Federal Energy Regulatory Commission

Office of Energy Projects

April 2017

Columbia Gas Transmission, LLC **Docket No. CP16-498-000**

B-System Project

Environmental Assessment

Cooperating Agencies:

US Army Corps of Engineers

Washington, DC 20426

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, D.C. 20426

OFFICE OF ENERGY PROJECTS

In Reply Refer To:
OEP/DG2E/Gas 4
Columbia Gas Transmission, LLC
B-System Project
Docket No. CP16-498-000

TO THE PARTY ADDRESSED:

The staff of the Federal Energy Regulatory Commission (FERC or Commission) has prepared an environmental assessment (EA) for the B-System Project, proposed by Columbia Gas Transmission, LLC (Columbia) in the above-referenced docket. Columbia requests authorization to modernize and upgrade Columbia's B-System pipelines by replacing and abandoning existing pipeline and constructing new pipeline and appurtenant facilities in Fairfield and Franklin Counties, Ohio.

The EA assesses the potential environmental effects of the construction and operation of the B-System Project in accordance with the requirements of the National Environmental Policy Act (NEPA). The FERC staff concludes that approval of the proposed project, with appropriate mitigating measures, would not constitute a major federal action significantly affecting the quality of the human environment.

The U.S. Army Corps of Engineers and Ohio Department of Natural Resources participated as cooperating agencies in the preparation of the EA. Cooperating agencies have jurisdiction by law or special expertise with respect to resources potentially affected by the proposal and participate in the NEPA analysis.

As part of its proposed B-System Project, Columbia would:

- abandon in place approximately 17.5 miles of 20-inch-diameter pipeline, remove two associated mainline valves (mileposts 7.7 and 10.9), install two gas heaters, and remove various exposed pipe segments on Columbia's Line B-105;
- construct approximately 14.0 miles of 20-inch-diameter replacement pipeline on Columbia's Line B-111;
- construct approximately 0.1 mile of 4-inch-diameter replacement pipeline on Columbia's Line B-121;
- construct approximately 0.5 mile of 4-inch-diameter replacement pipeline on Columbia's Line B-130;

- construct approximately 7.6 miles of new 20-inch-diameter pipeline ("Line K-270") connecting Columbia's K-System and B-System; and
- remove, replace, restore, and install various appurtenances including connections, valves, aboveground piping, one regulation facility, and pig[1] launchers and receivers.

The FERC staff mailed copies of the EA to federal, state, and local government representatives and agencies; elected officials; environmental and public interest groups; Native American tribes; potentially affected landowners and other interested individuals and groups; and newspapers and libraries in the project area. In addition, the EA is available for public viewing on the FERC's website (www.ferc.gov) using the eLibrary link. A limited number of copies of the EA are available for distribution and public inspection at:

Federal Energy Regulatory Commission
Public Reference Room
888 First Street NE, Room 2A
Washington, DC 20426
(202) 502-8371

Any person wishing to comment on the EA may do so. Your comments should focus on the potential environmental effects, reasonable alternatives, and measures to avoid or lessen environmental impacts. The more specific your comments, the more useful they will be. To ensure that the Commission has the opportunity to consider your comments prior to making its decision on this project, it is important that we receive your comments in Washington, DC **on or before May 30, 2017**.

For your convenience, there are three methods you can use to file your comments with the Commission. In all instances please reference the project docket number (CP16-498-000) with your submission. The Commission encourages electronic filing of comments and has expert staff available to assist you at 202-502-8258 or FercOnlineSupport@ferc.gov.

(1) You can file your comments electronically using the eComment feature located on the Commission's website (www.ferc.gov) under the link to Documents and Filings. This is an easy method for submitting brief, text-only comments on a project;

[1] A "pig" is a tool that the pipeline company inserts into and pushes through the pipeline for cleaning the pipeline, conducting internal inspections, or other purposes.

