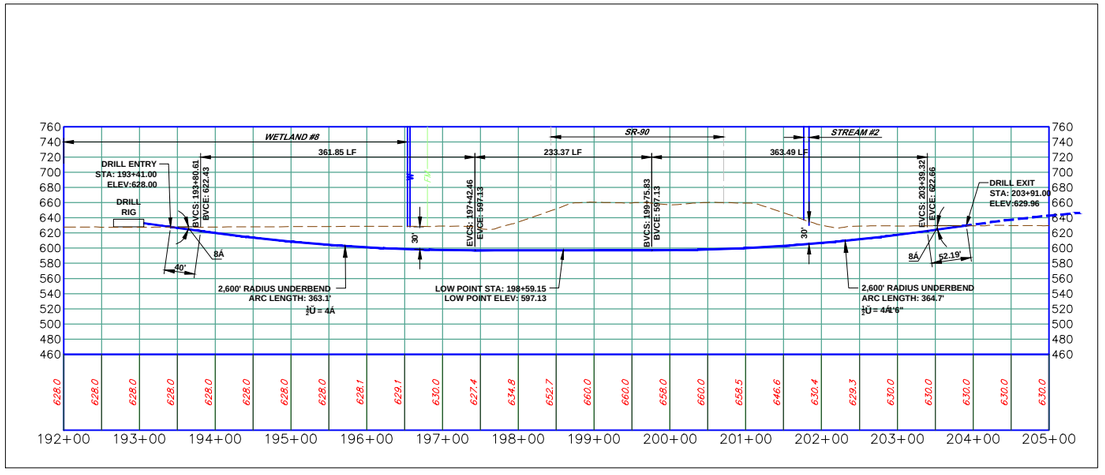


STATE ROUTE 2 & STREAM #2 (TO BE BORED)

SCALE: 1" = 100'

NOTES:

1. PLACE SEDIMENT BARRIER/SIGNAGE AROUND PERIMETER OF WETLAND PRIOR TO ANY EARTHWORK. IF THE CONTRACTOR IS NOT SURE WHERE THE WETLAND "LIMIT" IS, HE SHALL CONTACT THE OWNER TO HAVE THE WETLAND REMARKED.
2. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.



STATE ROUTE 2 HDD

SCALE: 1" = 100'

LEGEND

- INDEX CONTOUR
- CONTOUR
- PROPERTY LINE
- TEMP. CONSTRUCTION EASEMENT/LIMIT OF DISTURBANCE
- PERMANENT PIPELINE R.O.W.
- CENTERLINE PIPELINE R.O.W.
- ABOVE GROUND PIPE
- CONVENTIONAL BORE
- HDD
- FENCE
- EDGE WOODS
- PEM/PSS / PFO — WETLANDS
- STONE WALL
- OVERHEAD/UTILITY POLE
- PERENNIAL STREAM
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- ORD. HIGH WATER MARK LINE
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- LoB — SOIL TYPE & BOUNDARY
- SS12 — SILTSOXX OR EQUIV. 12" HEIGHT
- SS24 — SILTSOXX OR EQUIV. 24" HEIGHT
- SS32 — SILTSOXX OR EQUIV. 32" HEIGHT
- RCE — ROCK CONSTRUCTION ENTRANCE
- LM — LOG MAT
- MT — EROSION CONTROL MATTING
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- TB/P — TRENCH BREAKER/PLUG
- LDG — LONGITUDINAL DIVERSION GRADING
- XW — EXTRA WORKSPACE

LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE – 235 AC.

GENERAL NOTES:

1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
2. STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100ft.

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SEAL

NO.	REVISIONS	DATE

E&SPC SITE DETAIL

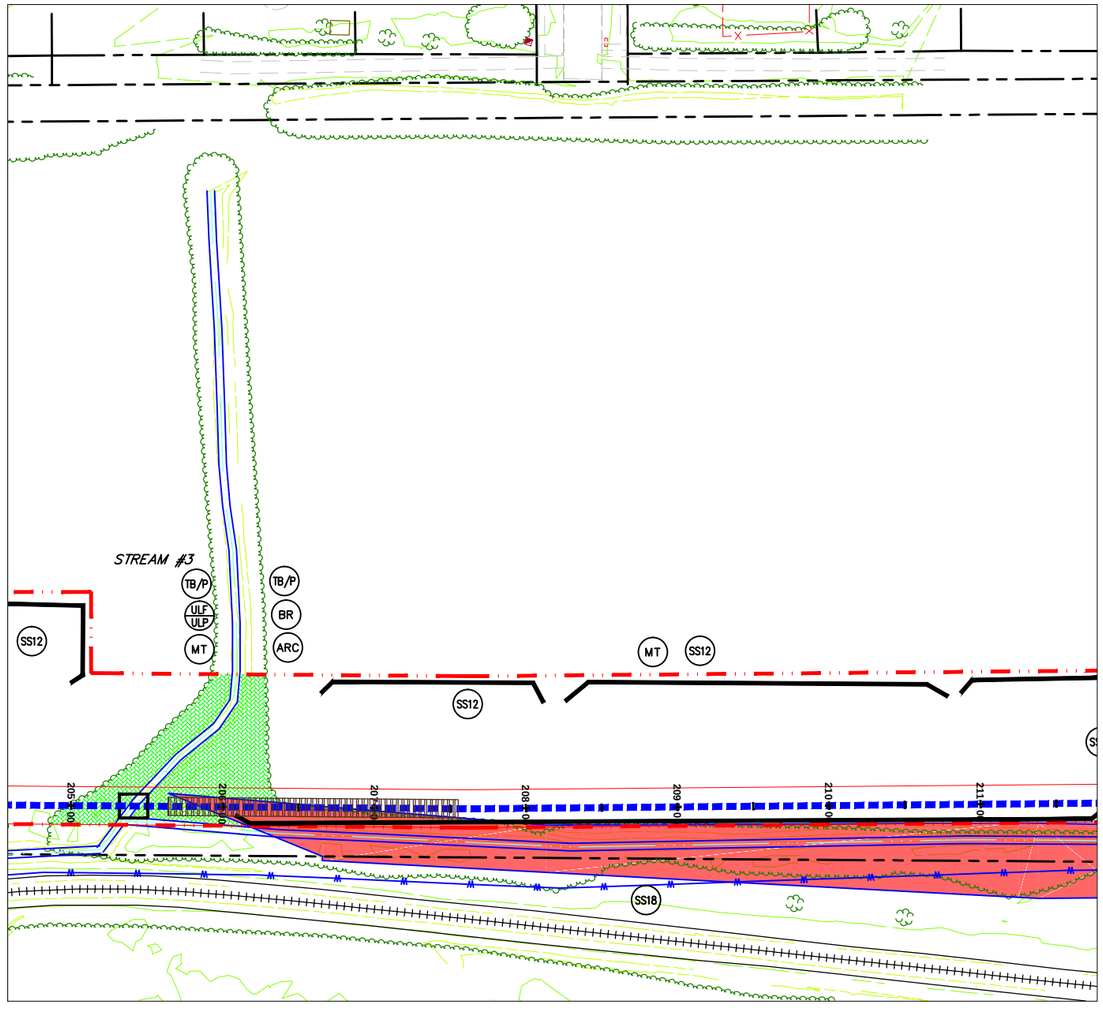
AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: AS NOTED
PROJECT NO. NRG-1007
SHEET NO. 54 OF 88

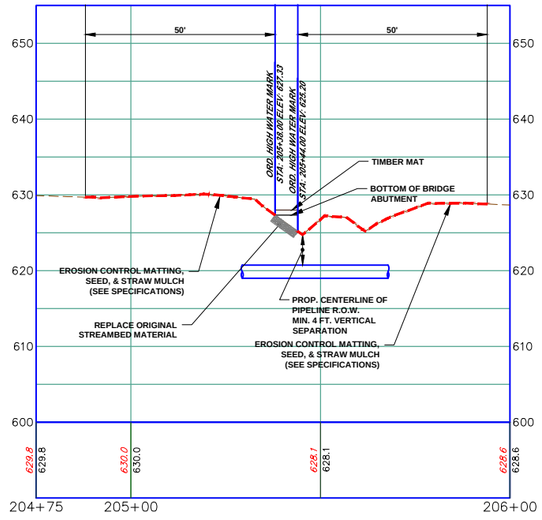
Hanover Engineering Associates Inc
3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768

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STREAM #3 & WETLAND #9

SCALE: 1" = 50'



STREAM #3 PROFILE

(ON 22x34 SHEET)
HORIZONTAL
GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

(ON 22x34 SHEET)
VERTICAL
GRAPHIC SCALE

10 0 5 10 20 40

(IN FEET)
1 inch = 10 ft.

LEGEND

- 398 — INDEX CONTOUR
- 400 — CONTOUR
- PROPERTY LINE
- TEMP. CONSTRUCTION EASEMENT/LIMIT OF DISTURBANCE
- PERMANENT PIPELINE R.O.W.
- CENTERLINE PIPELINE R.O.W.
- ABOVE GROUND PIPE
- CONVENTIONAL BORE
- HDD
- FENCE
- WOODS LINE — EDGE WOODS
- PEM/PSS / PFO — WETLANDS
- STONE WALL
- #0670106 — OVERHEAD/UTILITY POLE
- FLOW — PERENNIAL STREAM
- FLOW — EPHEMERAL/INTERMITTENT STREAM
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- FLOODWAY
- LoB — SOIL TYPE & BOUNDARY
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- SS24 — SILTSOXX OR EQUIV. 24" HEIGHT
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- XW — EXTRA WORKSPACE

LIMIT OF CONSTRUCTION AND
LIMIT OF DISTURBANCE – 235 AC.

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. PLACE SEDIMENT BARRIER/SIGNAGE AROUND PERIMETER OF WETLAND PRIOR TO ANY EARTHWORK. IF THE CONTRACTOR IS NOT SURE WHERE THE WETLAND "LIMIT" IS, HE SHALL CONTACT THE OWNER TO HAVE THE WETLAND REMARKED.
3. REFER TO DETAIL SHEET 6 FOR "MT" DETAIL:
   a) WETLAND #9 USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "C".
   b) STREAM #3 USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "B".
4. REFER TO DETAIL SHEET 4 FOR "ULF" OR ULP" DETAIL. UTILIZE FOR STREAM CROSSINGS.
5. ALTHOUGH A BRIDGE IS SHOWL A TEMPORARY CULVERT CROSSING MAY BE INSTALLED. REFER TO DETAIL SHEET 1 FOR "BR" DETAIL AND FOR THE SPECIFIED SIZE AND NUMBER OF CULVERTS.
6. REFER TO DETAIL SHEET 4 FOR "ARC" DETAIL.
7. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.

GENERAL NOTES:

1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
2. STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

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SEAL

NO.	REVISIONS	DATE

E&SPC SITE DETAIL

AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

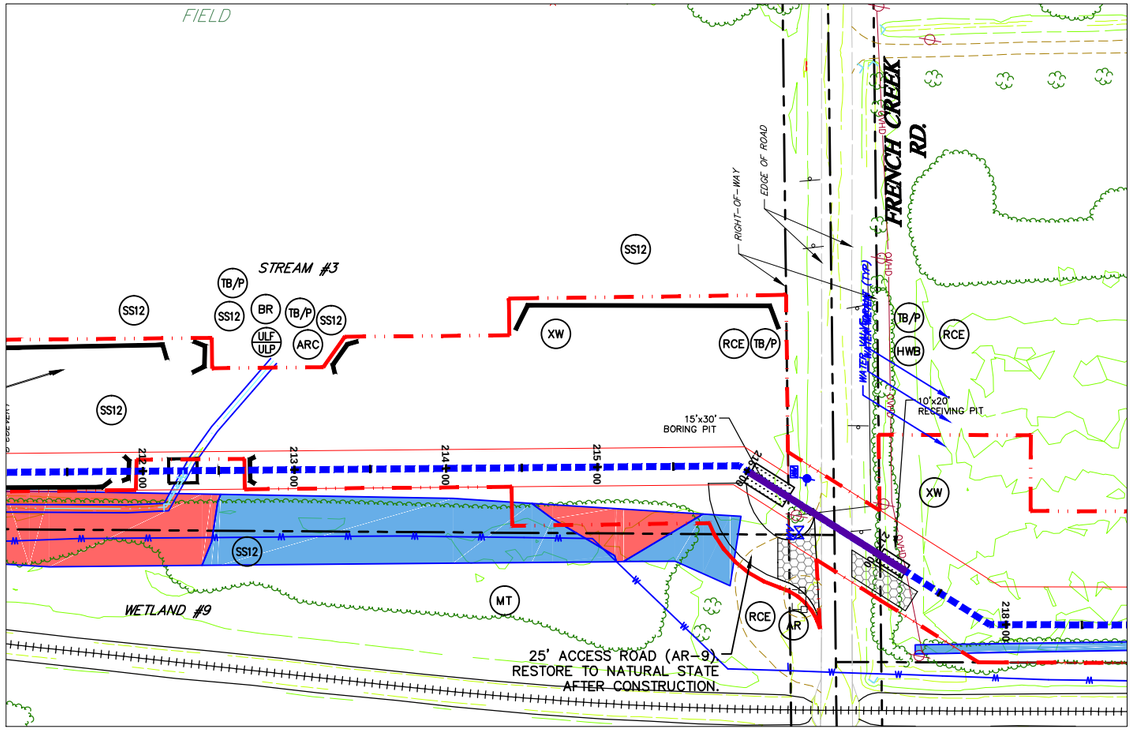
DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: AS NOTED

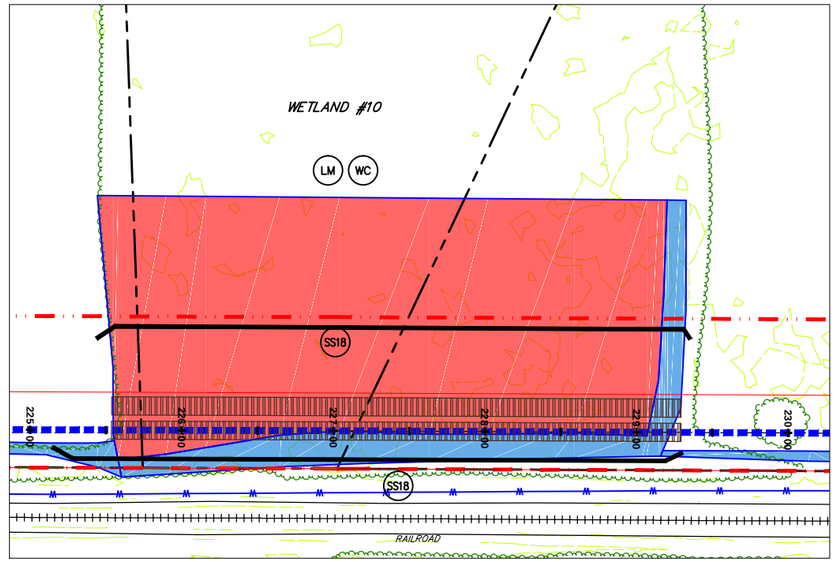
PROJECT NO. NRG-1007

SHEET NO. 55 OF 88

Hanover
Engineering Associates Inc
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Bartonsville, PA 18321-7822
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Fax 570.688.9768

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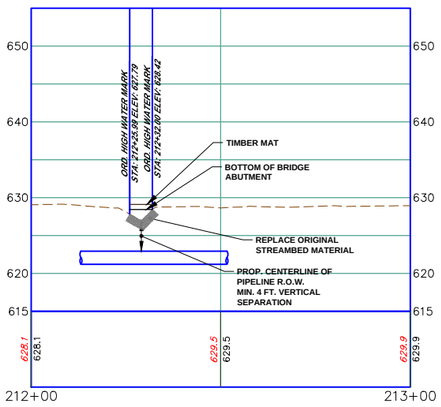


STREAM #3, WETLAND #9, ACCESS ROAD (AR-9) TO FRENCH CREEK RD., FRENCH CREEK RD. & WETLAND #10

SCALE: 1" = 50'

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. PLACE SEDIMENT BARRIER/SIGNAGE AROUND PERIMETER OF WETLAND PRIOR TO ANY EARTHWORK. IF THE CONTRACTOR IS NOT SURE WHERE THE WETLAND "LIMIT" IS, HE SHALL CONTACT THE OWNER TO HAVE THE WETLAND REMARKED.
3. REFER TO DETAIL SHEET 6 FOR "MT" DETAIL:
   a) WETLAND #9 & WETLAND #10 USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "C".
   b) STREAM #3 USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "B".
4. REFER TO DETAIL SHEET 4 FOR "ULF" OR ULP" DETAIL. UTILIZE FOR STREAM CROSSINGS.
5. ALTHOUGH A BRIDGE IS SHOW, A TEMPORARY CULVERT CROSSING MAY BE INSTALLED. REFER TO DETAIL SHEET 1 FOR "BR" DETAIL AND FOR THE SPECIFIED SIZE AND NUMBER OF CULVERTS.
6. REFER TO DETAIL SHEET 4 FOR "ARC" DETAIL.
7. REFER TO DETAIL SHEET 5 FOR "RCE" OR DETAIL.
8. REFER TO DETAIL SHEET 3 FOR OR "HWB" DETAIL. PLACE TRENCH BREAKERS ON EITHER SIDE OF THE EXISTING ROAD.
9. REFER TO DETAIL SHEET 3 FOR "STONE/DIRT TWP ROAD CROSSING DETAIL" OR "PAVED TWP ROAD CROSSING" FOR TRENCH BACKFILL AND ROAD SURFACE RESTORATION.
10. REFER TO DETAIL SHEET 3 FOR "WC" DETAIL.
11. REFER TO DETAIL SHEET 3 FOR "TB" DETAIL.
12. REFER TO DETAIL SHEET 6 FOR INLET PROTECTION DETAIL.



STREAM #3 PROFILE

(ON 22x34 SHEET)
HORIZONTAL
GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

(ON 22x34 SHEET)
VERTICAL
GRAPHIC SCALE

10 0 5 10 20 40

(IN FEET)
1 inch = 10 ft.

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

LEGEND

- 398 — INDEX CONTOUR
- 400 — CONTOUR
- PROPERTY LINE
- TEMP. CONSTRUCTION EASEMENT/LIMIT OF DISTURBANCE
- PERMANENT PIPELINE R.O.W.
- CENTERLINE PIPELINE R.O.W.
- ABOVE GROUND PIPE
- CONVENTIONAL BORE
- HDD
- FENCE
- WOODS LINE — EDGE WOODS
- PEM/PSS PFO — WETLANDS
- STONE WALL
- #0670106 — OVERHEAD/UTILITY POLE
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- FLOODWAY
- LoB — SOIL TYPE & BOUNDARY
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- ARC — ACCESS RD. w/CULVERT
- ULF ULP — UTILITY LINE STREAM X-ING WITH DAM AND PUMPING OR WITH PIPE FLUME
- TB/P — TRENCH BREAKER/PLUG
- LDG — LONGITUDINAL DIVERSION GRADING
- XW — EXTRA WORKSPACE

LIMIT OF CONSTRUCTION AND
LIMIT OF DISTURBANCE – 235 AC.

GENERAL NOTES:

1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
2. STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.

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SEAL

NO.	REVISIONS	DATE

E&SPC SITE DETAIL

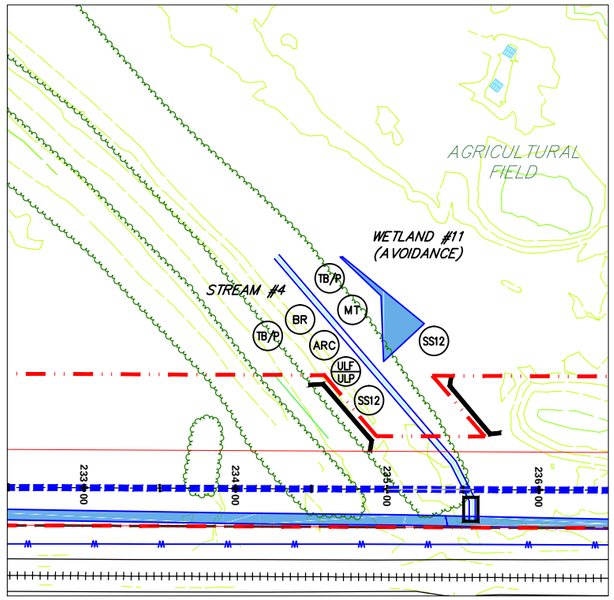
AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

DRAWN BY: AEJ	PROJECT NO. NRG–1007
CHECKED BY: SJC	
DATE: 12.15.14	SHEET NO. 56 OF 88
SCALE: AS NOTED	

Hanover
Engineering Associates Inc
3355 Route 611, Suite 1
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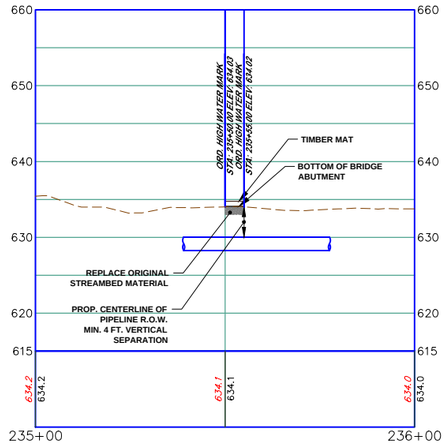


STREAM #4, WETLAND #11 (AVOIDANCE), & WETLAND #12

SCALE: 1" = 50'

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. PLACE SEDIMENT BARRIER/SIGNAGE AROUND PERIMETER OF WETLAND PRIOR TO ANY EARTHWORK. IF THE CONTRACTOR IS NOT SURE WHERE THE WETLAND "LIMIT" IS, HE SHALL CONTACT THE OWNER TO HAVE THE WETLAND REMARKED.
3. REFER TO DETAIL SHEET 6 FOR "MT" DETAIL:
   a) WETLAND #12 USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "C".
   b) STREAM #4 USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "B".
4. REFER TO DETAIL SHEET 4 FOR "ULF" OR ULP" DETAIL. UTILIZE FOR STREAM CROSSINGS.
5. ALTHOUGH A BRIDGE IS SHOW, A TEMPORARY CULVERT CROSSING MAY BE INSTALLED. REFER TO DETAIL SHEET 1 FOR "BR" DETAIL AND FOR THE SPECIFIED SIZE AND NUMBER OF CULVERTS.
6. REFER TO DETAIL SHEET 4 FOR "ARC" DETAIL.
7. REFER TO DETAIL SHEET 5 FOR "RCE" OR DETAIL.
8. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.



STREAM #4 PROFILE

(ON 22x34 SHEET)
HORIZONTAL
GRAPHIC SCALE

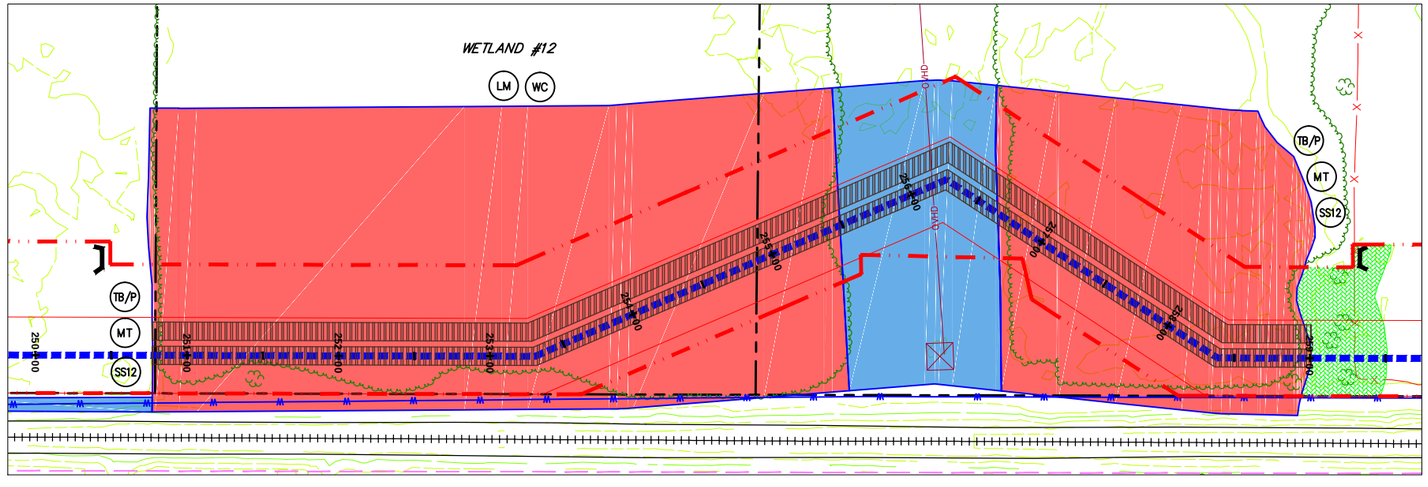
20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

(ON 22x34 SHEET)
VERTICAL
GRAPHIC SCALE

10 0 5 10 20 40

(IN FEET)
1 inch = 10 ft.



GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

GENERAL NOTES:

1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
2. STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.

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LEGEND

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- 400 — CONTOUR
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- TEMP. CONSTRUCTION EASEMENT/LIMIT OF DISTURBANCE
- PERMANENT PIPELINE R.O.W.
- CENTERLINE PIPELINE R.O.W.
- ABOVE GROUND PIPE
- CONVENTIONAL BORE
- HDD
- FENCE
- WOODS LINE — EDGE WOODS
- PEM/PSS / PFO — WETLANDS
- STONE WALL
- #0670106 — OVERHEAD/UTILITY POLE
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- FLOW — EPHEMERAL/INTERMITTENT STREAM
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LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE – 235 AC.

E&SPC SITE DETAIL

NO.	REVISIONS	DATE

SEAL

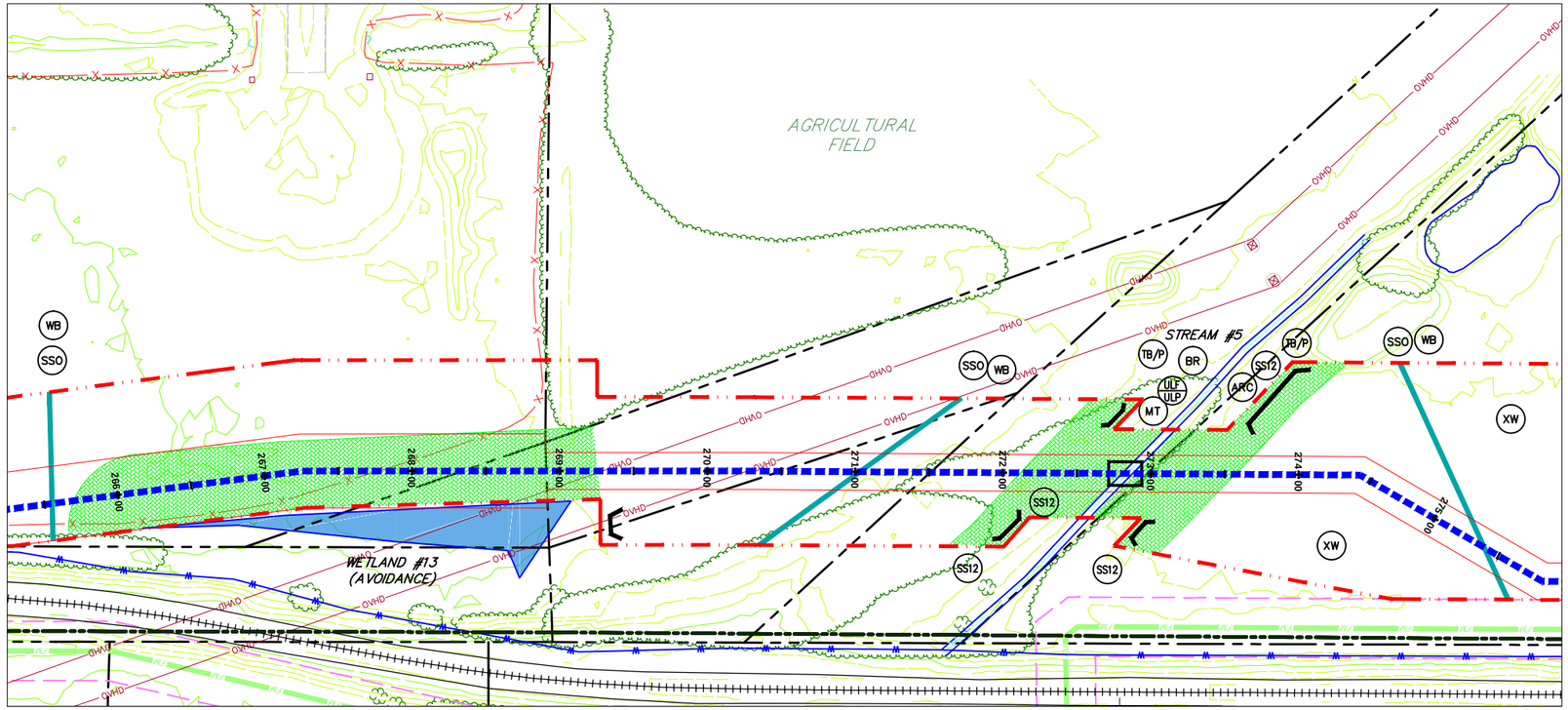
AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

DRAWN BY: AEJ	PROJECT NO. NRG–1007
CHECKED BY: SJC	
DATE: 12.15.14	SHEET NO. 57 OF 88
SCALE: AS NOTED	

Hanover Engineering Associates Inc
3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768

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WETLAND #13 (AVOIDANCE)& STREAM #5

SCALE: 1" = 100'

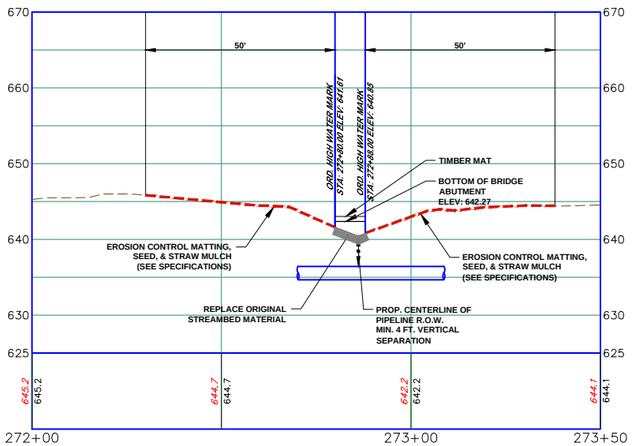
NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 3 FOR "WC" DETAIL.
3. PLACE SEDIMENT BARRIER/SIGNAGE AROUND PERIMETER OF WETLAND PRIOR TO ANY EARTHWORK. IF THE CONTRACTOR IS NOT SURE WHERE THE WETLAND "LIMIT" IS, HE SHALL CONTACT THE OWNER TO HAVE THE WETLAND REMARKED.
4. THE CONTRACTOR SHALL PLACE LOG MATS TO CROSS THE WETLAND AREA. ALL APPLICABLE WETLAND AREA WITHIN THE LIMITS OF CONSTRUCTION/DISTURBANCE SHALL BE COVERED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY FINES AND/OR REPAIRS REQUIRED AS A RESULT OF DAMAGE TO WETLANDS AND WATERCOURSES AT NO COST TO THE FACILITY OWNER.
5. REFER TO DETAIL SHEET 6 FOR "MT" DETAIL:
   a) WETLAND #13 USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "C".
   b) STREAM #5 USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "B".
6. REFER TO DETAIL SHEET 4 FOR "ULF" OR ULP" DETAIL. UTILIZE FOR STREAM CROSSINGS.
7. ALTHOUGH A BRIDGE IS SHOW, A TEMPORARY CULVERT CROSSING MAY BE INSTALLED. REFER TO DETAIL SHEET 1 FOR "BR" DETAIL AND FOR THE SPECIFIED SIZE AND NUMBER OF CULVERTS.
8. REFER TO DETAIL SHEET 4 FOR "ARC" DETAIL.
9. REFER TO DETAIL SHEET 5 FOR "RCE" OR DETAIL.
10. REFER TO DETAIL SHEET 5 FOR "AR" DETAIL.
11. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.

LEGEND

- 398 — INDEX CONTOUR
- 400 — CONTOUR
- PROPERTY LINE
- TEMP. CONSTRUCTION EASEMENT/LIMIT OF DISTURBANCE
- PERMANENT PIPELINE R.O.W.
- CENTERLINE PIPELINE R.O.W.
- ABOVE GROUND PIPE
- CONVENTIONAL BORE
- HDD
- X — FENCE
- WOODS LINE — EDGE WOODS
- PEM/PSS / PFO — WETLANDS
- STONE WALL
- #0670106 — OVERHEAD/UTILITY POLE
- FLOW — PERENNIAL STREAM
- FLOW — EPHEMERAL/INTERMITTENT STREAM
- ORD. HIGH WATER MARK — ORD. HIGH WATER MARK LINE
- FLOODWAY
- LoB — SOIL TYPE & BOUNDARY
- SS12 — SILTSOXX OR EQUIV. 12" HEIGHT
- SS24 — SILTSOXX OR EQUIV. 24" HEIGHT
- SS32 — SILTSOXX OR EQUIV. 32" HEIGHT
- RCE — ROCK CONSTRUCTION ENTRANCE
- LM — LOG MAT
- MT — EROSION CONTROL MATTING
- SBR — STREAMBANK RESTORATION
- TP — TEMP. PIPE
- WB — WATERBAR
- RFB — ROCK FILTER BERM
- BR — BRIDGE
- WC — WETLAND CROSSING
- SSO — SEDIMENT SILT SOXX PROTECTION AT WATER BAR
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- HWB — HIGHWAY BORING
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- TB/P — TRENCH BREAKER/PLUG
- LDG — LONGITUDINAL DIVERSION GRADING
- XW — EXTRA WORKSPACE

LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE – 235 AC.



STREAM #5 PROFILE

(ON 22x34 SHEET)
HORIZONTAL
GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

(ON 22x34 SHEET)
VERTICAL
GRAPHIC SCALE

10 0 5 10 20 40

(IN FEET)
1 inch = 10 ft.

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

GENERAL NOTES:

1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
2. STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.

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SEAL

NO.	REVISIONS	DATE

E&SPC SITE DETAIL

AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
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LORAIN COUNTY
OHIO

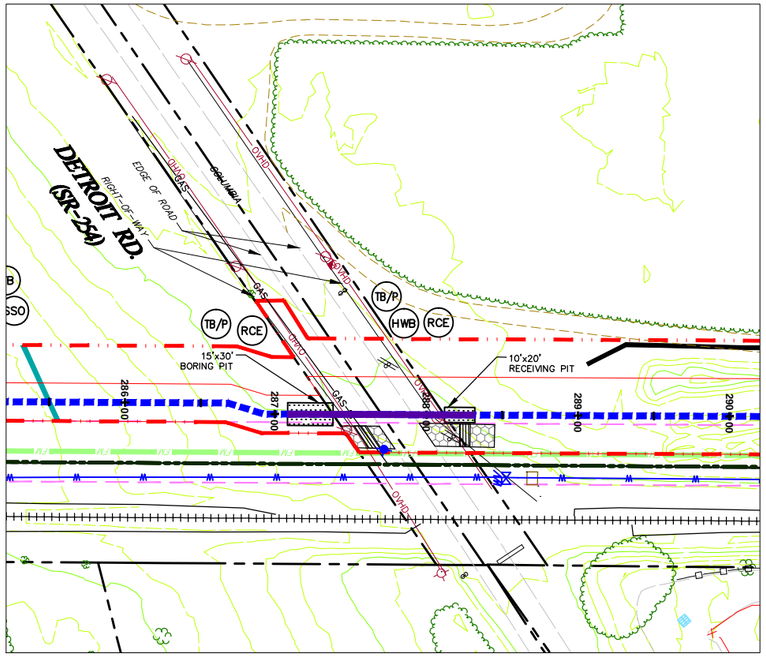
DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: AS NOTED

PROJECT NO. NRG-1007

SHEET NO. 58 OF 88

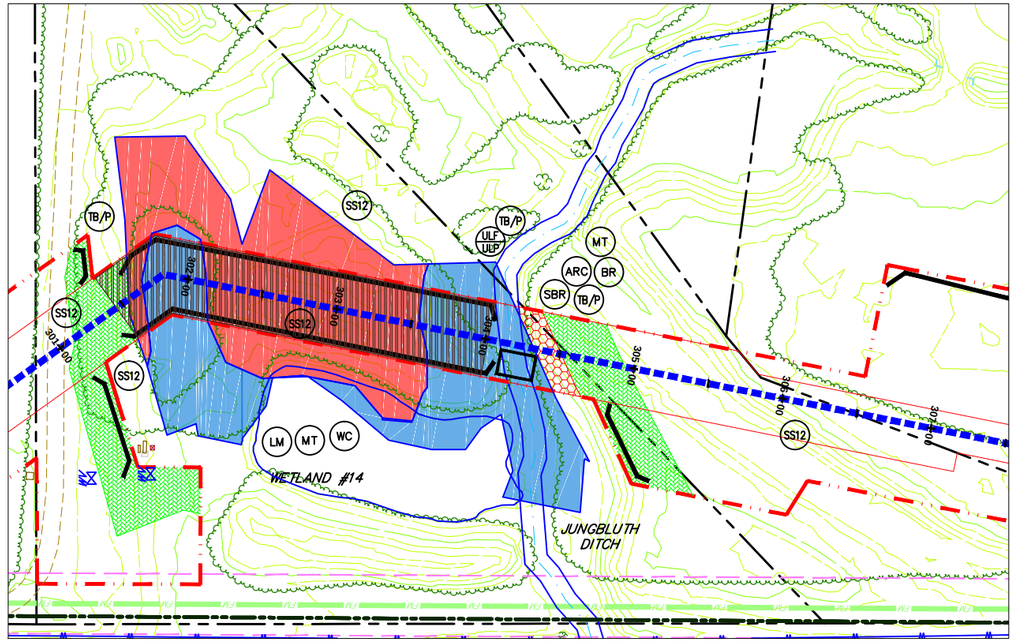
Hanover
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DETROIT RD. (SR-254)

SCALE: 1" = 50'



WETLAND #14, & JUNGBLUTH DITCH

SCALE: 1" = 50'

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 3 FOR "WB" DETAIL.
3. REFER TO DETAIL SHEET 3 FOR "SSO" DETAIL.
4. REFER TO DETAIL SHEET 3 FOR "WC" DETAIL.
5. PLACE SEDIMENT BARRIER/SIGNAGE AROUND PERIMETER OF WETLAND PRIOR TO ANY EARTHWORK. IF THE CONTRACTOR IS NOT SURE WHERE THE WETLAND "LIMIT" IS, HE SHALL CONTACT THE OWNER TO HAVE THE WETLAND REMARKED.
6. THE CONTRACTOR SHALL PLACE LOG MATS TO CROSS THE WETLAND AREA. ALL APPLICABLE WETLAND AREA WITHIN THE LIMITS OF CONSTRUCTION/DISTURBANCE SHALL BE COVERED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY FINES AND/OR REPAIRS REQUIRED AS A RESULT OF DAMAGE TO WETLANDS AND WATERCOURSES AT NO COST TO THE FACILITY OWNER.
7. REFER TO DETAIL SHEET 6 FOR "MT" DETAIL:
   a) WETLAND #14 USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "C".
   b) JUNGBLUTH DITCH USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "B".
8. REFER TO DETAIL SHEET 4 FOR "ULF" OR ULP" DETAIL. UTILIZE FOR STREAM CROSSINGS.
9. ALTHOUGH A BRIDGE IS SHOW, A TEMPORARY CULVERT CROSSING MAY BE INSTALLED. REFER TO DETAIL SHEET 1 FOR "BR" DETAIL AND FOR THE SPECIFIED SIZE AND NUMBER OF CULVERTS.
10. REFER TO DETAIL SHEET 4 FOR "ARC" DETAIL.
11. REFER TO DETAIL SHEET 2 FOR STREAMBANK RESTORATION SPECIFICATIONS.
12. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.
13. REFER TO DETAIL SHEET 6 FOR INLET PROTECTION DETAIL.

LEGEND

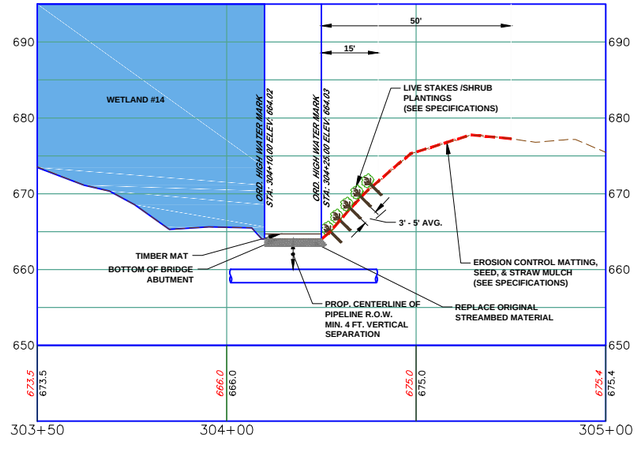
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- XW — EXTRA WORKSPACE

LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE – 235 AC.

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 3 FOR "WB" DETAIL.
3. REFER TO DETAIL SHEET 3 FOR "SSO" DETAIL.
4. REFER TO DETAIL SHEET 5 FOR "RCE" OR DETAIL.
5. REFER TO DETAIL SHEET 3 FOR OR "HWB" DETAIL. PLACE TRENCH BREAKERS ON EITHER SIDE OF THE EXISTING ROAD.
6. REFER TO DETAIL SHEET 3 FOR "STONE/DIRT TWP ROAD CROSSING DETAIL" OR "PAVED TWP ROAD CROSSING" FOR TRENCH BACKFILL AND ROAD SURFACE RESTORATION.
7. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.
8. REFER TO DETAIL SHEET 6 FOR INLET PROTECTION DETAIL.

JUNGBLUTH DITCH PROFILE



(ON 22x34 SHEET)
HORIZONTAL
GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

(ON 22x34 SHEET)
VERTICAL
GRAPHIC SCALE

10 0 5 10 20 40

(IN FEET)
1 inch = 10 ft.

GENERAL NOTES:

1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
2. STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

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E&SPC SITE DETAIL

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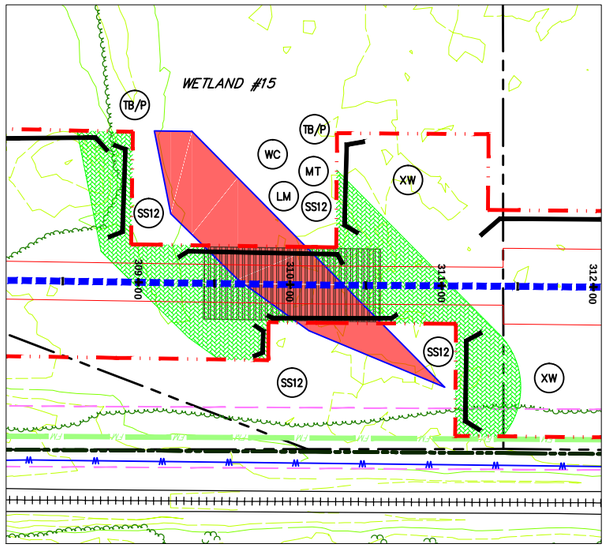
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PROJECT NO. NRG-1007

SHEET NO. 59 OF 88

Hanover
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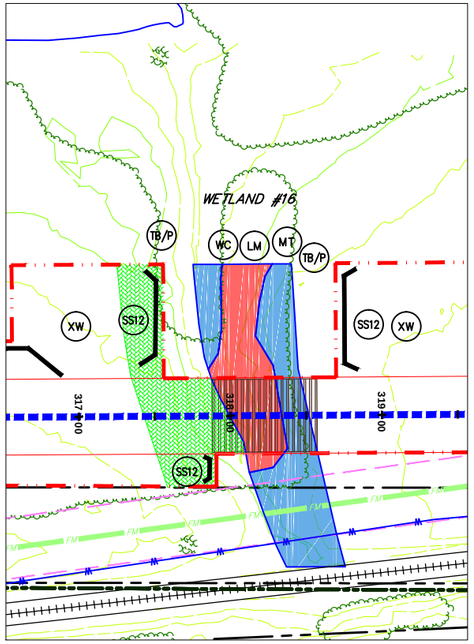


WETLAND #15

SCALE: 1" = 50'

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 3 FOR "WC" DETAIL.
3. PLACE SEDIMENT BARRIER/SIGNAGE AROUND PERIMETER OF WETLAND PRIOR TO ANY EARTHWORK. IF THE CONTRACTOR IS NOT SURE WHERE THE WETLAND "LIMIT" IS, HE SHALL CONTACT THE OWNER TO HAVE THE WETLAND REMARKED.
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5. REFER TO DETAIL SHEET 6 FOR "MT" DETAIL:
   a) WETLAND #15 USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "C".
6. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.