(2) You can also file your comments electronically using the eFiling feature on the Commission's website (www.ferc.gov) under the link to Documents and Filings. With eFiling, you can provide comments in a variety of formats by attaching them as a file with your submission. New eFiling users must first create an account by clicking on "eRegister." You must select the type of filing you are making. If you are filing a comment on a particular project, please select "Comment on a Filing"; or

(3) You can file a paper copy of your comments by mailing them to the following address:

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street NE, Room 1A
Washington, DC 20426

Any person seeking to become a party to the proceeding must file a motion to intervene pursuant to Rule 214 of the Commission's Rules of Practice and Procedures (18 CFR 385.214).[2] Only intervenors have the right to seek rehearing of the Commission's decision. The Commission grants affected landowners and others with environmental concerns intervenor status upon showing good cause by stating that they have a clear and direct interest in this proceeding which no other party can adequately represent. **Simply filing environmental comments will not give you intervenor status, but you do not need intervenor status to have your comments considered.**

Additional information about the project is available from the Commission's Office of External Affairs, at **(866) 208-FERC,** or on the FERC website (www.ferc.gov) using the eLibrary link. Click on the eLibrary link, click on "General Search," and enter the docket number excluding the last three digits in the Docket Number field (i.e., CP16-498). Be sure you have selected an appropriate date range. For assistance, please contact FERC Online Support at FercOnlineSupport@ferc.gov or toll free at (866) 208-3676, or for TTY, contact (202) 502-8659. The eLibrary link also provides access to the texts of formal documents issued by the Commission, such as orders, notices, and rulemakings.

[2] See the previous discussion on the methods for filing comments.

In addition, the Commission offers a free service called eSubscription which allows you to keep track of all formal issuances and submittals in specific dockets. This can reduce the amount of time you spend researching proceedings by automatically providing you with notification of these filings, document summaries, and direct links to the documents. Go to www.ferc.gov/docs-filing/esubscription.asp.

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TECHNICAL ABBREVIATIONS AND ACRONYMS

ATWS	additional temporary workspace
BGEPA	Bald and Golden Eagle Protection Act
CAA	Clean Air Act
Certificate	Certificate of Public Convenience and Necessity
CFR	Code of Federal Regulations
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalents
Corps	U.S. Army Corps of Engineers
Commission	Federal Energy Regulatory Commission
dBA	decibels on the A-weighted scale
DOT	U.S. Department of Transportation
ECS	Environmental Construction Standards
EDR	Environmental Data Resources, Inc.
EI	environmental inspector
EPA	U.S. Environmental Protection Agency
FERC	Federal Energy Regulatory Commission
FERC Plan	FERC *Upland Erosion Control, Revegetation, and Maintenance Plan*
FERC Procedures	FERC *Wetland and Waterbody Construction and Mitigation Procedures*
FWS	U.S. Fish and Wildlife Service
GHG	greenhouse gas
GHGRP	Greenhouse Gas Reporting Program
GWP	Global Warming Potential
HCA	High Consequence Area
HDD	horizontal directional drill
HUC	Hydrologic Unit Code
L_{dn}	day-night sound level
L_{eq}	equivalent sound level
MBTA	Migratory Bird Treaty Act
MLV	mainline valve
MSHCP	Multi-Species Habitat Conservation Plan
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NGA	Natural Gas Act
NLCD	National Land Cover Database
NOI	*Notice of Intent to Prepare an Environmental Assessment for the Planned B-System Project and Request for Comments on Environmental Issues*
NO_x	nitrogen oxides