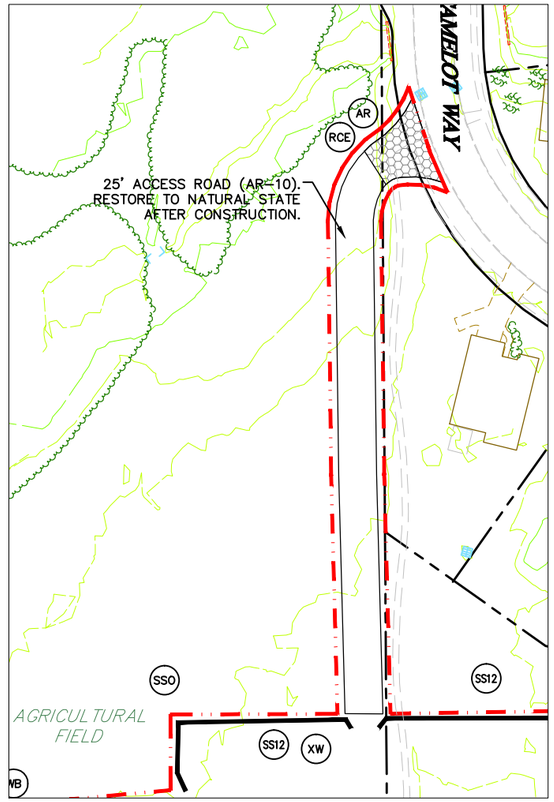


WETLAND #16.

SCALE: 1" = 50'

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 3 FOR "WC" DETAIL.
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7. REFER TO DETAIL SHEET 6 FOR "MT" DETAIL:
   a) WETLAND #16 USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "C".
8. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.



ACCESS ROAD (AR-10) TO CAMELOT WAY

SCALE: 1" = 50'

NOTES:

1. REFER TO DETAIL SHEET 5 FOR "RCE" OR DETAIL.
2. REFER TO DETAIL SHEET 5 FOR "AR" DETAIL.
3. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.

LEGEND

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- 400 — CONTOUR
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- XW — EXTRA WORKSPACE

LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE – 235 AC.

GENERAL NOTES:

1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
2. STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

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E&SPC SITE DETAIL

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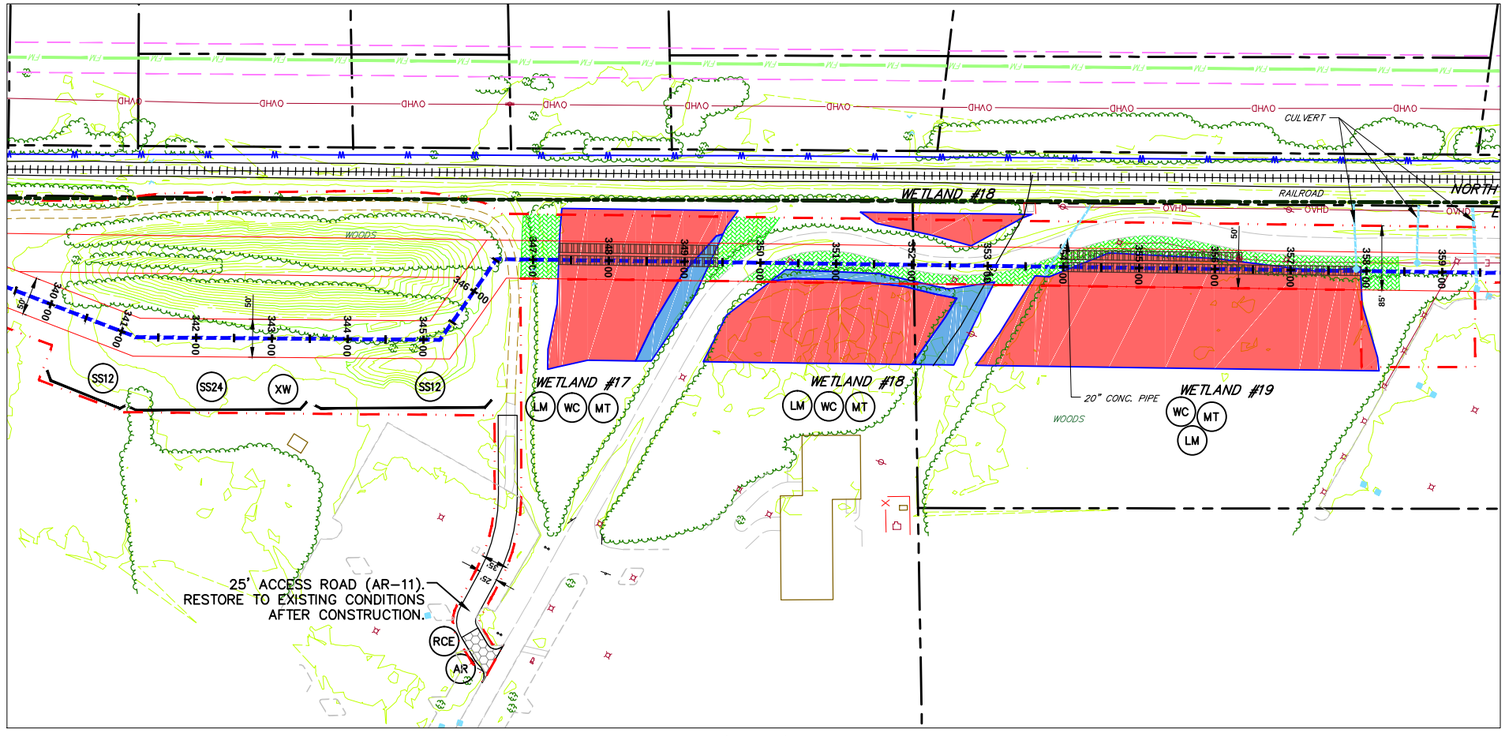
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SHEET NO. 60 OF 88

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ACCESS ROAD (AR-11), WETLAND #17, WETLAND #18, & WETLAND #19

SCALE: 1" = 100'

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 3 FOR "WC" DETAIL.
3. PLACE SEDIMENT BARRIER/SIGNAGE AROUND PERIMETER OF WETLAND PRIOR TO ANY EARTHWORK. IF THE CONTRACTOR IS NOT SURE WHERE THE WETLAND "LIMIT" IS, HE SHALL CONTACT THE OWNER TO HAVE THE WETLAND REMARKED.
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5. REFER TO DETAIL SHEET 6 FOR "MT" DETAIL:
   a) WETLAND #17, #18 & #19 USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "C".
6. REFER TO DETAIL SHEET 5 FOR "RCE" DETAIL.
7. REFER TO DETAIL SHEET 5 FOR "AR" DETAIL.
8. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.
9. REFER TO DETAIL SHEET 6 FOR INLET PROTECTION DETAIL.

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GENERAL NOTES:

1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
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GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

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SEAL

NO.	REVISIONS	DATE

E&SPC SITE DETAIL

AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

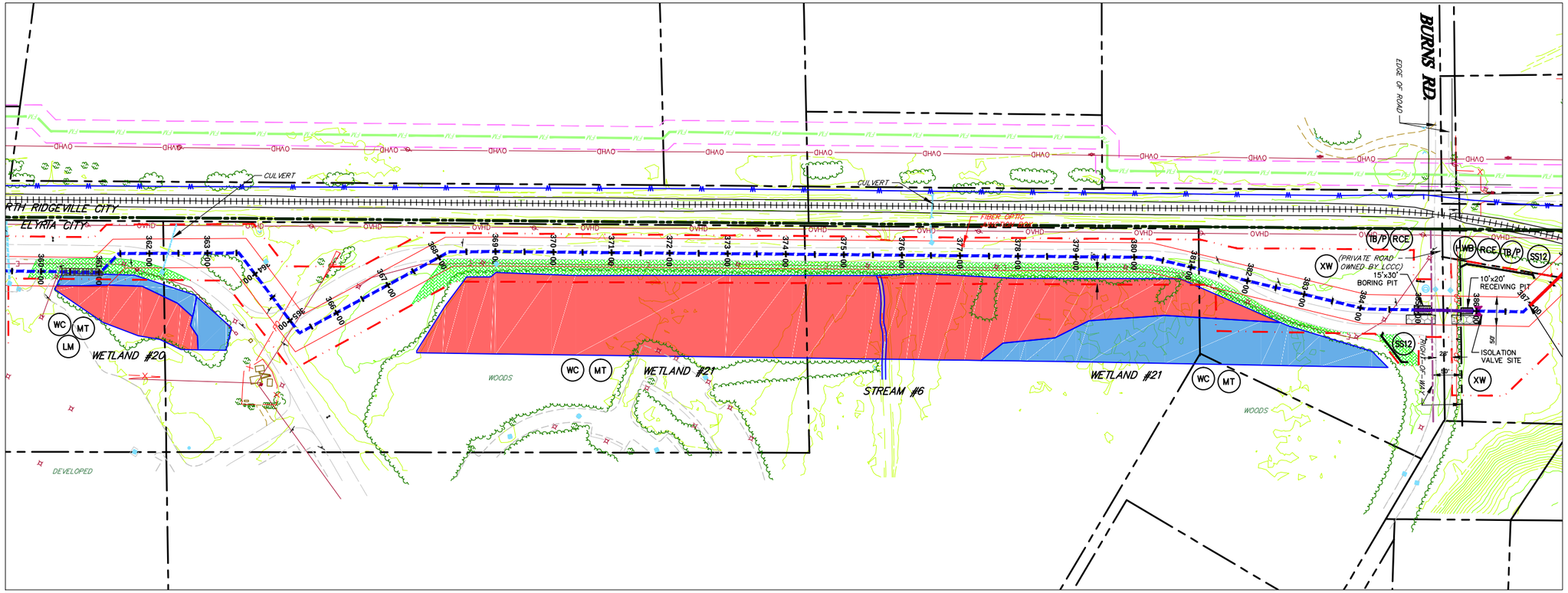
DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: AS NOTED

PROJECT NO. NRG-1007

SHEET NO. 61 OF 88

Hanover
Engineering Associates Inc
3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768

Y:\Projects\Energy\NRG Energy\NRG-1007-Avon Lakes Pipeline\DWG\ESPC\ ESPC-NRG-1007-AVON LAKE-006-SITE DETAILS-1.dwg Dec 14,2014 - 6:12pm



WETLAND #20, WETLAND #21, STREAM #6, & BURNS RD.

SCALE: 1" = 100'

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 3 FOR "WC" DETAIL.
3. PLACE SEDIMENT BARRIER/SIGNAGE AROUND PERIMETER OF WETLAND PRIOR TO ANY EARTHWORK. IF THE CONTRACTOR IS NOT SURE WHERE THE WETLAND "LIMIT" IS, HE SHALL CONTACT THE OWNER TO HAVE THE WETLAND REMARKED.
4. THE CONTRACTOR SHALL PLACE LOG MATS TO CROSS THE WETLAND AREA. ALL APPLICABLE WETLAND AREA WITHIN THE LIMITS OF CONSTRUCTION/DISTURBANCE SHALL BE COVERED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY FINES AND/OR REPAIRS REQUIRED AS A RESULT OF DAMAGE TO WETLANDS AND WATERCOURSES AT NO COST TO THE FACILITY OWNER.
5. REFER TO DETAIL SHEET 6 FOR "MT" DETAIL:
   a) WETLAND #20 & #21 USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "C".
6. REFER TO DETAIL SHEET 5 FOR "RCE" DETAIL.
7. REFER TO DETAIL SHEET 3 FOR "HWB" DETAIL. PLACE TRENCH BREAKERS ON EITHER SIDE OF THE EXISTING ROAD.
8. REFER TO DETAIL SHEET 3 FOR "PAVED TWP ROAD CROSSING" FOR TRENCH BACKFILL AND ROAD SURFACE RESTORATION.
9. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.
10. REFER TO DETAIL SHEET 6 FOR INLET PROTECTION DETAIL.

LEGEND

- 398 — INDEX CONTOUR
- 400 — CONTOUR
- PROPERTY LINE
- TEMP. CONSTRUCTION EASEMENT/LIMIT OF DISTURBANCE
- PERMANENT PIPELINE R.O.W.
- CENTERLINE PIPELINE R.O.W.
- ABOVE GROUND PIPE
- CONVENTIONAL BORE
- HDD
- FENCE
- WOODS LINE — EDGE WOODS
- PEM/PSS / PFO — WETLANDS
- STONE WALL
- #0670106 — OVERHEAD/UTILITY POLE
- FLOW — PERENNIAL STREAM
- FLOW — EPHEMERAL/INTERMITTENT STREAM
- ORD. HIGH WATER MARK — ORD. HIGH WATER MARK LINE
- FLOODWAY
- LoB — SOIL TYPE & BOUNDARY
- SS12 — SILTSOXX OR EQUIV. 12" HEIGHT
- SS24 — SILTSOXX OR EQUIV. 24" HEIGHT
- SS32 — SILTSOXX OR EQUIV. 32" HEIGHT
- RCE — ROCK CONSTRUCTION ENTRANCE
- LM — LOG MAT
- MT — EROSION CONTROL MATTING
- SBR — STREAMBANK RESTORATION
- TP — TEMP. PIPE
- WB — WATERBAR
- RFB — ROCK FILTER BERM
- BR — BRIDGE
- WC — WETLAND CROSSING
- SSO — SEDIMENT SILT SOXX PROTECTION AT WATER BAR
- AR — ACCESS ROAD
- HWB — HIGHWAY BORING
- HWC — HIGHWAY CUT
- APR — ACCESS RD. X-ING (PAVED ROAD)
- ARC — ACCESS RD. w/CULVERT
- ULF / ULP — UTILITY LINE STREAM X-ING WITH DAM AND PUMPING OR WITH PIPE FLUME
- TB/P — TRENCH BREAKER/PLUG
- LDG — LONGITUDINAL DIVERSION GRADING
- XW — EXTRA WORKSPACE

LIMIT OF CONSTRUCTION AND
LIMIT OF DISTURBANCE – 235 AC.

GENERAL NOTES:

1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
2. STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

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SEAL

NO.	REVISIONS	DATE

E&SPC SITE DETAIL

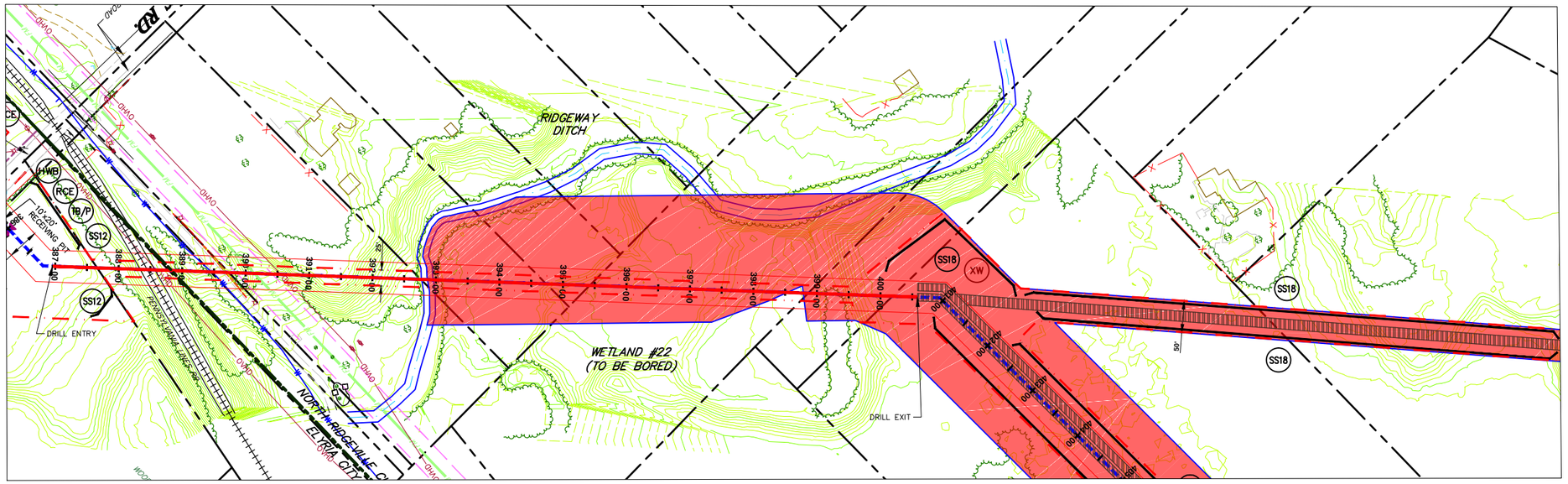
AVON LAKE GAS ADDITION PROJECT

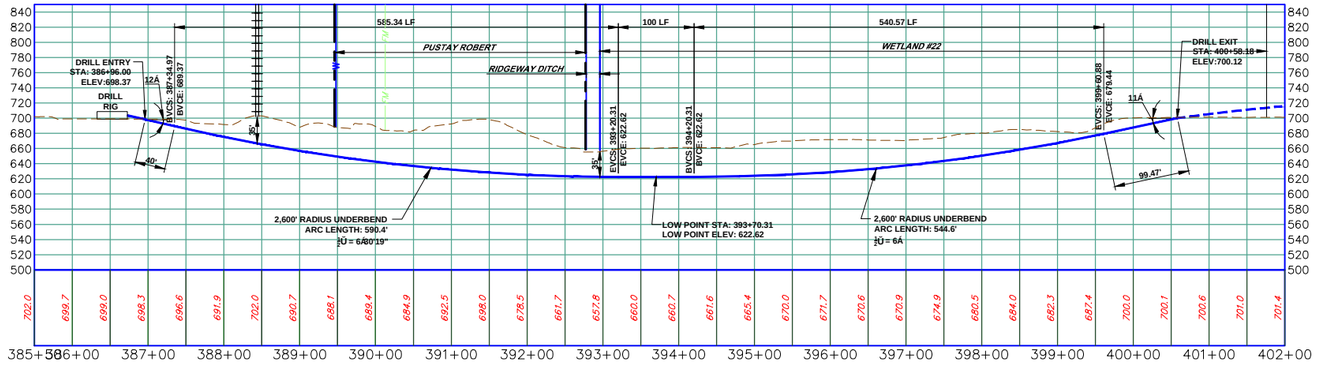
CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: AS NOTED
PROJECT NO. NRG-1007
SHEET NO. 62 OF 88

Hanover Engineering Associates Inc
3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
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PUSTAY PROPERTY HDD

RIDGEWAY DITCH & WETLAND #22

SCALE: 1" = 100'

NOTES:

1. RIDGEWAY DITCH AND WETLAND #22 TO BE BORED.
2. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
3. PLACE SEDIMENT BARRIER/SIGNAGE AROUND PERIMETER OF WETLAND PRIOR TO ANY EARTHWORK. IF THE CONTRACTOR IS NOT SURE WHERE THE WETLAND "LIMIT" IS, HE SHALL CONTACT THE OWNER TO HAVE THE WETLAND REMARKED.
4. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.

LEGEND

- INDEX CONTOUR (398)
- CONTOUR (400)
- PROPERTY LINE
- TEMP. CONSTRUCTION EASEMENT/LIMIT OF DISTURBANCE
- PERMANENT PIPELINE R.O.W.
- CENTERLINE PIPELINE R.O.W.
- ABOVE GROUND PIPE
- CONVENTIONAL BORE
- HDD
- FENCE
- EDGE WOODS (WOODS LINE)
- WETLANDS (PEM/PSS, PFO)
- STONE WALL
- OVERHEAD/UTILITY POLE (#0670106)
- PERENNIAL STREAM (FLOW)
- EPHEMERAL/INTERMITTENT STREAM (FLOW)
- ORD. HIGH WATER MARK LINE (ORD. HIGH WATER MARK)
- FLOODWAY
- SOIL TYPE & BOUNDARY (LoB)
- SS12 — SILTSOXX OR EQUIV. 12" HEIGHT
- SS24 — SILTSOXX OR EQUIV. 24" HEIGHT
- SS32 — SILTSOXX OR EQUIV. 32" HEIGHT
- RCE — ROCK CONSTRUCTION ENTRANCE
- LM — LOG MAT
- MT — EROSION CONTROL MATTING
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- TP — TEMP. PIPE
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- RFB — ROCK FILTER BERM
- BR — BRIDGE
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- TB/P — TRENCH BREAKER/PLUG
- LDG — LONGITUDINAL DIVERSION GRADING
- XW — EXTRA WORKSPACE

LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE – 235 AC.

HDD PROFILE

(ON 22x34 SHEET)
HORIZONTAL & VERTICAL

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100ft.

GENERAL NOTES:

1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
2. STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.

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SEAL

NO.	REVISIONS	DATE

E&SPC SITE DETAIL

AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

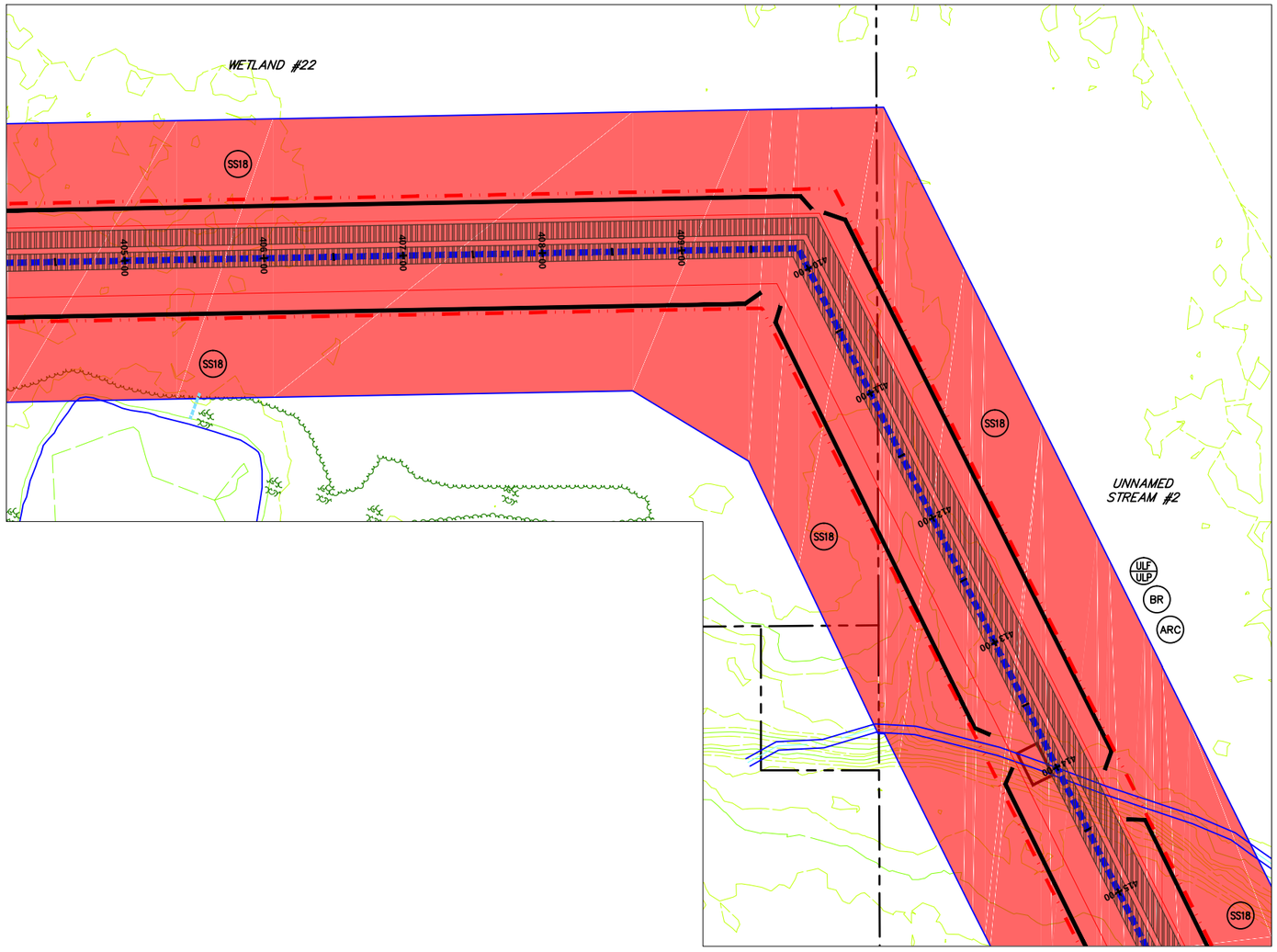
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CHECKED BY: SJC
DATE: 12.15.14
SCALE: AS NOTED

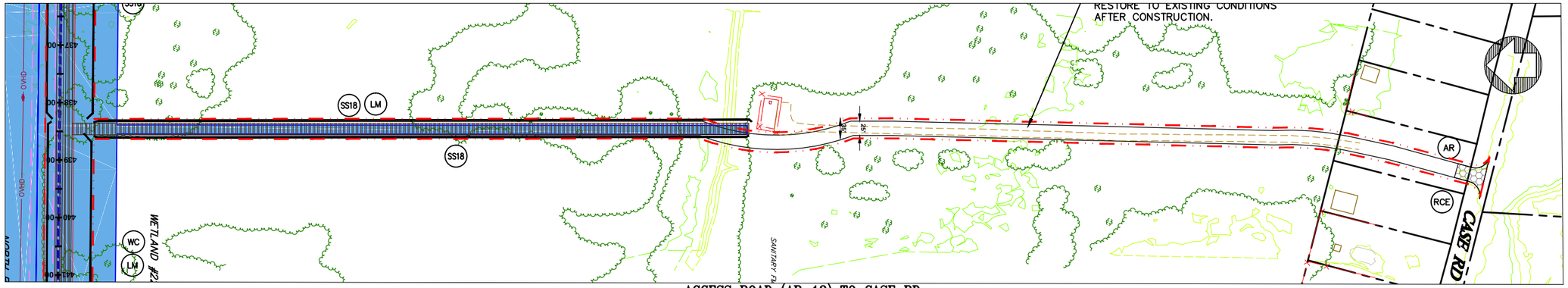
PROJECT NO. NRG-1007

SHEET NO. 63 OF 88

Hanover Engineering Associates Inc
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Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768

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WETLAND #22
SS18
SS18
SS18
SS18
SS18
UNNAMED STREAM #2
ULF
ULP
BR
ARC
40.0 FT
40.0 FT
40.0 FT

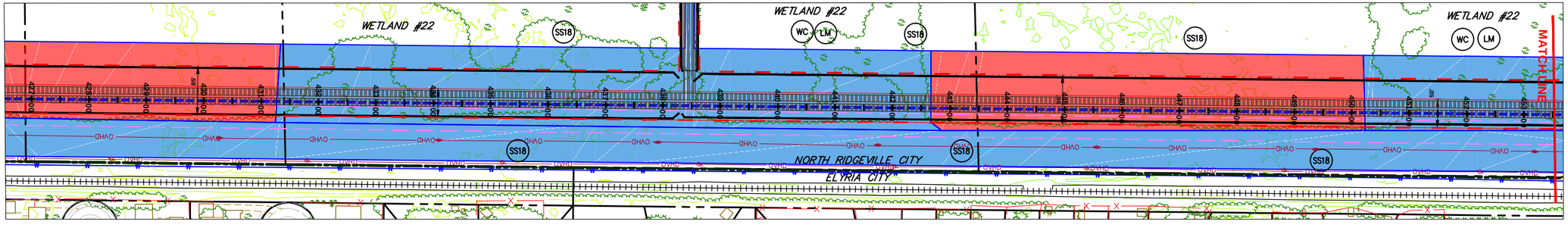


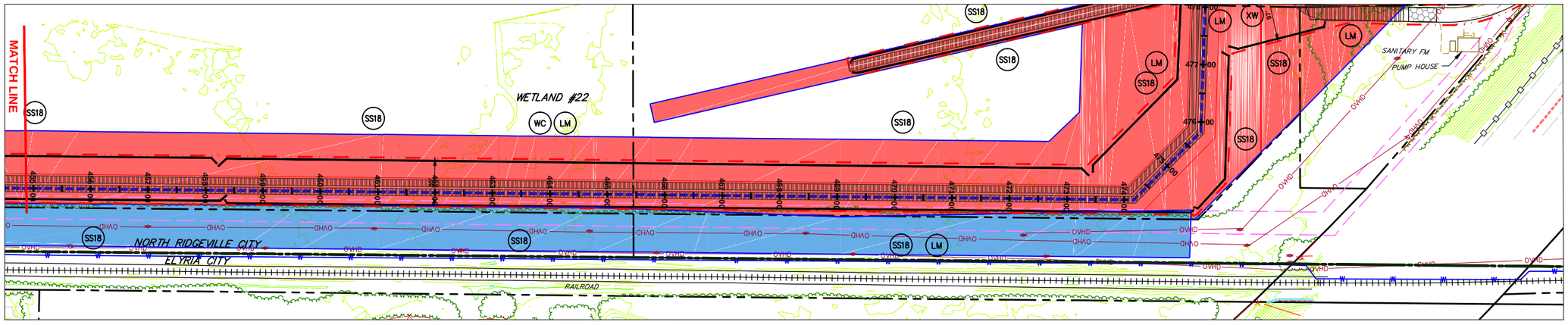
ACCESS ROAD (AR-12) TO CASE RD

SCALE: 1" = 100'

NOTES:

1. REFER TO DETAIL SHEET 5 FOR "RCE" OR DETAIL.
2. REFER TO DETAIL SHEET 5 FOR "AR" DETAIL.



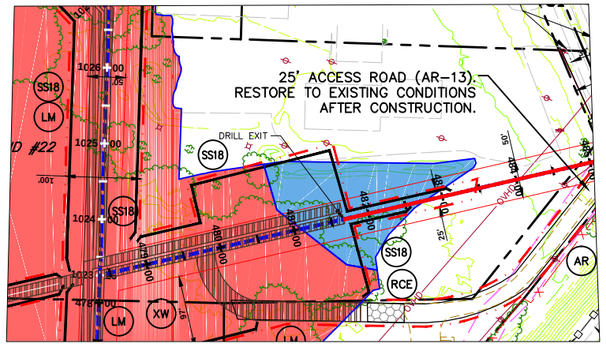


WETLAND #22

SCALE: 1" = 50'

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 3 FOR "WC" DETAIL.
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5. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.



GENERAL NOTES:

1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
2. STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

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LEGEND

- 398 — INDEX CONTOUR
- 400 — CONTOUR
- PROPERTY LINE
- TEMP. CONSTRUCTION EASEMENT/LIMIT OF DISTURBANCE
- PERMANENT PIPELINE R.O.W.
- CENTERLINE PIPELINE R.O.W.
- ABOVE GROUND PIPE
- CONVENTIONAL BORE
- HDD
- FENCE
- WOODS LINE — EDGE WOODS
- PEM/PSS / PFO — WETLANDS
- STONE WALL
- #0670106 — OVERHEAD/UTILITY POLE
- FLOW — PERENNIAL STREAM
- FLOW — EPHEMERAL/INTERMITTENT STREAM
- ORD. HIGH WATER MARK — ORD. HIGH WATER MARK LINE
- FLOODWAY
- LoB — SOIL TYPE & BOUNDARY
- SS12 — SILTSOXX OR EQUIV. 12" HEIGHT
- SS24 — SILTSOXX OR EQUIV. 24" HEIGHT
- SS32 — SILTSOXX OR EQUIV. 32" HEIGHT
- RCE — ROCK CONSTRUCTION ENTRANCE
- LM — LOG MAT
- MT — EROSION CONTROL MATTING
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- LDG — LONGITUDINAL DIVERSION GRADING
- XW — EXTRA WORKSPACE

LIMIT OF CONSTRUCTION AND
LIMIT OF DISTURBANCE – 235 AC.

E&SPC SITE DETAIL

NO.	REVISIONS	DATE

AVON LAKE GAS ADDITION PROJECT

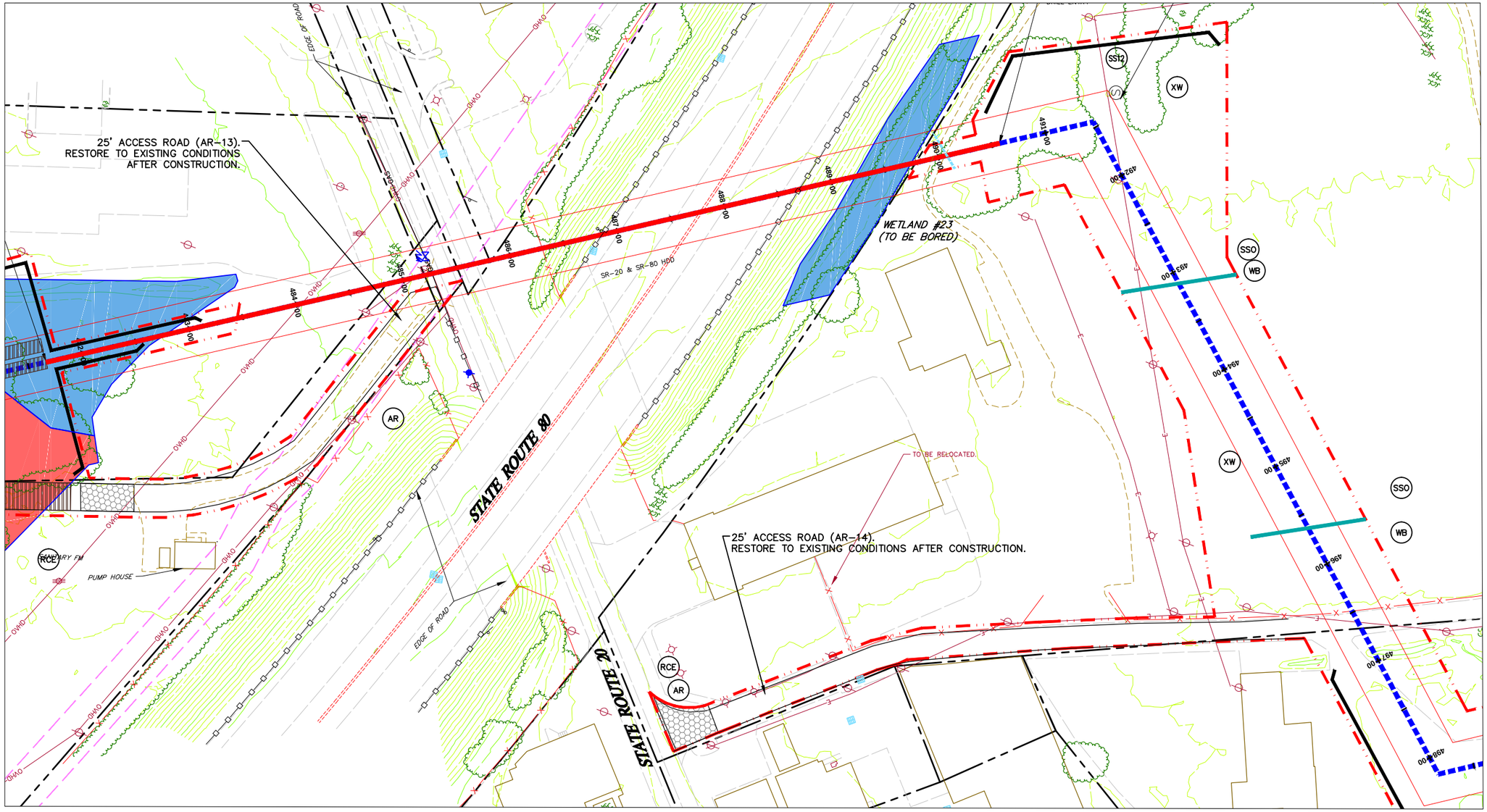
CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: AS NOTED
PROJECT NO. NRG-1007
SHEET NO. 65 OF 88

SEAL

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ACCESS ROAD (AR-13 & AR-14) TO STATE ROUTE 20, STATE ROUTE 20 (TO BE BORED), STATE ROUTE 80 (TO BE BORED) & WETLAND #23 (TO BE BORED)

SCALE: 1" = 50'

NOTES:

1. REFER TO DETAIL SHEET 5 FOR "RCE" OR DETAIL.
2. REFER TO DETAIL SHEET 5 FOR "AR" DETAIL.
3. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.

GENERAL NOTES:

1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
2. STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

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- 400 — CONTOUR
- PROPERTY LINE
- TEMP. CONSTRUCTION EASEMENT/LIMIT OF DISTURBANCE
- PERMANENT PIPELINE R.O.W.
- CENTERLINE PIPELINE R.O.W.
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- CONVENTIONAL BORE
- HDD
- FENCE
- WOODS LINE — EDGE WOODS
- PEM/PSS / PFO — WETLANDS
- STONE WALL
- #0670106 — OVERHEAD/UTILITY POLE
- FLOW — PERENNIAL STREAM
- FLOW — EPHEMERAL/INTERMITTENT STREAM
- ORD. HIGH WATER MARK — ORD. HIGH WATER MARK LINE
- FLOODWAY
- LoB — SOIL TYPE & BOUNDARY
- SS12 — SILTSOXX OR EQUIV. 12" HEIGHT
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LIMIT OF CONSTRUCTION AND
LIMIT OF DISTURBANCE – 235 AC.

E&SPC SITE DETAIL

NO.	REVISIONS	DATE

SEAL

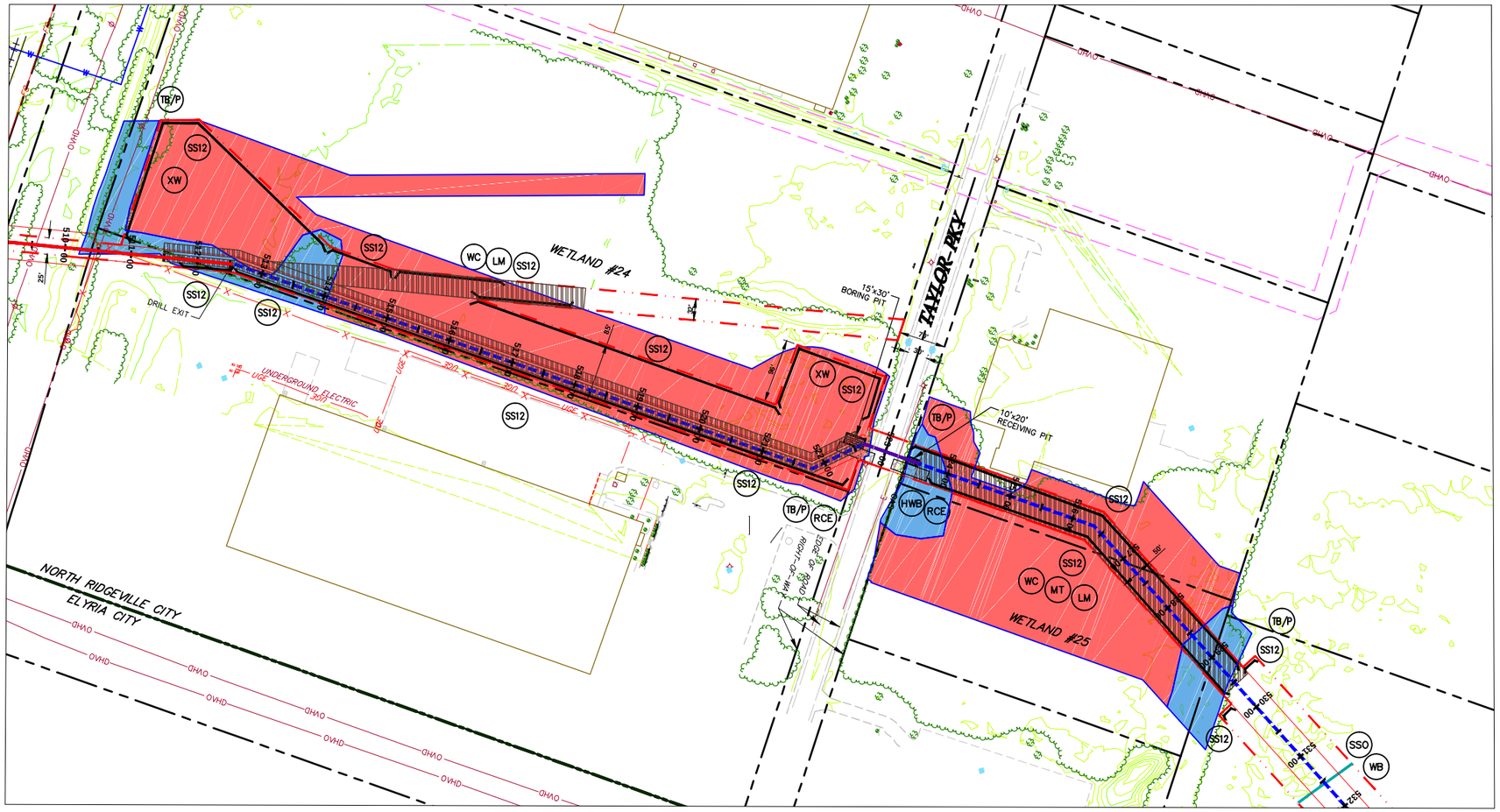
AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: AS NOTED
PROJECT NO. NRG-1007
SHEET NO. 66 OF 88

Hanover Engineering Associates Inc
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WETLAND #24, TAYLOR PARKWAY, & WETLAND #25

SCALE: 1" = 100'

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 3 FOR "WC" DETAIL.
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5. REFER TO DETAIL SHEET 6 FOR "MT" DETAIL:
   a) WETLAND #25 USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "C".
6. REFER TO DETAIL SHEET 5 FOR "RCE" OR DETAIL.
7. REFER TO DETAIL SHEET 3 FOR "HWB" DETAIL. PLACE TRENCH BREAKERS ON EITHER SIDE OF THE EXISTING ROAD.
8. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.
9. REFER TO DETAIL SHEET 6 FOR INLET PROTECTION DETAIL.

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- MT — EROSION CONTROL MATTING
- SBR — STREAMBANK RESTORATION
- TP — TEMP. PIPE
- WB — WATERBAR
- RFB — ROCK FILTER BERM
- BR — BRIDGE — BRIDGE
- WC — WETLAND CROSSING
- SSO — SEDIMENT SILT SOXX PROTECTION AT WATER BAR
- AR — ACCESS ROAD
- HWB — HIGHWAY BORING
- HWC — HIGHWAY CUT
- APR — ACCESS RD. X-ING (PAVED ROAD)
- ARC — ACCESS RD. w/CULVERT
- ULF / ULP — UTILITY LINE STREAM X-ING WITH DAM AND PUMPING OR WITH PIPE FLUME
- TB/P — TRENCH BREAKER/PLUG
- LDG — LONGITUDINAL DIVERSION GRADING
- XW — EXTRA WORKSPACE

LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE – 235 AC.