NRCS	U.S. Department of Agriculture, Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSA	noise-sensitive area
NWI	National Wetlands Inventory
OBCI	Ohio Bird Conservation Initiative
ODNR	Ohio Department of Natural Resources
ODOT	Ohio Department of Transportation
OEP	FERC's Office of Energy Projects
OEPA	Ohio Environmental Protection Agency
PCB	polychlorinated biphenyl
PEM	palustrine emergent
PFO	palustrine forested
PHMSA	U.S. Department of Transportation's Pipeline and Hazardous Materials Safety Administration
PM_{10}	particulate matter with an aerodynamic diameter less than or equal to 10 microns in diameter
$PM_{2.5}$	particulate matter with an aerodynamic diameter less than or equal to 2.5 microns in diameter
POD	Point of Delivery
PSS	palustrine scrub-shrub
PUB	palustrine unconsolidated bottom
SHPO	State Historic Preservation Office
SO_2	sulfur dioxide
SPCC Plan	Spill Prevention, Control, and Countermeasure Plan
TWS	temporary workspaces
USGCRP	U.S. Global Change Research Program
USGS	U.S. Geological Survey
VOC	volatile organic compound

A. PROPOSED ACTION

1. Introduction

The Federal Energy Regulatory Commission (Commission or FERC) is the lead federal agency responsible for evaluating applications filed for authorization to construct and operate interstate natural gas pipeline facilities under section 7(c) of the Natural Gas Act (NGA) and to abandon pipeline facilities under section 7(b) of the NGA. We[1] have prepared this environmental assessment (EA) to assess the potential environmental impacts of the natural gas facilities and abandonment activities proposed by Columbia Gas Transmission, LLC (Columbia), referred to as the B-System Project (Project), in compliance with the requirements of the National Environmental Policy Act (NEPA) (Title 40 of the Code of Federal Regulations, Parts 1500-1508 [40 CFR 1500-1508]) and the Commission's implementing regulations under 18 CFR 380. The U.S. Army Corps of Engineers (Corps) is a cooperating agency in the preparation of this EA due to its permitting and own NEPA obligations, as well as its special expertise regarding wetland and waterbody impacts. The Ohio Department of Natural Resources (ODNR) is a cooperating agency in the preparation of this EA in order to provide special expertise regarding wetland, waterbody, and state-listed species impacts.

The assessment of environmental impacts is an important and integral part of the FERC's decision on whether to issue Columbia a Certificate of Public Convenience and Necessity (Certificate) to construct and operate the proposed Project. The EA includes our assessment and conclusions regarding the proposed action as well as our additional recommendations that we believe would appropriately and reasonably avoid, minimize, or mitigate environmental impacts associated with the Project. Our principal purposes in preparing this EA are to:

- identify and assess the potential impacts on the natural and human environment that would result from the implementation of the Project;
- identify and recommend reasonable alternatives and specific mitigation measures to avoid or minimize environmental impacts; and
- encourage and facilitate public involvement in the environmental review process.

This EA will be used by the Commission in its decision-making process to determine whether to authorize Columbia's proposal. Approval would be granted if, after consideration of both environmental and non-environmental issues, the Commission finds the Project is in the public convenience and necessity.

2. Purpose and Need

Columbia has developed a multi-year, comprehensive modernization program to address its aging infrastructure. According to Columbia, this modernization program is

[1] "We," us," and "our" refer to the environmental staff of the FERC's Office of Energy Projects.

designed to enhance pipeline safety and increase customer service reliability. The modernization program aligns with the U.S. Department of Transportation's (DOT) initiative for pipeline safety that urges pipeline operators to reinvest in their infrastructure to ensure continued pipeline safety and reliability.

Columbia's modernization program identifies projects through a risk-based prioritization process. Modernization projects are identified and prioritized by identifying aging infrastructure that: (a) operates at a relatively higher level of risk; (b) would require upgrades to meet emerging regulations; and/or (c) has lower than desired reliability to meet current or future service requirements due to current design and/or condition. As a result of this identification and prioritization process, Columbia's B-System Project would replace older high-pressure pipeline with high-pressure modern pipeline, as well as install additional new pipeline and appurtenant facilities in Fairfield and Franklin Counties, Ohio. To maintain integrity, Columbia would make each B-System pipeline capable of using "smart pigs"[2] and "cleaning pigs."

Columbia's modernization program identified the need to replace existing 20-inch-diameter pipeline with modern pipeline along its Line B-111 (including two associated 4-inch-diameter lateral pipelines Line B-121 and Line B-130), abandon a section of its Line B-105, and install a new pipeline designated as Line K-270. These existing B-System pipelines serve various delivery points in Ohio including the Fairwood delivery point that currently provides Columbus, Ohio with 10 percent of its market volume.

Pursuant to 49 CFR 192.917, new pipelines must be constructed to accommodate the passage of instrumental internal inspection devices including smart pigs for pipeline cleaning and maintenance activities. Smart pigs are used for periodic internal inspection of pipelines as required by DOT pipeline safety regulations. In addition to using smart pigs to inspect pipeline conditions, cleaning pigs are also used to periodically clean the pipeline interior. Meeting this requirement involves installing a vessel at the end of each pipeline segment for launching or receiving these devices. Columbia proposes to modernize the B-System by making each new and replaced Project pipeline pig-capable. These modifications would allow Columbia to more effectively monitor the integrity of each new and replaced Project pipeline and identify areas of concern that may require maintenance. The Project would not result in any change to Columbia's certificated capacity.

Under section 7(c) of the NGA, the Commission determines whether proposed interstate natural gas transportation facilities would be in the interest of public convenience and necessity and, if so, grants a Certificate to construct and operate them. The Commission bases its decision on technical competence, financing, rates, market demand, gas supply, environmental impacts, long-term feasibility, and other issues concerning a proposed project. Section 7(b) of the NGA specifies that no natural gas company shall abandon any portion of its facilities subject to the Commission's jurisdiction without the Commission first finding

[2] A "pig" is a tool that the pipeline company inserts into and pushes through the pipeline for cleaning the pipeline, conducting internal inspections, or other purposes. Many older pipelines are not piggable.

that the abandonment will not negatively affect the present or future public convenience and necessity.

3. Public Review and Comment

On March 10, 2016, FERC approved Columbia's pre-filing request and assigned Docket No. PF16-4-000. As part of the FERC pre-filing process, Columbia held public informational open houses in the Project area (Canal Winchester and Lancaster) on March 22 and 23, 2016, respectively. Columbia and FERC representatives were in attendance. Additionally, a representative of the Ohio Historic Preservation Office (OHPO) participated in the open house on March 22, 2016.

On May 6, 2016, the FERC issued a *Notice of Intent to Prepare an Environmental Assessment for the Planned B-System Project and Request for Comments on Environmental Issues* (NOI). The NOI was mailed to various parties, including affected landowners; federal, state, and local government representatives and agencies; elected officials; environmental and public interest groups; Native American tribes; other interested parties; and local libraries and newspapers. In response to our NOI, we received comments from six landowners, two agencies, and one Native American tribe.

Mr. Michael Haemmerle expressed a concern about a portion of the existing Line B-105 on his land that is currently exposed within a creek. Mr. Todd Cooper suggested alternate routes for the portion of the proposed new Line K-270 right-of-way that transects his property and requested clarification of Columbia's proposed route. Mr. Jon R. Bright commented on the need for additional information regarding placement of the Line K-270 pipeline on his property, the impact of the new pipeline on property values, and recommended a minor route variation. Likewise, Mr. Richard Paulus expressed concerns about the Line K-270 pipeline route through his property. Victory Hill Church commented on the proposed Project's impact on its property values and suggested a minor route alternative for Line K-270. Lastly, Mr. Steven Wharton commented on the proposed relocation of replacement Line B-111 on his property and expressed concerns that relocation of the pipeline would disturb an existing sewer system and potentially contaminate drinking water obtained from his and adjacent properties. Each of these landowner comments are addressed in sections B.5.1 and C.3.2.