GENERAL NOTES:

1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
2. STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

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SEAL

NO.	REVISIONS	DATE

E&SPC SITE DETAIL

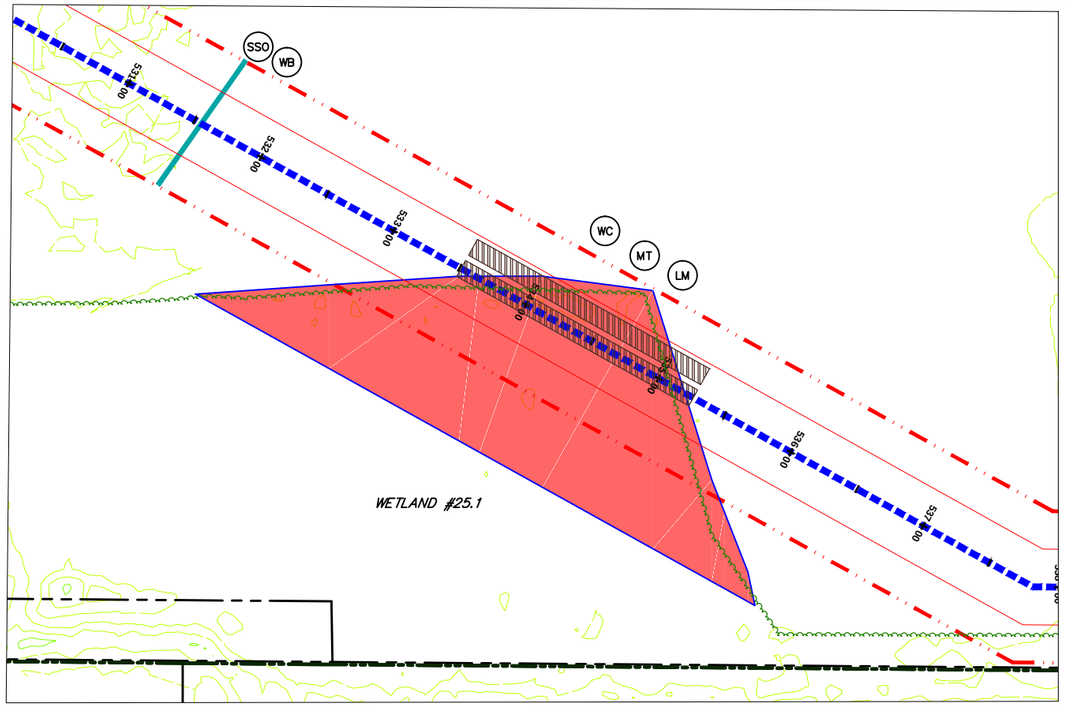
AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: AS NOTED
PROJECT NO. NRG-1007
SHEET NO. 67 OF 88

Hanover
Engineering Associates Inc
3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768

X:\Projects\Energy\NRG Energy\NRG-1007-Avon Lakes Pipeline\DWG\ESPC\ ESPC-NRG-1007-AVON LAKE-006-SITE DETAILS-2.dwg Dec 14,2014 - 5:02pm

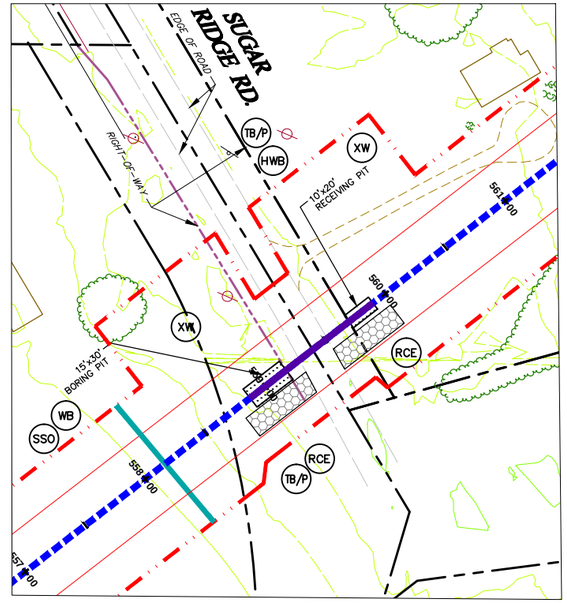


WETLAND #25.1

SCALE: 1" = 50'

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 3 FOR "WC" DETAIL.
3. PLACE SEDIMENT BARRIER/SIGNAGE AROUND PERIMETER OF WETLAND PRIOR TO ANY EARTHWORK. IF THE CONTRACTOR IS NOT SURE WHERE THE WETLAND "LIMIT" IS, HE SHALL CONTACT THE OWNER TO HAVE THE WETLAND REMARKED.
4. THE CONTRACTOR SHALL PLACE LOG MATS TO CROSS THE WETLAND AREA. ALL APPLICABLE WETLAND AREA WITHIN THE LIMITS OF CONSTRUCTION/DISTURBANCE SHALL BE COVERED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY FINES AND/OR REPAIRS REQUIRED AS A RESULT OF DAMAGE TO WETLANDS AND WATERCOURSES AT NO COST TO THE FACILITY OWNER.
5. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.



SUGAR RIDGE ROAD

SCALE: 1" = 50'

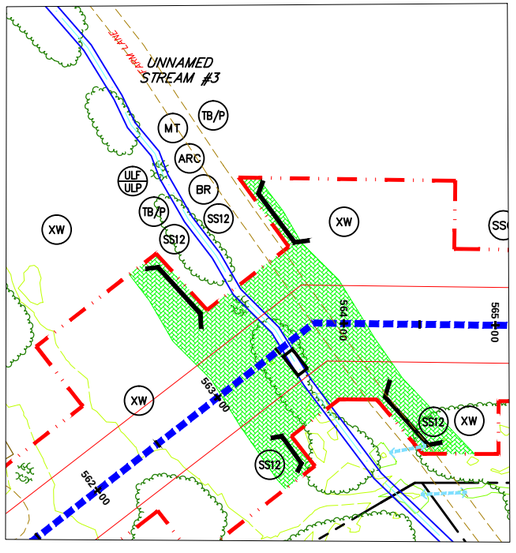
NOTES:

1.. REFER TO DETAIL SHEET 5 FOR "RCE" OR DETAIL.
2. REFER TO DETAIL SHEET 3 FOR OR "HWB" DETAIL. PLACE TRENCH BREAKERS ON EITHER SIDE OF THE EXISTING ROAD.
3. REFER TO DETAIL SHEET 3 FOR "STONE/DIRT TWP ROAD CROSSING DETAIL" OR "PAVED TWP ROAD CROSSING" FOR TRENCH BACKFILL AND ROAD SURFACE RESTORATION.
4. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.

LEGEND

- 398 — INDEX CONTOUR
- 400 — CONTOUR
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- TEMP. CONSTRUCTION EASEMENT/LIMIT OF DISTURBANCE
- PERMANENT PIPELINE R.O.W.
- CENTERLINE PIPELINE R.O.W.
- ABOVE GROUND PIPE
- CONVENTIONAL BORE
- HDD
- FENCE
- WOODS LINE — EDGE WOODS
- PEM/PSS / PFO — WETLANDS
- STONE WALL
- #0670106 — OVERHEAD/UTILITY POLE
- FLOW — PERENNIAL STREAM
- FLOW — EPHEMERAL/INTERMITTENT STREAM
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- FLOODWAY
- LoB — SOIL TYPE & BOUNDARY
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- SS24 — SILTSOXX OR EQUIV. 24" HEIGHT
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- LM — LOG MAT
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LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE – 235 AC.



UNNAMED STREAM #3

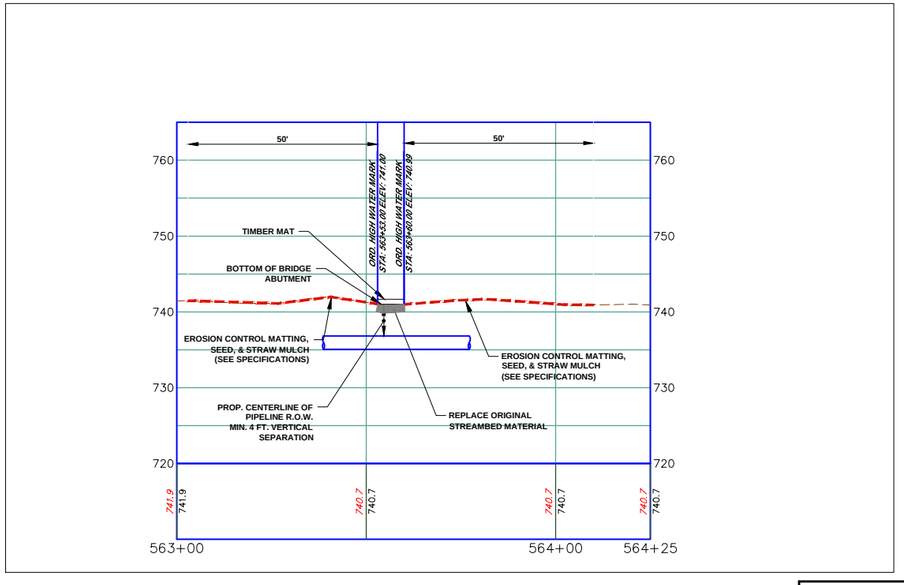
SCALE: 1" = 50'

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 6 FOR "MT" DETAIL:
   a) STREAM #12 USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "B".
3. REFER TO DETAIL SHEET 4 FOR "ULF" OR ULP" DETAIL. UTILIZE FOR STREAM CROSSINGS.
4. ALTHOUGH A BRIDGE IS SHOW, A TEMPORARY CULVERT CROSSING MAY BE INSTALLED. REFER TO DETAIL SHEET 1 FOR "BR" DETAIL AND FOR THE SPECIFIED SIZE AND NUMBER OF CULVERTS.
5. REFER TO DETAIL SHEET 4 FOR "ARC" DETAIL.
6. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.

GENERAL NOTES:

1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
2. STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.



UNNAMED STREAM #3 PROFILE

(ON 22x34 SHEET)
HORIZONTAL
GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

(ON 22x34 SHEET)
VERTICAL
GRAPHIC SCALE

10 0 5 10 20 40

(IN FEET)
1 inch = 10 ft.

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

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E&SPC SITE DETAIL

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LORAIN COUNTY
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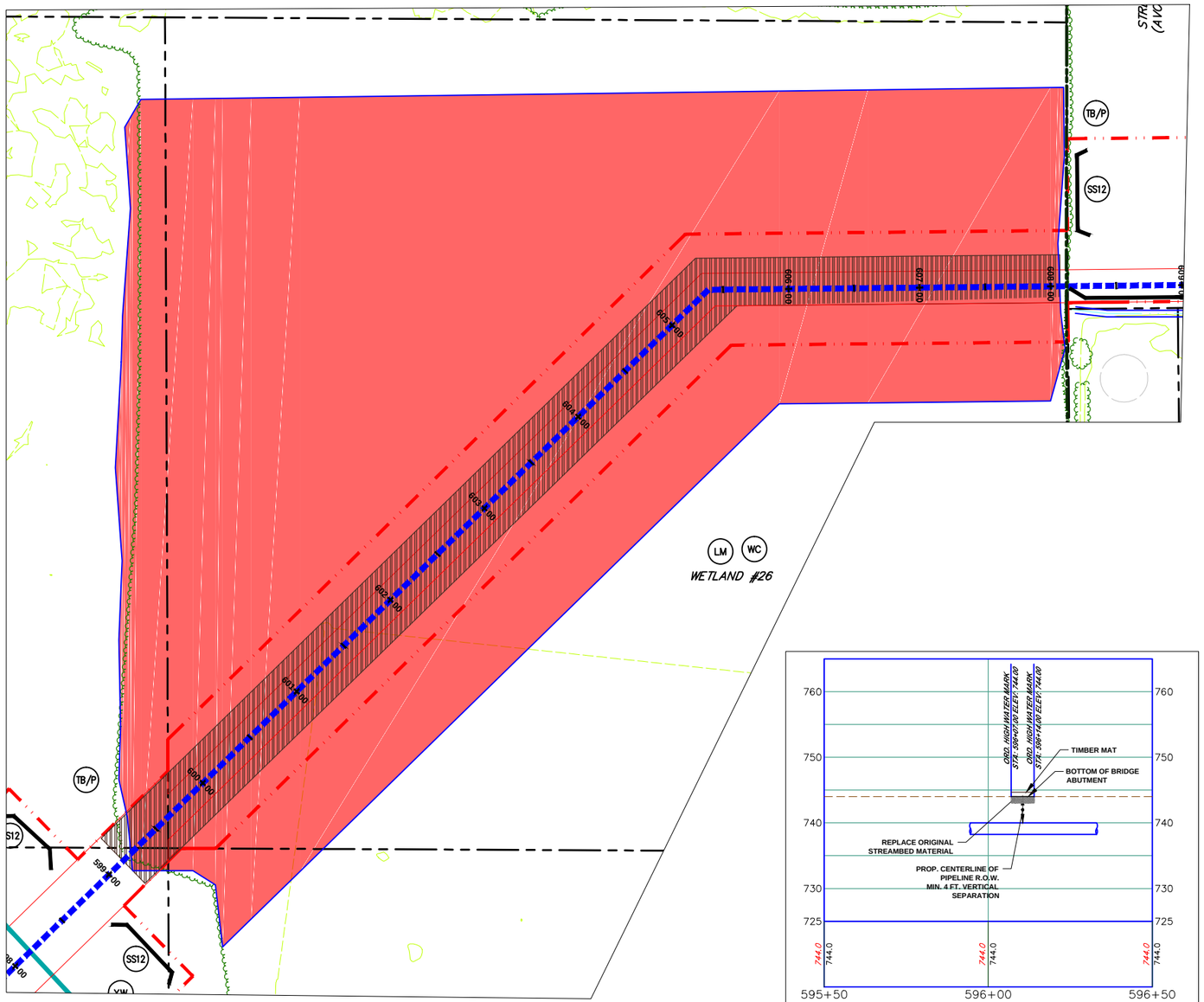
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DATE: 12.15.14
SCALE: AS NOTED

PROJECT NO. NRG-1007

SHEET NO. 68 OF 88

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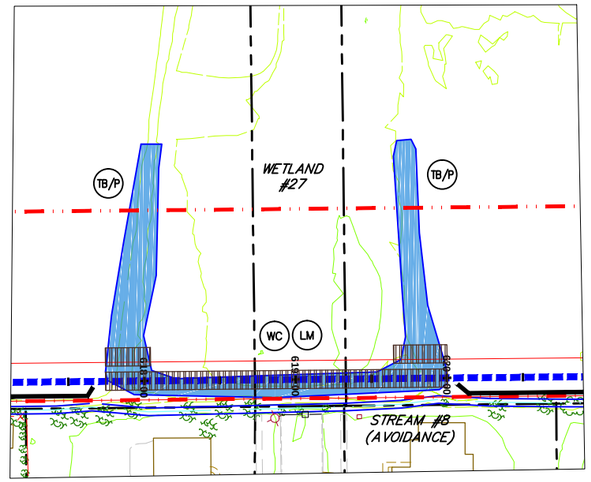


WETLAND #26

SCALE: 1" = 50'

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 3 FOR "WC" DETAIL.
3. PLACE SEDIMENT BARRIER/SIGNAGE AROUND PERIMETER OF WETLAND PRIOR TO ANY EARTHWORK. IF THE CONTRACTOR IS NOT SURE WHERE THE WETLAND "LIMIT" IS, HE SHALL CONTACT THE OWNER TO HAVE THE WETLAND REMARKED.
4. THE CONTRACTOR SHALL PLACE LOG MATS TO CROSS THE WETLAND AREA. ALL APPLICABLE WETLAND AREA WITHIN THE LIMITS OF CONSTRUCTION/DISTURBANCE SHALL BE COVERED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY FINES AND/OR REPAIRS REQUIRED AS A RESULT OF DAMAGE TO WETLANDS AND WATERCOURSES AT NO COST TO THE FACILITY OWNER.
5. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.



WETLAND #27 & STREAM #8 (AVOIDANCE)

SCALE: 1" = 50'

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 3 FOR "WC" DETAIL.
3. PLACE SEDIMENT BARRIER/SIGNAGE AROUND PERIMETER OF WETLAND PRIOR TO ANY EARTHWORK. IF THE CONTRACTOR IS NOT SURE WHERE THE WETLAND "LIMIT" IS, HE SHALL CONTACT THE OWNER TO HAVE THE WETLAND REMARKED.
4. THE CONTRACTOR SHALL PLACE LOG MATS TO CROSS THE WETLAND AREA. ALL APPLICABLE WETLAND AREA WITHIN THE LIMITS OF CONSTRUCTION/DISTURBANCE SHALL BE COVERED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY FINES AND/OR REPAIRS REQUIRED AS A RESULT OF DAMAGE TO WETLANDS AND WATERCOURSES AT NO COST TO THE FACILITY OWNER.
5. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.

STREAM #7 PROFILE

(ON 22x34 SHEET)
HORIZONTAL
GRAPHIC SCALE

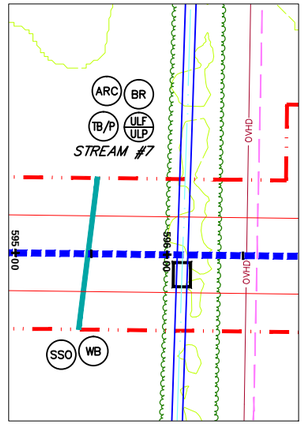
20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

(ON 22x34 SHEET)
VERTICAL
GRAPHIC SCALE

10 0 5 10 20 40

(IN FEET)
1 inch = 10 ft.



STREAM #7

SCALE: 1" = 50'

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 3 FOR "WB" DETAIL.
3. REFER TO DETAIL SHEET 3 FOR "SSO" DETAIL.
4. REFER TO DETAIL SHEET 4 FOR "ULF" OR ULP" DETAIL. UTILIZE FOR STREAM CROSSINGS.
5. ALTHOUGH A BRIDGE IS SHOW, A TEMPORARY CULVERT CROSSING MAY BE INSTALLED. REFER TO DETAIL SHEET 1 FOR "BR" DETAIL AND FOR THE SPECIFIED SIZE AND NUMBER OF CULVERTS.
6. REFER TO DETAIL SHEET 4 FOR "ARC" DETAIL.
7. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.

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LIMIT OF CONSTRUCTION AND
LIMIT OF DISTURBANCE – 235 AC.

GENERAL NOTES:

1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
2. STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

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LORAIN COUNTY
OHIO

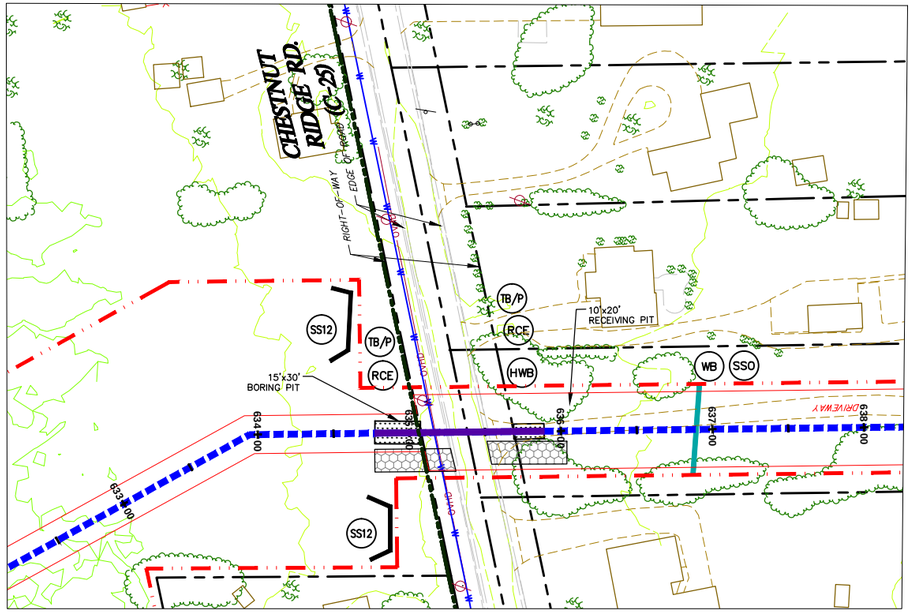
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PROJECT NO. NRG-1007

SHEET NO. 69 OF 88

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Engineering Associates Inc
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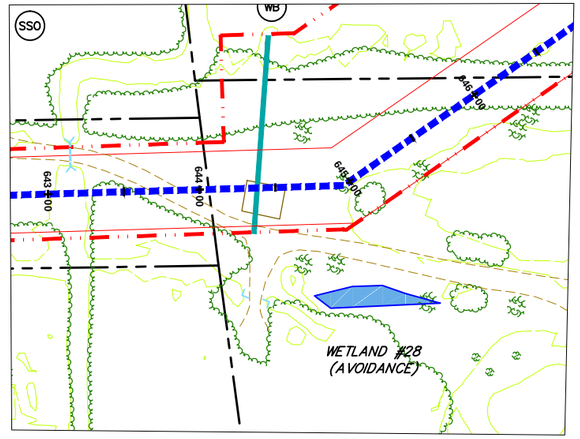


CHESTNUT RIDGE ROAD (C-25)

SCALE: 1" = 50'

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 3 FOR "WB" DETAIL.
3. REFER TO DETAIL SHEET 3 FOR "SSO" DETAIL.
4. REFER TO DETAIL SHEET 5 FOR "RCE" DETAIL.
5. REFER TO DETAIL SHEET 3 FOR "HWB" DETAIL. PLACE TRENCH BREAKERS ON EITHER SIDE OF THE EXISTING ROAD.
6. REFER TO DETAIL SHEET 3 FOR "STONE/DIRT TWP ROAD CROSSING DETAIL" OR "PAVED TWP ROAD CROSSING" FOR TRENCH BACKFILL AND ROAD SURFACE RESTORATION.
7. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.

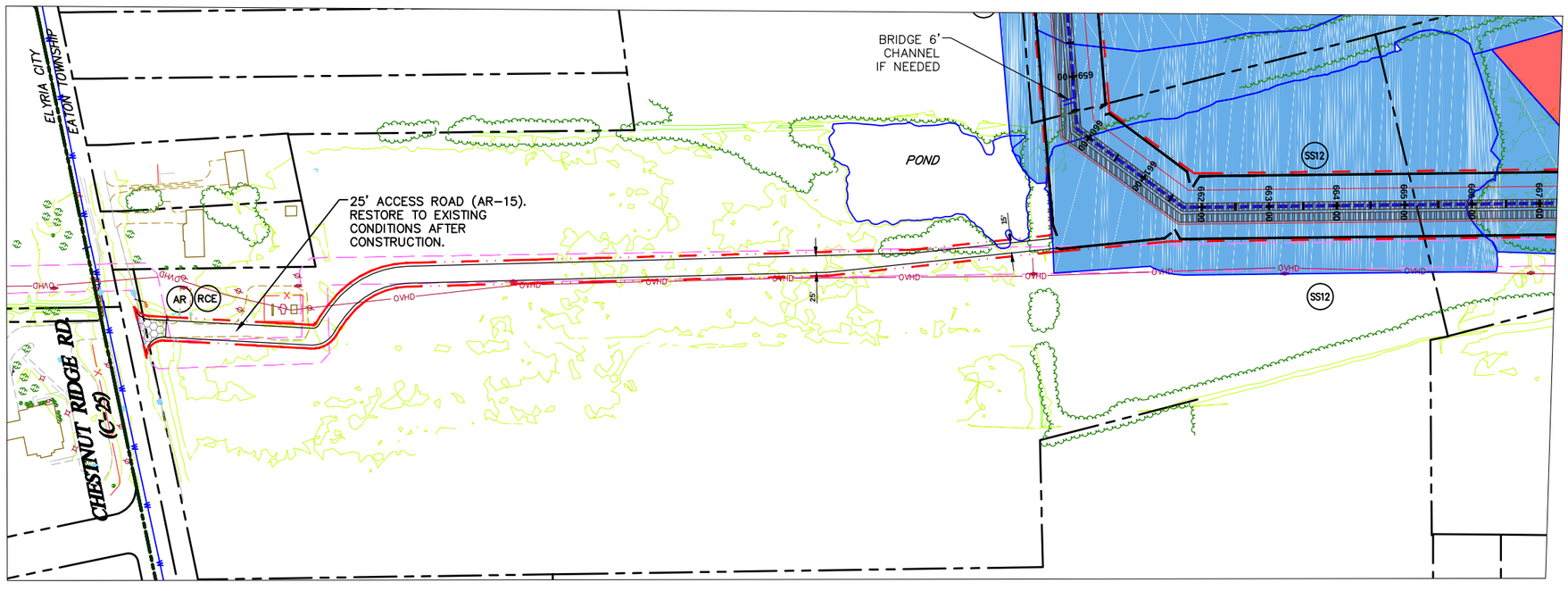


WETLAND #28 (AVOIDANCE)

SCALE: 1" = 50'

NOTES:

1. REFER TO DETAIL SHEET 6 FOR "MT" DETAIL:
   a) WETLAND #29 USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "C".
2. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.



ACCESS ROAD (AR-15) TO CHESTNUT RIDGE ROAD (C-25)

SCALE: 1" = 100'

NOTES:

1.. REFER TO DETAIL SHEET 5 FOR "RCE" DETAIL.
2. REFER TO DETAIL SHEET 5 FOR "AR" DETAIL.
3. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.

GENERAL NOTES:

1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
2. STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

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LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE – 235 AC.

E&SPC SITE DETAIL

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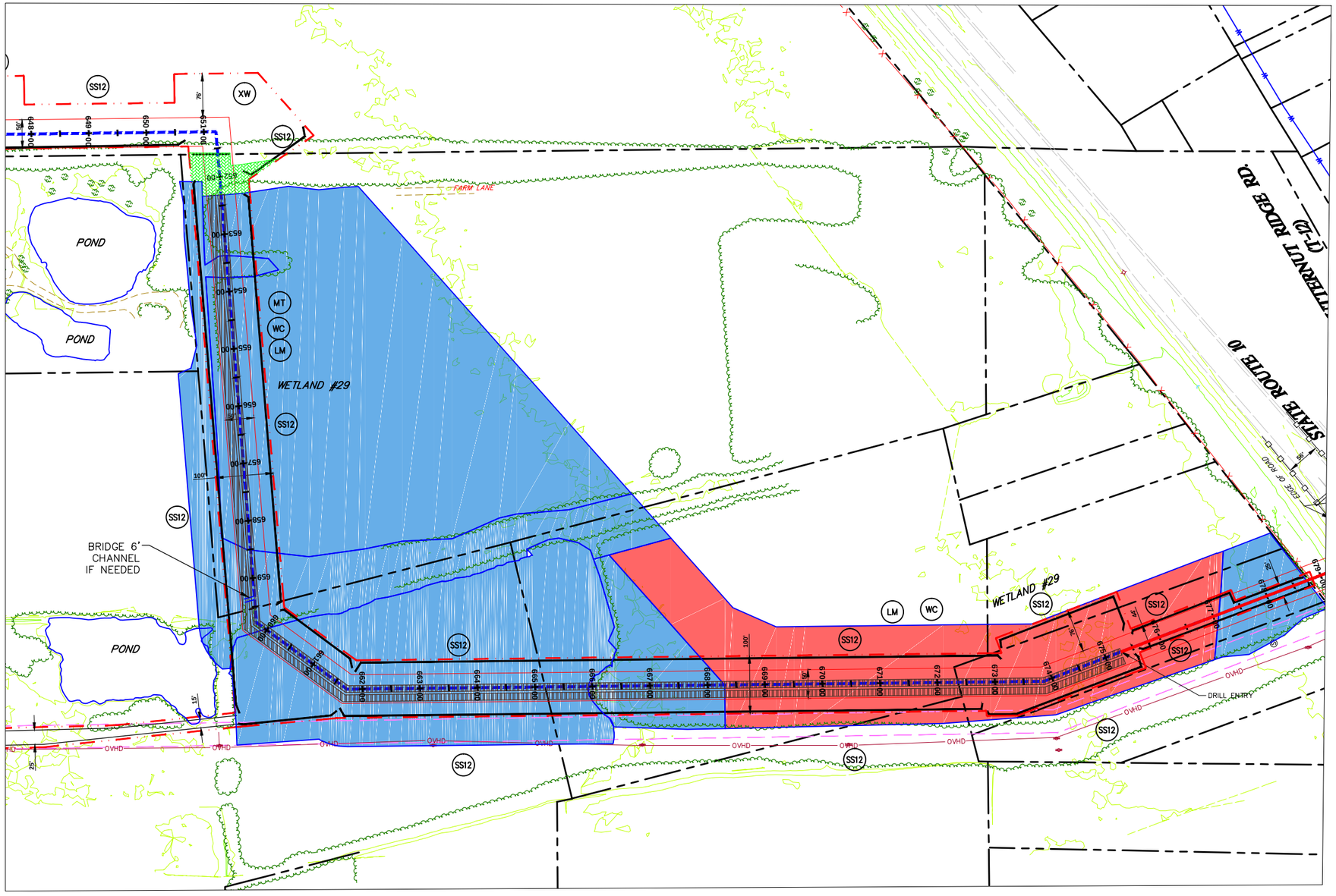
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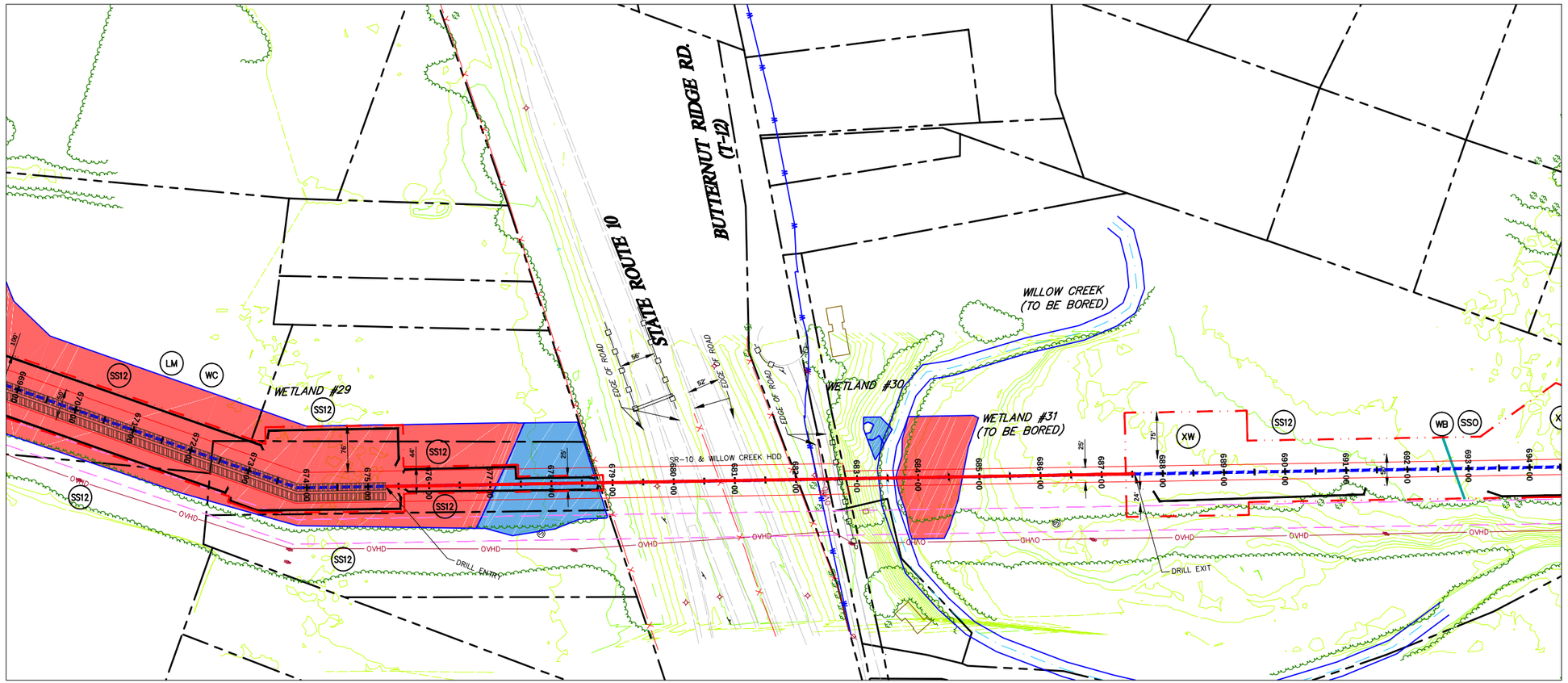
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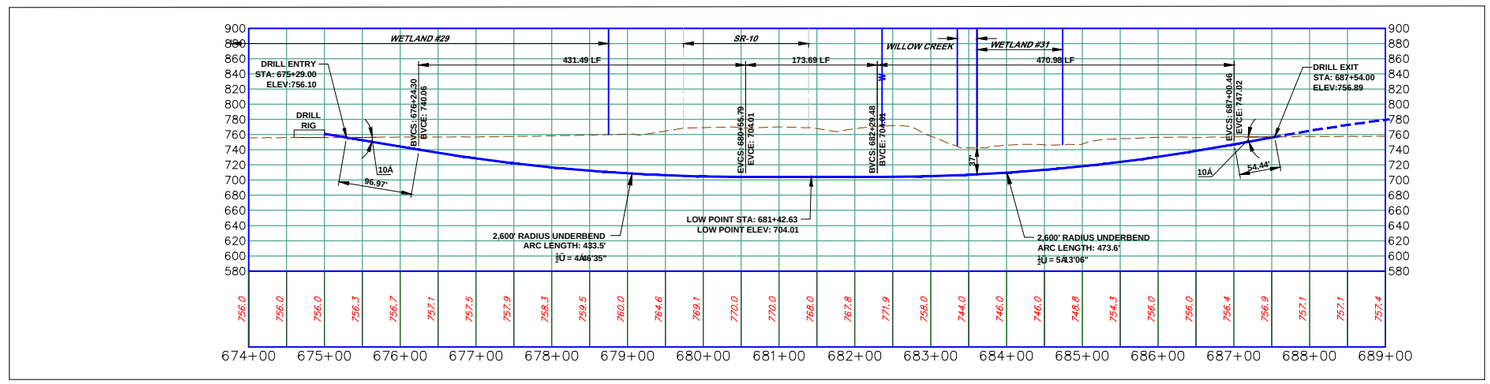
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SS12
XW
MT
WC
LM
POND
POND
WETLAND #29
FARM LANE
BRIDGE 6' CHANNEL IF NEEDED
STATE ROUTE 10
(T-12)
DRILL ENTRY
OVHD
648+00
649+00
650+00
651+00
652+00
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686+00
687+00



STATE ROUTE 10, BUTTERNUT RIDGE RD (T-12), WETLAND #30, WILLOW CREEK & WETLAND #31

SCALE: 1" = 100'



HDD PROFILE

(ON 22x34 SHEET)
HORIZONTAL & VERTICAL

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100ft.

LEGEND

- INDEX CONTOUR (398)
- CONTOUR (400)
- PROPERTY LINE
- TEMP. CONSTRUCTION EASEMENT/LIMIT OF DISTURBANCE
- PERMANENT PIPELINE R.O.W.
- CENTERLINE PIPELINE R.O.W.
- ABOVE GROUND PIPE
- CONVENTIONAL BORE
- HDD
- FENCE
- EDGE WOODS (WOODS LINE)
- WETLANDS (PEM/PSS, PFO)
- STONE WALL
- OVERHEAD/UTILITY POLE (#0670106)
- PERENNIAL STREAM (FLOW)
- EPHEMERAL/INTERMITTENT STREAM (FLOW)
- ORD. HIGH WATER MARK LINE (ORD. HIGH WATER MARK)
- FLOODWAY
- SOIL TYPE & BOUNDARY (LoB)
- SS12 SILTSOXX OR EQUIV. 12" HEIGHT
- SS24 SILTSOXX OR EQUIV. 24" HEIGHT
- SS32 SILTSOXX OR EQUIV. 32" HEIGHT
- RCE ROCK CONSTRUCTION ENTRANCE
- LM LOG MAT
- MT EROSION CONTROL MATTING
- SBR STREAMBANK RESTORATION
- TP TEMP. PIPE
- WB WATERBAR
- RFB ROCK FILTER BERM
- BR BRIDGE
- WC WETLAND CROSSING
- SSO SEDIMENT SILT SOXX PROTECTION AT WATER BAR
- AR ACCESS ROAD
- HWB HIGHWAY BORING
- HWC HIGHWAY CUT
- APR ACCESS RD. X-ING (PAVED ROAD)
- ARC ACCESS RD. w/CULVERT
- ULF / ULP UTILITY LINE STREAM X-ING WITH DAM AND PUMPING OR WITH PIPE FLUME
- TB/P TRENCH BREAKER/PLUG
- LDG LONGITUDINAL DIVERSION GRADING
- XW EXTRA WORKSPACE

LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE – 235 AC.

GENERAL NOTES:

1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
2. STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.

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SEAL

NO.	REVISIONS	DATE

E&SPC SITE DETAIL

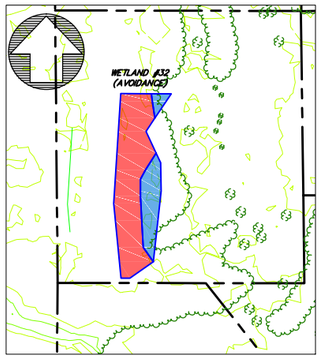
AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

DRAWN BY: AEJ	PROJECT NO. NRG–1007
CHECKED BY: SJC	
DATE: 12.15.14	SHEET NO. 72 OF 88
SCALE: AS NOTED	

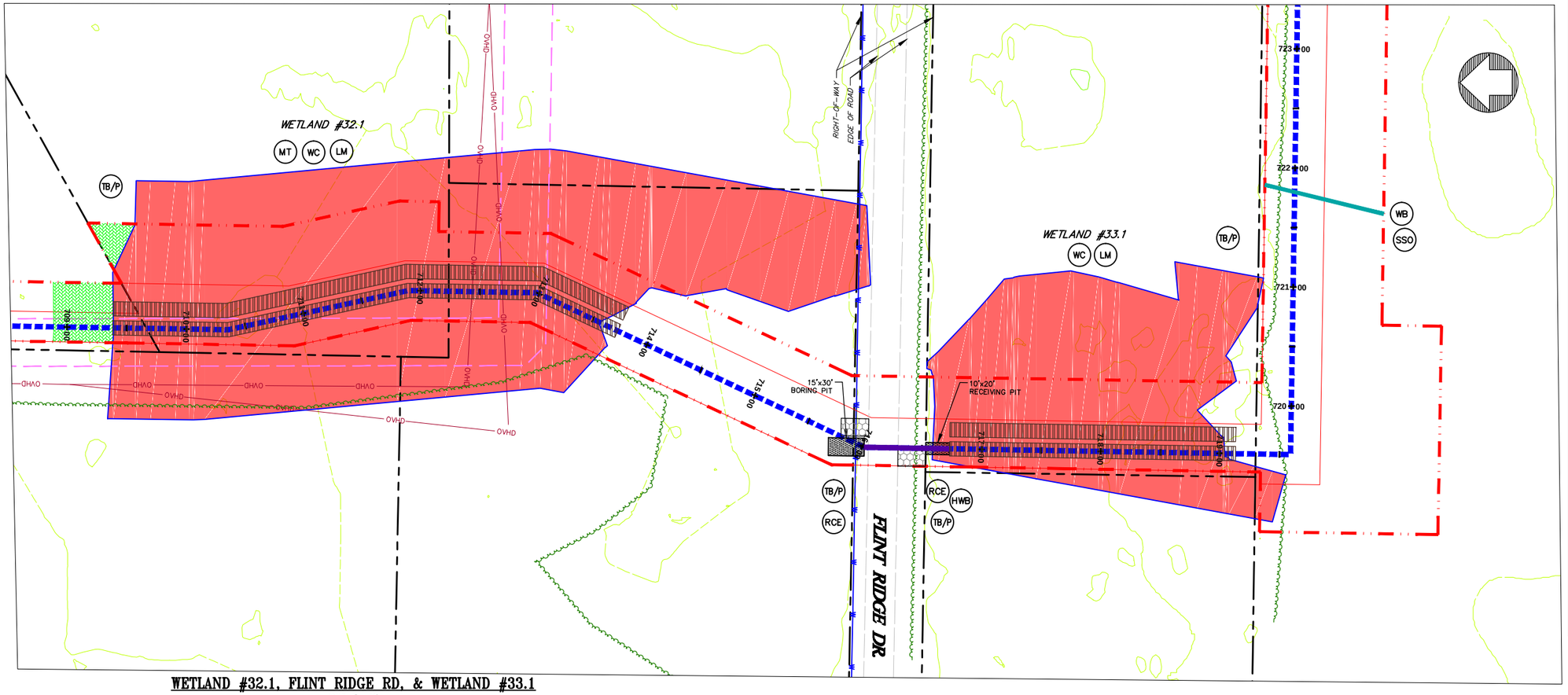
Hanover Engineering Associates Inc
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Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768

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WETLAND #32 (AVOIDANCE)

SCALE: 1" = 50'



WETLAND #32.1, FLINT RIDGE RD, & WETLAND #33.1

SCALE: 1" = 50'

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 3 FOR "WC" DETAIL.
3. PLACE SEDIMENT BARRIER/SIGNAGE AROUND PERIMETER OF WETLAND PRIOR TO ANY EARTHWORK. IF THE CONTRACTOR IS NOT SURE WHERE THE WETLAND "LIMIT" IS, HE SHALL CONTACT THE OWNER TO HAVE THE WETLAND REMARKED.
4. THE CONTRACTOR SHALL PLACE LOG MATS TO CROSS THE WETLAND AREA. ALL APPLICABLE WETLAND AREA WITHIN THE LIMITS OF CONSTRUCTION/DISTURBANCE SHALL BE COVERED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY FINES AND/OR REPAIRS REQUIRED AS A RESULT OF DAMAGE TO WETLANDS AND WATERCOURSES AT NO COST TO THE FACILITY OWNER.
5. REFER TO DETAIL SHEET 6 FOR "MT" DETAIL:
   a) WETLAND #32.1 & #33.1 USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "C".
6. REFER TO DETAIL SHEET 5 FOR "RCE" OR DETAIL.
7. REFER TO DETAIL SHEET 3 FOR OR "HWB" DETAIL. PLACE TRENCH BREAKERS ON EITHER SIDE OF THE EXISTING ROAD.
8. REFER TO DETAIL SHEET 3 FOR "WB" DETAIL.
9. REFER TO DETAIL SHEET 3 FOR "SSO" DETAIL.
10. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.

GENERAL NOTES:

1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
2. STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

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LEGEND

- 398 — INDEX CONTOUR
- 400 — CONTOUR
- PROPERTY LINE
- TEMP. CONSTRUCTION EASEMENT/LIMIT OF DISTURBANCE
- PERMANENT PIPELINE R.O.W.
- CENTERLINE PIPELINE R.O.W.
- ABOVE GROUND PIPE
- CONVENTIONAL BORE
- HDD
- FENCE
- WOODS LINE — EDGE WOODS
- PEM/PSS / PFO — WETLANDS
- STONE WALL
- #0670106 — OVERHEAD/UTILITY POLE
- FLOW — PERENNIAL STREAM
- FLOW — EPHEMERAL/INTERMITTENT STREAM
- ORD. HIGH WATER MARK — ORD. HIGH WATER MARK LINE
- FLOODWAY
- LoB — SOIL TYPE & BOUNDARY
- SS12 — SILTSOXX OR EQUIV. 12" HEIGHT
- SS24 — SILTSOXX OR EQUIV. 24" HEIGHT
- SS32 — SILTSOXX OR EQUIV. 32" HEIGHT
- RCE — ROCK CONSTRUCTION ENTRANCE
- LM — LOG MAT
- MT — EROSION CONTROL MATTING
- SBR — STREAMBANK RESTORATION
- TP — TEMP. PIPE
- WB — WATERBAR
- RFB — ROCK FILTER BERM
- BR — BRIDGE
- WC — WETLAND CROSSING
- SSO — SEDIMENT SILT SOXX PROTECTION AT WATER BAR
- AR — ACCESS ROAD
- HWB — HIGHWAY BORING
- HWC — HIGHWAY CUT
- APR — ACCESS RD. X-ING (PAVED ROAD)
- ARC — ACCESS RD. w/CULVERT
- ULF / ULP — UTILITY LINE STREAM X-ING WITH DAM AND PUMPING OR WITH PIPE FLUME
- TB/P — TRENCH BREAKER/PLUG
- LDG — LONGITUDINAL DIVERSION GRADING
- XW — EXTRA WORKSPACE

LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE – 235 AC.