The U.S. Fish and Wildlife Service (FWS) recommended that the Project avoid and minimize impacts on water quality and high quality fish and wildlife habitat. The FWS advised that the Project should implement avoidance and minimization measures to protect bats and migratory birds and their habitat. Additionally, the FWS recommended that revegetation of disturbed areas include native plant species of nectar-producing plants and milkweed where appropriate, and that additional Project information that addresses these recommendations be submitted to its office for review and comment. The EA addresses the FWS' comments in sections B.3.2, B.4.1, B.4.2, and B.4.3.

The ODNR provided information regarding state-listed threatened and endangered species in the Project area and requested that impacts on water resources be avoided and minimized. The EA addresses the ODNR's comments in section B.3.2.

The Acting Tribal Historic Preservation Officer for the Miami Tribe of Oklahoma offered no objection to the Project.

4. Proposed Facilities

The Project would entail modernization of Columbia's existing B-System pipelines through replacement of older high-pressure pipeline with high-pressure modern coated pipeline, installation of pig launchers and receivers, and installation of several mainline valve (MLV) assemblies and fittings to facilitate pipeline maintenance. In addition, the Project would abandon one pipeline in place.

Specifically, the Project would consist of modifications to the following Columbia facilities listed below:

- abandon in place 17.5 miles of 20-inch-diameter pipeline on Line B-105 from the Crawford Compressor Station to the Lockville MLV and Regulator Station;
- install two gas heaters on a portion of Line B-105 remaining in operation; one gas heater on Line B-108 at the facility "RS 1487" and one gas heater at the facility "Lancaster #5";
- remove one MLV at the Hooker Point of Receipt facility and one MLV at Cedar Hill on Line B-105;
- replace 14.0 miles of 20-inch-diameter pipeline on Line B-111 from the Lockville MLV to the Fairwood Meter Station, and abandon by removal approximately 12.0 miles of pipeline, and abandon in place approximately 2.0 miles of pipeline;
- install one 20-inch by 24-inch bi-directional launcher/receiver on Line B-111 at the Lockville Station;
- install one new MLV on Line B-111 at the Line B-130 interconnect;
- replace 0.1 mile of 4-inch-diameter pipe on Line B-121 and abandon by removal an approximately equal length of pipeline;
- replace 0.6 mile of 4-inch-diameter pipe on Line B-130 and abandon by removal an approximately equal length of pipeline;
- install 7.6 miles of new 20-inch-diameter pipeline "Line K-270" to connect the K-System to the B-System from Pleasant Exchange on the K-System and intersect with existing B-System pipelines B-100 and B-115;
- install one 20-inch by 24-inch launcher and one 20-inch by 24-inch receiver on Line K-270;
- install a gas heater and a new facility "Greenfield Regulator RS-7944" at the K-System/B-System Interconnect Site; and

- remove, replace, restore, and install various appurtenances associated with the Project including existing connections, valves, aboveground piping, and other items (see table 1 for additional details).

The Project includes proposed construction at the facilities listed in table 1, which are also identified on the topographic maps provided in appendix A.[3] Figure 1 illustrates the general location of the Project facilities. All Project facilities are within Fairfield and Franklin Counties, Ohio.

[3] Detailed alignment sheets identifying areas of project disturbance, access roads, and staging areas can be viewed on the FERC Internet website at http://www.ferc.gov as part of Columbia's Environmental Report and supplement filed on September 9, 2016 and February 7, 2017, respectively. Using the "eLibrary" link, select "Advanced Search" from the eLibrary menu and enter 20160909-5408 and 20170207-5203 in the "Accession Number" field.