SEAL

NO.	REVISIONS	DATE

E&SPC SITE DETAIL

AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

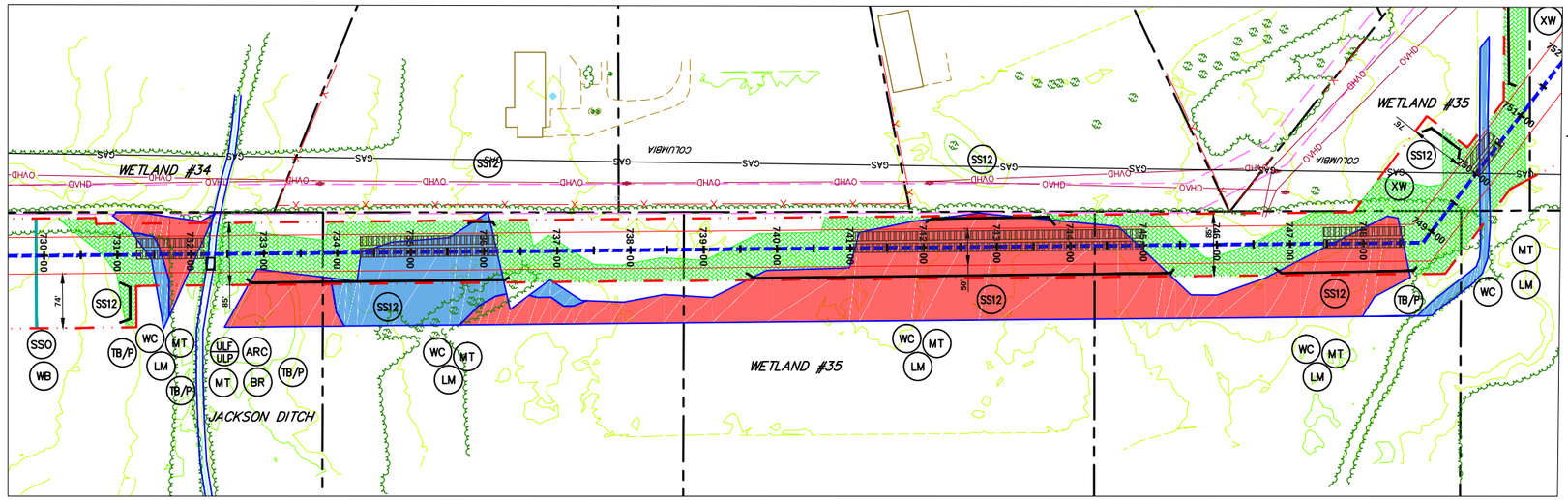
DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: AS NOTED

PROJECT NO. NRG-1007

SHEET NO. 73 OF 88

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WETLAND #34, JACKSON DITCH, & WETLAND #35

SCALE: 1" = 100'

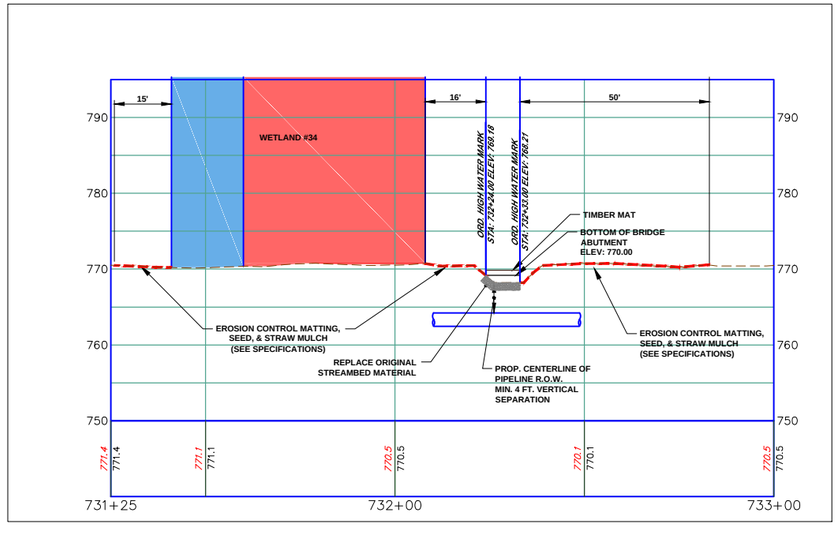
NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 3 FOR "WB" DETAIL.
3. REFER TO DETAIL SHEET 3 FOR "SSO" DETAIL.
4. REFER TO DETAIL SHEET 3 FOR "WC" DETAIL.
5. PLACE SEDIMENT BARRIER/SIGNAGE AROUND PERIMETER OF WETLAND PRIOR TO ANY EARTHWORK. IF THE CONTRACTOR IS NOT SURE WHERE THE WETLAND "LIMIT" IS, HE SHALL CONTACT THE OWNER TO HAVE THE WETLAND REMARKED.
6. THE CONTRACTOR SHALL PLACE LOG MATS TO CROSS THE WETLAND AREA. ALL APPLICABLE WETLAND AREA WITHIN THE LIMITS OF CONSTRUCTION/DISTURBANCE SHALL BE COVERED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY FINES AND/OR REPAIRS REQUIRED AS A RESULT OF DAMAGE TO WETLANDS AND WATERCOURSES AT NO COST TO THE FACILITY OWNER.
7. REFER TO DETAIL SHEET 6 FOR "MT" DETAIL:
   a) WETLAND #34 & #35 USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "C".
   b) JACKSON DITCH USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "B".
8. REFER TO DETAIL SHEET 4 FOR "ULP" OR ULP" DETAIL. UTILIZE FOR STREAM CROSSINGS.
9. ALTHOUGH A BRIDGE IS SHOW, A TEMPORARY CULVERT CROSSING MAY BE INSTALLED. REFER TO DETAIL SHEET 1 FOR "BR" DETAIL AND FOR THE SPECIFIED SIZE AND NUMBER OF CULVERTS.
10. REFER TO DETAIL SHEET 4 FOR "ARC" DETAIL.
11. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.

LEGEND

- 398 — INDEX CONTOUR
- 400 — CONTOUR
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- PERMANENT PIPELINE R.O.W.
- CENTERLINE PIPELINE R.O.W.
- ABOVE GROUND PIPE
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- HDD
- FENCE
- WOODS LINE — EDGE WOODS
- PEM/PSS / PFO — WETLANDS
- STONE WALL
- #067010G — OVERHEAD/UTILITY POLE
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- LDG — LONGITUDINAL DIVERSION GRADING
- XW — EXTRA WORKSPACE

LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE – 235 AC.



JACKSON DITCH

JACKSON DITCH PROFILE

(ON 22x34 SHEET)
HORIZONTAL
GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

(ON 22x34 SHEET)
VERTICAL
GRAPHIC SCALE

10 0 5 10 20 40

(IN FEET)
1 inch = 10 ft.

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

GENERAL NOTES:

1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
2. STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.

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SEAL

NO.	REVISIONS	DATE

E&SPC SITE DETAIL

AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

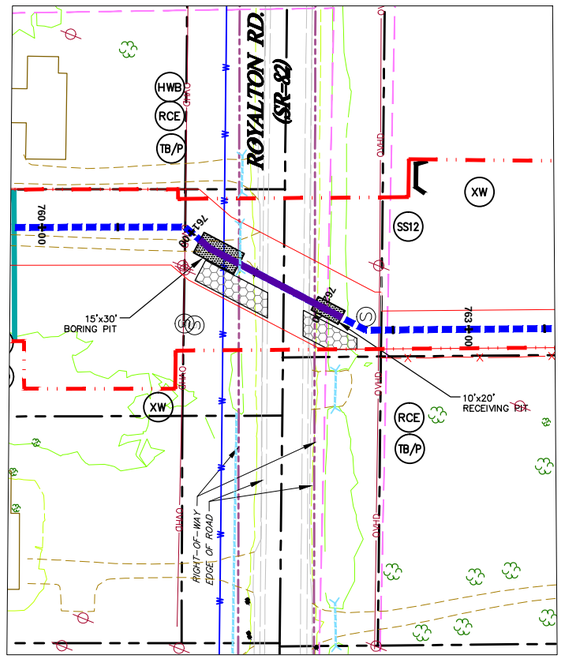
DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: AS NOTED

PROJECT NO. NRG-1007

SHEET NO. 74 OF 88

Hanover
Engineering Associates Inc
3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
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Fax 570.688.9768

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ROYALTON RD (SR-82)

SCALE: 1" = 50'

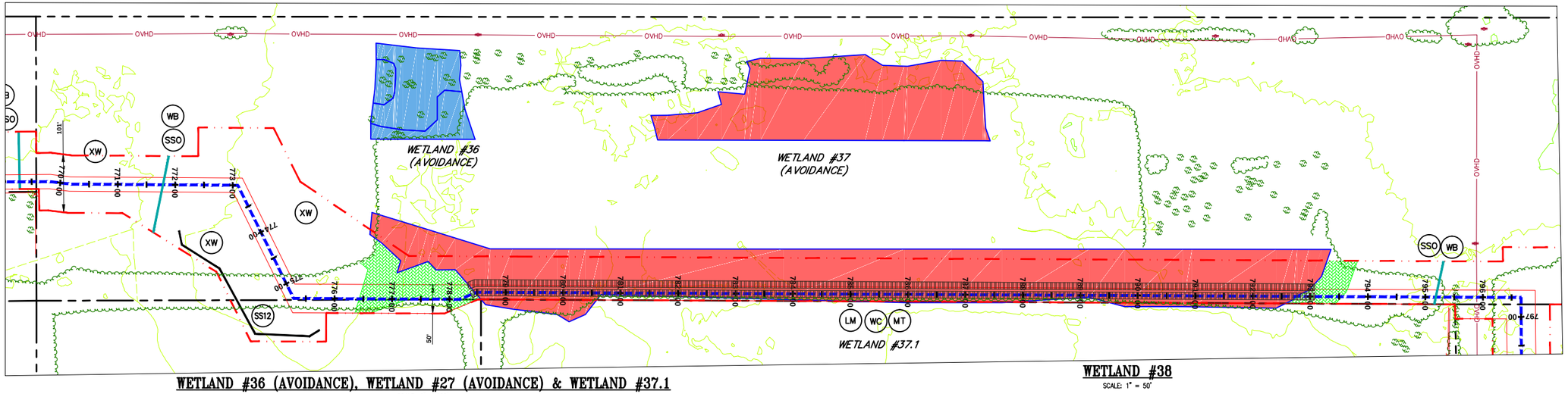
NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 5 FOR "RCE" DETAIL.
3. REFER TO DETAIL SHEET 5 FOR "AR" DETAIL.
4. REFER TO DETAIL SHEET 3 FOR "HWB" DETAIL. PLACE TRENCH BREAKERS ON EITHER SIDE OF THE EXISTING ROAD.
5. REFER TO DETAIL SHEET 3 FOR "STONE/DIRT TWP ROAD CROSSING DETAIL" OR "PAVED TWP ROAD CROSSING" FOR TRENCH BACKFILL AND ROAD SURFACE RESTORATION.
6. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.
7. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.

LEGEND

- INDEX CONTOUR (398)
- CONTOUR (400)
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- TEMP. CONSTRUCTION EASEMENT/LIMIT OF DISTURBANCE
- PERMANENT PIPELINE R.O.W.
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- WETLANDS (PEM/PSS, PFO)
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- XW — EXTRA WORKSPACE

LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE – 235 AC.



WETLAND #36 (AVOIDANCE), WETLAND #27 (AVOIDANCE) & WETLAND #37.1

SCALE: 1" = 100'

WETLAND #38

SCALE: 1" = 50'

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 3 FOR "WC" DETAIL.
5. PLACE SEDIMENT BARRIER/SIGNAGE AROUND PERIMETER OF WETLAND PRIOR TO ANY EARTHWORK. IF THE CONTRACTOR IS NOT SURE WHERE THE WETLAND "LIMIT" IS, HE SHALL CONTACT THE OWNER TO HAVE THE WETLAND REMARKED.
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7. REFER TO DETAIL SHEET 6 FOR "MT" DETAIL:
   a) WETLAND #37.1 USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "C".
8. REFER TO DETAIL SHEET 3 FOR "WB" DETAIL.
9. REFER TO DETAIL SHEET 3 FOR "SSO" DETAIL.
10. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.

GENERAL NOTES:

1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
2. STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

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SEAL

NO.	REVISIONS	DATE

E&SPC SITE DETAIL

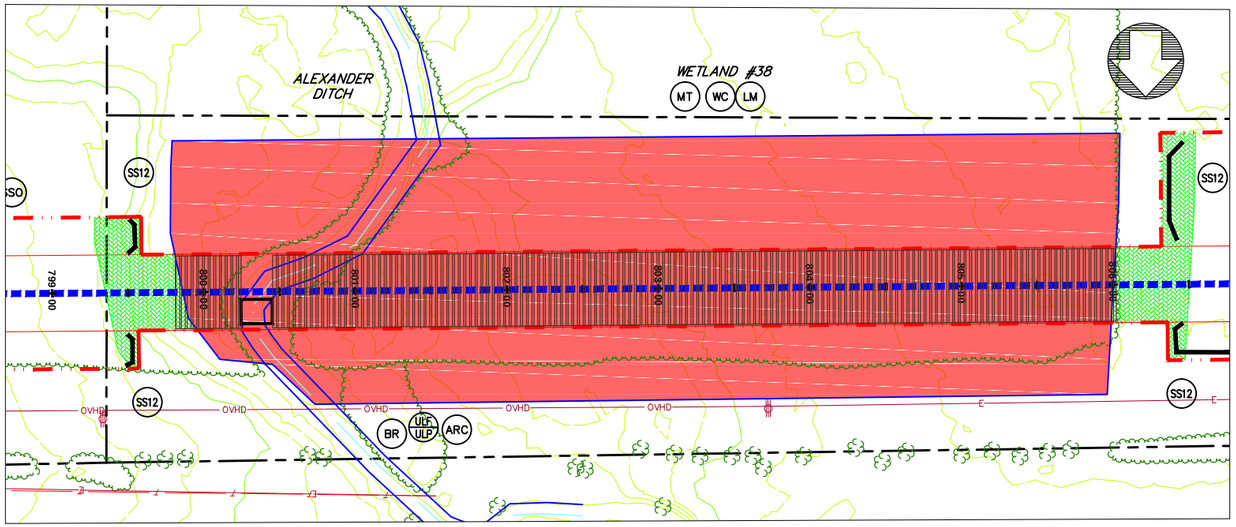
AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
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LORAIN COUNTY
OHIO

DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: AS NOTED
PROJECT NO. NRG-1007
SHEET NO. 75 OF 88

Hanover Engineering Associates Inc
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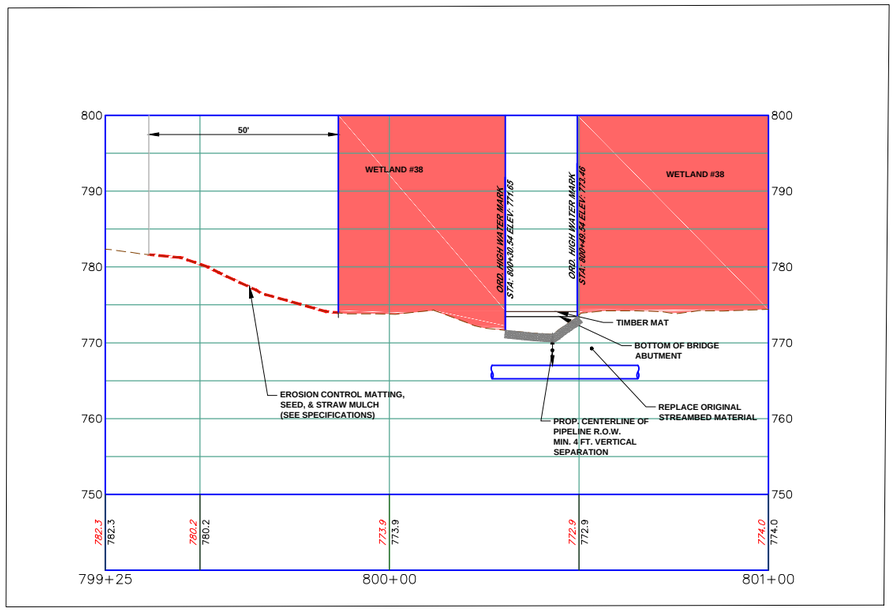


WETLAND #38 & ALEXANDER DITCH

SCALE: 1" = 50'

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 3 FOR "WC" DETAIL.
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5. REFER TO DETAIL SHEET 6 FOR "MT" DETAIL:
   a) WETLAND #38 USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "C".
   b) ALEXANDER DITCH USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "B".
6. REFER TO DETAIL SHEET 4 FOR "ULF" OR ULP" DETAIL. UTILIZE FOR STREAM CROSSINGS.
7. ALTHOUGH A BRIDGE IS SHOW, A TEMPORARY CULVERT CROSSING MAY BE INSTALLED. REFER TO DETAIL SHEET 1 FOR "BR" DETAIL AND FOR THE SPECIFIED SIZE AND NUMBER OF CULVERTS.
8. REFER TO DETAIL SHEET 4 FOR "ARC" DETAIL.
9. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.



ALEXANDER DITCH PROFILE

(ON 22x34 SHEET)
HORIZONTAL
GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

(ON 22x34 SHEET)
VERTICAL
GRAPHIC SCALE

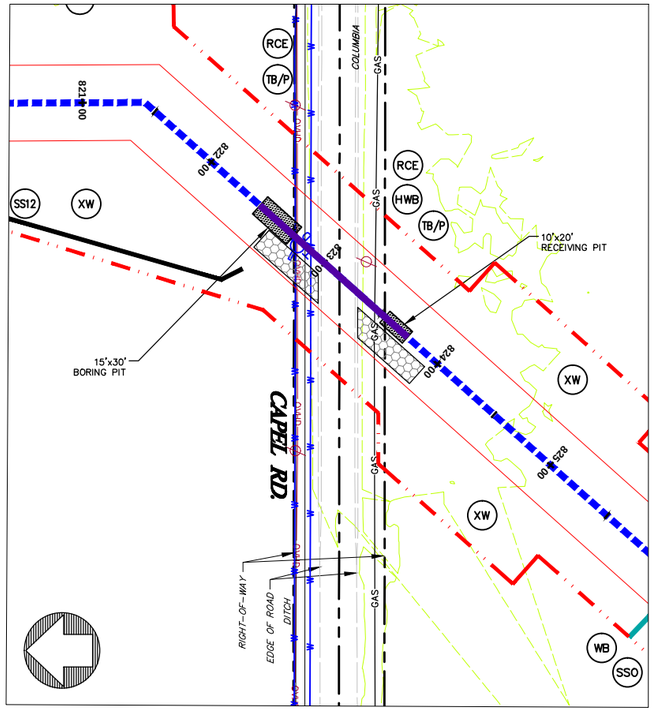
10 0 5 10 20 40

(IN FEET)
1 inch = 10 ft.

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.



CAPEL RD

SCALE: 1" = 50'

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 5 FOR "RCE" DETAIL.
3. REFER TO DETAIL SHEET 3 FOR "HWB" DETAIL. PLACE TRENCH BREAKERS ON EITHER SIDE OF THE EXISTING ROAD.
4. REFER TO DETAIL SHEET 3 FOR "STONE/DIRT TWP ROAD CROSSING DETAIL" OR "PAVED TWP ROAD CROSSING" FOR TRENCH BACKFILL AND ROAD SURFACE RESTORATION.
5. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.

LEGEND

- 398 — INDEX CONTOUR
- 400 — CONTOUR
- PROPERTY LINE
- TEMP. CONSTRUCTION EASEMENT/LIMIT OF DISTURBANCE
- PERMANENT PIPELINE R.O.W.
- CENTERLINE PIPELINE R.O.W.
- ABOVE GROUND PIPE
- CONVENTIONAL BORE
- HDD
- FENCE
- WOODS LINE — EDGE WOODS
- PEM/PSS / PFO — WETLANDS
- STONE WALL
- #0670106 — OVERHEAD/UTILITY POLE
- FLOW — PERENNIAL STREAM
- FLOW — EPHEMERAL/INTERMITTENT STREAM
- ORD. HIGH WATER MARK — ORD. HIGH WATER MARK LINE
- FLOODWAY
- LoB — SOIL TYPE & BOUNDARY
- SS12 — SILTSOXX OR EQUIV. 12" HEIGHT
- SS24 — SILTSOXX OR EQUIV. 24" HEIGHT
- SS32 — SILTSOXX OR EQUIV. 32" HEIGHT
- RCE — ROCK CONSTRUCTION ENTRANCE
- LM — LOG MAT
- MT — EROSION CONTROL MATTING
- SBR — STREAMBANK RESTORATION
- TP — TEMP. PIPE
- WB — WATERBAR
- RFB — ROCK FILTER BERM
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- WC — WETLAND CROSSING
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- AR — ACCESS ROAD
- HWB — HIGHWAY BORING
- HWC — HIGHWAY CUT
- APR — ACCESS RD. X-ING (PAVED ROAD)
- ARC — ACCESS RD. w/CULVERT
- ULF / ULP — UTILITY LINE STREAM X-ING WITH DAM AND PUMPING OR WITH PIPE FLUME
- TB/P — TRENCH BREAKER/PLUG
- LDG — LONGITUDINAL DIVERSION GRADING
- XW — EXTRA WORKSPACE

LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE – 235 AC.

GENERAL NOTES:

1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
2. STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.

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SEAL

NO.	REVISIONS	DATE

E&SPC SITE DETAIL

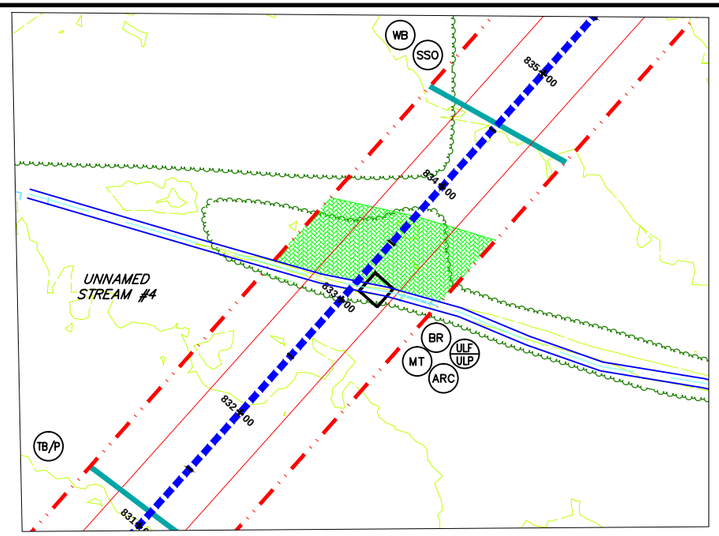
AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: AS NOTED
PROJECT NO. NRG-1007
SHEET NO. 76 OF 88

Hanover Engineering Associates Inc
3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768

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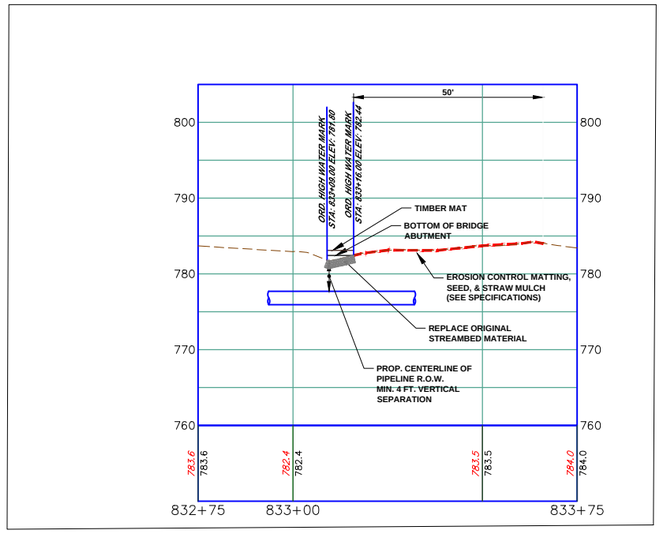


UNNAMED STREAM #4

SCALE: 1" = 50'

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 6 FOR "MT" DETAIL:
   a) UNNAMED STREAM #4 USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "B".
3. REFER TO DETAIL SHEET 4 FOR "ULF" OR ULP" DETAIL. UTILIZE FOR STREAM CROSSINGS.
4. ALTHOUGH A BRIDGE IS SHOW, A TEMPORARY CULVERT CROSSING MAY BE INSTALLED. REFER TO DETAIL SHEET 1 FOR "BR" DETAIL AND FOR THE SPECIFIED SIZE AND NUMBER OF CULVERTS.
5. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.



UNNAMED STREAM #4 PROFILE

(ON 22x34 SHEET)
HORIZONTAL
GRAPHIC SCALE

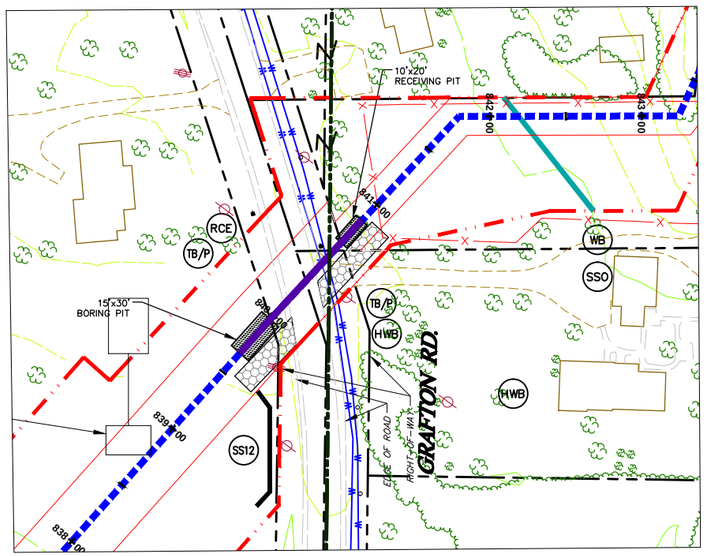
20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

(ON 22x34 SHEET)
VERTICAL
GRAPHIC SCALE

10 0 5 10 20 40

(IN FEET)
1 inch = 10 ft.



GRAFTON RD.

SCALE: 1" = 50'

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 3 FOR "HWB" DETAIL. PLACE TRENCH BREAKERS ON EITHER SIDE OF THE EXISTING ROAD.
3. REFER TO DETAIL SHEET 3 FOR "STONE/DIRT TWP ROAD CROSSING DETAIL" OR "PAVED TWP ROAD CROSSING" FOR TRENCH BACKFILL AND ROAD SURFACE RESTORATION.
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- CONVENTIONAL BORE
- HDD
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- FLOW — EPHEMERAL/INTERMITTENT STREAM
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- TP — TEMP. PIPE
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- ARC — ACCESS RD. w/CULVERT
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- TB/P — TRENCH BREAKER/PLUG
- LDG — LONGITUDINAL DIVERSION GRADING
- XW — EXTRA WORKSPACE

LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE – 235 AC.

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

GENERAL NOTES:

1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
2. STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.

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SEAL

NO.	REVISIONS	DATE

E&SPC SITE DETAIL

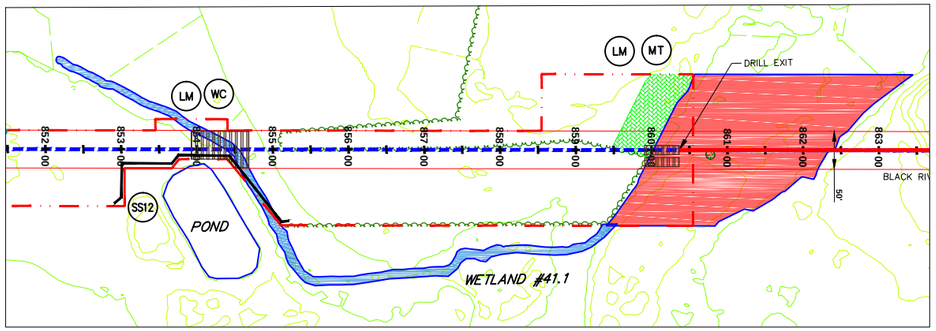
AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: AS NOTED
PROJECT NO. NRG-1007
SHEET NO. 77 OF 88

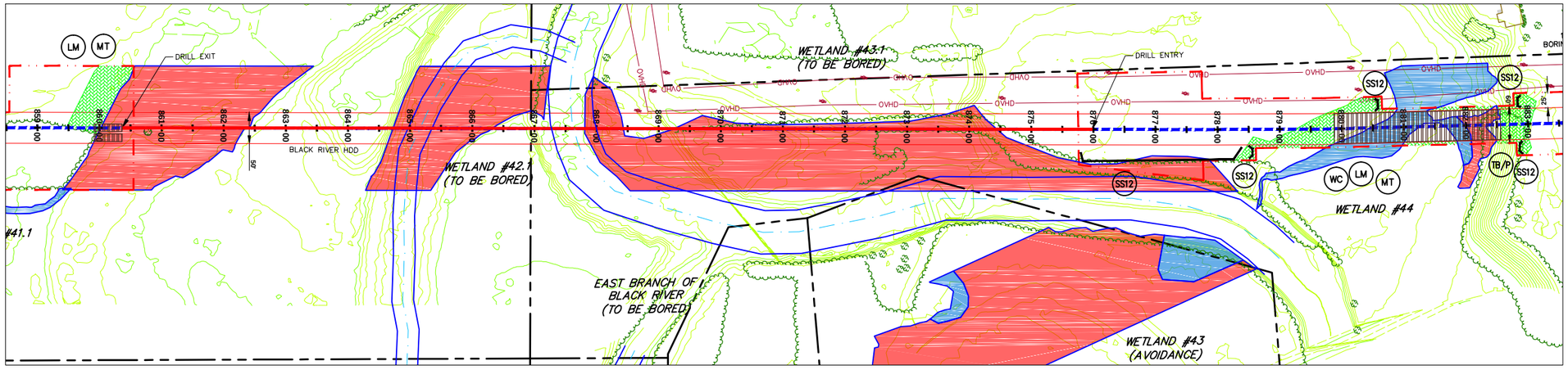
Hanover
Engineering Associates Inc
3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768

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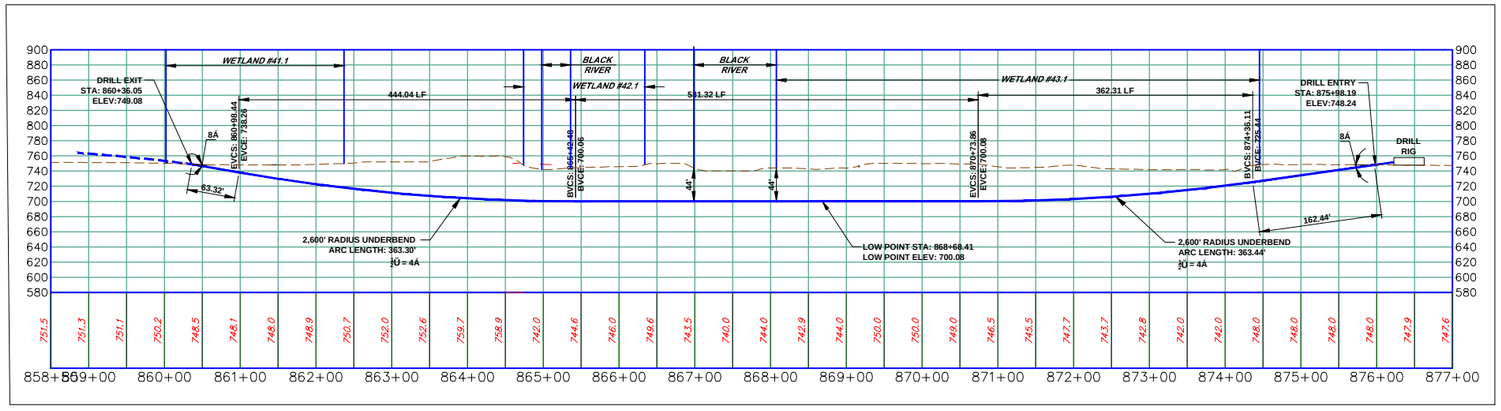
WETLAND #41.1

SCALE: 1" = 100'



WETLAND #42.1, BLACK RIVER, WETLAND #43 (AVOIDANCE), WETLAND #43.1 & WETLAND #44

SCALE: 1" = 100'



BLACK RIVER HDD

(ON 22x34 SHEET)
HORIZONTAL & VERTICAL

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100ft.

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 3 FOR "WC" DETAIL.
3. PLACE SEDIMENT BARRIER/SIGNAGE AROUND PERIMETER OF WETLAND PRIOR TO ANY EARTHWORK. IF THE CONTRACTOR IS NOT SURE WHERE THE WETLAND "LIMIT" IS, HE SHALL CONTACT THE OWNER TO HAVE THE WETLAND REMARKED.
4. THE CONTRACTOR SHALL PLACE LOG MATS TO CROSS THE WETLAND AREA. ALL APPLICABLE WETLAND AREA WITHIN THE LIMITS OF CONSTRUCTION/DISTURBANCE SHALL BE COVERED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY FINES AND/OR REPAIRS REQUIRED AS A RESULT OF DAMAGE TO WETLANDS AND WATERCOURSES AT NO COST TO THE FACILITY OWNER.
5. REFER TO DETAIL SHEET 6 FOR "MT" DETAIL:
   a) WETLAND #44 USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "C".
6. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.

LEGEND

- INDEX CONTOUR (398)
- CONTOUR (400)
- PROPERTY LINE
- TEMP. CONSTRUCTION EASEMENT/LIMIT OF DISTURBANCE
- PERMANENT PIPELINE R.O.W.
- CENTERLINE PIPELINE R.O.W.
- ABOVE GROUND PIPE
- CONVENTIONAL BORE
- HDD
- FENCE
- EDGE WOODS (WOODS LINE)
- WETLANDS (PEM/PSS, PFO)
- STONE WALL
- OVERHEAD/UTILITY POLE (#0670106)
- PERENNIAL STREAM (FLOW)
- EPHEMERAL/INTERMITTENT STREAM (FLOW)
- ORD. HIGH WATER MARK LINE (ORD. HIGH WATER MARK)
- FLOODWAY
- SOIL TYPE & BOUNDARY (LoB)
- SS12 SILTSOXX OR EQUIV. 12" HEIGHT
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- MT EROSION CONTROL MATTING
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- RFB ROCK FILTER BERM
- BR BRIDGE
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- APR ACCESS RD. X-ING (PAVED ROAD)
- ARC ACCESS RD. w/CULVERT
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- LDG LONGITUDINAL DIVERSION GRADING
- XW EXTRA WORKSPACE

LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE – 235 AC.

GENERAL NOTES:

1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
2. STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.

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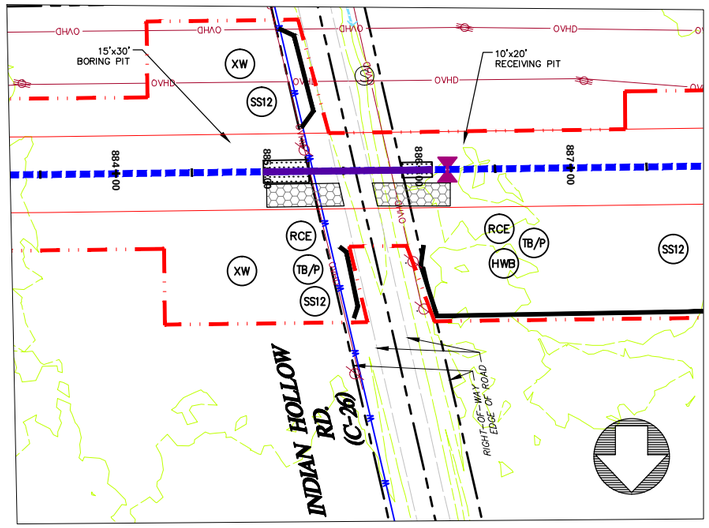
AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: AS NOTED
PROJECT NO. NRG-1007
SHEET NO. 78 OF 88

Hanover Engineering Associates Inc
3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768

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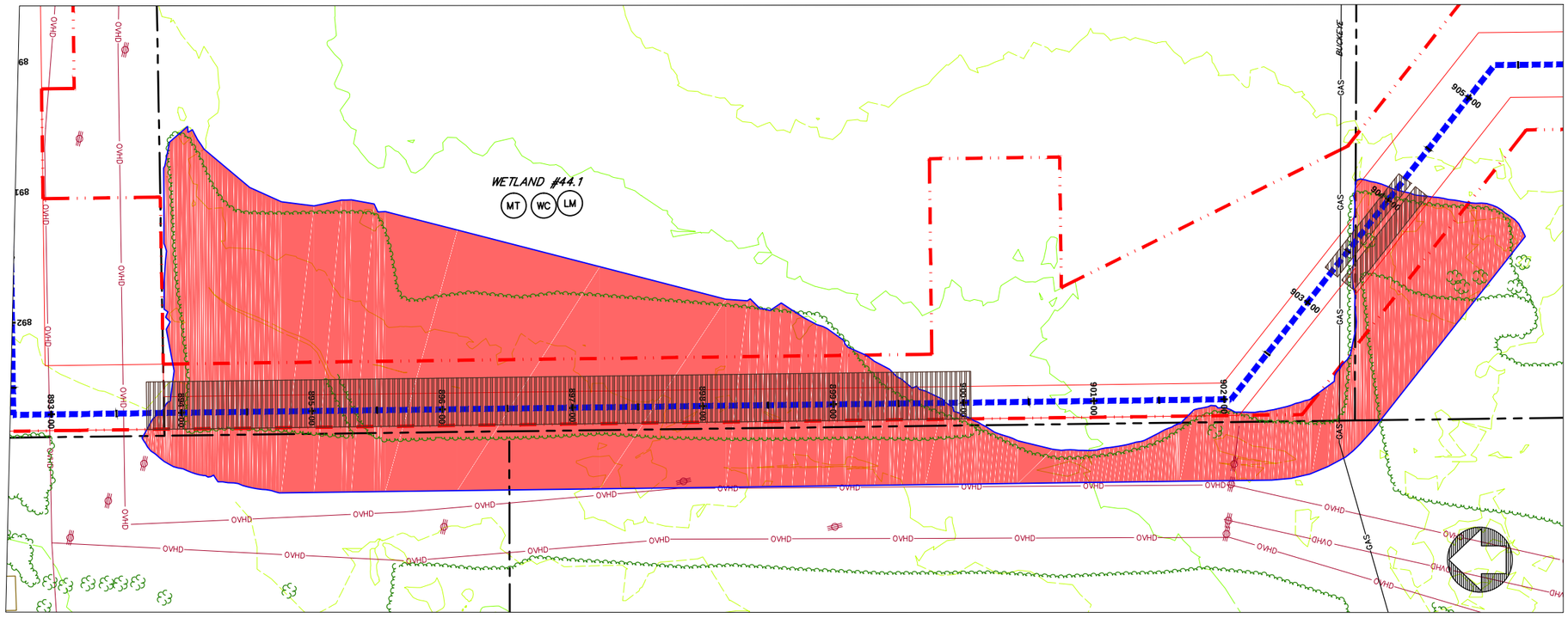


INDIAN HOLLOW ROAD

SCALE: 1" = 50'

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 5 FOR "RCE" OR "BRCE" DETAIL.
3. REFER TO DETAIL SHEET 3 FOR "HWB" DETAIL. PLACE TRENCH BREAKERS ON EITHER SIDE OF THE EXISTING ROAD.
4. REFER TO DETAIL SHEET 3 FOR "STONE/DIRT TWP ROAD CROSSING DETAIL" OR "PAVED TWP ROAD CROSSING" FOR TRENCH BACKFILL AND ROAD SURFACE RESTORATION.
5. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.



WETLAND #44.1

SCALE: 1" = 50'

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 3 FOR "WC" DETAIL.
3. PLACE SEDIMENT BARRIER/SIGNAGE AROUND PERIMETER OF WETLAND PRIOR TO ANY EARTHWORK. IF THE CONTRACTOR IS NOT SURE WHERE THE WETLAND "LIMIT" IS, HE SHALL CONTACT THE OWNER TO HAVE THE WETLAND REMARKED.
4. THE CONTRACTOR SHALL PLACE LOG MATS TO CROSS THE WETLAND AREA. ALL APPLICABLE WETLAND AREA WITHIN THE LIMITS OF CONSTRUCTION/DISTURBANCE SHALL BE COVERED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY FINES AND/OR REPAIRS REQUIRED AS A RESULT OF DAMAGE TO WETLANDS AND WATERCOURSES AT NO COST TO THE FACILITY OWNER.
5. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.

LEGEND

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- CONTOUR (400)
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- LDG — LONGITUDINAL DIVERSION GRADING
- XW — EXTRA WORKSPACE

LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE – 235 AC.

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)

1 inch = 50 ft.

GENERAL NOTES:

1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
2. STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.

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E&SPC SITE DETAIL

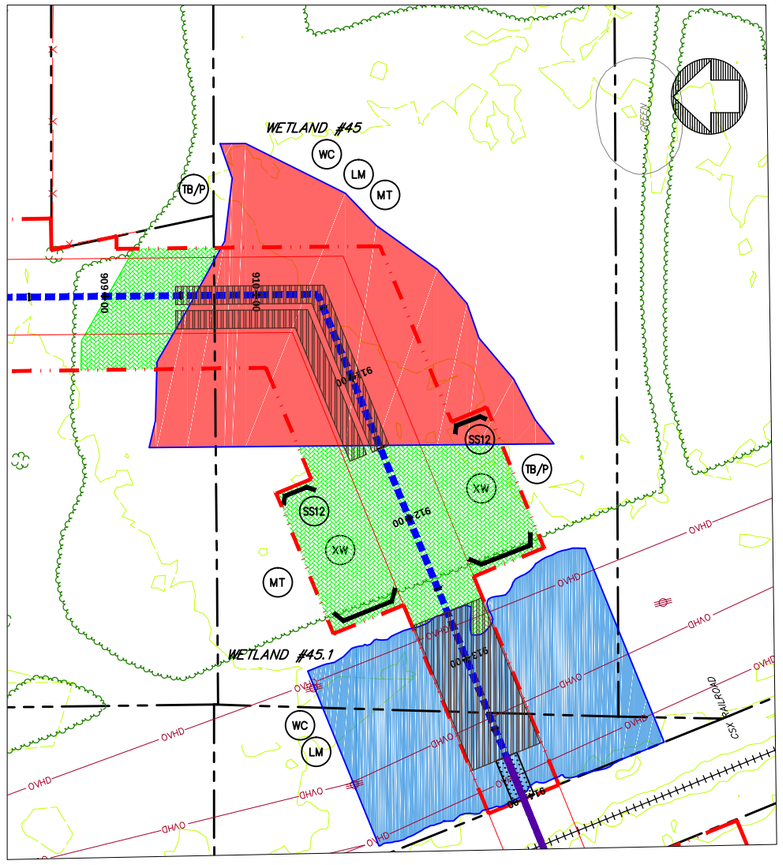
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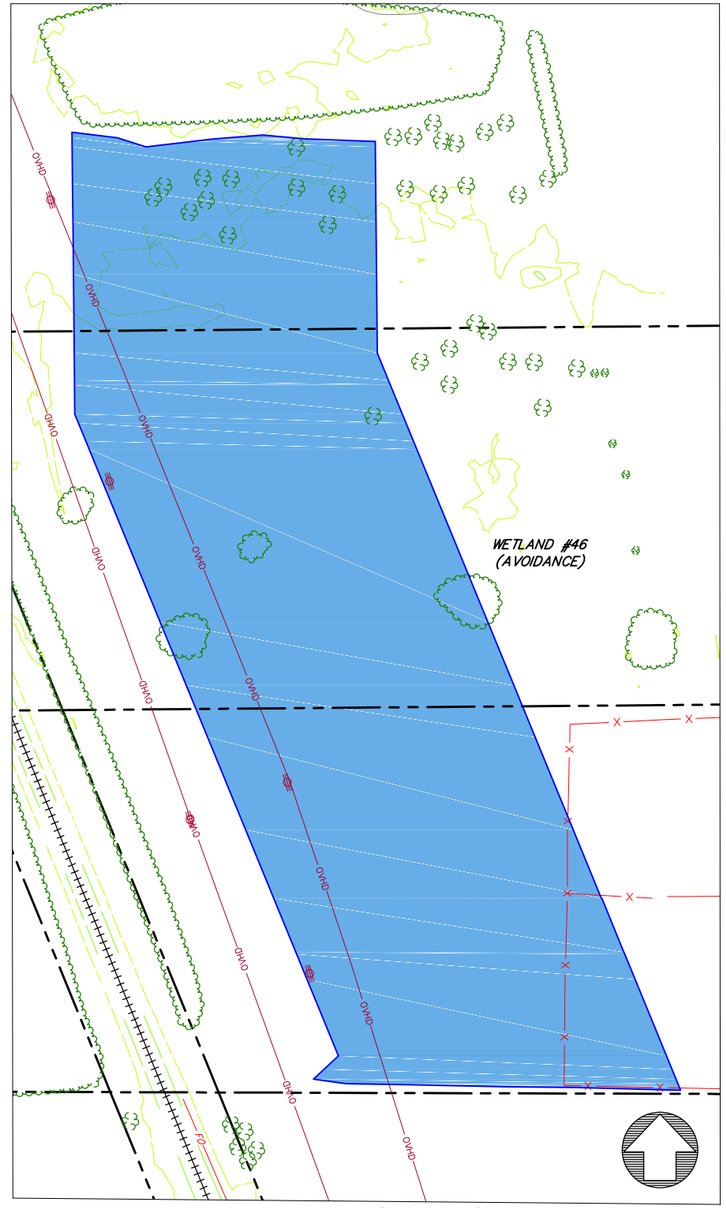


WETLAND #45 & WETLAND #45.1

SCALE: 1" = 50'

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 3 FOR "WC" DETAIL.
3. PLACE SEDIMENT BARRIER/SIGNAGE AROUND PERIMETER OF WETLAND PRIOR TO ANY EARTHWORK. IF THE CONTRACTOR IS NOT SURE WHERE THE WETLAND "LIMIT" IS, HE SHALL CONTACT THE OWNER TO HAVE THE WETLAND REMARKED.
4. THE CONTRACTOR SHALL PLACE LOG MATS TO CROSS THE WETLAND AREA. ALL APPLICABLE WETLAND AREA WITHIN THE LIMITS OF CONSTRUCTION/DISTURBANCE SHALL BE COVERED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY FINES AND/OR REPAIRS REQUIRED AS A RESULT OF DAMAGE TO WETLANDS AND WATERCOURSES AT NO COST TO THE FACILITY OWNER.
5. REFER TO DETAIL SHEET 6 FOR "MT" DETAIL:
   a) WETLAND #45 & #45.1 USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "C".
6. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.