Table 1
Facilities Associated with the Proposed Project

Project Component	Pipeline Diameter (inches)	County	Mileposts
Line B-105 (Modifications/Abandonment)			
Abandon in place approx. 17.5 miles of 20-inch-diameter pipeline	20	Fairfield	0.0 - 17.5
Remove existing fire valve and aboveground piping, replace/remove/install connections, remove MLV, install gas heaters, and rebuild station			0.0, 7.7, 9.6, 9.9, 10.1, 10.7
Remove MLV, and remove and install connections			10.9, 12.4, 14.5
Line B-111 (Replacement)			
Construct approx. 14.0 miles of 20-inch-diameter replacement pipeline, remove approx. 12.0 miles of 20-inch-diameter pipeline, and abandon in place approx. 2.0 miles of 20-inch-diameter pipeline	20	Franklin and Fairfield	0.0 – 14.0
Install a 20-inch by 24-inch bi-directional launcher/receiver and replace two connections		Fairfield	0.0, 3.2
Install MLV, replace two connections, and remove regulation set a/		Franklin	4.5, 8.1, 9.2, 14.0
Line B-121 (Replacement)			
Construct approx. 0.1 mile of 4-inch-diameter replacement pipeline and remove approx. 0.1 mile of 4-inch-diameter pipeline	4	Franklin	0.0 – 0.1
Replace valve and connection			0.0, 0.2
Line B-130 (Replacement)			
Construct approx. 0.6 mile of 4-inch-diameter replacement pipeline and remove approx. 0.6 mile of 4-inch-diameter pipeline	4	Franklin	0.0 – 0.6
Install launcher/receiver piping and replace connection			0.0, 0.5
Line K-270 (New)			
Construct approx. 7.6 miles of new 20-inch-diameter pipeline	20	Fairfield	0.0 – 7.6
Install one 20-inch by 24-inch launcher and associated tie-in piping; install one 20-inch by 24-inch receiver, associated tie-in piping, gas heater and regulator facility a/			0.0, 7.6
a/ The MLV on proposed replacement Line B-111 and regulator facility on proposed new Line K-270 would be constructed in accordance with 18 CFR 2.55(a).			

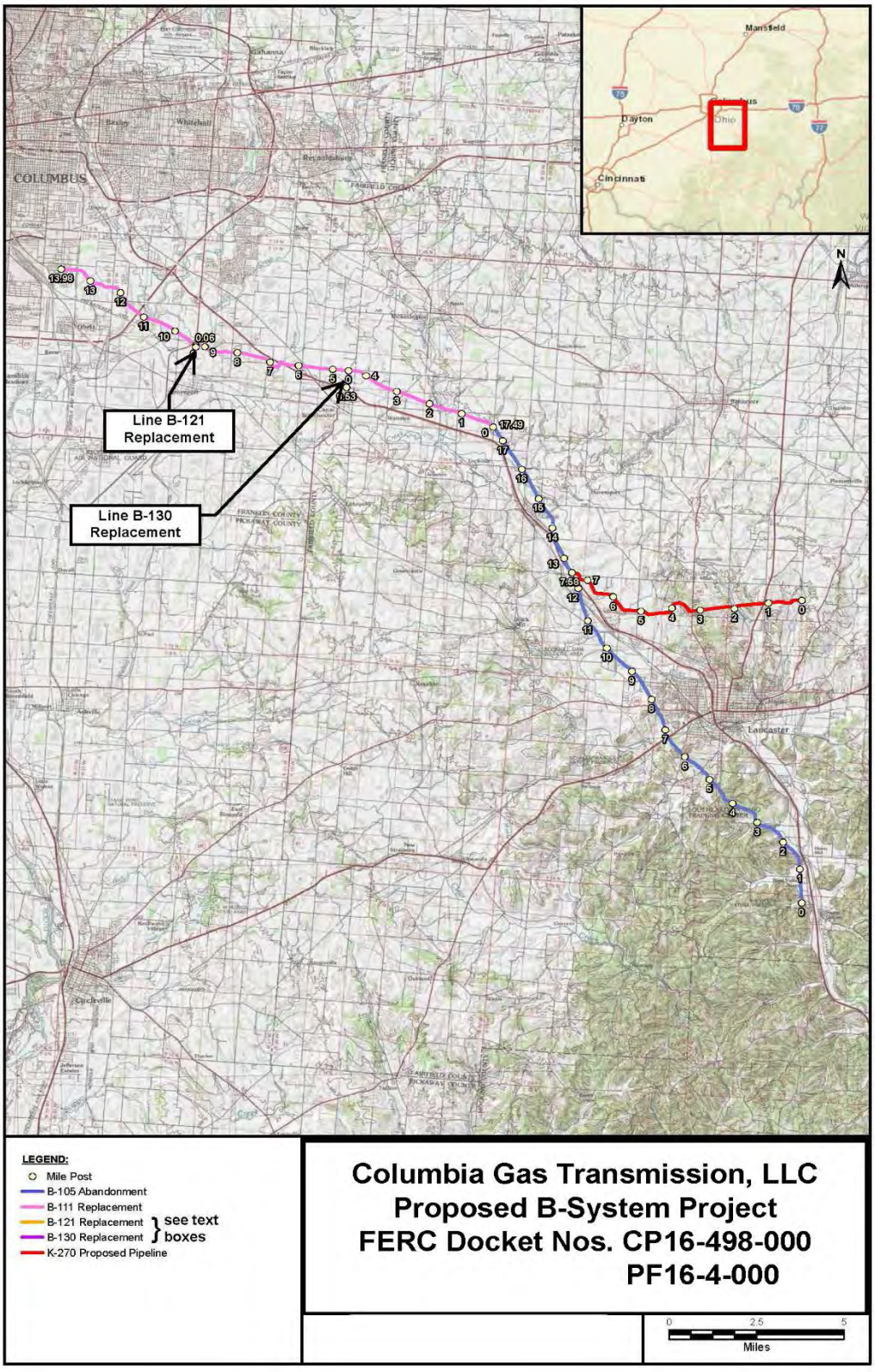

Figure 1: Location Map for the Proposed Project

4.1 Pipeline Facilities

Columbia's proposed new pipeline facilities include: approximately 14.0 miles of 20-inch-diameter replacement pipeline along its Line B-111 pipeline from Lockville Regulator Station in Fairfield County to the Fairwood Measuring Station in Franklin County; approximately 0.1 mile of 4-inch-diameter replacement pipeline on its Line B-121 pipeline from an interconnect with Line B-111 in Fairfield County to the Groveport-Lockbourne Regulation Station in Franklin County; approximately 0.6 mile of 4-inch-diameter replacement pipeline along its Line B-130 pipeline from an interconnect with Line B-111 in Franklin County to the Canal Winchester Regulation Station in Franklin County; and approximately 7.6 miles of new 20-inch-diameter pipeline (Line K-270) connecting its K-System to its B-System from Pleasant Exchange (on the K-System) to an intersect with existing pipelines B-100 and B-115. The Project pipeline routes are mostly collocated with existing pipeline corridors, summarized in table 2.

Columbia also proposes to abandon in place approximately 17.5 miles of 20-inch-diameter pipeline along Line B-105 from the Crawford Compressor Station in Fairfield County to the Lockville Regulation Station in Fairfield County, remove approximately 12.0 miles of 20-inch-diameter pipeline along Line B-111, abandon in place approximately 2.0 miles of 20-inch-diameter pipeline along Line B-111, and remove a total of 0.7 mile of 4-inch-diameter pipe along Lines B-121 and B-130 in Fairfield and Franklin Counties.

Additionally, Columbia would discontinue service on several mainline taps attached to Line B-105. Columbia would compensate these customers whose service is eliminated as a result of the tap disconnects by coordinating with the local distribution company, Columbia Gas of Ohio (COH), to determine whether customers can align with COH natural gas service. If COH is not able to provide service to the tap owners, Columbia would coordinate with the affected landowners to identify and convert to an alternative energy source (e.g., propane).