WETLAND #46 (AVOIDANCE)

SCALE: 1" = 50'

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- CONTOUR (400)
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- ULF / ULP — UTILITY LINE STREAM X-ING WITH DAM AND PUMPING OR WITH PIPE FLUME
- TB/P — TRENCH BREAKER/PLUG
- LDG — LONGITUDINAL DIVERSION GRADING
- XW — EXTRA WORKSPACE

LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE – 235 AC.

GENERAL NOTES:

1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
2. STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

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SEAL

NO.	REVISIONS	DATE

E&SPC SITE DETAIL

AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

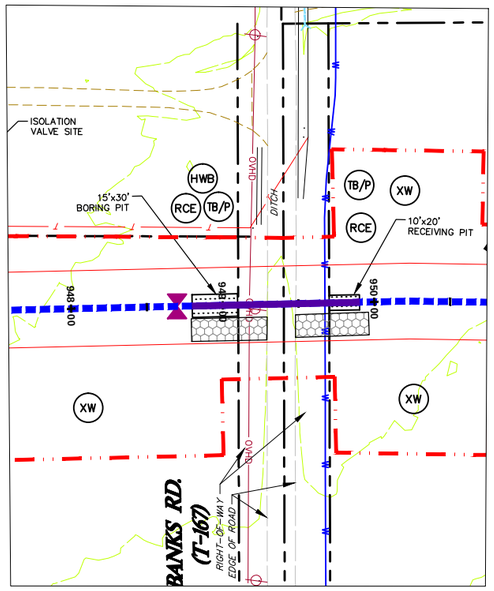
DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: AS NOTED

PROJECT NO. NRG–1007

SHEET NO. 80 OF 88

Hanover Engineering Associates Inc
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Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768

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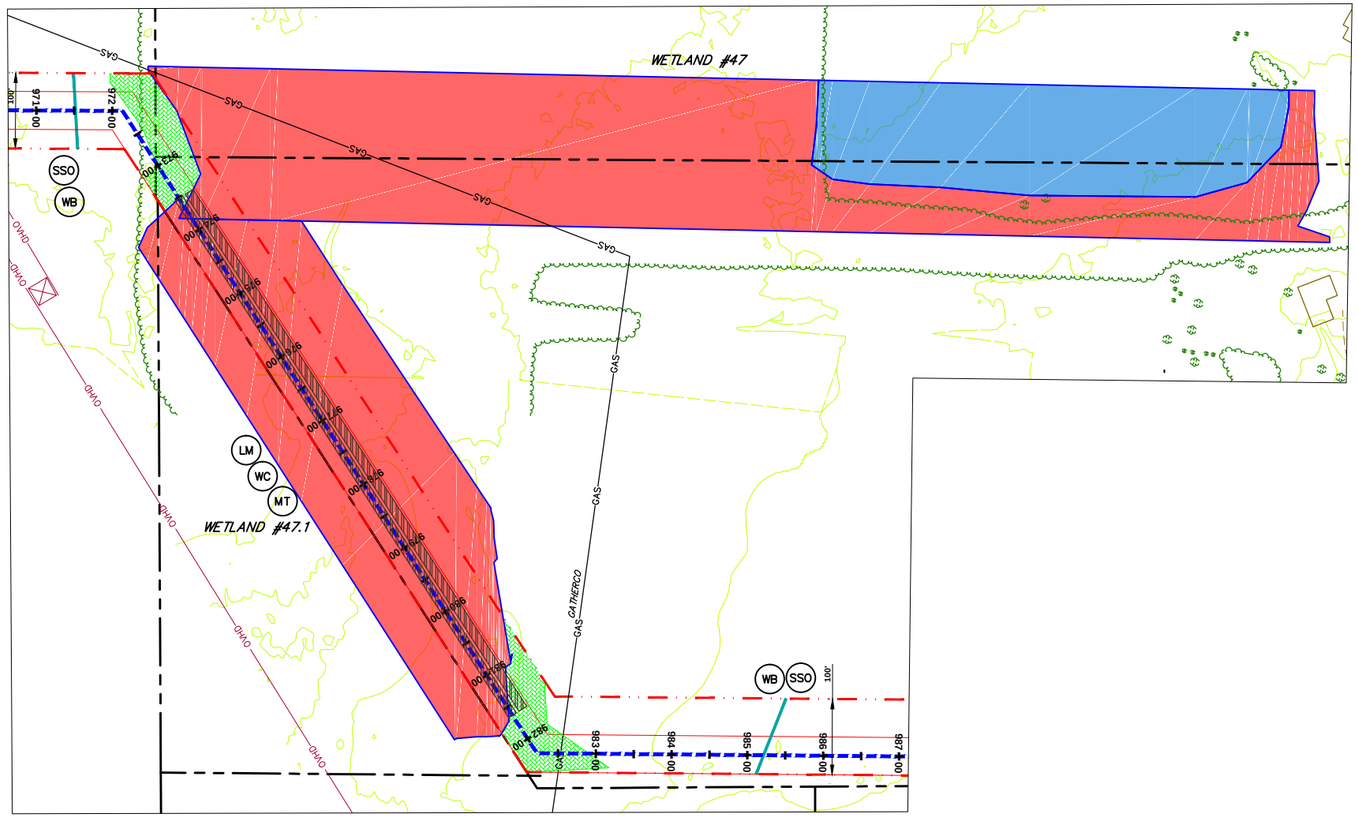


BANKS ROAD

SCALE: 1" = 50'

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 5 FOR "RCE" OR "BRCE" DETAIL.
3. REFER TO DETAIL SHEET 3 FOR "HWB" DETAIL. PLACE TRENCH BREAKERS ON EITHER SIDE OF THE EXISTING ROAD.
4. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.



WETLAND #47 & WETLAND #47.1

SCALE: 1" = 100'

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 3 FOR "WB" DETAIL.
3. REFER TO DETAIL SHEET 3 FOR "SSO" DETAIL.
4. REFER TO DETAIL SHEET 3 FOR "WC" DETAIL.
5. PLACE SEDIMENT BARRIER/SIGNAGE AROUND PERIMETER OF WETLAND PRIOR TO ANY EARTHWORK. IF THE CONTRACTOR IS NOT SURE WHERE THE WETLAND "LIMIT" IS, HE SHALL CONTACT THE OWNER TO HAVE THE WETLAND REMARKED.
6. THE CONTRACTOR SHALL PLACE LOG MATS TO CROSS THE WETLAND AREA. ALL APPLICABLE WETLAND AREA WITHIN THE LIMITS OF CONSTRUCTION/DISTURBANCE SHALL BE COVERED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY FINES AND/OR REPAIRS REQUIRED AS A RESULT OF DAMAGE TO WETLANDS AND WATERCOURSES AT NO COST TO THE FACILITY OWNER.
7. REFER TO DETAIL SHEET 6 FOR "MT" DETAIL:
   a) WETLAND #47 & 47.1 USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "C".
8. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.

LEGEND

- 398 — INDEX CONTOUR
- 400 — CONTOUR
- PROPERTY LINE
- TEMP. CONSTRUCTION EASEMENT/LIMIT OF DISTURBANCE
- PERMANENT PIPELINE R.O.W.
- CENTERLINE PIPELINE R.O.W.
- ABOVE GROUND PIPE
- CONVENTIONAL BORE
- HDD
- FENCE
- WOODS LINE — EDGE WOODS
- PEM/PSS | PFO — WETLANDS
- STONE WALL
- #0670106 — OVERHEAD/UTILITY POLE
- FLOW — PERENNIAL STREAM
- FLOW — EPHEMERAL/INTERMITTENT STREAM
- ORD. HIGH WATER MARK — ORD. HIGH WATER MARK LINE
- FLOODWAY
- LoB — SOIL TYPE & BOUNDARY
- SS12 — SILTSOXX OR EQUIV. 12" HEIGHT
- SS24 — SILTSOXX OR EQUIV. 24" HEIGHT
- SS32 — SILTSOXX OR EQUIV. 32" HEIGHT
- RCE — ROCK CONSTRUCTION ENTRANCE
- LM — LOG MAT
- MT — EROSION CONTROL MATTING
- SBR — STREAMBANK RESTORATION
- TP — TEMP. PIPE
- WB — WATERBAR
- RFB — ROCK FILTER BERM
- BR — BRIDGE
- WC — WETLAND CROSSING
- SSO — SEDIMENT SILT SOXX PROTECTION AT WATER BAR
- AR — ACCESS ROAD
- HWB — HIGHWAY BORING
- HWC — HIGHWAY CUT
- APR — ACCESS RD. X-ING (PAVED ROAD)
- ARC — ACCESS RD. w/CULVERT
- ULF / ULP — UTILITY LINE STREAM X-ING WITH DAM AND PUMPING OR WITH PIPE FLUME
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- XW — EXTRA WORKSPACE

LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE – 235 AC.

GENERAL NOTES:

1. SEE DETAIL SHEET 1 FOR SCHEDULE FOR PIPES/BRIDGES.
2. STREAM BUFFER IS 25 FEET FROM THE ORDINARY HIGH WATER MARK AND WETLAND BUFFER IS 25 FT. FROM WETLAND BOUNDARY.

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)

1 inch = 50 ft.

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E&SPC SITE DETAIL

AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
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LORAIN COUNTY
OHIO

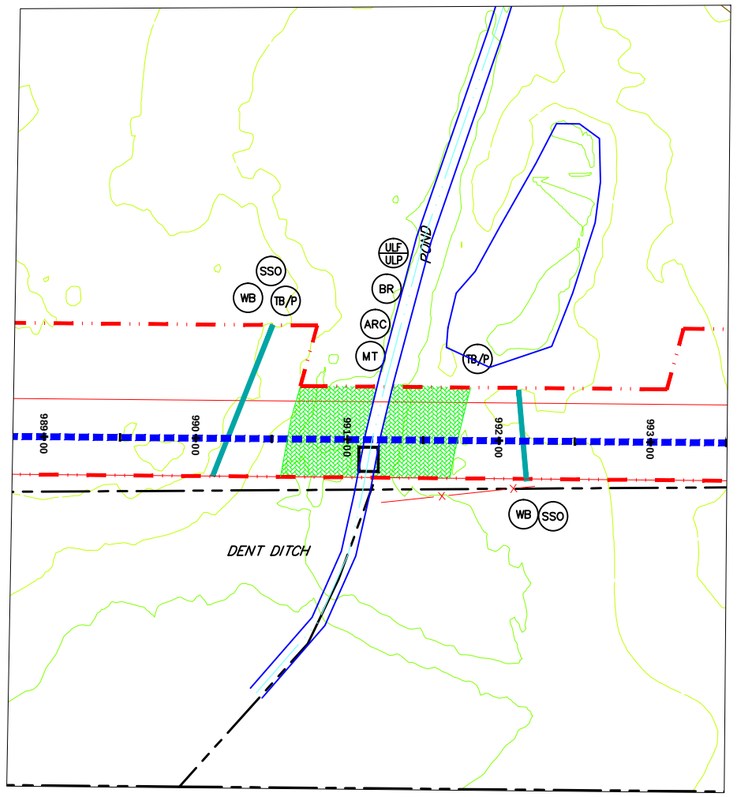
DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: AS NOTED

PROJECT NO. NRG-1007

SHEET NO. 81 OF 88

Hanover Engineering Associates Inc
3355 Route 611, Suite 1
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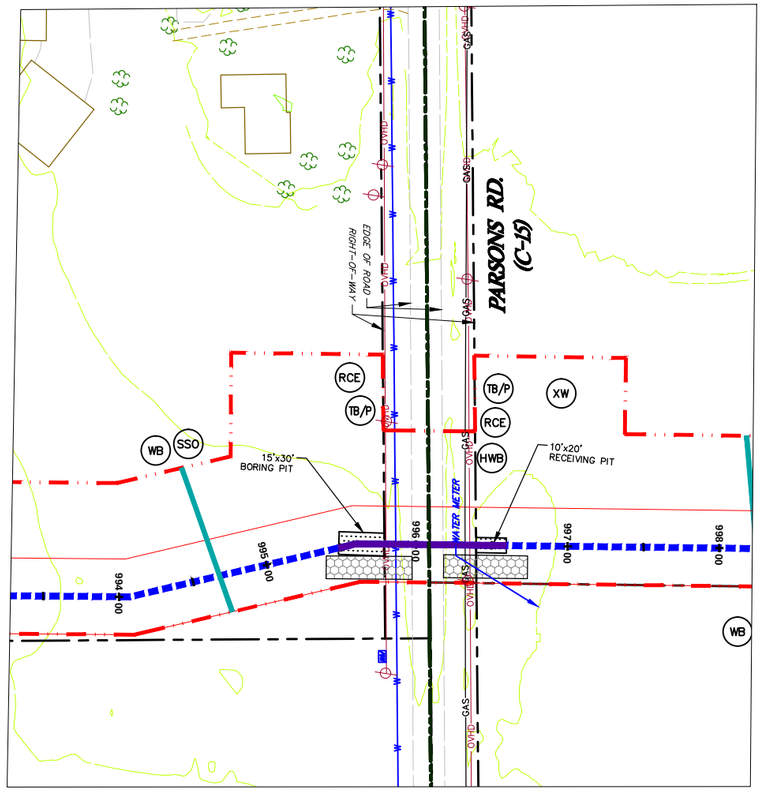


DENT DITCH

SCALE: 1" = 50'

NOTES:

1. REFER TO DETAIL SHEET 3 FOR "TB/P" DETAIL. ADDITIONAL TRENCH BREAKERS SHALL BE USED IF NEEDED.
2. REFER TO DETAIL SHEET 3 FOR "WB" DETAIL.
3. REFER TO DETAIL SHEET 3 FOR "SSO" DETAIL.
4. REFER TO DETAIL SHEET 6 FOR "MT" DETAIL:
   a) DENT DITCH USE BLANKET TYPE S75 OR APPROVED EQUAL, STAPLE PATTERN "B".
5. REFER TO DETAIL SHEET 4 FOR "ULF" OR ULP" DETAIL. UTILIZE FOR STREAM CROSSINGS.
6. ALTHOUGH A BRIDGE IS SHOW, A TEMPORARY CULVERT CROSSING MAY BE INSTALLED. REFER TO DETAIL SHEET 1 FOR "BR" DETAIL AND FOR THE SPECIFIED SIZE AND NUMBER OF CULVERTS.
7. REFER TO DETAIL SHEET 4 FOR "ARC" DETAIL.
8. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.



PARSONS RD.

SCALE: 1" = 50'

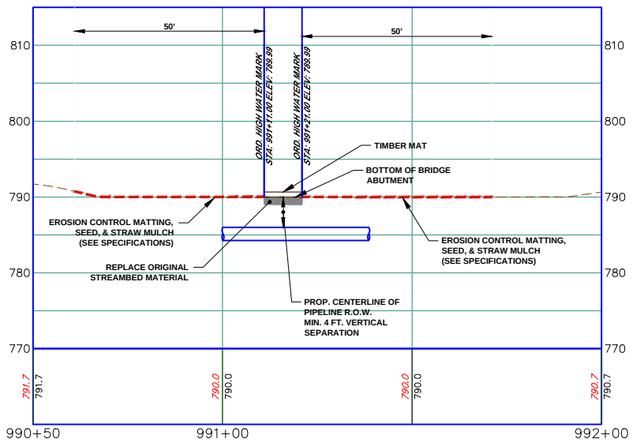
NOTES:

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2. REFER TO DETAIL SHEET 5 FOR "RCE" DETAIL.
3. REFER TO DETAIL SHEET 3 FOR "HWB" DETAIL. PLACE TRENCH BREAKERS ON EITHER SIDE OF THE EXISTING ROAD.
4. REFER TO DETAIL SHEET 3 FOR "STONE/DIRT TWP ROAD CROSSING DETAIL" OR "PAVED TWP ROAD CROSSING" FOR TRENCH BACKFILL AND ROAD SURFACE RESTORATION.
5. REFER TO DETAIL SHEET 3 FOR "FB" DETAIL.

LEGEND

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- 400 — CONTOUR
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LIMIT OF CONSTRUCTION AND LIMIT OF DISTURBANCE – 235 AC.



DENT DITCH PROFILE

(ON 22x34 SHEET)
HORIZONTAL
GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

(ON 22x34 SHEET)
VERTICAL
GRAPHIC SCALE

10 0 5 10 20 40

(IN FEET)
1 inch = 10 ft.

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

GENERAL NOTES:

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E&SPC SITE DETAIL

AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: AS NOTED

PROJECT NO. NRG-1007

SHEET NO. 82 OF 88

Hanover
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Instructions For Staging Of Earthmoving Activities:

CONSTRUCTION MUST BE IN ACCORDANCE WITH THE FOLLOWING SCHEDULE. THIS SCHEDULE IS DESIGNED TO MINIMIZE SOIL EROSION AND SEDIMENTATION. THE CONTRACTOR MAY DEVIATE SLIGHTLY FROM THE STAGING OF PERMANENT SITE IMPROVEMENTS, BUT NO DEVIATION FROM THE RELATIVE ORDER OF EROSION AND SEDIMENTATION CONTROL MEASURES WILL BE ALLOWED.

FACILITIES TO CONTROL THE TRANSPORT OF SOIL MATERIAL FROM THE CONSTRUCTION AREA SHALL BE INSTALLED PRIOR TO ANY EARTH DISTURBANCE OR PAVEMENT REMOVAL.

NOTE: THE STAGING OF EARTHMOVING ACTIVITIES FOR THIS PROJECT IS A GENERAL DESCRIPTION OF THE WORK REQUIRED. ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH COMPANY STANDARDS, THE OHIO DEPARTMENT OF ENVIRONMENTAL PROTECTION REGULATIONS, AND ALL OTHER APPLICABLE FEDERAL, STATE OR LOCAL REQUIREMENTS.

ALL EARTH DISTURBANCE ACTIVITIES SHALL PROCEED IN ACCORDANCE WITH THE FOLLOWING SEQUENCE. CONSTRUCTION MAY START AT MULTIPLE POINTS. THE CONTRACTOR SHALL PLACE ALL BMPS FOR THAT SECTION OR AREA PRIOR TO THE START OF CONSTRUCTION.

AT LEAST SEVEN (7) DAYS BEFORE STARTING ANY EARTH DISTURBANCE ACTIVITIES, THE COMPANY SHALL INVITE ALL CONTRACTORS INVOLVED IN THOSE ACTIVITIES, ALL APPROPRIATE MUNICIPAL, STATE & FEDERAL OFFICIALS, THE LOCAL COUNTY CONSERVATION DISTRICT, AND THE EROSION AND SEDIMENTATION CONTROL PLAN PREPARER TO AN ON-SITE PRECONSTRUCTION MEETING. THE MAIN LINE CONTRACTOR SHALL HAVE PRESENT THE SUPERVISORY PERSON RESPONSIBLE FOR THE GENERAL CONSTRUCTION AND SUPERVISORY PERSON RESPONSIBLE FOR THE INSTALLATION AND MAINTENANCE OF BMPS FOR THE PROJECT. THE COMPANY SHALL HAVE PRESENT AT LEAST ONE COMPANY PERSON WHO HAS ENFORCEMENT AUTHORITY TO ASSURE THAT THE CONTRACTOR COMPLIES WITH THE DESIGNED BMPS. THE COMPANY SHOULD ALSO HAVE AT LEAST ONE OF THE COMPANY'S INSPECTION PERSONNEL (WITH STOP WORK AUTHORITY) WHO WILL BE ON SITE TO ASSURE THAT THE CONTRACTOR COMPLIES WITH THE DESIGNED BMPS AND IS QUALIFIED TO DIRECT THE INSTALLATION OF ADDITIONAL BMPS AS NECESSARY. BEFORE IMPLEMENTING ANY REVISIONS TO THE APPROVED EROSION AND SEDIMENT CONTROL PLAN OR REVISIONS TO OTHER PLANS WHICH MAY AFFECT THE EFFECTIVENESS OF THE APPROVED E & S CONTROL PLAN, THE OPERATOR MUST RECEIVE APPROVAL OF THE REVISIONS FROM THE COUNTY CONSERVATION DISTRICT.

AT LEAST THREE (3) DAYS BEFORE STARTING ANY EARTH DISTURBANCE ACTIVITIES, ALL CONTRACTORS INVOLVED IN THOSE ACTIVITIES SHALL NOTIFY THE ONE CALL SYSTEM INCORPORATED AT 1-800-362-2764 FOR BURIED UTILITIES LOCATION.

BEFORE IMPLEMENTING ANY REVISIONS TO THE APPROVED EROSION AND SEDIMENTATION CONTROL PLAN OR REVISIONS TO OTHER PLANS WHICH MAY AFFECT THE EFFECTIVENESS OF THE APPROVED E&S PLAN, THE OPERATOR MUST RECEIVE APPROVAL OF THE REVISIONS FROM THE APPROPRIATE CONSERVATION DISTRICT.

THE CONTRACTOR SHALL REMOVE FROM THE SITE, RECYCLE, OR DISPOSE OF ALL BUILDING MATERIALS AND WASTES IN ACCORDANCE WITH OHIO EPA'S SOLID WASTE MANAGEMENT REGULATIONS AT OAC CHAPTER 3745. THE CONTRACTOR SHALL NOT ILLEGALLY BURY, DUMP, OR DISCHARGE ANY BUILDING MATERIAL OR WASTES AT THE SITE. BEFORE DISPOSING OF SOIL OR RECEIVING BORROW FOR THE SITE, THE CONTRACTOR MUST ASSURE THAT EACH SOIL OR BORROW AREA HAS AN EROSION AND SEDIMENTATION CONTROL PLAN APPROVED BY OHIO EPA, AND WHICH IS BEING IMPLEMENTED AND MAINTAINED ACCORDING TO THEIR REGULATIONS.

THE APPROVED EROSION AND SEDIMENTATION CONTROL PLAN INCLUDING THE SOIL EROSION CONTROL DRAWINGS AND NARRATIVE SHALL BE AVAILABLE ON SITE AT ALL TIMES DURING EARTH DISTURBANCE.

SEQUENCE OF BMP INSTALLATION AND REMOVAL DURING PIPELINE CONSTRUCTION

1. STAKE/FLAG DISTURBED RIGHT-OF-WAY EXTENTS, CLEARLY IDENTIFYING WETLAND AND STREAM EDGES AND BUFFERS. INSTALL SIGNS OR OTHER MEANS TO IDENTIFY IMPORTANT PROJECT ATTRIBUTES SUCH AS APPROVED ACCESS ROADS, NO REFUELING ZONES, WETLAND/STREAM BOUNDS, ETC.
2. SCHEDULE A PRECONSTRUCTION CONFERENCE AS DESCRIBED ABOVE AND PROVIDE AT LEAST THREE (3) WORKING DAYS, SEVENTY-TWO (72 HOURS) NOTICE TO THE OHIO EPA PRIOR TO COMMENCEMENT OF SITE GRADING WORK.
   NOTE: IT IS INTENDED THAT THE PIPELINE PROJECT WILL BEGIN AT ONE END AND PROGRESS IN AN ORDERLY FASHION TO THE OTHER END. IT IS ALSO INTENDED THAT DISTURBED SOILS WILL BE RESTORED TO THEIR VEGETATED STATE AS SOON AS IS PRACTICAL WITH PERMANENT BMPS PROPERLY INSTALLED AND MAINTAINED. DUE TO THE NATURE OF THE TERRAIN AND OTHER FACTORS, DEVIATION FROM THE SEQUENTIAL PROGRESS OF THE PROJECT FROM ONE END TO THE OTHER WILL BE ALLOWED WITH PERMISSION FROM THE COMPANY, BUT THE SEQUENCE OF BMP INSTALLATION RELATED TO SOIL DISTURBANCE, ESPECIALLY STREAM AND WETLAND CROSSINGS, IS AN ABSOLUTE.
3. PRIOR TO ACCESSING THE RIGHT-OF-WAY FROM A PUBLIC ROAD, INSTALL THE REQUIRED BMPS PER THE SPECIFIC DETAIL DESIGN. THE PRIORITY IS TYPICALLY TO FIRST BE SILT FENCE, FILTER SOXX, STRAW BALES, ETC., THEN CULVERTS IF REQUIRED, FOLLOWED BY ROCK PADS AND THEN ALL OTHER BMPS AS DESIGNED.
4. FOR RIGHT-OF-WAY IN UPLAND AREAS, THE RIGHT-OF-WAY IS FIRST TO MOWED/BRUSH HOGGED/HYDRO-AXED; TREES CUT; BRUSH, LIMBS, AND TREES UNDER 6 INCHES CHIPPED, WITH CHIPS BROADCAST OFF RIGHT-OF-WAY (PROVIDED ON SAME PROPERTY COVERED BY R.O.W. OPTION) AND LOGS STACKED IN DESIGNATED AREAS.
5. AS STREAMS OR WETLANDS ARE ENCOUNTERED DURING CLEARING, INSTALL TEMPORARY OR PERMANENT BMPS PER DETAILED DESIGN. TEMPORARY BMPS ARE TO INCLUDE SILT FENCE OR EQUIVALENT ACROSS ENTIRE RIGHT-OF-WAY ON BOTH SIDES UNTIL PERMANENT BMPS ARE INSTALLED. CLEARING EQUIPMENT IS NOT TO CROSS ANY STREAM OR WETLAND EXCEPT ON TIMBER MATS.
6. IN ACTIVE AGRICULTURAL AREAS, CROPS ARE TO BE BRUSH HOGGED IF NECESSARY AND THE TOPSOIL STRIPPED PRIOR TO ANY VEHICULAR TRAVEL ON THE RIGHT-OF-WAY. ALL TOPSOIL THAT IS STRIPPED IS TO BE PLACED ON ONE SIDE OF THE RIGHT-OF-WAY IN THE DESIGNATED AREA ON TOP OF UNDISTURBED TOPSOIL. FOR RIGHT-OF-WAY WHICH SPECIFIC BMPS SUCH AS UPSLOPE DIVERSION DITCHES, SILT FENCE, ETC. IS DESIGNED; THOSE BMPS ARE TO BE INSTALLED PRIOR TO STRIPPING.
7. PRIOR TO GRADING OR OTHER EARTH DISTURBANCE ON THE RIGHT-OF-WAY, PERMANENT DOWN SLOPE BMPS ARE TO BE INSTALLED. SPECIFICALLY, AS GRADING APPROACHES STREAM OR WETLAND CROSSINGS, NO EARTH DISTURBANCE IS TO OCCUR WITHIN 50 FEET OF THE STREAM OR WETLAND WITHOUT DESIGNED BMPS INSTALLED AT THAT PARTICULAR CROSSING.
8. AT THE END OF EACH WORK DAY WHERE THE RIGHT-OF-WAY HAS BEEN GRADED INCLUDING ANY STRIPPING, STUMPING, LEVELING, TWO-TONE ON SIDE SLOPES, ETC., BMPS ARE TO BE INSTALLED. IN NO CASE IS THE CONTRACTOR TO LEAVE THE JOB SITE AT THE END OF THE WORK DAY WITHOUT TEMPORARY OR PERMANENT BMPS (SPECIFICALLY WATER BARS) BEING INSTALLED. THE CONTRACTOR IS NOT REQUIRED TO MAINTAIN WATER BARS DURING THE WORK DAY UNLESS THE ENVIRONMENTAL INSPECTOR DETERMINES THAT THERE IS A RISK OF A RAIN EVENT THAT WARRANTS THEIR INSTALLATION/MAINTENANCE.
9. AS CROSSINGS ARE CONSTRUCTED, THE DETAIL DESIGN IS TO BE FOLLOWED PAYING PARTICULAR ATTENTION TO THE SPECIFIC NOTES SECTION OF THE DRAWING.
10. ONCE ALL REQUIRED BMPS ARE IN PLACE ON THE DISTURBED RIGHT-OF-WAY, DITCHING, STRINGING, BENDING OPERATIONS, WELDING, ETC. CAN BEGIN. ONCE THE PIPE IS LOWERED INTO THE TRENCH, TRENCH BREAKERS ARE TO BE INSTALLED PER THE STANDARD SPACING SPECIFICATION. NOTE THAT THE DETAILED CROSSING DESIGNS REQUIRE SPECIFIC LOCATIONS OF TRENCH BREAKERS.
11. IT IS DESIRED THAT THE AMOUNT AND DURATION OF OPEN TRENCH BE MINIMIZED DURING THE PROJECT. IN GENERAL, NO TRENCH SHALL BE OPEN AT ONE TIME FOR MORE THAN 30 DAYS EXCEPT FOR TIE IN LOCATIONS WITHOUT THE APPROVAL OF THE COMPANY.
12. ALL AREAS OF OPEN TRENCH MUST HAVE INSTALLED TRENCH BREAKERS/TRENCH PLUGS AS LISTED IN TRENCH BREAKERS/TRENCH PLUGS DETAIL ON DETAIL SHEET 3.
13. IF TOPSOIL PILES ARE EXPOSED FOR GREATER THAN 2 DAYS, THEY SHALL BE SEEDED IN ACCORDANCE WITH DETAILS PROVIDED HEREIN. WHERE CESSATION OF EARTH DISTURBANCE ACTIVITY WILL EXCEED TWO (2) DAYS, THE SITE SHALL IMMEDIATELY SEEDED, MULCHED OR OTHERWISE PROTECTED FROM ACCELERATED EROSION AND SEDIMENTATION.
14. PRIOR TO ANY PERMANENT SEEDING, LIME, AND FERTILIZING APPLICATION, A SOIL TEST SHALL BE PREFORMED TO DETERMINE THE PH FACTOR.
15. LIME, FERTILIZE, SEED, AND MULCH THE DISTURBED AREAS PER THE COMPANY SPECIFICATIONS. IN AREAS OF STEEP SLOPES OR OBVIOUS AREAS WHERE POTENTIAL EROSION MAY OCCUR, AND EROSION CONTROL MAT OR FLEXIBLE GROWTH MEDIUM (FGM) SHALL BE USED. FGM SHALL BE APPLIED PER THE MANUFACTURER'S SPECIFICATIONS.
16. ONCE A SECTION OF THE PIPELINE HAS BEEN STABILIZED, NO CONSTRUCTION TRAFFIC SHALL OCCUR TO REMOVE ANY BMPS UNTIL THE SECTION HAS ACHIEVED 85% PERENNIAL VEGETATIVE COVER. AN AREA SHALL BE CONSIDERED TO HAVE ACHIEVED FINAL STABILIZATION WHEN IT HAS A MINIMUM UNIFORM 85% PERENNIAL VEGETATIVE COVER OR OTHER PERMANENT NONVEGATATIVE COVER WITH A DENSITY SUFFICIENT TO RESIST ACCELERATED SURFACE EROSION AND SUBSURFACE CHARACTERISTICS SUFFICIENT TO RESIST SLIDING OR OTHER MOVEMENTS.

PERMANENT STABILIZATION – ALTERNATE FINAL RESTORATION NOTE

A. LIMITING EXPOSED AREAS – "EARTH DISTURBANCE ACTIVITIES SHALL BE PLANNED AND CONDUCTED TO MINIMIZE THE EXTENT AND DURATION OF THE DISTURBANCE."

THE LENGTH OF TIME FOR CONSTRUCTING ACCESS ROADS, UTILITY LINE TRENCHING, TRENCH BACK-FILLING, FINAL GRADING, AND CLEANUP SHOULD BE KEPT TO A MINIMUM. GOOD PLANNING AND SCHEDULING OF THE VARIOUS UTILITY CONSTRUCTION ITEMS, TOGETHER WITH TIMELY AVAILABILITY OF MATERIALS, ADEQUATE EQUIPMENT, AND ADEQUATE MANPOWER, WILL HELP REDUCE THE TIME OF EXPOSURE OF DISTURBED LAND.

LARGE DIAMETER STEEL PIPELINES WITH WELDED JOINTS WHERE THE PIPE JOINTS ARE WELDED WHILE THE PIPE IS OUT OF THE TRENCH USUALLY REQUIRE A FAIRLY LONG LENGTH OF OPEN PIPELINE TRENCH. THE TOTAL TIME FROM TRENCH EXCAVATION TO PLACEMENT OF BACKFILL FOR THIS TYPE OF PIPELINE CONSTRUCTION SHOULD GENERALLY BE LIMITED TO NO MORE THAN THIRTY (30) CALENDAR DAYS AT ANY GIVEN POINT ALONG THE PIPELINE. THIS MEANS THAT, FOR EXAMPLE, THAT FROM THE TIME THAT TRENCH EXCAVATION ACTIVITIES COMMENCE AT STATION 1+00 UNTIL THE TRENCH IS BACKFILLED AT STATION 1+00, NO MORE THAN THIRTY (30) CALENDAR DAYS SHOULD EXPIRE. AT ANY GIVEN PLACE ALONG THE PIPELINE TRENCH WHERE THE TIME TO EXCAVATE AND BACKFILL THE TRENCH WILL EXCEED THIRTY (30) CALENDAR DAYS, OR THE TIME SPECIFIED IN THE PERMIT, THE CONTRACTOR SHALL CONTACT THE COMPANY TO DETERMINE IF THE ADDITIONAL TIME CAN BE APPROVED UNDER A MINOR MODIFICATION. WHERE EARTH DISTURBANCE ACTIVITY IS NOT COMPLETED IN AN AREA WHERE THE TRENCH HAS BEEN BACKFILLED, BMPS SHOULD BE MAINTAINED AND TEMPORARY STABILIZATION PROVIDED AS REQUIRED ACCORDING TO §102.22(B). WHERE DISTURBANCE ACTIVITIES HAVE BEEN COMPLETED, PERMANENT STABILIZATION SHALL BE PROVIDED AS REQUIRED UNDER §102.22(A).

NO SOIL IS TO BE HAULED OFF SITE WITHOUT A SEPARATE EROSION AND SEDIMENTATION CONTROL PLAN REVIEWED FOR ADEQUACY BY THE OHIO EPA OR THE LOCAL COUNTY CONSERVATION DISTRICT AS APPROPRIATE.

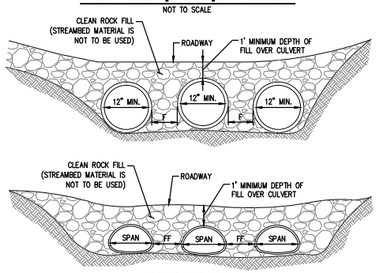
INSPECTION – ALL BMPS SHOULD BE INSPECTED AFTER EACH MEASURABLE RAINFALL RUNOFF EVENT AND ON A WEEKLY BASIS. ANY NECESSARY REPAIRS MUST BE MADE IMMEDIATELY TO ENSURE EFFECTIVE AND EFFICIENT OPERATION.

General Notes:

1. BMPS SHOWN MAY NEED TO BE FIELD ADJUSTED TO FIT ACTUAL CONDITIONS. IN SOME CASES, THE NEXT LARGER BMP MAY BE NEEDED DUE TO UNFORESEEN CONDITIONS. ADDITIONAL BMPS MAY BE REQUIRED OTHER THAN THOSE SHOWN. THE CONTRACTOR SHALL TAKE WHATEVER MEASURES NECESSARY TO PREVENT SILT FROM LEAVING THE SITE.
2. ALL PIPES/BRIDGES ARE FOR CONSTRUCTION ONLY AND THE SITE OF SAID PIPES/BRIDGES SHALL BE RESTORED TO ORIGINAL TOPOGRAPHY AND STABILIZED WITHIN FIVE (5) DAYS AFTER TERMINATION OF ITS INTENDED USE OR AT THE END OF THE ONE (1) YEAR PERIOD, WHICHEVER OCCURS FIRST.

Temporary Stream Crossing With Multiple Pipes Detail

NOT TO SCALE



CROSS-SECTIONS

NOTES:
1. MULTIPLE PIPES AND MULTIPLE SPAN BRIDGES AND CULVERTS WHICH MAY TEND TO COLLECT DEBRIS, CONTRIBUTE TO THE FORMATION OF ICE JAMS AND INCREASE HEAD LOSSES SHALL BE AVOIDED TO THE MAXIMUM EXTENT PRACTICABLE. CROSSINGS OF LESS THAN 15 FEET SHALL BE BY ONE SPAN, EXCEPT WHERE CONDITIONS MAKE IT IMPRACTICAL TO AFFECT THE CROSSING WITHOUT MULTIPLE SPANS.
2. PROVIDE 50' STABILIZED ACCESS TO CROSSING ON BOTH SIDES OF STREAM CHANNEL. PIPES SHALL EXTEND BEYOND THE TOE OF THE ROADWAY.
3. RUNOFF FROM THE ROADWAY SHALL BE DIVERTED OFF THE ROADWAY AND INTO A SEDIMENT REMOVAL BMP BEFORE IT REACHES THE ROCK APPROACH TO THE CROSSING.

MAINTENANCE
1. TEMPORARY STREAM CROSSINGS SHALL BE INSPECTED ON A DAILY BASIS.
2. DAMAGED CROSSINGS SHALL BE REPAIRED WITHIN 24 HOURS OF THE INSPECTION AND BEFORE ANY SUBSEQUENT USE.
3. SEDIMENT DEPOSITS ON THE CROSSING OR ITS APPROACHES SHALL BE REMOVED WITHIN 24 HOURS OF THE INSPECTION.
4. AS SOON AS THE TEMPORARY CROSSING IS NO LONGER NEEDED, IT SHALL BE REMOVED. ALL MATERIALS SHALL BE DISPOSED OF PROPERLY AND DISTURBED AREAS STABILIZED.

Temporary Stream Crossing With Single Pipe Detail

NOT TO SCALE

CROSS-SECTION VIEW

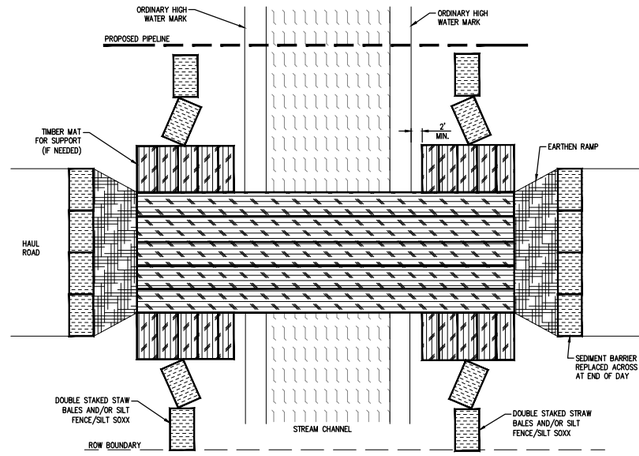
NOTES:
1. PROVIDE 50' STABILIZED ACCESS TO CROSSING ON BOTH SIDES OF STREAM CHANNEL.
2. PIPES SHALL EXTEND BEYOND THE TOE OF THE ROADWAY.
3. RUNOFF FROM THE ROADWAY SHALL BE DIVERTED OFF THE ROADWAY AND INTO A SEDIMENT REMOVAL BMP BEFORE IT REACHES THE ROCK APPROACH TO THE CROSSING.

MAINTENANCE:
1. TEMPORARY STREAM CROSSINGS SHALL BE INSPECTED ON A DAILY BASIS.
2. DAMAGED CROSSINGS SHALL BE REPAIRED WITHIN 24 HOURS OF THE INSPECTION AND BEFORE ANY SUBSEQUENT USE.
3. SEDIMENT DEPOSITS ON THE CROSSING OR ITS APPROACHES SHALL BE REMOVED WITHIN 24 HOURS OF THE INSPECTION.
4. AS SOON AS THE TEMPORARY CROSSING IS NO LONGER NEEDED, IT SHALL BE REMOVED. ALL MATERIALS SHALL BE DISPOSED OF PROPERLY AND DISTURBED AREAS STABILIZED.

Timber Mat Bridge Detail

NOT TO SCALE

BR



PLAN VIEW

PROFILE VIEW

NOTES:
1. STRAW BALES TO BE PLACED ACROSS BRIDGE ENTRANCE EVERY NIGHT.
2. THE CONTRACTOR HAS THE OPTION TO INSTALL PIPES OR BRIDGE TO CROSS STREAM. IF USING BRIDGE, CULVERTS MAY BE USED TO STABILIZE BRIDGE. THE QUANTITY AND DIAMETER OF CULVERTS SHALL BE AS NEEDED TO STABILIZE THE BRIDGE AND TO MEET THE MINIMUM BRIDGE ELEVATION SHOWN IN TABLE BELOW. IF USING PIPES, THE DIAMETER AND QUANTITY OF PIPES SHALL BE AS SHOWN IN TABLE BELOW.
3. CONTRACTOR HAS THE OPTION TO CHOOSE BETWEEN PUMPING OR FLUMING STREAM FLOW FOR TRENCH CROSSING.

GENERAL NOTES:
1. ALL BMP'S SHALL BE INSPECTED AFTER EACH RUNOFF EVENT AND ON A WEEKLY BASIS. ANY NECESSARY REPAIRS MUST BE MADE IMMEDIATELY TO ENSURE EFFECTIVE AND EFFICIENT OPERATION.
2. BMPS SHOWN MAY NEED TO BE FIELD ADJUSTED TO FIT ACTUAL CONDITIONS.
3. IN SOME CASES, THE NEXT LARGER BMP MAY BE NEEDED DUE TO UNFORESEEN CONDITIONS.
4. ADDITIONAL BMPS MAY BE REQUIRED OTHER THAN THOSE SHOWN.
5. THE CONTRACTOR SHALL TAKE WHATEVER MEASURES NECESSARY TO PREVENT SEDIMENT FROM LEAVING THE SITE.

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SEAL

NO.	REVISIONS	DATE

E&SPC TYPICAL DETAIL SHEET 1

AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: AS NOTED

PROJECT NO. NRG-1007

SHEET NO. 83 OF 88

Hanover Engineering Associates Inc
3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768

Y:\Projects\Energy\NRG Energy\NRG-1007-Avon Lakes Pipeline\DWG\ESPC\ ESPC-NRG-1007-AVON LAKE-007-TYPICAL DETAILS.dwg Dec 14,2014 - 4:45pm

Revegetation Best Management Practices:

AFTER EARTH DISTURBANCE ACTIVITY IS COMPLETED, THE DISTURBED AREA MUST BE REVEGETATED. THE VEGETATIVE COVER MUST BE A UNIFORM 85% PERENNIAL VEGETATIVE COVER, WITH A DENSITY CAPABLE OF RESISTING ACCELERATED EROSION AND SEDIMENTATION. ANOTHER OPTION IS TO USE AN ACCEPTABLE BMP WHICH PERMANENTLY MINIMIZES ACCELERATED EROSION AND SEDIMENTATION.

1. SEED MIXTURES - STANDARD SEED MIXTURES, THAT HAVE BEEN SHOWN TO BE EFFECTIVE IN STABILIZING AREAS IN OHIO ARE RECOMMENDED. THIS INFORMATION IS SUMMARIZED IN TABLES 13 THROUGH 16. ALTHOUGH THESE RECOMMENDED MIXTURES WILL BE SUITABLE FOR MOST SITES, THEY MAY NOT BE DESIRABLE FOR ALL SITUATIONS THAT MAY BE ENCOUNTERED IN SUCH INSTANCES, THE COMPANY SHOULD BE CONTRACTED FOR ADDITIONAL GUIDANCE. THE WEBSITE WWW.PLANT-MATERIALS.NRCS.USDA.GOV <HTTP://WWW.PLANT-MATERIALS.NRCS.USDA.GOV/> IS ANOTHER EXCELLENT SOURCE OF INFORMATION.
   - A. SEED MIX SHOULD CONTAIN MORE THAN ONE VARIETY OF SEED AND INCLUDE THE APPLICATION RATE (E.G. LB./ACRE), AND GERMINATION SEASON.
   - B. IF THE AREA TO BE VEGETATED IS A STEEP SLOPE (≥ 3:1), A STEEP SLOPE MIXTURE SHOULD BE USED. OTHER LIMITATIONS, SUCH AS DROUGHTY OR SATURATED CONDITIONS, ACID SOILS, AND SHADED AREAS SHOULD ALSO BE ADDRESSED BY THE PROPOSED SEEDING PLAN (SEE TABLES 13 THOUGH 16).
   - C. WHEREVER TALL RESCUE IS PROPOSED, AN ENDOPHYTE FREE VARIETY (E.G. JOHNSTONE, BARCEL, OR FESTORINA) SHOULD BE USED.
   - D. SEED MIXTURES SHOULD INCLUDE A LEGUME. WHEN USED IN AREAS DIFFICULT TO VEGETATE, LEGUME SEED LOTS SHOULD CONTAIN A CERTAIN AMOUNT OF HARD SEED (SEE TABLE 13 FOR RECOMMENDED SPECIFICATIONS). LEGUME SEED MUST BE INOCULATED IN ORDER TO FORM NODULES ON THE ROOTS WHICH FIX ATMOSPHERIC NITROGEN. USE ONLY SEED WHICH HAS BEEN FRESHLY AND PROPERLY INOCULATED.
   - E. WARM SEASON GRASSES MAY HAVE SOME LIMITATIONS FOR USE IN EROSION CONTROL AND MUST BE CONSIDERED WHEN SELECTING A SEED MIXTURE, THEY GROW MUCH MORE SLOWLY DURING THE SPRING AND FALL MONTHS. THEY TEND TO FORM BUNCHES, RATHER THAN SOD. THEREFORE, THE COVERAGE MAY NOT BE AS UNIFORM AS DESIRED.

TABLE 13 PLANT TOLERANCES OF SOIL LIMITATION FACTORS

SPECIES	GROWTH HABIT	WET SOIL	DRY SITE	TOLERATES ② LOW FERTILITY	TOLERATES ② ACID SOIL (pH 5-5.5)	MINIMUM SEED SPECIFICATIONS ③ PURITY (%)	READY GERM (%)	HARD SEED (%)	TOTAL GERM (%)	SEEDS/lb (1,000s)
WARM-SEASON GRASSES										
DEERTOUNGUE	BUNCH	YES	YES	YES	YES	95	75		75	250
WEEPING LOVEGRASS	BUNCH	NO	YES	YES	YES	97	75		75	1,500
SWITCHGRASS ④	BUNCH	YES	YES	YES	YES		(60 PLS)			390
BIG BLUESTEM	BUNCH	NO	YES	YES	YES		(60 PLS)			150
COOL-SEASON GRASSES										
TALL FESCUE	BUNCH	YES	NO	YES	NO	95	80		80	227
REDTOP	SOD	NO	YES	YES	YES	92	80		80	5,000
FINE FESCUES	SOD	NO	NO	YES	NO	95	80		80	400
PERENNIAL RYEGRASS	BUNCH	YES	NO	NO	NO	95	85		85	227
ANNUAL RYEGRASS	BUNCH	YES	NO	NO	NO	95	85		85	227
KENTUCKY BLUEGRASS	SOD	NO	NO	NO	NO	85	75		75	2,200
REEDCANARYGRASS	SOD	YES	YES	YES	NO	95	70		70	520
ORCHARDGRASS	BUNCH	YES	YES	YES	NO	95	80		80	654
TIMOTHY	BUNCH	YES	YES	YES	NO	95	80		80	1,230
SMOOTH BROMEGRASS	SOD	NO	YES	YES	NO	95	80		80	136
LEGUMES ⑤										
CROWNVETCH	SOD	NO	NO	YES	NO	98	40	30	65	120
BIRDSFOOT TREFOIL ⑥	BUNCH	YES	NO	YES	YES	98	60	20	80	400
FLATPEA	SOD	NO	NO	YES	YES	98	55	20	75	10
SEREOIA LESPEDEZA	BUNCH	NO	NO	YES	YES	98	60	20	80	335
CEREALS										
WINTER WHEAT	BUNCH	NO	NO	NO	NO	98	85		85	15
WINTER RYE	BUNCH	NO	NO	NO	YES	98	85		85	18
SPRING OATS	BUNCH	NO	NO	NO	NO	98	85		85	13
SUNDANGRASS	BUNCH	NO	YES	NO	NO	98	85		85	55
JAPANESE MILLET	BUNCH	YES	NO	YES	NO	98	80		80	155

① GROWTH HABIT REFERS TO THE ABILITY OF THE SPECIES TO EITHER FORM A DENSE SOD BY VEGETATIVE MEANS (STOLONS, RHIZOMES, OR ROOTS) OR REMAIN IN A BUNCH OR SINGLE PLANT FORM. IF SEEDED HEAVILY ENOUGH, EVEN BUNCH FORMERS CAN PRODUCE A VERY GOOD STAND. THIS IS SOMETIMES CALLED A SOD, BUT NOT IN THE SENSE OF A SOD FORMED BY VEGETATION MEANS.

② ONCE ESTABLISHED, PLANTS MAY GROW AT A SOMEWHAT LOWER PH, BUT COVER GENERALLY IS ONLY ADEQUATE AT PH 6.0 OR ABOVE.

③ MINIMUM SEEDLOTS ARE TRULY MINIMUM, AND SEEDLOTS TO BE USED FOR REVEGETATION PURPOSES SHOULD EQUAL OR EXCEED THESE STANDARDS. THUS, DEERTONGUE GRASS SHOULD GERMINATE 75% OR BETTER. CROWNVETCH SHOULD HAVE ATLEAST 40% READILY GERMINABLE SEED AND 30% HARD SEED. COMMONLY, SEEDLOTS ARE AVAILABLE THAT EQUAL OR EXCEED MINIMUM SPECIFICATIONS. REMEMBER THAT DISTURBED SITES ARE ADVERSE FOR PLANT ESTABLISHMENT. READY GERMINATION REFERS TO SEED THAT GERMINATES DURING THE PERIOD OF THE GERMINATION TEST AND THAT WOULD BE EXPECTED, IF CONDITIONS ARE FAVORABLE, TO GERMINATE RAPIDLY WHEN PLANTED. THE OPPOSITE OF READY GERMINATION IS DORMANT SEED, OF WHICH HARD SEED IS ONE TYPE.

④ SWITCHGRASS SEED IS SOLD ONLY ON THE BASIS OF PURE LIVE SEED (PLS).

⑤ NEED SPECIFIC LEGUME INOCULANT, INOCULANT SUITABLE FOR GARDEN PEAS AND SWEETPEAS USUALLY IS SATISFACTORY FOR FLATPEA.

⑥ BIRDSFOOT TREFOIL IS ADAPTED OVER THE ENTIRE STATE, EXCEPT IN THE EXTREME SOUTHEAST WHERE CROWN AND ROOT ROTS MAY INJURE STANDS.

TABLE 14. RECOMMENDED PERMANENT SEED MIXTURES COOL AND WARM SEASON GRASSES

MIXTURE NUMBER	SEASON	SPECIES	SEEDING RATE lb./ac.
1	COOL	TALL FESCUE*,OR FINE FESCUE,PLUS REDTOP,OR PERENNAIL RYEFRASS,PLUS BIRDSFOOT TREFOIL	79 46 4 19 8
2	COOL	BIRDSFOOT TREFOIL,PLUS TALL FESCUE*	8 40
3	COOL	ORCHARDGRASS,OR SMOOTH BROMEGRASS,PLUS BIRDSFOOT TREFOIL	26 33 8
4	WARM	FLATPEA,PLUS TALL FESCUE*,OR PERENNIAL RYEGRASS	27 26 25
5	WARM	DEERTONGUE,PLUS BIRDSFOOT TREEFOIL	21 8
6	WARM	SWITCHGRASS,OR BIG BLUESTEM,PLUS BIRDSFOOT,TREFOIL	15 15 8

* USE ONLY ENDOPHYTE TREE VARIETIES SUCH AS JOHNSTONE, BARCEL OR FESTORINA.

TEMPORARY SEEDING SPECIFICATIONS

SEEDING DATES	SPECIES	LB. PER 1,000 SQ. FT.	PER ACRE
MARCH 1 TO AUGUST 15	OATS	3	4 BUSHELS
	TALL FESCUE	1	40 LB
	ANNUAL RYEGRASS	1	40 LB
	PERENNIAL RYEGRASS	1	40 LB
	TALL FESCUE	1	40 LB
	ANNUAL RYEGRASS	1	40 LB
AUGUST 1 TO NOVEMBER 1	RYE	3	2 BUSHELS
	TALL FESCUE	1	40 LB
	ANNUAL RYEGRASS	1	40 LB
	WHEAT	3	2 BUSHELS
	TALL FESCUE	1	40 LB
	ANNUAL RYEGRASS	1	40 LB
	PERENNIAL RYEGRASS	1	40 LB
	TALL FESCUE	1	40 LB
	ANNUAL RYEGRASS	1	40 LB
NOVEMBER 1 TO SPRING	USE HEAVY STRAW-MULCH & DORMANT SEEDING, WOOD CHIPS OR PERMANENT SODDING.		

NOTE: OTHER APPROVED SEED SPECIES MAY BE SUBSTITUTED.

TABLE 16. RECOMMENDED SEED MIXTURES FOR STABILIZING DISTURBED AREAS

STIE CONDITION	SEED MIXTURE (SELECT ONE MIXTURE)
CUT SLOPES AND FILLS (NOT MOWED)	
WELL-DRAINED VARIABLE DRAINAGE	2,4, OR 6 2
CUT SLOPES AND FILLS (MOWED)	1
CUT SLOPES AND FILLS(GRAZED/HAY)	1,2,OR 3
GULLIES AND ERODED AREAS	2 OR 6
EROSION CONTROL BMPS CHANNELS, DRAINAGE DITCHES, TRAP EMBANKMENTS, ETC. FOR HAY OR SILAGE	1 OR 2 2 OR 3
RIGHT-OF-WAY	
WELL-DRAINED VARIABLE DRAINAGE WELL-DRAINED AREAS FOR GRAZING/HAY	4 OR 6 2 2 OR 3
STRIP MINED AREAS SPOILS, WASTE AREAS, FLY ASH, SLAG, ETC. (LIME TO SOIL TEST) FOR GRAZING/HAY	2,4,OR 5 2,3,OR 6

2. SOIL AMENDMENTS. A SOIL TEST IS RECOMMENDED TO DETERMINE THE TYPE AND RATE OF APPLICATION OF SOIL AMENDMENTS, ESPECIALLY WHEN THE COUNTY SOIL SURVEY INDICATES THE PRESENCE OF SOILS WITH LOW FERTILITY OR A PH RANGING BELOW 5.5 IT IS ALSO RECOMMENDED WHERE DIFFICULTIES HAVE BEEN ENCOUNTERED IN ESTABLISHING A GOOD COVER (E.G. ABANDONED MINED LANDS). THE COSTS OF SOIL TESTING ARE MINIMAL AND CAN RESULT IN HUGE SAVINGS IN SOIL AMENDMENTS AND THE COSTS OF RE-SEEDING. IN THE ABSENCE OF A SOIL TEST:
   - A. THE LIMING RATE SHOULD BE AT LEAST 4 TO 5 TONS/ACRE. FOR TEMPORARY SEEDING, A LIMING RATE OF 2 TONS/ACRE IS ACCEPTABLE. NO MORE THAN 4 TONS/ACRE SHOULD BE ADDED TO AGRICULTURAL LAND.
   - B. FERTILIZER SHOULD BE APPLIED AT THE RATE OFF 100LB N, 200 LB. OF P205, AND 200 LB. OF K20 PER ACRE (E.G. 1000 LB./ACRE OF 10-20-20 FERTILIZER). FOR TEMPORARY SEEDING, A RATE OF 50 LB. N, 50 LB. P205, 50 LB. K20 PER ACRE(E.G. 500 LB. OF 10-10-10 FERTILIZER) IS ACCEPTABLE.

3. MULCHING-MULCH ABSORBS RAINFALL IMPACT, INCREASES THE RATE OF INFILTRATION, REDUCES SOIL MOISTURE LOSS DUE TO EVAPORATION, MODERATES SOIL TEMPERATURES, PROVIDES A SUITABLE ENVIRONMENT FOR GERMINATION, AND PROTECTS THE SEEDING FROM INTENSE SUNLIGHT. ALL SEEDED AREAS SHOULD BE MULCHED UNLESS THE SEED MIXTURE IS DRILLED AND INCLUDES A NURSE CROP (SEE TABLE 4-17). MULCHING MAY ALSO BE USED AS A TEMPORARY STABILIZATION OF DISTURBED AREAS IN NON-GERMINATING SEASONS.
   - A. THE MINIMUM APPLICATION RATE FOR HAY OR STRAW MULCH SHOULD BE 3 TONS/ACRE. ON STEEP SLOPES THE HAY OR STRAW SHOULD BE CRIMPED, TACKED, NETTED, OR OTHERWISE ANCHORED.
   - B. WOOD CELLULOSE IS NOT RECOMMENDED FOR STEEP SLOPE (≥ 1:3 H:V) APPLICATIONS, WHERE USED, THE MINIMUM RATE OF APPLICATION SHOULD BE 2000 LB./ACRE.
   - C. EROSION CONTROL BLANKETING SHOULD BE CONSIDERED FOR STEEP SLOPE (≥ 1:3 H:V) SITUATIONS AND IN CRITICAL AREAS (E.G. STREAM CROSSINGS, ADJACENT WETLANDS, ETC.)

TABLE 17. MULCH APPLICATION RATES

MULCH	APPLICATION RATE (MIN.)			
TYPE	PER ACRE	PER 1,000 sq.ft.	PER 1,000 sq.yd.	NOTES
STRAW	2 TONS	90 lb.	810 lb.	EITHER WHEAT OR OAT STRAWFREE OF WEEDS, NOT CHOPPED OR FINELY BROKEN
HAY	2 TONS	90 lb.	810 lb.	TIMOTHY, MIXED CLOVER AND TIMOTHY OR OTHER NATIVE FORAGE GRASSES
WOOD CELLULOSE	2,000 lb.	46 lb.	414 lb.	DO NOT USE ALONE IN WINTER DURING HOT AND DRY WEATHER, OR ON STEEP SLOPES(>3:1)
WOOD CHIPS	6 TONS			MAY PREVENT GERMINATION OF GRASSES AND LEGUMES

NOTE:
AFTER SOIL PH ANALYSIS IS PERFORMED, A SUITABLE MIX SHALL BE DETERMINED FROM THE TABLES.

Upland Seed Mix Option:

SHOWY NORTHEAST NATIVE WILDFLOWER MIX: ERNMX-153
ERNST CONSERVATION SEED
9006 MERCER PIKE
MEADVILLE, PA 16335-9299
TELEPHONE: 800-873-3321 / 814-336-2404
FAX: 814-336-5191
EMAIL: ernst@ernstseed.com
APPLICATION RATE: 15 lbs/acre (BULK) THOROUGHLY MIXED WITH ANNUAL RYEGRASS (LOLIUM MULTIFLORUM) AT 10 lbs/acre.
NOTE: STRAW MULCH LIGHTLY AND COVER WITH JUTE MAT, INSTALLED PER MANUFACTURER'S SPECS.

PERCENT BY NO. OF SEEDS (NOT WEIGHT)	SCIENTIFIC NAME	COMMON NAME
15%	ANDROPOGON SCOPARIUS	LITTLE BLUESTEM
10%	BOUTELOUA CURTIPENDULA	SIDE OATS GRAMA
10%	ELYMUS VILLOSUS	SILKY WILD RYE
10%	SORGHASTRUM NUTANS	INDIAN GRASS
7%	CHAMAECRISTA FASCICULATA	PARTRIDGE PEA
6%	HELIOPSIS HELIANTHOIDES	OX EYE SUNFLOWER
5%	ANDROPOGON GERARDII, NIAGARA	NIAGARA BIG BLUESTEM
5%	PENSTEMON DIGITALIS	TALL WHITE BEARD TONGUE
5%	RUDBECKIA HIRTA	BLACK EYED SUSAN
5%	SENNA HEBECARPA	WILD SENNA
4%	ASTER PRENANTHOIDES/NOVIBELGI MIX	ZIGZAG ASTER/NEW YORK ASTER MIX
3%	HYPERICUM PYRAMIDATUM	GREAT ST. JOHN'S WORT
2.5%	ZIZIA AUREA	GOLDEN ALEXANDERS
2%	ASCLEPIAS SYRIACA	COMMON MILKWEED
2%	ASCLEPIAS TUBEROSA	BUTTERFLY MILKWEED
2%	TRADESCANTIA OHIOENSIS	OHIO SPIDERWORT
1.5%	ASTER NOVAEANGLIAE	NEW ENGLAND ASTER
1.5%	LUPINIUS PERENNIS	WILD BLUE LUPINE
1.5%	MONARDA FISTULOSA	WILD BERGAMOT
1%	BAPTISIA AUSTRALIS	BLUE FALSE INDIGO
1%	LESPEDEZA CAPITATA	ROUNDHEAD LESPEDEZA

Wetland Seed Method :

1. WETLAND AREAS SHALL BE TOPSOILED WITH THE NATURAL TOPSOIL. AN ANNUAL RYE MIX SHALL BE PLANTED IN THE INTERIM UNTIL THE NATURAL PLANTS INUNDATE THE DISTURBED AREAS.
2. NO LIME OR FERTILIZER SHALL BE USED IN WETLAND AREAS.

Streambank & Wetland Seed Mix Option:

"RETENTION BASIN FLOOR SEEDING FOR WILDLIFE & PLANT DIVERSITY MIX - ERNMX-127" APPLIED AT A SEEDING RATE OF 15 BULK LBS PER ACRE OR 1/3-1/2 LBS PER 1,000 FT2, SEWN ALONG WITH 10 LBS/ACRE OF CEREAL OATS (AVENA SATIVA) OR GRAIN (CEREAL) RYE (SECALE CEREAL) AVAILABLE FROM:
ERNST CONSERVATION SEEDS
9006 MERCER PIKE
MEADVILLE, PA 16335
PHONE: (800) 873-3321 (814) 336-2404
FAX: (814) 336-5191
EMAIL: SALES@ERNSTSEED.COM <mailto:SALES@ERNSTSEED.COM>

General Construction Notes:

EROSION CONTROL BLANKET FOR STEEP SLOPES

STEEP SLOPES THAT ARE DISTRIBUTED FOR UTILITY LINE CONSTRUCTION SUCH AS ROADWAY/RAILROAD CUT OR EMBANKMENT SLOPES GREATER THAN OR EQUAL TO 3 HORIZONTAL TO 1 VERTICAL SHOULD BE PROTECTED AGAINST EROSION WITH EROSION CONTROL BLANKETS OR MATS SUITABLE FOR THE ESTABLISHMENT OF VEGETATION. THE EROSION CONTROL BLANKETS SHOULD BE INSTALLED IMMEDIATELY AFTER THE SOIL AMENDMENTS AND THE SEED ARE APPLIED. EROSION CONTROL BLANKETS SHOULD ALSO BE INSTALLED ON OTHER STEEP RIGHT-OF-WAY SLOPES WHERE EROSION WILL BE A PROBLEM UNTIL VEGETATION IS ESTABLISHED.

THE INSTALLATION PROCEDURE SHOULD COMPLY WITH THE MANUFACTURER'S RECOMMENDATIONS, INCLUDING SLOPE PREPARATION, ORIENTATION, TRENCHING, OVERLAP AND SPACING OF STAPLES.

STABILIZATION DURING NON-GROWING SEASONS

ALL UTILITY LINE CONSTRUCTION SHOULD BE PLANNED FOR COMPLETION WITHIN THE RECOMMENDED DATES FOR THE APPLICATION OF PERMANENT SEEDING AND ESTABLISHMENT OF PERMANENT VEGETATIVE COVER. HOWEVER, WHEN EMERGENCY UTILITY LINE CONSTRUCTION MUST BE DONE AND IS COMPLETED DURING A NON-GROWING SEASON (WINTERTIME, ETC.), INTERIM STABILIZATION BMP'S MUST BE IMPLEMENTED AND ADEQUATELY MAINTAINED. THE APPLICATION OF STRAW MULCH AT THE RATE OF TWO TONS PER ACRE IS RECOMMENDED. THE BMP'S SHOULD BE CHECKED WEEKLY (UNLESS SNOW COVERED) TO IDENTIFY AREAS THAT BECOME BARE.

THESE BARE AREAS SHOULD BE COVERED WITH A PROPERLY INSTALLED EROSION CONTROL BLANKET. ALL TEMPORARY EROSION AND SEDIMENT POLLUTION CONTROLS MUST BE MAINTAINED UNTIL PERENNIAL VEGETATION IS ESTABLISHED.

A PRE-WINTER STABILIZATION MEETING NEEDS TO BE HELD IF THE PROJECT IS TO REMAIN OPEN THROUGH WINTER. PLANNING SHOULD BE SUCH THAT THE SITE IS ABLE TO BE SEEDED DURING THE GROWING SEASON. IF SEEDING IS NOT POSSIBLE, THEN THE SITE WILL HAVE TO BE MULCHED AND POSSIBLY DORMANT SEEDED

PERMANENT STABILIZATION

PERMANENT CONTROL BMP'S SUCH AS SLOPE BREAKERS/INTERCEPTOR DIKES/WATER BARS, ETC., SHOULD BE IN PLACE PRIOR TO APPLICATION OF SOIL AMENDMENTS, SEED AND MULCH. THE OBJECTIVE SHOULD BE TO OBTAIN PERENNIAL VEGETATIVE COVER THAT IS RESISTANT TO EROSION. THE ACCEPTABLE STANDARD FOR VEGETATIVE STABILIZATION IS A UNIFORM 85% COVER.

RESPONSIBILITY FOR E&S CONTROL FACILITIES:

DURING IMPROVEMENTS CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONSTRUCTION, STABILIZATION & MAINTENANCE OF ALL SITE EROSION & SEDIMENTATION CONTROL FACILITIES. AFTER CONTRACTOR INVOLVEMENT CEASES, RESPONSIBILITY SHALL REVERT TO THE PROJECT OWNER.

SEDIMENT RE-DISTRIBUTION

WASHING OF FILTER STONE AND RE-DISTRIBUTION OF WET SEDIMENT FROM BASINS, TRAPS OR OTHER FACILITIES SHALL ONLY BE PERMITTED UPHILL OF AN EFFECTIVE SEDIMENT FILTER FACILITY. SILT LADEN RUNOFF SHALL NOT BE ALLOWED TO FLOW DIRECTLY TO UNPROTECTED CATCH BASINS, PONDS, ADJACENT PROPERTIES, ROADS OR WETLANDS.

OFF-SITE BORROW OR DISPOSAL AREAS

IT IS INTENDED THAT ANY BORROW OR DISPOSAL AREAS FOR THIS SITE SHALL BE ACQUIRED FROM OR DISPOSED OF ON THIS SITE. THE CONTRACTOR SHALL UTILIZE THIS APPROVED PLAN.

ASSURANCE OF DESIGN PERFORMANCE

THE SPECIFICATIONS AND REQUIREMENTS OF THE PROJECT PLANS, NARRATIVE AND SPECIFICATION ARE THE MINIMUM ACCEPTABLE CONSTRUCTION CRITERIA FOR THIS PROJECT.

DURING SITE DEVELOPMENT CONSTRUCTION, ALL TEMPORARY EROSION AND SEDIMENTATION CONTROL FACILITIES MUST BE CHECKED BY THE CONTRACTOR AFTER EACH RUNOFF EVENT AND ON A WEEKLY BASIS. ANY DAMAGE TO THE FACILITIES MUST BE REPAIRED IMMEDIATELY. ANY LOST SOIL MATERIAL SHALL BE RECOVERED, IF POSSIBLE. WASHED OUT LAWN OR SLOPE AREAS MUST HAVE TOPSOIL REPLACED AND THEN MUST BE RE-SEEDED AND MULCHED.

IF, FOR ANY REASON, THE DESIGNED FACILITIES OR MEASURES DO NOT PROVIDE THE NECESSARY PROTECTION, THE CONTRACTOR SHALL ADJUST THE EROSION CONTROL MEASURES AND SEDIMENT CONTROL MEASURES TO ACHIEVE A COMPLETE NON-ERODED STABILIZED SITE CONDITION.

REFUELING AREAS

ALL ABOVE-GROUND GAS OR LIQUID STORAGE TANKS SHALL BE ANCHORED TO PREVENT FLOTATION OR LATERAL MOVEMENT RESULTING FROM HYDRODYNAMIC AND HYDROSTATIC LOADS IF THEY ARE LOCATED WITHIN 1,000 FT OF A FLOODWAY, 100-YEAR FLOODPLAIN, OR A 500-YEAR FLOODPLAIN.

ALL FUEL TANKS AND DRUMS SHALL BE STORED IN A MARKED STORAGE AREA. A DIKE SHALL BE CONSTRCUTED AROUND THIS STORAGE AREA ACCORDING TO ALL LOCAL, STATE, AND FEDERAL REGULATIONS.

WASTE DISPOSAL

AREAS DESIGNATED FOR STORAGE DISPOSAL OF SOLID, SANITARY AND TOXIC WASTES (DUMPSTER AREAS, CEMENT TRUCK WASHOUT, VEHICLE FUELING) SHALL BE CLEARLY IDENTIFIED.

COVERED CONTAINERS SHALL BE AVAILABLE FOR DISPOSAL OF DEBRIS TRASH AND HAZARDOUS WASTES.

DUST CONTROL

FUGITIVE DUST RESULTING FROM CONSTRUCTION ACTIVITIES SHALL BE MINIMIZED TO THE MAXIMUM EXTENT PRACTICAL BY IMPLEMENTING APPROPRIATE CONTROL MEASURES. THESE MEASURES INCLUDE THE APPLICATION OF MULCH, WATER, STONE, OR APPROVED CHEMICAL AGENTS ON ACCESS ROADS, EXPOSED SOILS, STOCKPILED SOILS, OR UNPAVED PUBLIC ROADS WHEN DRY AND WINDY CONDITIONS EXIST. A WATERING VEHICLE SHALL BE AVAILABLE FOR THE DURATION OF PROJECT ACTIVITIES, INCLUDING THROUGHOUT RESTORATION.

Standard Erosion And Sedimentation Control Plan Notes:

1. VEHICLES AND EQUIPMENT MAY NEITHER ENTER DIRECTLY TO NOR EXIT DIRECTLY FROM ANYWHERE EXCEPT AT THE PROPOSED ROCK CONSTRUCTION ENTRANCES.
2. STOCKPILE HEIGHTS MUST NOT EXCEED 35 FEET. STOCKPILE SLOPES MUST BE 2:1 OR FLATTER.
3. THE OPERATOR SHALL ASSURE THAT THE APPROVED EROSION AND SEDIMENT CONTROL PLAN IS PROPERLY AND COMPLETELY IMPLEMENTED.
4. FAILURE TO CORRECTLY INSTALL SEDIMENT CONTROL FACILITIES OR FAILURE TO PREVENT SEDIMENT LADEN RUNOFF FROM LEAVING THE CONSTRUCTION SITE OR FAILURE TO TAKE CORRECTIVE ACTIONS TO IMMEDIATELY RESOLVE FAILURES OF SEDIMENT CONTROL FACILITIES MAY RESULT IN ADMINISTRATIVE, CIVIL AND/OR CRIMINAL PENALTIES BEING INSTITUTED.
5. UNTIL THE SITE ACHIEVES FINAL STABILIZATION, THE OPERATOR SHALL ASSURE THAT THE BEST MANAGEMENT PRACTICES ARE IMPLEMENTED, OPERATED, AND MAINTAINED PROPERLY AND COMPLETELY. MAINTENANCE SHALL INCLUDE INSPECTIONS OF ALL BEST MANAGEMENT PRACTICE FACILITIES. THE OPERATOR WILL MAINTAIN AND MAKE AVAILABLE TO THE DEPARTMENT AND APPLICABLE CONSERVATION DISTRICT, WRITTEN INSPECTION LOGS OF ALL THOSE INSPECTIONS. ALL MAINTENANCE WORK, INCLUDING CLEANING, REPAIR, REPLACEMENT, REGRADING, AND RESTABILIZATION SHALL BE PERFORMED IMMEDIATELY.
6. IMMEDIATELY UPON DISCOVERING UNFORESEEN CIRCUMSTANCES POSING THE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION, THE OPERATOR SHALL IMPLEMENT APPROPRIATE BEST MANAGEMENT PRACTICES TO ELIMINATE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION.
7. ALL PUMPING OF SEDIMENT LADEN WATER SHALL BE THROUGH A SEDIMENT CONTROL BMP, SUCH AS A PUMPED WATER FILTER BAG DISCHARGING OVER NON-DISTURBED AREAS.
8. A COPY OF THE APPROVED EROSION AND SEDIMENT CONTROL PLAN MUST BE AVAILABLE AT THE PROJECT SITE AT ALL TIMES.
9. ONLY LIMITED DISTURBANCE WILL BE PERMITTED TO PROVIDE ACCESS TO SEDIMENT BASIN FOR GRADING AND ACQUIRING BORROW TO CONSTRUCT THOSE BMPS.
10. EROSION AND SEDIMENT BMPS MUST BE CONSTRUCTED, STABILIZED, AND FUNCTIONAL BEFORE SITE DISTURBANCE BEGINS WITHIN THE TRIBUTARY AREAS OF THOSE BMPS.
11. AFTER FINAL SITE STABILIZATION HAS BEEN ACHIEVED, TEMPORARY EROSION AND SEDIMENT BMPS CONTROLS MUST BE REMOVED. AREAS DISTURBED DURING REMOVAL OF THE BMPS MUST BE STABILIZED IMMEDIATELY.
12. AT LEAST 7 DAYS BEFORE STARTING ANY EARTH DISTURBANCE ACTIVITIES, THE OPERATOR SHALL INVITE ALL CONTRACTORS INVOLVED IN THOSE ACTIVITIES, THE LANDOWNER, ALL APPROPRIATE MUNICIPAL OFFICIALS, THE EROSION AND SEDIMENT CONTROL PLAN PREPARER, AND THE CONSERVATION DISTRICT TO AN ON-SITE MEETING. ALSO, AT LEAST 3 DAYS BEFORE STARTING ANY EARTH DISTURBANCE ACTIVITIES, ALL CONTRACTORS INVOLVED IN THOSE ACTIVITIES SHALL NOTIFY THE ONE CALL SYSTEM INCORPORATED AT 1-800-362-2764 FOR BURIED UTILITIES LOCATIONS.
13. ALL EARTH DISTURBANCE ACTIVITIES SHALL PROCEED IN ACCORDANCE WITH THE CONSTRUCTION SEQUENCE. EACH STAGE SHALL BE COMPLETED BEFORE ANY FOLLOWING STAGE IS INITIATED. CLEARING AND GRUBBING SHALL BE LIMITED ONLY TO THOSE AREAS DESCRIBED IN EACH STAGE.
14. IMMEDIATELY AFTER EARTH DISTURBANCE ACTIVITIES CEASE, THE OPERATOR SHALL STABILIZE ANY AREAS DISTURBED BY THE ACTIVITIES. DURING NON-GERMINATING PERIODS, MULCH MUST BE APPLIED AT THE SPECIFIED RATES. DISTURBED AREAS WHICH ARE NOT AT FINISHED GRADE AND WHICH WILL BE REDISTURBED WITHIN 1 YEAR MUST BE STABILIZED IN ACCORDANCE WITH THE TEMPORARY VEGETATIVE STABILIZATION SPECIFICATIONS. DISTURBED AREAS WHICH ARE AT FINISHED GRADE OR WHICH WILL NOT BE REDISTURBED WITHIN 1 YEAR MUST BE STABILIZED IN ACCORDANCE WITH THE PERMANENT VEGETATIVE STABILIZATION SPECIFICATIONS.
15. AN AREA SHALL BE CONSIDERED TO HAVE ACHIEVED FINAL STABILIZATION WHEN IT HAS A MINIMUM UNIFORM 85% PERENNIAL VEGETATIVE COVER OR OTHER PERMANENT NON-VEGETATIVE COVER WITH A DENSITY SUFFICIENT TO RESIST ACCELERATED SURFACE EROSION AND SUBSURFACE CHARACTERISTICS SUFFICIENT TO RESIST SLIDING AND OTHER MOVEMENTS.

OTHER BMPS (SPECIFY)

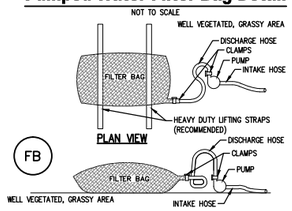
1. SEDIMENT MUST BE REMOVED FROM STORM WATER INLET PROTECTION WHEN DEVICE IS HALF FULL.
2. AT STREAM CROSSINGS, 50' BUFFER AREAS SHOULD BE MAINTAINED. ON BUFFERS, CLEARING, SOD DISTURBANCES, EXCAVATION, AND EQUIPMENT TRAFFIC SHOULD BE MINIMIZED. ACTIVITIES SUCH AS STACKING LOGS, BURNING CLEARED BRUSH, DISCHARGING RAINWATER FROM TRENCHES, WELDING PIPE SECTIONS, REFUELING AND MAINTAINING EQUIPMENT SHOULD BE ACCOMPLISHED OUTSIDE OF BUFFERS.
3. ALL WETLANDS MUST BE DELINEATED AND PROTECTED WITH ORANGE SAFETY FENCE PRIOR TO ANY EARTH MOVING ACTIVITY.

TEMPORARY STABILIZATION & PERMANENT STABILIZATION

1. HAY OR STRAW MULCH MUST BE APPLIED AT 2.0 TONS PER ACRE.
2. MULCH WITH MULCH CONTROL NETTING OR EROSION CONTROL BLANKETS MUST BE INSTALLED ON ALL SLOPES 3:1 AND STEEPER."
3. STRAW MULCH SHALL BE APPLIED IN LONG STRANDS, NOT CHOPPED OR FINELY BROKEN.
4. UNTIL THE SITE IS STABILIZED, ALL EROSION AND SEDIMENT BMPS MUST BE MAINTAINED PROPERLY. MAINTENANCES MUST INCLUDE INSPECTIONS OF ALL EROSION AND SEDIMENT CONTROL BMPS AFTER EACH RUNOFF EVENT AND ON A WEEKLY BASIS. ALL PREVENTATIVE AND REMEDIAL MAINTENANCE WORK, INCLUDING CLEAN OUT, REPAIR, REPLACEMENT, REGARDING, RESEEDING, REMULCHING, AND RENETTING, MUST BE PERFORMED IMMEDIATELY. IF EROSION AND SEDIMENT CONTROL BMPS FAIL TO PERFORM AS EXPECTED, REPLACEMENT BMPS, OR MODIFICATIONS OF THOSE INSTALLED WILL BE REQUIRED.
5. SEDIMENT REMOVED FROM BMPS SHALL BE DISPOSED OF IN LANDSCAPED AREAS OUTSIDE OF STEEP SLOPES, WETLANDS, FLOODPLAINS OR DRAINAGE SWALES AND IMMEDIATELY STABILIZED, OR PLACED IN TOPSOIL STOCKPILES.
6. THE OPERATOR SHALL REMOVE FROM TH

Pumped Water Filter Bag Detail

NOT TO SCALE



NOTES:

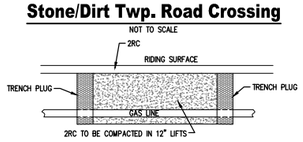
1. LOW VOLUME FILTER BAGS SHALL BE MADE FROM NON-WOVEN GEOTEXTILE MATERIAL SEWN WITH HIGH STRENGTH, DOUBLE STITCHED "J" TYPE SEAMS. THEY SHALL BE CAPABLE OF TRAPPING PARTICLES LARGER THAN 150 MICRONS. HIGH VOLUME FILTER BAGS SHALL BE MADE FROM WOVEN GEOTEXTILES THAT MEET THE FOLLOWING STANDARDS:

PROPERTY	TEST METHOD	MINIMUM STANDARD
AVG. WIDE WIDTH STRENGTH	ASTM D-4884	60 LB/IN
GRAB TENSILE	ASTM D-4632	205 LB
PUNCTURE	ASTM D-4833	110 LB
MULLEN BURST	ASTM D-3786	350 PSI
UV RESISTANCE	ASTM D-4355	85%
AOS % RETAINED	ASTM D-4751	80 SIEVE

2. A SUITABLE MEANS OF ACCESSING THE BAG WITH MACHINERY REQUIRED FOR DISPOSAL PURPOSES SHALL BE PROVIDED. FILTER BAGS SHALL BE REPLACED WHEN THEY BECOME 1/2 FULL OF SEDIMENT. SPARE BAGS SHALL BE KEPT AVAILABLE FOR REPLACEMENT OF THOSE THAT HAVE FAILED OR ARE FILLED. BAGS SHALL BE PLACED ON STRAPS TO FACILITATE REMOVAL UNLESS BAGS COME WITH LIFTING STRAPS ALREADY ATTACHED.
3. BAGS SHALL BE LOCATED IN WELL-VEGETATED (GRASSY) AREA, AND DISCHARGE ONTO STABLE, EROSION RESISTANT AREAS. WHERE THIS IS NOT POSSIBLE, A GEOTEXTILE UNDERLAYMENT AND FLOW PATH SHALL BE PROVIDED. BAGS MAY BE PLACED ON FILTER STONE TO INCREASE DISCHARGE CAPACITY. BAGS SHALL NOT BE PLACED ON SLOPES GREATER THAN 5%, FOR SLOPES EXCEEDING 5%, CLEAN ROCK OR OTHER NON-ERODIBLE AND NON-POLLUTING MATERIAL MAY BE PLACED UNDER THE BAG TO REDUCE SLOPE STEEPNESS.
4. NO DOWNSLOPE SEDIMENT BARRIER IS REQUIRED FOR MOST INSTALLATIONS.
5. THE PUMP DISCHARGE HOSE SHALL BE INSERTED INTO THE BAGS IN THE MANNER SPECIFIED BY THE MANUFACTURER AND SECURELY CLAMPED. A PIECE OF PVC PIPE IS RECOMMENDED FOR THIS PURPOSE.
6. THE PUMPING RATE SHALL BE NO GREATER THAN 750 GPM OR 1/2 THE MAXIMUM SPECIFIED BY THE MANUFACTURER, WHICHEVER IS LESS. PUMP INTAKES SHALL BE FLOATING AND SCREENED.
7. FILTER BAGS SHALL BE INSPECTED DAILY. IF ANY PROBLEM IS DETECTED, PUMPING SHALL CEASE IMMEDIATELY AND NOT RESUME UNTIL THE PROBLEM IS CORRECTED.

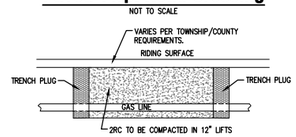
Stone/Dirt Twp. Road Crossing

NOT TO SCALE



Paved Twp. Road Crossing

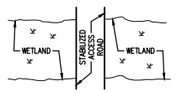
NOT TO SCALE



Access Road Wetland And Crossing

NOT TO SCALE

REMOVAL OF TREES, TREE STUMPS ,BRUSH AND VEGETATION SHOULD BE KEPT TO A MINIMUM IN THE WETLAND. GRADING SHOULD BE LIMITED TO THE AREA DIRECTLY OVER THE TRENCH TO THE EXTENT POSSIBLE. WHERE CLEARING OF TREES AND VEGETATION IS REQUIRED FOR THE EQUIPMENT ACCESS AREAS, THE TREE AND VEGETATION ROOT MASS IS TO REMAIN UNDISTURBED. VEGETATION MAY BE CUT AT/NEAR THE GROUND LINE AND SHOULD BE REMOVED FROM THE WETLAND. TREES SHOULD BE CUT ABOVE THE GROUND LINE AND SHOULD BE REMOVED FROM THE WETLAND. TREES SHOULD BE CUT ABOVE THE GROUND LINE WITH THE STUMPS LEFT IN PLACE, EXCEPT WHERE REMOVAL IS REQUIRED FOR SAFETY REASONS.

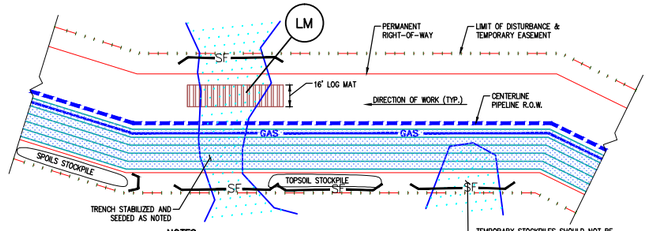


PLAN

THE MOVEMENT OF VEHICLES AND/OR EQUIPMENT ACCESS WETLANDS, SHOULD BE KEPT TO AN ABSOLUTE MINIMUM. THE ACCESS ROAD WIDTH SHOULD BE KEPT TO A MINIMUM AND BE STABILIZED AS SPECIFIED IN THE EROSION AND SEDIMENTATION CONTROL PLAN. THE ACCESS ROAD MAY BE STABILIZED BY PLACING GRAVEL OR CRUSHED AGGREGATE UPON GEOTEXTILE FABRIC, OR BY PLACING TIMBER RIP RAP OR PREFABRICATED SWAMP MATS. THE TIMBER RIP RAP OR PREFABRICATED SWAMP MATS SHOULD NOT BE MORE THAN 2 LAYERS THICK. A PROPERLY DESIGNED PLANK ROAD MAY ALSO BE UTILIZED. DIRT, ROCK, STUMPS OR BRUSH SHALL NOT BE USED TO STABILIZE THE WETLAND. ALL MATERIAL USED TO STABILIZE THE ACCESS ROAD MUST BE REMOVED FROM THE WETLAND WHEN UTILITY CONSTRUCTION IS COMPLETED.

Typical Trench E&S Controls For Wetland Areas (WC)

NOT TO SCALE

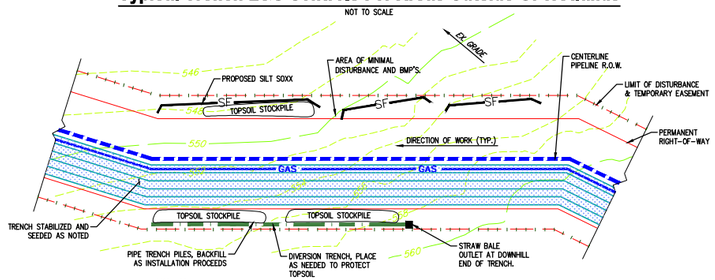


NOTES:

1. NO LIME OR FERTILIZER SHALL BE USED IN WETLAND AREAS.
2. CONTRACTOR HAS THE OPTION TO USE LOG MATTING, STEEL PLATING OR GEOTEXTILE WITH CLEAN FILL OVER WETLANDS.
3. ONCE TEMPORARY CROSSING IS REMOVED, THIS AREA MUST BE PERMANENTLY STABALIZED WITHIN 2 DAYS.

Typical Trench E&S Controls For Areas Outside Of Wetlands

NOT TO SCALE

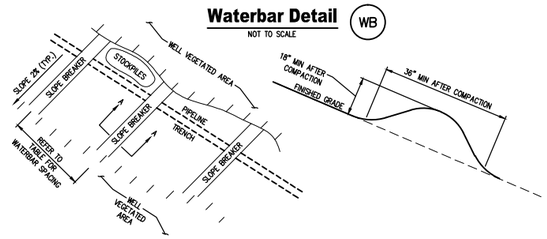


NOTES:

1. SILT BARRIER TO BE INSTALLED DOWNGRADIENT OF ALL EXPOSED AREAS AS WORK PROGRESSES, AND CONTINUALLY KEPT DOWNGRADIENT OF ALL EXPOSED TRENCHES DURING CONSTRUCTION OPERATIONS. UPON BACKFILLING OF TRENCH, THE SILT FENCE MAY BE MOVED TO THE NEXT APPROPRIATE LOCATION.
2. ANY STOCKPILES FOR FUTURE USE SHALL BE IMMEDIATELY STABILIZED AND SHALL HAVE SILT FENCE PLACED DOWNSLOPE.
3. WHEN CROSSING PAVEMENT, 8" SILT SOCK SHALL BE USED.
4. IF TOPSOIL PILES ARE TO BE LEFT FOR ANY AMOUNT OF TIME, DIVERSION TRENCHES SHALL BE CONSTRUCTED UPHILL. STRAW BALE OUTLET PROTECTION SHALL BE PLACED AT THE ENDS OF THESE TRENCHES.
5. BREAKS IN SOIL STOCKPILES ARE TO BE INSTALLED AS NEEDED TO PREVENT PONDING/RUNOFF BEHIND STOCKPILE.
6. ONCE TEMPORARY CROSSING IS REMOVED, THIS AREA MUST BE PERMANENTLY STABALIZED WITHIN 2 DAYS.

Waterbar Detail (WB)

NOT TO SCALE



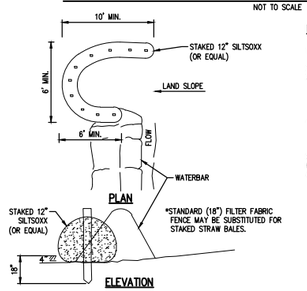
Required Spacing For Temporary Waterbars

PERCENT SLOPE	SPACING (FT.)
< 5	250
5 – 15	150
15 – 30	100
> 30	50

* PERMANENT WATERBARS ARE REQUIRED AT ALL STREAM, RIVER, AND OTHER WATER BODY CROSSINGS AS WELL AS UPSLOPE FROM ROADWAY AND RAILROAD CUT SLOPES. OTHERWISE NOT REQUIRED.

Sediment Filter-Sock Protection At Waterbar Outlet (SSO)

NOT TO SCALE

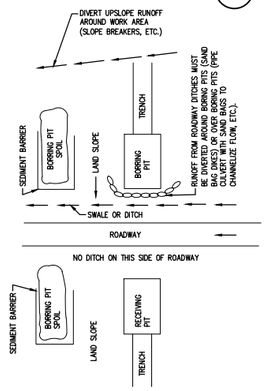


NOTES:

1. BACKFILL MATERIAL SHOULD BE MOUNDED OVER THE EXCAVATED AREA TO ALLOW FOR SETTLING, AND SEEDED AND MULCHED.
2. THE EXCAVATED AREA MUST BE STABILIZED WITHIN 72 HOURS.
3. STAGING AREAS, ASSEMBLY AREAS, TEMPORARY EQUIPMENT AND NON-HAZARDOUS MATERIAL STORAGE AREAS SHOULD BE LOCATED OUTSIDE THE 100 YEAR FLOODWAY. HAZARDOUS OR POLLUTIVE MATERIAL STORAGE AREAS SHOULD BE LOCATED AT LEAST 100 FEET BACK FROM TOP OF STREAM BANK.
4. WHETHER OR NOT BLASTING WILL BE REQUIRED SHOULD BE DETERMINED PRIOR TO COMMENCING THE TRENCH EXCAVATION FOR A STREAM CROSSING, SINCE THIS MAY AFFECT THE STAGING FOR THE CROSSING.
5. AT DRAINAGE SWALES CROSSING THE DISTURBED AREAS ARE TO BE STABILIZED WITH RIP-RAP OR JUTE MATTING WITH VEGETATION, AS APPROPRIATE.

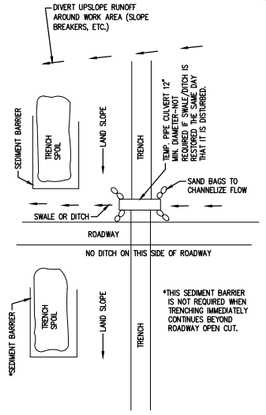
Utility Line Highway/Roadway Crossing Boring Method

NOT TO SCALE (HWB)



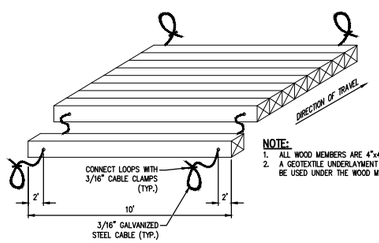
Utility Line Highway/Roadway Crossing Open Cut Method

NOT TO SCALE (HWC)



Typical Log Mat Detail (LM)

NOT TO SCALE

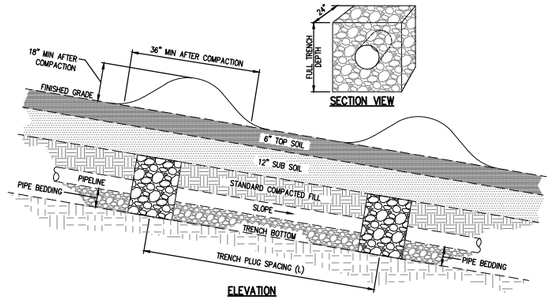


NOTE:

1. ALL WOOD MEMBERS ARE 4"x4".
2. A GEOTEXTILE UNDERLAYMENT SHALL BE USED UNDER THE WOOD MAT.

Trench Breakers/Trench Plugs (TB/P)

NOT TO SCALE



Required Spacing And Materials For Trench Breakers/Trench Plugs

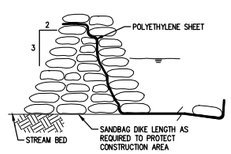
TRENCH SLOPE	SPACING (L) IN FEET	PLUG MATERIAL
0-5%	1,000	CLAY, BENTONITE, OR CONCRETE FILLED SACKS
5-15%	500	CLAY, BENTONITE, OR CONCRETE FILLED SACKS
15-25%	300	CLAY, BENTONITE, OR CONCRETE FILLED SACKS
25-35%	200	CLAY, BENTONITE, OR CONCRETE FILLED SACKS
35-100%	100	CLAY, BENTONITE, OR CONCRETE FILLED SACKS
OVER 100%	50	CLAY, BENTONITE, OR CONCRETE FILLED SACKS

NOTES:

1. IMPERVIOUS TRENCH PLUGS ARE REQUIRED FOR ALL STREAM, RIVER, WETLAND, OR OTHER BODY CROSSING REGARDLESS OF TRENCH SLOPE
2. TO ENSURE PROPER TOPSOIL CONSERVATION, TOPSOIL SHOULD NOT BE USED IN EARTH FILLED SACKS.
3. PLACE AT ALL VERTICAL ANGLE POINTS (TOP AND BOTTOM OF SLOPE).
4. TRENCH BREAKRES/TRENCH PLUGS SHOULD BE INSTALLED IN ALL UTILITY LINE TRENCHERS PER TABLE ABOVE. TABLE ABOVE INDICATES THE REQUIRED SPACING AND MATERIALS FOR THE TRENCH BREAKERS/TRENCH PLUGS.

Sandbag Dike (SC)

NOT TO SCALE



GENERAL NOTES:

1. ALL BMP'S SHALL BE INSPECTED AFTER EACH RUNOFF EVENT AND ON A WEEKLY BASIS. ANY NECESSARY REPAIRS MUST BE MADE IMMEDIATELY TO ENSURE EFFECTIVE AND EFFICIENT OPERATION.
2. BMP'S SHOWN MAY NEED TO BE FIELD ADJUSTED TO FIT ACTUAL CONDITIONS.
3. IN SOME CASES, THE NEXT LARGER BMP MAY BE NEEDED DUE TO UNFORESEEN CONDITIONS.
4. ADDITIONAL BMP'S MAY BE REQUIRED OTHER THAN THOSE SHOWN.
5. THE CONTRACTOR SHALL TAKE WHATEVER MEASURES NECESSARY TO PREVENT SEDIMENT FROM LEAVING THE SITE.

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SEAL

NO.	REVISIONS	DATE

E&SPC TYPICAL DETAIL SHEET 3

AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

DRAWN BY: AEJ	PROJECT NO. NRG-1007
CHECKED BY: SJC	
DATE: 12.15.14	SHEET NO. 85 OF 88
SCALE: AS NOTED	

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Bartonsville, PA 18321-7822
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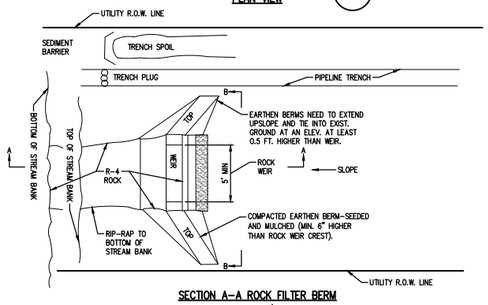
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Rock Filter Berm

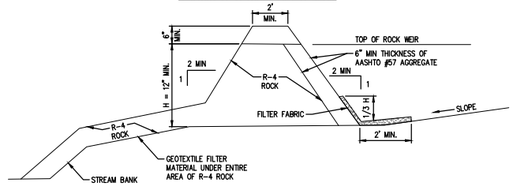
NOT TO SCALE

RFB

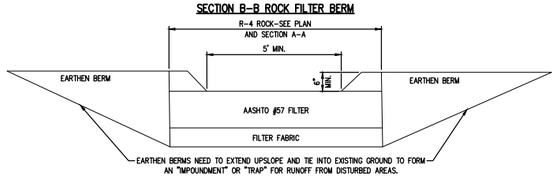
PLAN VIEW



SECTION A–A ROCK FILTER BERM



SECTION B–B ROCK FILTER BERM

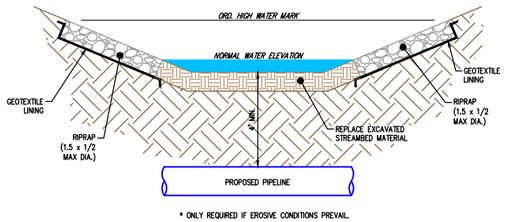


NOTES:

1. THE "ROCK FILTER BERM" SHOULD ONLY BE USED AT THE BOTTOM OF VERY STEEP UTILITY LINE SLOPES THAT DISCHARGE DIRECTLY TO A STREAM OR RIVER AND WHERE THERE IS NOT SUFFICIENT AREA TO INSTALL CONVENTIONAL SEDIMENT POLLUTION CONTROLS (SEDIMENT TRAPS, ETC.).
2. GEOTEXTILE FILTER MATERIAL SHOULD BE PLACED UNDER THE ENTIRE AREA OF THE R-4 ROCK. R-4 ROCK SHOULD BE PLACED IN THE FLOW PATH FROM THE ROCK FILTER TO THE BOTTOM OF THE STREAM BANK. IF THE STREAM BANK IS TOO STEEP TO PROPERLY PLACE THE R-4 ROCK, THEN THE GEOTEXTILE MATERIAL ALONE SHOULD EXTEND DOWN OVER THE STREAM BANK AND BE SECURED TO PREVENT ITS MOVEMENT OR DISPLACEMENT.
3. THE EARTHEN BERMS NEED TO EXTEND UPSLOPE AND TIE INTO EXISTING GROUND AT AN ELEVATION AT LEAST 0.5 FEET HIGHER THAN THE ROCK WEIR CREST. THE OBJECTIVE IS TO COLLECT RUNOFF FROM DISTURBED AREAS AND MAKE THAT RUNOFF FLOW THROUGH THE FILTER MEDIA.
4. IF AN ACCESS ROAD PARALLEL TO THE TRENCH IS NEEDED, THE AFFECTED EARTHEN BERM SHOULD BE DESIGNED AND INSTALLED SO THAT TRAFFIC CAN SAFELY PASS OVER IT. ALSO, THE BERM SHOULD BE "REINFORCED" TO PREVENT "BREAKDOWN" FROM HEAVY VEHICLES.
5. ALL OF THE AREAS THAT ARE DISTURBED TO INSTALL THE ROCK FILTER BERM SHOULD BE SEEDED AND MULCHED.
6. SEDIMENT SHOULD BE REMOVED FROM THE FILTER WHEN IT REACHES HALF OF THE HEIGHT OF THE FILTER FABRIC ON THE UPSLOPE SIDE OF THE FILTER. THE REMOVED SEDIMENT SHOULD BE DISPOSED OF AT A LOCATION THAT PREVENTS SEDIMENT FROM DISCHARGING TO A STREAM.

Utility Trench Crossing

NOT TO SCALE



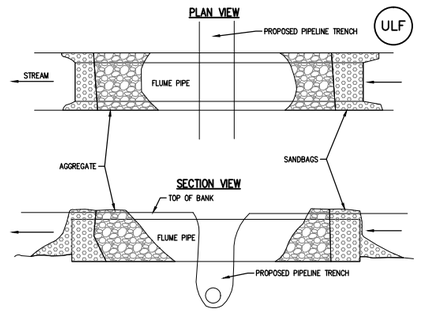
* ONLY REQUIRED IF EROSIVE CONDITIONS PREVAIL.

Utility Line Stream Crossing With Pipe Flume

NOT TO SCALE

ULF

PLAN VIEW



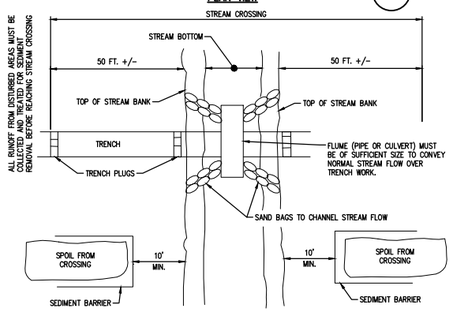
SECTION VIEW

Utility Line Stream Crossing With Pipe Flume

NOT TO SCALE

ULF

PLAN VIEW



NOTES:

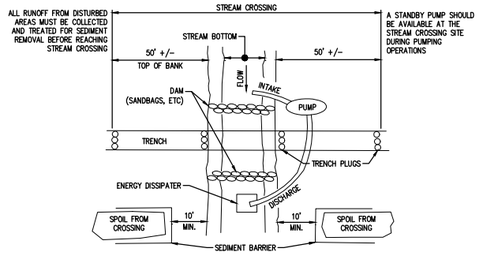
1. TRENCH EXCAVATION FOR UTILITY LINE CROSSINGS SHOULD BE UNDERTAKEN FROM THE TOP OF BANKS WHENEVER POSSIBLE. THE CROSSING SHOULD BE PERPENDICULAR TO THE LENGTH OF THE STREAM TO MINIMIZE THE DISTURBED AREA IN THE STREAM.
2. ALL EXCAVATED CHANNEL MATERIALS THAT WILL BE SUBSEQUENTLY USED AS BACKFILL WILL BE PLACED IN A TEMPORARY STOCKPILE LOCATED OUTSIDE OF THE CHANNEL. THESE STORAGE AREAS MUST BE ENCIRCLED WITH A BARRIER OR SEDIMENT REMOVAL STRUCTURE TO PREVENT SEDIMENT LADEN RUNOFF FROM RE-ENTERING THE CHANNEL. ALL EXCAVATED MATERIALS THAT WILL NOT BE USED ON THE SITE CANNOT BE STORED IN THE FLOODPLAIN AND MUST BE HAULED TO A DISPOSAL SITE LOCATED OUTSIDE OF THE FLOODPLAIN.
3. DISTURBED AREAS SHOULD BE STABILIZED WHEN THE CROSSING IS COMPLETED.
4. ALL WORK, INCLUDING STABILIZATION, SHOULD BE PLANNED FOR PERIODS OF LOW STREAM FLOWS. THE SCHEDULE SHOULD ALLOW SUFFICIENT TIME TO ALLOW FOR THE ESTABLISHMENT OF AN EROSION RESISTANT VEGETATIVE COVER ON DISTURBED AREAS BEFORE THE START OF THE DORMANT SEASON UNLESS OTHER MEANS TO STABILIZE AGAINST EROSION ARE USED.
5. TEMPORARY ACCESS ROADS, CROSSINGS WHERE REPEATED TRAFFIC IS PLANNED, AND ANY OTHER FORM OF TEMPORARY FILL OR BALLAST LOCATED WITHIN THE CHANNEL, WILL BE CONSTRUCTED WITH CLEAN ROCK FILL.

Utility Line Stream Crossing With Dam And Pumping

NOT TO SCALE

ULP

PLAN VIEW

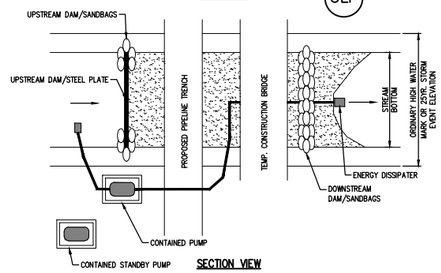


Utility Line Stream Crossing With Steel Plate

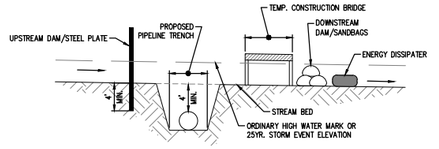
NOT TO SCALE

PLAN VIEW

ULP



SECTION VIEW



Utility Line Crossing General Notes:

THESE COMMENTS APPLY TO BOTH "UTILITY LINE STREAM CROSSING WITH PIPE FLUME" AND "UTILITY LINE STREAM CROSSING WITH DAM AND PUMPING".

UTILITY LINE STREAM CROSSING ARE CONSIDERED TO BEGIN (OR END) 50 FEET BACK FROM THE TOP OF THE STREAM BANK ON BOTH SIDES OF THE STREAM. PIPELINES WITH THE PIPE JOINTS ASSEMBLED/MADE IN THE TRENCH SHOULD MAINTAIN A 50 FOOT BUFFER ON BOTH SIDES OF THE STREAM UNTIL THE STREAM CROSSING COMMENCES. LARGE DIAMETER STEEL PIPELINES WITH WELDED JOINTS WHERE THE PIPE JOINTS ARE WELDED WHILE THE PIPELINE IS OUT OF THE TRENCH SHOULD MAINTAIN A 25 FOOT BUFFER ON BOTH SIDES OF THE STREAM UNTIL THE STREAM CROSSING COMMENCES.

A UTILITY LINE STREAM CROSSING OF A STREAM 10 FEET IN (BOTTOM) WIDTH OR LESS SHOULD BE COMPLETED WITHIN 24 HOURS (FROM START TO FINISH) INCLUDING THE TRENCH BACKFILLING.

FACILITIES FOR REMOVING SEDIMENT FROM PUMPED WATER SHOULD BE AVAILABLE AT THE UTILITY LINE STREAM CROSSING SITE BEFORE TRENCHING COMMENCES AND MAINTAINED UNTIL TRENCH BACKFILLING IS COMPLETED.

ASSEMBLY AREAS, TEMPORARY EQUIPMENT AND NON-HAZARDOUS MATERIAL STORAGE AREAS SHOULD BE LOCATED AT LEAST 50 FEET BACK FROM THE TOP OF THE STREAM BANK.

HAZARDOUS OR POLLUTIVE MATERIAL STORAGE AREAS SHOULD BE LOCATED AT LEAST 100 FEET BACK FROM THE TOP OF THE STREAM BANK.

ALL EXCESS EXCAVATED MATERIAL SHALL BE IMMEDIATELY REMOVED FROM STREAM CROSSING.

UTILITY LINE CROSSING OF A STREAM CHANNEL WITH A BOTTOM WIDTH OF 10 FEET OR LESS SHALL BE COMPLETED WITH 24 HOURS FROM START TO FINISH. CROSSINGS WITH A BOTTOM WIDTH OF 10 FEET TO 100 FEET SHALL BE COMPLETED WITHIN 48 HOURS FROM START TO FINISH. COMPLETION INCLUDES THE STABILIZATION OF STREAM BANKS AND THE STABILIZATION OF THE AREA 50 FEET BACK FROM THE TOP OF EACH STREAM BANK.

UTILITY LINE WETLAND CROSSING

STAGING AREAS OR WORK AREAS REQUIRED TO MAKE THE WETLAND CROSSING SHOULD BE LOCATED IN AN UPLAND AT LEAST 50 FEET FROM THE WETLAND EDGE AND INDICATED ON THE SITE DRAWINGS. STREAM/RIVER CROSSINGS MUST BE CAREFULLY PLANNED AND CONSTRUCTED WHERE WETLANDS ARE ADJACENT TO THE STREAM/RIVER CROSSING. WHERE TRENCH SPOIL FROM THE STREAM/RIVER CROSSING MUST BE TEMPORARILY PLACED/STORED ON AN ADJACENT WETLAND, SUFFICIENT RIGHT-OF-WAY SHOULD BE FURNISHED FOR THE TRENCH SPOIL AND THE STREAM/RIVER CROSSING WORK AND PRECAUTIONS SHOULD BE TAKEN TO PREVENT THE TRENCH SPOIL FROM INTERMINGLING WITH THE WETLANDS SOILS. IT MAY BE NECESSARY TO PLACE A LAYER OF GEOTEXTILE MATERIAL OR OTHER COVER ON THE WETLAND TO TEMPORARILY STORE THE STREAM CROSSING TRENCH SPOIL.

WHEN GRADING AND TRENCH EXCAVATION OCCUR WITHIN THE WETLAND, THE WETLAND TOPSOIL (WITH THE VEGETATION ROOT MASS) SHALL BE CAREFULLY REMOVED AND STOCKPILED SEPARATELY FROM THE SUBSOIL. THE FOREGOING WILL NOT BE REQUIRED WHERE THERE IS STANDING WATER OR THE TOPSOIL IS SATURATED TO THE POINT THAT IT CANNOT BE SEGREGATED. SHORTLY AFTER THE PIPELINE IS INSTALLED AND THE TRENCH BACKFILLED, THE TOPSOIL SHOULD BE RESTORED TO THE GRADED AREAS.

SEDIMENT POLLUTION CONTROLS SHOULD BE PROVIDED AS NECESSARY TO PREVENT SEDIMENT DISCHARGES FROM DISTURBED AREAS INTO WETLANDS AND OFF THE RIGHT-OF-WAY FROM WETLAND CONSTRUCTION. WATER PUMPED OR REMOVED FROM TRENCHES SHALL NOT BE DISCHARGED INTO WETLANDS WITHOUT PROPER SEDIMENT REMOVAL TREATMENT.

BMP'S (TRENCH PLUGS, ETC.) SHOULD BE IMPLEMENTED TO PREVENT THE TRENCH FROM PERMANENTLY DRAINING THE WETLAND OR CHANGING THE SITE HYDROLOGY. THE STOCKPILED WETLAND TOPSOIL SHOULD BE RETURNED TO ITS ORIGINAL HORIZON. ALL TEMPORARY RIGHT-OF-WAY STABILIZATION FOR THE ACCESS ROAD SHOULD BE REMOVED.

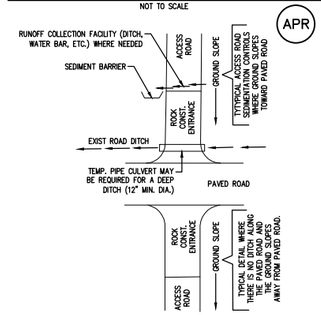
ORIGINAL CONTOURS AND CROSS DRAINAGES SHOULD BE RESTORED. ALL EXCESS SPOIL MUST BE REMOVED FROM THE WETLAND AND PROPERLY DISPOSED OF.

IN GENERAL, ANNUAL RYEGRASS AT THE RATE OF 40 POUNDS PER ACRE SHOULD BE APPLIED TO ALL DISTURBED AREAS WHERE STANDING WATER IS NOT PREVALENT. STRAW MULCH, WITHOUT BINDING AGENTS, SHOULD BE APPLIED AT THE RATE OF 3 TONS PER ACRE ON AREAS SEEDED WITH ANNUAL RYEGRASS. FUELS OR HAZARDOUS MATERIALS SHOULD NOT BE STORED WITHIN 100 FEET OF A WETLAND. APPLICATION OF CONCRETE COATING OF PIPES SHOULD NOT BE PERFORMED WITHIN 100 FEET OF A WETLAND.

Access Road Crossing Of Paved Road

NOT TO SCALE

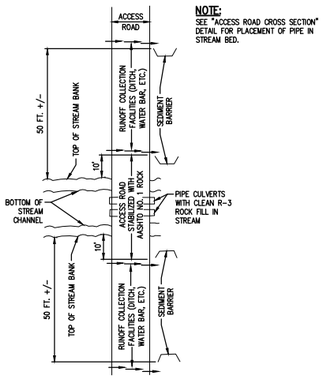
APR



Access Road Stream Crossing With Pipe Culverts

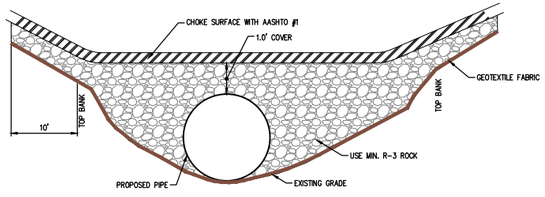
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ARC



Access Road Cross Section

NOT TO SCALE



GENERAL NOTES:

1. ALL BMP'S SHALL BE INSPECTED AFTER EACH RUNOFF EVENT AND ON A WEEKLY BASIS. ANY NECESSARY REPAIRS MUST BE MADE IMMEDIATELY TO ENSURE EFFECTIVE AND EFFICIENT OPERATION.
2. BMPS SHOWN MAY NEED TO BE FIELD ADJUSTED TO FIT ACTUAL CONDITIONS.
3. IN SOME CASES, THE NEXT LARGER BMP MAY BE NEEDED DUE TO UNFORESEEN CONDITIONS.
4. ADDITIONAL BMPS MAY BE REQUIRED OTHER THAN THOSE SHOWN.
5. THE CONTRACTOR SHALL TAKE WHATEVER MEASURES NECESSARY TO PREVENT SEDIMENT FROM LEAVING THE SITE.

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SEAL

NO.	REVISIONS	DATE

E&SPC TYPICAL DETAIL SHEET 4

AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: AS NOTED

PROJECT NO. NRG–1007

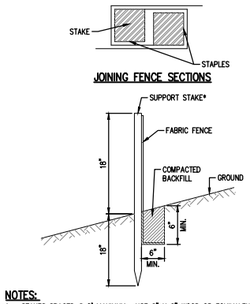
SHEET NO. 86 OF 88

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Y:\Projects\Energy\NRG Energy\NRG-1007-Avon Lakes Pipeline\DWG\ESPC\ ESPC-NRG-1007-AVON LAKE-007-TYPICAL DETAILS.dwg Dec 14,2014 - 4:44pm

Standard Construction Detail #19
Standard Filter Fabric Fence (18" High)

NOT TO SCALE

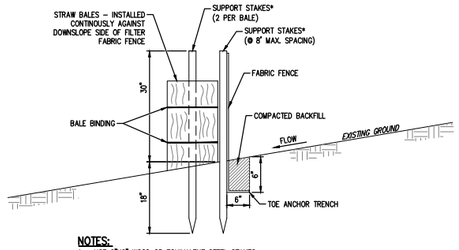


NOTES:

*1. STAKES SPACED @ 8' MAXIMUM. USE 2" X 2" WOOD OR EQUIVALENT STEEL STAKES.
2. FILTER FABRIC FENCE MUST BE PLACED AT LEVEL EXISTING GRADE. BOTH ENDS OF THE BARRIER MUST BE EXTENDED AT LEAST 8 FEET UP SLOPE AT 45 DEGREES TO THE MAIN BARRIER ALIGNMENT.
3. SEDIMENT MUST BE REMOVED WHEN ACCUMULATIONS REACH 1/2 THE ABOVE GROUND HEIGHT OF THE FENCE.
4. ANY SECTION OF FILTER FABRIC FENCE WHICH HAS BEEN UNDERMINED OR TOPPED MUST BE IMMEDIATELY REPLACED WITH A ROCK FILTER OUTLET. SEE STANDARD CONSTRUCTION DETAIL #18.

Standard Construction Detail #21
Filter Fabric Fence Reinforced By Staked Straw Bales

NOT TO SCALE

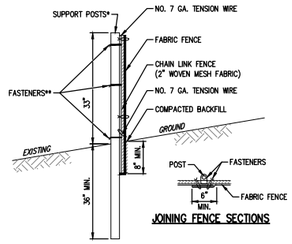


NOTES:

*1. USE 2"x2" WOOD OR EQUIVALENT STEEL STAKES.
2. FILTER FABRIC FENCE STAKES TO BE ACTUAL SIZE NOTED IN DETAILS.
3. FILTER FABRIC FENCE MUST BE INSTALLED AT EXISTING LEVEL GRADE. BOTH ENDS OF EACH FENCE SECTION MUST BE EXTENDED AT LEAST 8 FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT.
4. SEDIMENT MUST BE REMOVED WHERE ACCUMULATIONS REACH 1/2 THE ABOVE GROUND HEIGHT OF THE FENCE.
5. ANY FENCE SECTION WHICH HAS BEEN UNDERMINED OR TOPPED MUST BE IMMEDIATELY REPLACED WITH A ROCK FILTER OUTLET.

Standard Construction Detail #22
Super Filter Fabric Fence

NOT TO SCALE

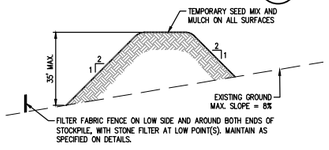


NOTES:

*1. POSTS SPACED @ 10' MAX. USE 2 1/2" DIA. GALVANIZED OR ALUMINUM POSTS.
**2. CHAIN LINK TO POST FASTENERS SPACED @ 14" MAX. USE NO. 6 GA. ALUMINUM WIRE OR NO. 9 GALVANIZED STEEL PRE-FORMED CLIPS. CHAIN LINK TO TENSION WIRE FASTENERS SPACED @ 60" MAX. USE NO. 10 GA. GALVANIZED STEEL WIRE. FABRIC TO CHAIN FASTENERS SPACED @ 24" MAX. C TO C.
3. NO. 7 GA. TENSION WIRE INSTALLED HORIZONTALLY AT TOP AND BOTTOM OF CHAIN-LINK FENCE.
4. FILTER FABRIC FENCE MUST BE PLACED AT EXISTING LEVEL GRADE. BOTH ENDS OF THE BARRIER MUST BE EXTENDED AT LEAST 8 FEET UPSLOPE AT 45 DEGREES TO THE MAIN BARRIER ALIGNMENT.
5. SEDIMENT MUST BE REMOVED WHEN ACCUMULATIONS REACH 1/2 THE ABOVE GROUND HEIGHT OF THE FENCE.

Typical Soil Stockpile (SP)

NOT TO SCALE

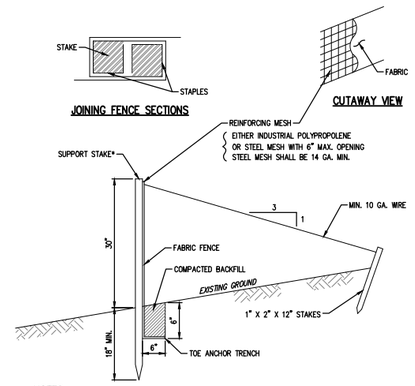


SOIL STOCKPILE MAINTENANCE

1. STOCKPILE TOPSOIL OR EXCAVATED SOIL MATERIAL AT LOCATIONS SHOWN FOR EACH PHASE OF CONSTRUCTION.
2. HEIGHT AND SIDES LOPES SHALL NOT EXCEED MAXIMUM VALUES SHOWN ON DETAIL.
3. INSTALL FILTER FENCE PRIOR TO STOCKPILING OF MATERIAL. REPLACE ANY FENCE REMOVED FOR VEHICULAR ACCESS AFTER EACH WORK DAY.
4. APPLY A TEMPORARY SEED MIX AND MULCH WHEN PILE WILL REMAIN FOR 30 DAYS OR MORE.
5. TOPSOIL PILES AND TRENCH SPOIL STOCKPILES SHOULD BE SEPARATED BY A MINIMUM OF 2 FEET TO AVOID CONTAMINATION OF TOPSOIL.

Standard Construction Detail #20 Reinforced
Filter Fabric Fence (30" High)

NOT TO SCALE



NOTES:

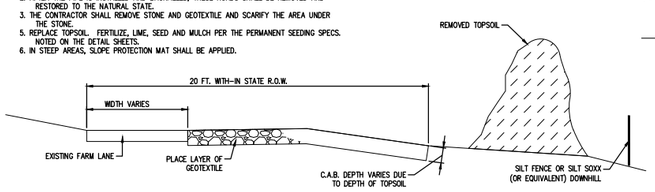
*1. STAKES SPACED @ 8' MAX. USE 2" X 2" WOOD OR EQUIVALENT STEEL STAKES.
2. SHOW ALL DETAILS AND CONSTRUCTION DIMENSIONS ON PLAN DRAWINGS.
3. FILTER FABRIC FENCE MUST BE INSTALLED AT EXISTING LEVEL GRADE. BOTH ENDS OF EACH FENCE SECTION MUST BE EXTENDED AT LEAST 8 FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT.
4. SEDIMENT MUST BE REMOVED WHERE ACCUMULATIONS REACH 1/2 THE ABOVE GROUND HEIGHT OF THE FENCE.
5. ANY FENCE SECTION WHICH HAS BEEN UNDERMINED OR TOPPED MUST BE IMMEDIATELY REPLACED WITH A ROCK FILTER OUTLET. SEE STANDARD CONSTRUCTION DETAIL #18.
6. ALL FENCE INSTALLATIONS SHOULD BE INSPECTED AFTER EVERY RUNOFF EVENT AND OR WEEKLY. ANY NECESSARY REPAIRS MUST BE MADE IMMEDIATELY.

Access Road For Pipe Installation (AR)

NOT TO SCALE

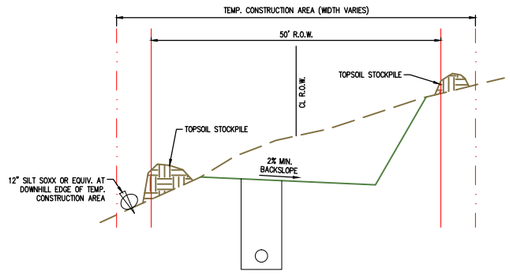
NOTES:

1. THE LOCATIONS OF THESE ACCESS ROADS SHALL ONLY BE PLACED AT LOCATION AS SHOWN ON THE PLANS.
2. AFTER THE PIPE IS INSTALLED AND BACKFILLED, THESE ROADS SHALL BE REMOVED AND RESTORED TO THE NATURAL STATE.
3. THE CONTRACTOR SHALL REMOVE STONE AND GEOTEXTILE AND SCARIFY THE AREA UNDER THE STONE.
5. REPLACE TOPSOIL. FERTILIZE, LIME, SEED AND MULCH PER THE PERMANENT SEEDING SPECS. NOTED ON THE DETAIL SHEETS.
6. IN STEEP AREAS, SLOPE PROTECTION MAT SHALL BE APPLIED.

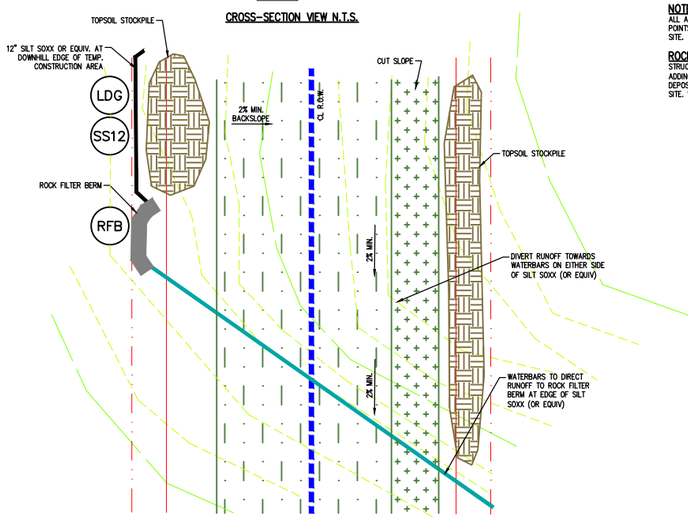


Longitudinal Diversion Grading Method (LDG)

NOT TO SCALE



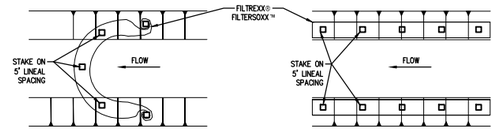
CROSS-SECTION VIEW N.T.S.



PLAN VIEW

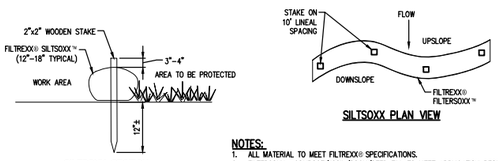
Silt Soxx Staking Details

NOT TO SCALE



SILTSOXX PLAN VIEW

EDGE SAVER PLAN VIEW



SILTSOXX SECTION

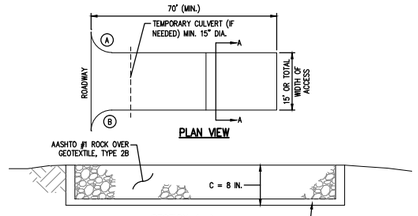
SILTSOXX PLAN VIEW

NOTES:

1. ALL MATERIAL TO MEET FILTREXX® SPECIFICATIONS.
2. FILTERSOXX™ COMPOST/JSOIL/ROCK/SEED FILL TO MEET APPLICATION REQUIREMENTS.
3. COMPOST MATERIAL TO BE DISPERSED ON SITE, AS DETERMINED BY ENGINEER.

Rock Construction Entrance (RCE)

NOT TO SCALE



SECTION A-A

(A) RADIUS=35'

(B) AREAS TO RECEIVE RADIUS TO FIT SITE CONDITIONS(MIN.-10 FT.)

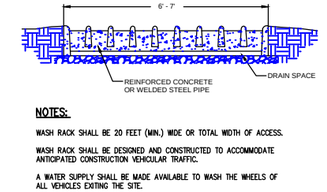
(C) ROADSIDE DITCH FLOWS TO BE MAINTAINED. USE APPROPRIATE SIZED CULVERTS AS NECESSARY.

NOTE:
ALL ACCESS TO THE SITE MUST BE VIA AN APPROVED ROCK CONSTRUCTION ENTRANCE. POINTS OF POTENTIAL UNAUTHORIZED SITE ACCESS MUST BE PHYSICALLY BARRICADED AT THE SITE.

ROCK CONSTRUCTION ENTRANCE MAINTENANCE:
STRUCTURE THICKNESS MUST BE CONSTANTLY MAINTAINED TO THE SPECIFIED DIMENSION BY ADDING ROCK (AS NECESSARY). AT THE END OF EACH CONSTRUCTION DAY, ALL SEDIMENT DEPOSITED ON PUBLIC ROADWAYS, MUST BE REMOVED AND RETURNED TO THE CONSTRUCTION SITE. WASHING OF THE ROADWAY WITH WATER IS NOT PERMITTED.

ROCK CONSTRUCTION ENTRANCE WITH WASH RACK (RCE)

N.T.S.



NOTES:

WASH RACK SHALL BE 20 FEET (MIN.) WIDE OR TOTAL WIDTH OF ACCESS.

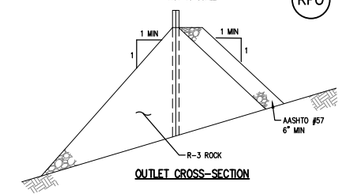
WASH RACK SHALL BE DESIGNED AND CONSTRUCTED TO ACCOMMODATE ANTICIPATED CONSTRUCTION VEHICULAR TRAFFIC.

A WATER SUPPLY SHALL BE MADE AVAILABLE TO WASH THE WHEELS OF ALL VEHICLES EXITING THE SITE.

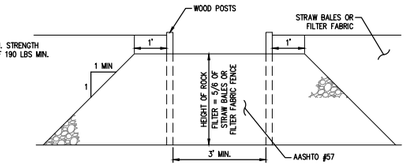
MAINTENANCE: ROCK CONSTRUCTION ENTRANCE THICKNESS SHALL BE CONSTANTLY MAINTAINED TO THE SPECIFIED DIMENSIONS BY ADDING ROCK. A STOCKPILE OF ROCK MATERIAL SHALL BE MAINTAINED ON SITE FOR THIS PURPOSE. DRAIN SPACE UNDER WASH RACK SHALL BE KEPT OPEN AT ALL TIMES. DAMAGE TO THE WASH RACK SHALL BE REPAIRED PRIOR TO FURTHER USE OF THE RACK. ALL SEDIMENT DEPOSITED ON ROADWAYS SHALL BE REMOVED AND RETURNED TO THE CONSTRUCTION SITE IMMEDIATELY. WASHING THE ROADWAY OR SWEEPING THE DEPOSITS INTO ROADWAY DITCHES, SEWERS, CULVERTS, OR OTHER DRAINAGE COURSES IS NOT ACCEPTABLE.

Standard Construction Detail #18
Rock Filter Outlets (RFO)

NOT TO SCALE



OUTLET CROSS-SECTION



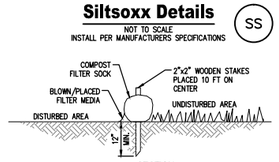
UP-SLOPE FACE

NOTES:

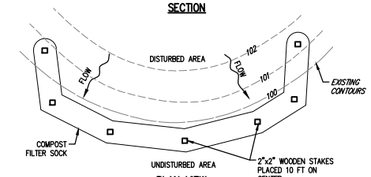
1. SEDIMENT MUST BE REMOVED WHEN ACCUMULATIONS REACH 1/3 THE HEIGHT OF THE OUTLET.
2. ALL INSTALLATIONS SHOULD BE INSPECTED AFTER EVERY RUNOFF EVENT AND OR WEEKLY. ANY NECESSARY REPAIRS MUST BE MADE IMMEDIATELY.

Siltsoxx Details (SS)

NOT TO SCALE
INSTALL PER MANUFACTURERS SPECIFICATIONS



SECTION



PLAN VIEW

NOTES:

1. SOCK FABRIC SHALL MEET STANDARDS OF CHAPTER 6 OF THE RAINWATER & LAND DEVELOPMENT MANUAL FOR OHIO. COMPOST SHALL MEET THE STANDARDS OF CHAPTER 6 OF THE RAINWATER & LAND DEVELOPMENT MANUAL FOR OHIO.
2. COMPOST FILTER SOCK SHALL BE PLACED AT EXISTING LEVEL GRADE. BOTH ENDS OF THE BARRIER SHALL BE EXTENDED AT LEAST 8 FEET UP SLOPE AT 45 DEGREES TO THE MAIN BARRIER ALIGNMENT. MAXIMUM SLOPE LENGTH ABOVE ANY BARRIER SHALL NOT EXCEED THAT SPECIFIED FOR THE SIZE OF THE SOCK AND THE SLOPE OF ITS TRIBUTARY AREA.
3. TRAFFIC SHALL NOT BE PERMITTED TO CROSS COMPOST FILTER SOCKS.
4. ACCUMULATED SEDIMENT SHALL BE REMOVED WHEN IT REACHES 1/2 THE ABOVE GROUND HEIGHT OF THE BARRIER AND DISPOSED IN THE MANNER DESCRIBED ELSEWHERE IN THE PLAN.
5. COMPOST FILTER SOCKS SHALL BE INSPECTED WEEKLY AND AFTER EACH RUNOFF EVENT. DAMAGED SOCKS SHALL BE REPAIRED ACCORDING TO MANUFACTURER REPLACED WITHIN 24 HOURS OF INSPECTION.
6. BIODEGRADABLE COMPOST FILTER SOCKS SHALL BE REPLACED AFTER 6 MONTHS; PHOTODEGRADABLE SOCKS AFTER 1 YEAR. POLYPROPYLENE SOCKS SHALL BE REPLACED ACCORDING TO MANUFACTURER.
7. UPON STABILIZATION OF THE AREA TRIBUTARY TO THE SOCK, STAKES SHALL BE REMOVED. THE SOCK MAY BE LEFT IN PLACE AND VEGETATED OR REMOVED. IN THE LATTER CASE, THE MESH SHALL BE CUT OPEN AND THE MULCH SPREAD AS A SOIL SUPPLEMENT.
8. THE EXISTING SURFACE SHOULD BE PREPARED PRIOR TO INSTALLATION OF SILT SOCKS TO CREATE A DIRECT CONTACT BETWEEN THE BOTTOM OF THE SILT SOCKS AND THE EARTH ON WHICH THEY ARE PLACED.

GENERAL NOTES:

1. ALL BMP'S SHALL BE INSPECTED AFTER EACH RUNOFF EVENT AND ON A WEEKLY BASIS. ANY NECESSARY REPAIRS MUST BE MADE IMMEDIATELY TO ENSURE EFFECTIVE AND EFFICIENT OPERATION.
2. BMPS SHOWN MAY NEED TO BE FIELD ADJUSTED TO FIT ACTUAL CONDITIONS.
3. IN SOME CASES, THE NEXT LARGER BMP MAY BE NEEDED DUE TO UNFORESEEN CONDITIONS.
4. ADDITIONAL BMPS MAY BE REQUIRED OTHER THAN THOSE SHOWN.
5. THE CONTRACTOR SHALL TAKE WHATEVER MEASURES NECESSARY TO PREVENT SEDIMENT FROM LEAVING THE SITE.

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SEAL

NO.	REVISIONS	DATE

E&SPC TYPICAL DETAIL SHEET 5

AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

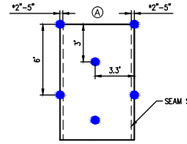
DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: AS NOTED
PROJECT NO. NRG-1007
SHEET NO. 87 OF 88

Hanover Engineering Associates Inc
3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768

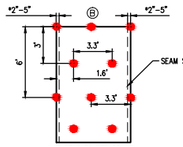
Y:\Projects\Energy\NRG Energy\NRG-1007-Avon Lakes Pipeline\DWG\ESPC\ ESPC-NRG-1007-AVON LAKE-007-TYPICAL DETAILS.dwg Dec 14,2014 - 4:44pm

Staple Pattern Guide

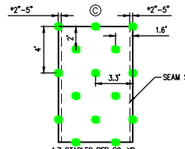
NOT TO SCALE



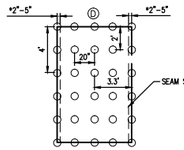
0.7 STAPLES PER SQ. YD.
(0.8 STAPLES PER SQ. M)
FOR BLANKETS WITH THE OPTIONAL NORTH AMERICAN GREEN DOT SYSTEM™ PLACE STAPLES/STAKES THROUGH EACH OF THE BLUE COLORED DOTS.



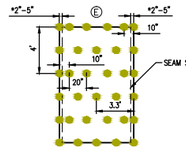
1.15 STAPLES PER SQ. YD.
(1.35 STAPLES PER SQ. M)
FOR BLANKETS WITH THE OPTIONAL NORTH AMERICAN GREEN DOT SYSTEM™ PLACE STAPLES/STAKES THROUGH EACH OF THE RED COLORED DOTS.



1.7 STAPLES PER SQ. YD.
(2.0 STAPLES PER SQ. M)
FOR BLANKETS WITH THE OPTIONAL NORTH AMERICAN GREEN DOT SYSTEM™ PLACE STAPLES/STAKES THROUGH EACH OF THE GREEN COLORED DOTS.



3.4 STAPLES PER SQ. YD.
(4.1 STAPLES PER SQ. M)
FOR BLANKETS WITH THE OPTIONAL NORTH AMERICAN GREEN DOT SYSTEM™ PLACE STAPLES/STAKES THROUGH EACH OF THE WHITE COLORED DOTS.



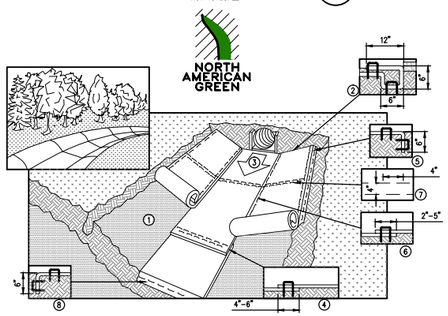
3.75 STAPLES PER SQ. YD.
(4.5 STAPLES PER SQ. M)
FOR BLANKETS WITH THE OPTIONAL NORTH AMERICAN GREEN DOT SYSTEM™ PLACE STAPLES/STAKES THROUGH EACH OF THE YELLOW COLORED DOTS.

*LOCATION OF SEAM STITCH™ WILL VARY DEPENDING ON NORTH AMERICAN GREEN PRODUCT TYPE.

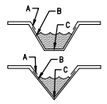
14649 HIGHWAY 41 NORTH, EVANSVILLE, INDIANA 47725
USA 1-800-772-2040 CANADA 1-800-448-2040
www.nagreen.com

Channel Installation

NOT TO SCALE



1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED. NOTE: WHEN USING CELL-O-SEED DO NOT SEED PREPARED AREA. CELL-O-SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.
2. BEGIN AT THE TOP OF THE CHANNEL BY ANCHORING THE BLANKET IN A 6" DEEP X 6" WIDE TRENCH WITH APPROXIMATELY 12" OF BLANKET EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF BLANKET BACK OVER SEED AND COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" APART ACROSS THE WIDTH OF THE BLANKET.
3. ROLL CENTER BLANKET IN DIRECTION OF WATER FLOW IN BOTTOM OF CHANNEL. BLANKETS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL BLANKETS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING OPTIONAL DOT SYSTEM™ STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
4. PLACE CONSECUTIVE BLANKETS END OVER END (SHINGLE STYLE) WITH A 4"-6" OVERLAP. USE A DOUBLE ROW OF STAPLES STAGGERED 4" APART AND 4" ON CENTER TO SECURE BLANKETS.
5. FULL LENGTH EDGE OF BLANKETS AT TOP OF SIDE SLOPES MUST BE ANCHORED WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN A 6" DEEP X 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.
6. ADJACENT BLANKETS MUST BE OVERLAPPED APPROXIMATELY 2"-5" (DEPENDING ON BLANKET TYPE) AND STAPLED. TO ENSURE PROPER SEAM ALIGNMENT, PLACE THE EDGE OF THE OVERLAPPING BLANKET (BLANKET BEING INSTALLED ON TOP) EVEN WITH THE COLORED SEAM STITCH™ ON THE BLANKET BEING OVERLAPPED.
7. IN HIGH FLOW CHANNEL APPLICATIONS, A STAPLE CHECK SLOT IS RECOMMENDED AT 30 TO 40 FOOT INTERVALS. USE A DOUBLE ROW OF STAPLES STAGGERED 4" APART AND 4" ON CENTER OVER ENTIRE WIDTH OF THE CHANNEL.
8. THE TERMINAL END OF THE BLANKETS MUST BE ANCHORED WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN A 6" DEEP X 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.



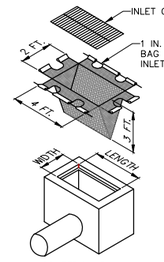
CRITICAL POINTS
A. OVERLAPS AND SEAMS
B. PROJECTED WATER LINE
C. CHANNEL BOTTOM/SIDE SLOPE VERTICES

NOTE:
* HORIZONTAL STAPLE SPACING SHOULD BE ALTERED IF NECESSARY TO ALLOW STAPLES TO SECURE THE CRITICAL POINTS ALONG THE CHANNEL SURFACE.
** IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" MAY BE NECESSARY TO PROPERLY ANCHOR THE BLANKETS.

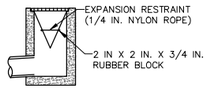
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FILTER BAG INLET PROTECTION - TYPE M INLET

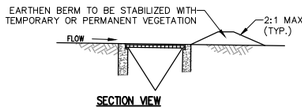
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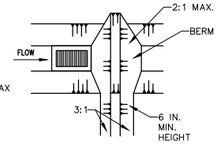
ISOMETRIC VIEW



INSTALLATION DETAIL



SECTION VIEW



PLAN VIEW

NOTES:

MAXIMUM DRAINAGE AREA = 1/2 ACRE.

INLET PROTECTION SHALL NOT BE REQUIRED FOR INLET TRIBUTARY TO SEDIMENT BASIN OR TRAP. BERMS SHALL BE REQUIRED FOR ALL INSTALLATIONS.

ROLLED EARTHEN BERM IN ROADWAY SHALL BE MAINTAINED UNTIL ROADWAY IS STONED. ROAD SUBBASE BERM ON ROADWAY SHALL BE MAINTAINED UNTIL ROADWAY IS PAVED. EARTHEN BERM IN CHANNEL SHALL BE MAINTAINED UNTIL PERMANENT STABILIZATION IS COMPLETED OR REMAIN PERMANENTLY.

AT A MINIMUM, THE FABRIC SHALL HAVE A MINIMUM GRAB TENSILE STRENGTH OF 120 LBS., A MINIMUM BURST STRENGTH OF 200 PSI, AND A MINIMUM TRAPEZOIDAL TEAR STRENGTH OF 50 LBS. FILTER BAGS SHALL BE CAPABLE OF TRAPPING ALL PARTICLES NOT PASSING A NO. 40 SIEVE.

INLET FILTER BAGS SHALL BE INSPECTED ON A WEEKLY BASIS AND AFTER EACH RUNOFF EVENT. BAGS SHALL BE EMPTIED AND RINSED OR REPLACED WHEN HALF FULL OR WHEN FLOW CAPACITY HAS BEEN REDUCED SO AS TO CAUSE FLOODING OR BYPASSING OF THE INLET. DAMAGED OR CLOGGED BAGS SHALL BE REPLACED. A SUPPLY SHALL BE MAINTAINED ON SITE FOR REPLACEMENT OF BAGS. ALL NEEDED REPAIRS SHALL BE INITIATED IMMEDIATELY AFTER THE INSPECTION. DISPOSE ACCUMULATED SEDIMENT AS WELL AS ALL USED BAGS ACCORDING TO THE PLAN NOTES.

DO NOT USE ON MAJOR PAVED ROADWAYS WHERE PONDING MAY CAUSE TRAFFIC HAZARDS.

Rock Gradation Chart

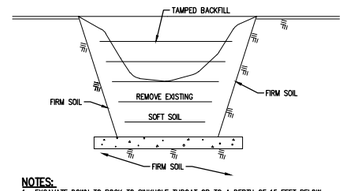
AASHTO NUMBER	NSA NUMBER	PA NUMBER	6 1/2"	4"	3 1/2"	2 1/2"	2"	1 1/2"	1"	3/4"	1/2"	3/8"	#4	#8	#16	#30	#100	#200
	FS-3		100			50									0			
1		4		100	90-100	25-60		0-15		0-5								
3		3A				100	90-100	35-70	0-15		0-5							
467							100	95		35-70		10-30	0-5					
	FS-2						100						50				0	
		2A					100			52-100		36-70	24-50	16-38	10-30			0-10
5								100	90-100	20-55	0-10	0-5						
57		2B						100	90-100		25-60		0-10	0-5				
		2NS						100	90-100		0-15							
67		2							100	90-100		20-55	0-10	0-5				
		1NS							100		90-100		0-15					
7										100	90-100	40-70	0-15	0-5				
8											100	85-100	10-30	0-10	0-5			
		1B									100	75-100	10-30	0-10				
10		1										100	75-100				10-30	
	FS-1											100				50	0	

Table 4-9 ROCK GRADATION, FILTER BLANKET REQUIREMENTS, MAXIMUM VELOCITIES

NSA NO.	GRADED ROCK SIZE (IN.)			FILTER BLANKET REQUIREMENTS		Vmax (FT/SEC)
	MAX	D	MIN.	SIZE NSA NO.	PLACEMENT THICKNESS	
R-1	1.5	0.75	NO. 8	FS-1	N/A	2.5
R-2	3	1.5	1	FS-1	N/A	4.5
R-3	6	3	2	FS-1	3	6.5
R-4	12	6	3	FS-2	4	9.0
R-5	18	9	5	FS-2	6	11.5
R-6	24	12	7	FS-3	8	13.0
R-7	30	15	12	FS-3	10	14.5

Sinkhole In Soil

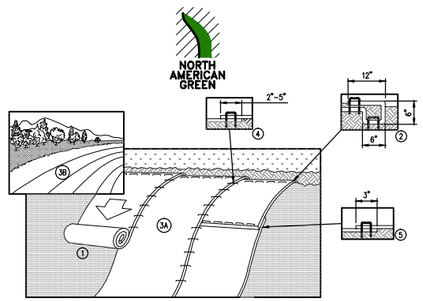
NOT TO SCALE



NOTES:
1. EXCAVATE DOWN TO ROCK TO SINKHOLE THROAT OR TO A DEPTH OF 15 FEET BELOW GRADE, WHICHEVER OCCURS FIRST.
2. IF ROCK IS ENCOUNTERED WITHIN 10 FEET, STOP EXCAVATION. THE LIMIT OF EXCAVATION SHALL BE DETERMINED BY THE ENGINEER. GENERALLY, A ZONE OF SOFT, IN-FILL MATERIAL WILL BE FOUND WHEN COVERS MOST OF THE BOTTOM OF THE EXCAVATION. COVER THIS AREA WITH FOUR(4) FEET OF CONCRETE EXTENDING AT LEAST 1 FOOT INTO FIRM SOIL. IF THE SOFT ZONE IS LARGE(+3FT.), REINFORCING STEEL SHOULD BE INCLUDED WITHIN THE CONCRETE CAP WITH 1" DIAMETER REBAR AT 24" ON CENTER EACH WAY. THE LIMIT OF CONCRETE SHOULD BE DETERMINED BY THE THE ENGINEER.
3. AFTER CONCRETE HAS SET OVERNIGHT, BACKFILL HOLE WITH RELATIVELY IMPERMEABLE CLAY SOIL. COMPACT SOIL IN 6" LIFTS WITH A POWER TAMPER OR RAMMER. THE TOP THREE(3) FEET SHALL BE BACKFILLED WITH 2RC CRUSHED AGGREGATE.
4. BACKFILL HOLE ABOVE EXISTING GRADE TO DIVERT SURFACE WATER.
5. WHEN SINKHOLE IS UNDER A PROPOSED UTILITY, CONCRETE IS TO BE SET 6" BELOW THE UTILITY TO ALLOW FOR A STONE BEDDING.

Slope Installation

NOT TO SCALE



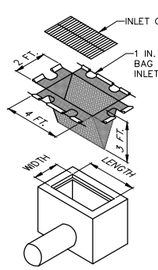
1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED. NOTE: WHEN USING CELL-O-SEED DO NOT SEED PREPARED AREA. CELL-O-SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN A 6" DEEP X 6" WIDE TRENCH WITH APPROXIMATELY 12" OF BLANKET EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF BLANKET BACK OVER SEED AND COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" APART ACROSS THE WIDTH OF THE BLANKET.
3. ROLL THE BLANKETS (A) DOWN OR (B) HORIZONTALLY ACROSS THE SLOPE. BLANKETS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL BLANKETS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING OPTIONAL DOT SYSTEM™ STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
4. THE EDGES OF PARALLEL BLANKETS MUST BE STAPLED WITH APPROXIMATELY 2"-5" OVERLAP DEPENDING ON BLANKET TYPE. TO ENSURE PROPER SEAM ALIGNMENT, PLACE THE EDGE OF THE OVERLAPPING BLANKET (BLANKET BEING INSTALLED ON TOP) EVEN WITH THE COLORED SEAM STITCH™ ON THE PREVIOUSLY INSTALLED BLANKET.
5. CONSECUTIVE BLANKETS SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" APART ACROSS ENTIRE BLANKET WIDTH.

NOTE:
* IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" MAY BE NECESSARY TO PROPERLY SECURE THE BLANKETS.

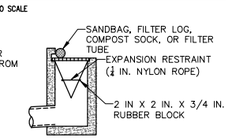
14649 HIGHWAY 41 NORTH, EVANSVILLE, INDIANA 47725
USA 1-800-772-2040 CANADA 1-800-448-2040
www.nagreen.com

FILTER BAG INLET PROTECTION - TYPE C INLET

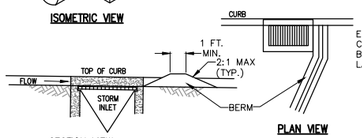
NOT TO SCALE



ISOMETRIC VIEW



INSTALLATION DETAIL



SECTION VIEW



PLAN VIEW

NOTES:

MAXIMUM DRAINAGE AREA = 1/2 ACRE.

INLET PROTECTION SHALL NOT BE REQUIRED FOR INLET TRIBUTARY TO SEDIMENT BASIN OR TRAP. BERMS SHALL BE REQUIRED FOR ALL INSTALLATIONS.

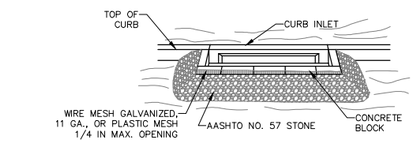
ROLLED EARTHEN BERM SHALL BE MAINTAINED UNTIL ROADWAY IS STONED. ROAD SUBBASE BERM SHALL BE MAINTAINED UNTIL ROADWAY IS PAVED. SIX INCH MINIMUM HEIGHT ASPHALT BERM SHALL BE MAINTAINED UNTIL ROADWAY SURFACE RECEIVES FINAL COAT.
AT A MINIMUM, THE FABRIC SHALL HAVE A MINIMUM GRAB TENSILE STRENGTH OF 120 LBS, A MINIMUM BURST STRENGTH OF 200 PSI, AND A MINIMUM TRAPEZOIDAL TEAR STRENGTH OF 50 LBS. FILTER BAGS SHALL BE CAPABLE OF TRAPPING ALL PARTICLES NOT PASSING A NO. 40 SIEVE.

INLET FILTER BAGS SHALL BE INSPECTED ON A WEEKLY BASIS AND AFTER EACH RUNOFF EVENT. BAGS SHALL BE EMPTIED AND RINSED OR REPLACED WHEN HALF FULL OR WHEN FLOW CAPACITY HAS BEEN REDUCED SO AS TO CAUSE FLOODING OR BYPASSING OF THE INLET. DAMAGED OR CLOGGED BAGS SHALL BE REPLACED. A SUPPLY SHALL BE MAINTAINED ON SITE FOR REPLACEMENT OF BAGS. ALL NEEDED REPAIRS SHALL BE INITIATED IMMEDIATELY AFTER THE INSPECTION. DISPOSE OF ACCUMULATED SEDIMENT AS WELL AS ALL USED BAGS ACCORDING TO THE PLAN NOTES.

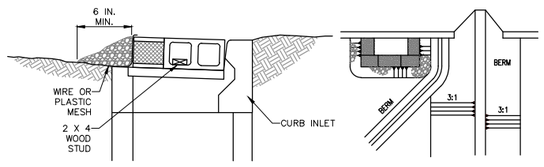
DO NOT USE ON MAJOR PAVED ROADWAYS WHERE PONDING MAY CAUSE TRAFFIC HAZARDS.

STONE AND CONCRETE BLOCK INLET PROTECTION - TYPE C INLET

NOT TO SCALE



FRONT VIEW



SECTION VIEW PLAN VIEW

NOTES:

MAXIMUM DRAINAGE AREA = 1 ACRE.

INLET PROTECTION SHALL NOT BE REQUIRED FOR INLET TRIBUTARY TO SEDIMENT BASIN OR TRAP. BERMS SHALL BE REQUIRED FOR ALL INSTALLATIONS.

ROLLED EARTHEN BERM SHALL BE PROVIDED AND MAINTAINED IMMEDIATELY DOWN GRADIENT OF THE PROTECTED INLET UNTIL ROADWAY IS STONED. ROAD SUBBASE BERM SHALL BE MAINTAINED UNTIL ROADWAY IS PAVED. SIX INCH MINIMUM HEIGHT ASPHALT BERM SHALL BE MAINTAINED UNTIL ROADWAY SURFACE RECEIVES FINAL COAT.

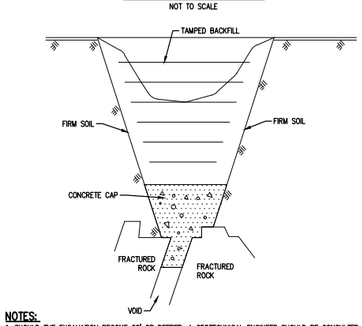
SEDIMENT SHALL BE REMOVED WHEN IT REACHES HALF THE HEIGHT OF THE STONE. DAMAGED OR CLOGGED INSTALLATIONS SHALL BE REPAIRED OR REPLACED IMMEDIATELY.

FOR SYSTEMS DISCHARGING TO HQ OR EV SURFACE WATER, A 6 INCH THICK COMPOST LAYER SHALL BE SECURELY ANCHORED ON OUTSIDE AND OVER TOP OF STONE.

DO NOT USE ON MAJOR PAVED ROADWAYS WHERE PONDING MAY CAUSE TRAFFIC HAZARDS.

Sinkhole In Rock

NOT TO SCALE



NOTES:
1. SHOULD THE EXCAVATION BECOME 20' OR DEEPER, A GEOTECHNICAL ENGINEER SHOULD BE CONSULTED AS TO THE CORRECT PROCEDURE TO BE CARRIED OUT.
2. EXCAVATE DOWN TO BEDROCK OR TO THE SINKHOLE THROAT.
3. EXPOSE THE ROCK SURFACE BY WASHING THE AREA WITH A SMALL HOSE WATER SPRAY AND INSTALL HIGHSUMP CEMENT INTO VOIDS AND CREVICES UNTIL VOIDS ARE FILLED AND A CAP COVERS THE AREA. THE LIMIT OF EXCAVATION AND CONCRETE SHALL BE DETERMINED BY THE ENGINEER.
4. AFTER CONCRETE HAS SET OVERNIGHT, BACKFILL HOLE WITH RELATIVELY IMPERMEABLE CLAY SOIL. COMPACT SOIL IN 6" LIFTS WITH A POWER TAMPER OR RAMMER. THE TOP THREE(3) FEET SHALL BE BACKFILLED WITH 2RC CRUSHED AGGREGATE.
5. BACKFILL HOLE ABOVE EXISTING GRADE TO DIVERT SURFACE WATER.
6. WHEN SINKHOLE IS UNDER A PROPOSED UTILITY. CONCRETE IS TO BE SET 6" BELOW THE UTILITY TO ALLOW FOR A STONE BEDDING.

GENERAL NOTES:
1. ALL BMP'S SHALL BE INSPECTED AFTER EACH RUNOFF EVENT AND ON A WEEKLY BASIS. ANY NECESSARY REPAIRS MUST BE MADE IMMEDIATELY TO ENSURE EFFECTIVE AND EFFICIENT OPERATION.
2. BMPS SHOWN MAY NEED TO BE FIELD ADJUSTED TO FIT ACTUAL CONDITIONS.
3. IN SOME CASES, THE NEXT LARGER BMP MAY BE NEEDED DUE TO UNFORESEEN CONDITIONS.
4. ADDITIONAL BMPS MAY BE REQUIRED OTHER THAN THOSE SHOWN.
5. THE CONTRACTOR SHALL TAKE WHATEVER MEASURES NECESSARY TO PREVENT SEDIMENT FROM LEAVING THE SITE.

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SEAL

NO.	REVISIONS	DATE

E&SPC TYPICAL DETAIL SHEET 6

AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

DRAWN BY: AEJ	PROJECT NO. NRG-1007
CHECKED BY: SJC	
DATE: 12.15.14	SHEET NO. 88 OF 88
SCALE: AS NOTED	

Hanover
Engineering Associates Inc
3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768

Y:\Projects\Energy\NRG Energy\NRG-1007-Avon Lakes Pipeline\DWG\ESPC\ ESPC-NRG-1007-AVON LAKE-007-TYPICAL DETAILS.dwg Dec 14,2014 - 4:43pm

Appendix B

Affected Wetlands and Waterways

Avon Lake Gas Addition Project
NRG Ohio Pipeline Company LLC
Attachment B: Wetlands and Streams Crossed by the Project

Wetlands Affected by the Project

Wetland ID	Corwardin Class	ORAM Category	Temporary Impacts (Acres) [1]	Mile Post
3	PFO/PSS	2	0.0	1.1
4	PFO/PSS	2	0.3	1.2
5	PEM	1	0.6	1.4
6	PEM	1	2.6	1.8
7	PEM	2	4.8	2.1
8	PEM	2	2.8	3.6
9	PFO/PSS	2	0.1	4.0
10	PEM/PFO/PSS	2	1.0	4.2
12	PEM/PFO	2	1.8	4.8
13	PEM	2	0	5.1
14	PFO/PSS	1	0.3	5.8
15	PFO	2	0.1	6.0
16	PFO/PSS	2	0.1	6.1
17	PFO/PSS	2	0.4	6.7
18	PFO/PSS	2	0.1	6.7
19	PFO	2	0.3	6.8
20	PSS	2	0.0	6.9
21	PFO/PSS	2	0.5	7.1
22	PEM/PFO/PSS	2	21.5	7.5
24	PFO/PSS	2	3.6	9.8
25	PFO/PSS	2	0.7	10.0
25.1	PFO	2	0.4	10.2
26	PFO	2	1.7	11.4
27	PEM	1	0.2	11.8
29	PEM/PFO/PSS	2	6.1	12.5
32.1	PFO	1	0.9	13.5
33.1	PFO	1	0.4	13.7
34	PEM/PFO	2	0.1	14.0
35	PEM/PFO/PSS	2	1.3	14.0
37.1	PFO	2	2.5	14.8
38	PFO	2	0.7	15.3
41.1	PFO/PSS	2	0.3	16.4
43.1	PFO	2	0.1	16.7

Wetland ID	Corwardin Class	ORAM Category	Temporary Impacts (Acres) [1]	Mile Post
44	PEM/PFO	2	0.2	16.8
44.1	PFO	2	0.8	17.0
45	PFO	2	0.4	17.3
45.1	PEM	1	0.1	17.4
47	PFO	2	0.1	18.5
47.1	PFO	2	1.4	18.5
		Total	**59.4**	

[1]All impacts will be temporary and all grades will be returned to pre-construction contours

Streams Affected by the Project

Mile Post	Waterbody Name	Waterbody Type	Crossing Type
1.8	Stream 1	Intermittent	HDD
3.0	French Creek	Perennial	HDD
3.6	Unnamed Stream	Intermittent	Open Cut
3.7	Stream 2	Intermittent	HDD
4.1	Stream 3	Intermittent	Open Cut
4.6	Stream 4	Intermittent	Open Cut
5.3	Stream 5	Intermittent	Open Cut
5.9	Jungbluth Ditch	Perennial	Open Cut
7.5	Ridgeway Ditch	Perennial	HDD
7.9	Unnamed Stream	Intermittent	Open Cut
10.8	Unnamed Stream	Intermittent	Open Cut
11.4	Stream 7	Intermittent	Open Cut
13.0	Willow Creek	Intermittent	HDD
14.0	Jackson Ditch	Intermittent	Open Cut
15.3	Alexander Ditch	Intermittent	Open Cut
15.9	Unnamed Stream	Intermittent	Open Cut
16.5	East Branch of Black River	Perennial	HDD
18.9	Dent Ditch	Intermittent	Open Cut

Appendix C

Inspection Form

Power to be free℠

Construction Storm Water
Inspection and Maintenance Form

Type of Inspection: ___7 Day ___24-hour for >0.5-inch precipitation

Milepost/Station Location: _____to_____ Date: _____

Inspector: _____ Time: _____

Date of Precipitation Event (if applicable): _____

Amount of Rainfall (if applicable): _____inches

Inspect Construction areas for appropriate sediment control barriers
Identify locations where sediment barriers must be maintained or replaced, or where additional sediment barriers are necessary.

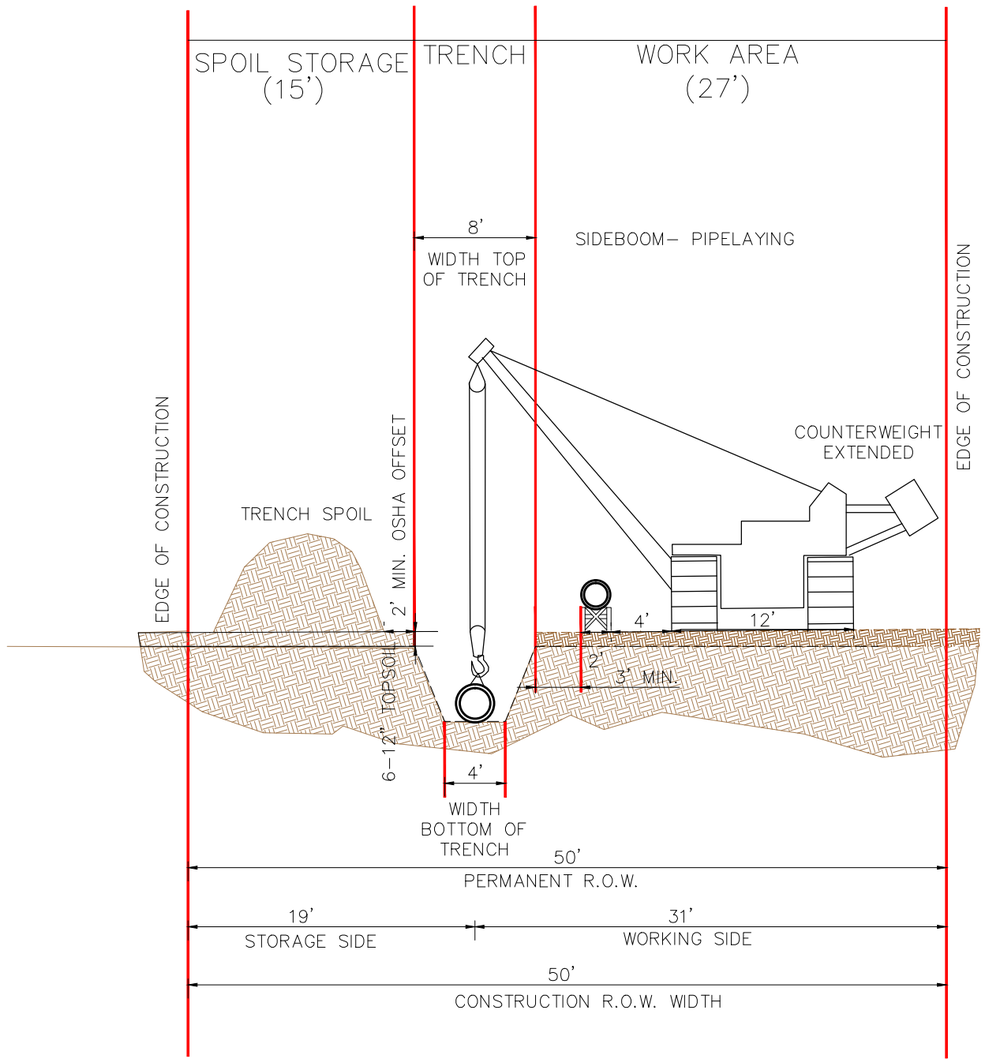
Location (Milepost/Stationing)	BMP Type	Required Activity	Date Maintenance Completed

Additional Inspection Notes:

Appendix D

Typical Construction Diagrams

CROSS SECTION
NOT TO SCALE



MAINLINE CONSTRUCTION
NON–PARALLEL CONSTRUCTION
WITH TOPSOIL SEGREGATION
50' RIGHT–OF–WAY

811
Know what's **below.**
Call before you dig.

SUMMARY

NO.	SUMMARY OF MATERIALS – DESCRIPTION (IN HORIZONTAL DISTANCE)	QTY.	REFERENCE DRAWINGS	REV.	REVISIONS	DATE	DRAWN	CHKD.	APPD.

NOT FOR CONSTRUCTION

DRAWING APPROVAL

	SIGNATURE	DATE
DRAWN BY	JAG	9.15.14
CHECKED BY	SJC	
IN HOUSE APPD.		
CLIENT APPD.		
CLIENT APPD.		

PROJECT NUMBER
NRG–1003

CLIENT
NRG OHIO PIPELINE COMPANY LLC

PROJECT TITLE
AVON LAKE NATURAL GAS PIPELINE PROJECT
PROPOSED 24" GAS PIPELINE

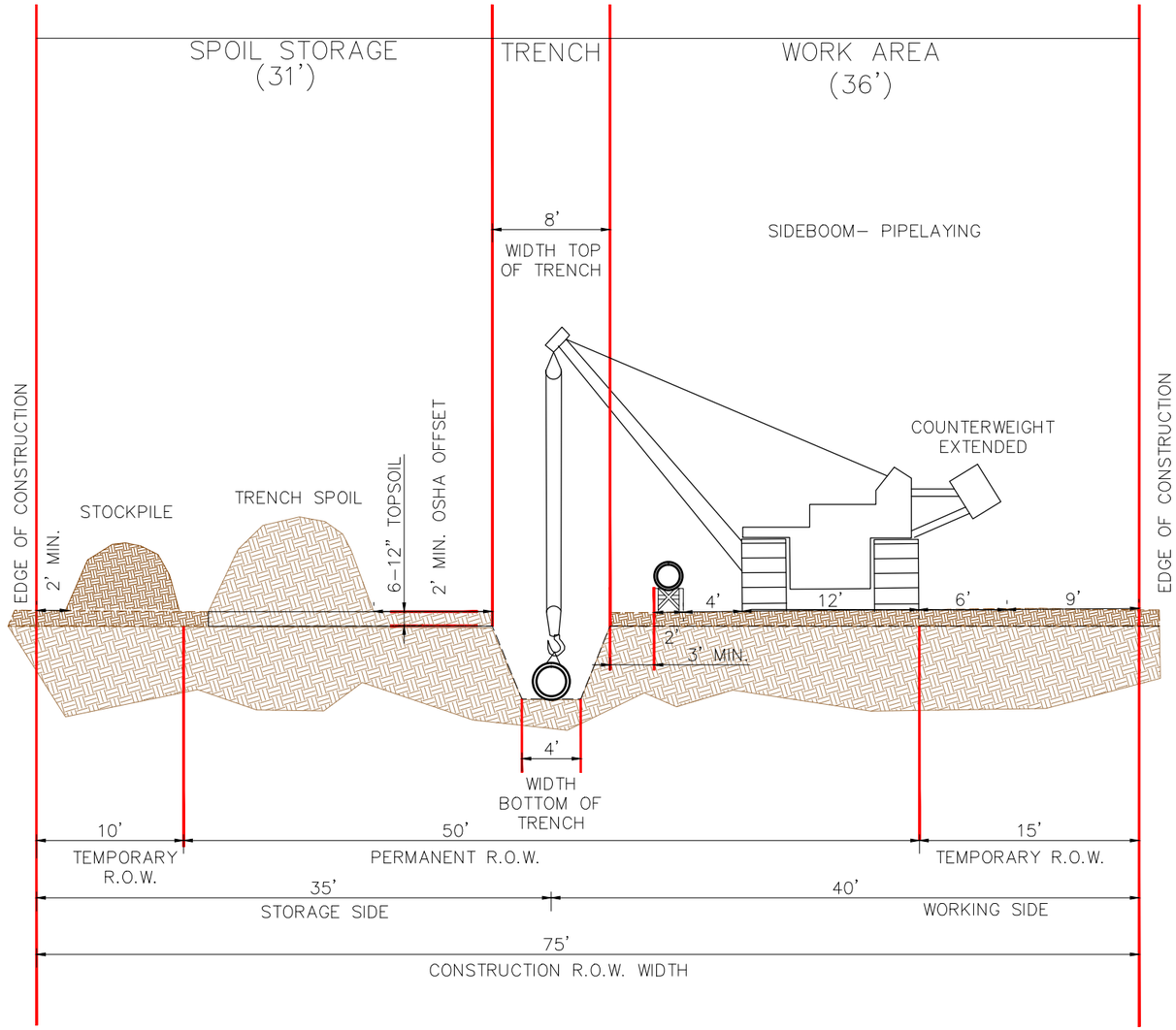
Hanover
Engineering Associates Inc

DWG. TITLE
MAINLINE NON–PARA CONST. WITH TOP SOIL SEGREGATION R.O.W.
CHAUTAUQUA COUNTY NEW YORK

SCALE	SHEET NO.	REV.
AS NOTED	1 OF 1	0

7.17.14

CROSS SECTION
NOT TO SCALE



MAINLINE CONSTRUCTION
NON–PARALLEL CONSTRUCTION
WITH TOPSOIL SEGREGATION
75' RIGHT–OF–WAY

811
Know what's **below.**
Call before you dig.

SUMMARY

NO.	SUMMARY OF MATERIALS – DESCRIPTION (IN HORIZONTAL DISTANCE)	QTY.	REFERENCE DRAWINGS	REV.	REVISIONS	DATE	DRAWN	CHKD.	APPD.

NOT FOR CONSTRUCTION

DRAWING APPROVAL

	SIGNATURE	DATE
DRAWN BY	JAG	9.15.14
CHECKED BY	SJC	
RV HOUSE APPD.		
CLIENT APPD.		
CLIENT APPD.		

PROJECT NUMBER
NRG–1003

CLIENT
NRG OHIO PIPELINE COMPANY LLC

Hanover
Engineering Associates Inc

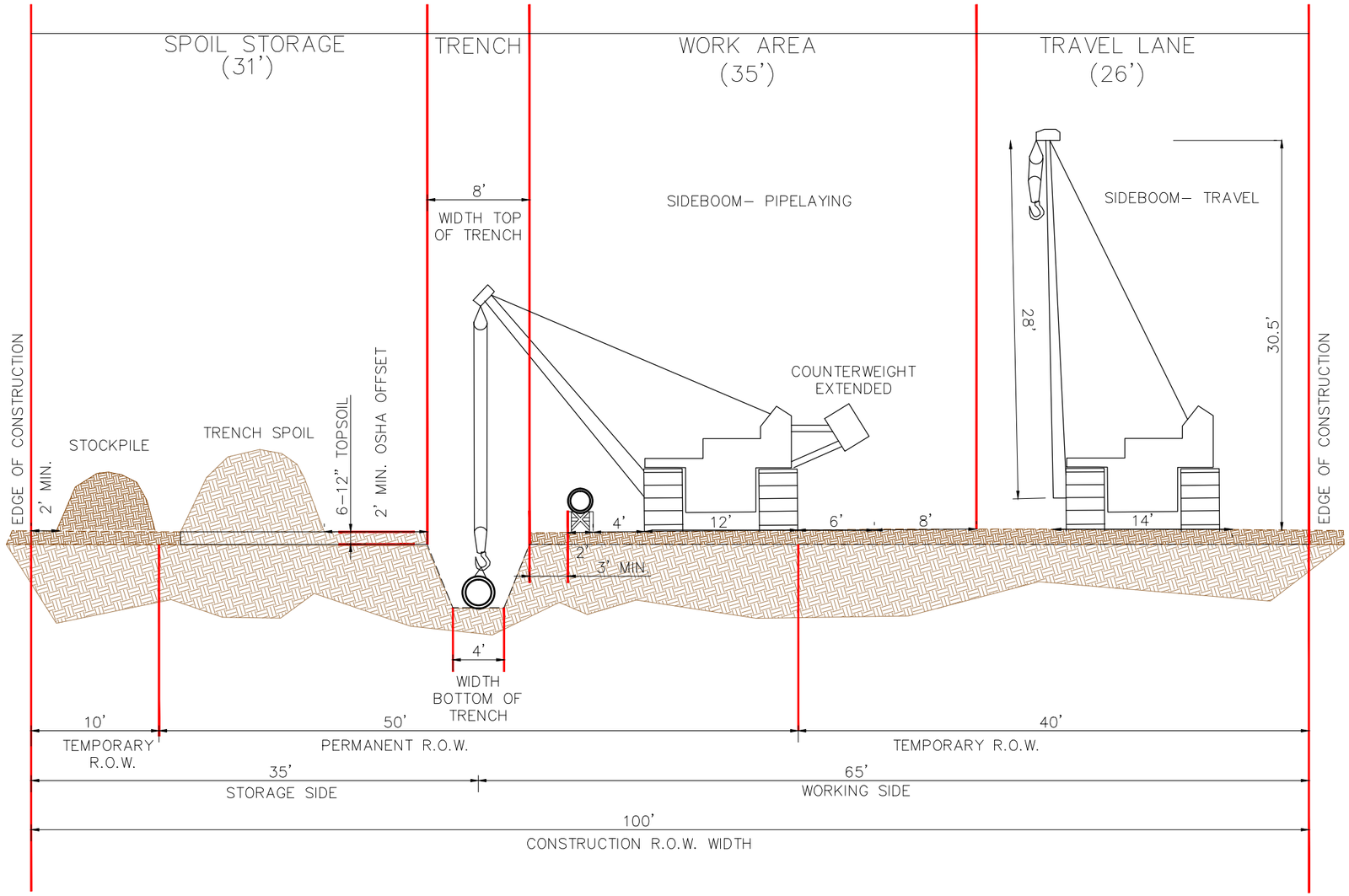
PROJECT TITLE
AVON LAKE NATURAL GAS PIPELINE PROJECT
PROPOSED 24" GAS PIPELINE

DWG. TITLE
MAINLINE NON–PARA CONST. WITH TOP SOIL SEGREGATION R.O.W.
CHAUTAUQUA COUNTY NEW YORK

SCALE AS NOTED | SHEET NO. 1 OF 1 | REV. 0

7.17.14

CROSS SECTION
NOT TO SCALE



MAINLINE CONSTRUCTION
NON–PARALLEL CONSTRUCTION
WITH TOPSOIL SEGREGATION
100' RIGHT–OF–WAY

811 Know what's **below.** **Call** before you dig.

SUMMARY

NO.	SUMMARY OF MATERIALS – DESCRIPTION (IN HORIZONTAL DISTANCE)	QTY.	REFERENCE DRAWINGS	REV.	REVISIONS	DATE	DRAWN	CHKD.	APPD.

NOT FOR CONSTRUCTION

DRAWING APPROVAL

	SIGNATURE	DATE
DRAWN BY	JAG	9.15.14
CHECKED BY	SJC	
IN HOUSE APPD.		
CLIENT APPD.		
CLIENT APPD.		

PROJECT NUMBER
NRG–1003

CLIENT
NRG OHIO PIPELINE COMPANY LLC

PROJECT TITLE
AVON LAKE NATURAL GAS PIPELINE PROJECT
PROPOSED 24" GAS PIPELINE

Hanover Engineering Associates Inc

DWG. TITLE
MAINLINE NON–PARA CONST. WITH TOP SOIL SEGREGATION R.O.W.
CHAUTAUQUA COUNTY NEW YORK

SCALE: AS NOTED
SHEET NO.: 1 OF 1
REV.: 0

7.17.14