4.2 Aboveground Facilities

Columbia has identified certain appurtenant facilities that would be constructed in accordance with 18 CFR 2.55(a), otherwise known as "2.55 facilities." "2.55 facilities" are those strictly for the purpose of more efficient or economical operation of proposed or previously authorized facilities and do not require additional or specific Commission approval. However, we are including them in this EA due to their proximity and relationship with the proposed 7(c) facilities. The proposed facilities regulated under 18 CFR 2.55(a) include one new regulation facility (Greenfield Regulator RS-7944) on the western end of the proposed Line K-270 where it would interconnect with existing Lines B-115 and B-100; and one new MLV assembly to be installed on Line B-111 within the graveled, fenced, and existing permanent right-of-way. The MLV would be installed as a safety precaution to contain unplanned pipeline system outages and provide for controlled venting during planned system maintenance. Pressure reduction systems designed to disperse released gas would be installed at the MLV, which would be sited in accordance with DOT safety regulations (49 CFR 192) and for convenience of access. These facilities are included in table 1.

Table 2
Existing Rights-of-Way Collocated with the Proposed Project Pipelines

Project Component	Mileposts of Collocation	Type of Collocation
Line B-111 (replacement)	0.00 – 1.11; 1.15 – 5.89; 6.19 – 6.39; 7.09 – 7.89; 8.30 – 8.88; 9.04 – 9.26; 9.52 – 12.39; 12.51 – 12.69; and 12.91 - 13.98	Construction within existing Line B-111 right-of-way
Line B-121 (replacement)	0.0 – 0.06	Construction within existing Line B-121 right-of-way
Line B-130 (replacement)	0.04 – 0.46	Construction within existing Line B-130 right-of-way
Line K-270 (new)	0.00 – 0.32; 0.57 – 1.81; 2.17 – 3.33; 3.87 – 4.12; 4.16 – 4.55; and 7.47 - 7.53	Parallels but does not overlap non-Columbia-owned pipeline rights-of-way

Columbia proposes to install one pig launcher and one pig receiver on the new Line K-270 and one bi-directional pig launcher and receiver on Line B-111 to monitor and maintain the pipelines. Fencing around the existing facility on Line B-111 would be expanded to contain the new bi-directional launcher and receiver, and new property would be acquired for the proposed launcher and receiver along Line K-270. Land impacts associated with installation of the launchers and receivers, including impacts on newly acquired property, are further detailed in section B.5.1 of this EA.

4.3 Access Roads and Staging/Contractor Yards

Construction access to the proposed Project and its ancillary facilities generally would be via existing Columbia rights-of-way and the existing public road network in the Project area. In Project areas where public access is unavailable, Columbia would use 24 permanent and 32 temporary access roads for construction and operation of the Project, as shown in appendix B. These roads would affect about 26.8 acres of land during construction, assuming a 25-foot width for each road. Most proposed Project access roads are existing graveled or two-track roads and require only minor improvements. Some access roads may require widening (up to 25 feet), tree clearing, or improvements to accommodate use. For construction, the widened areas would be covered with geotextile fabric and gravel. After construction is complete, the gravel and geotextile fabric would be removed and the

access roads returned to pre-existing conditions to the extent practicable or left in place at the request of the landowner. Access roads are further discussed in section B.5.1.

Columbia has identified 14 staging areas for potential use during construction of the Project. These sites would be used to store pipe, equipment, and employee vehicles, as well as provide areas for temporary contractor office space. The sites were selected based on proximity to each construction site. Proposed staging areas are further discussed in section B.5.1 of this EA and tabulated in appendix B.

5. Land Requirements

The total land required for construction of the Project is about 383 acres. Following construction, approximately 235 of these acres, including construction rights-of-way, temporary workspaces (TWS), additional temporary workspaces (ATWS), staging and contractor yards, and temporary access roads (unless left in place by landowner request) would be returned to pre-construction conditions. Approximately 148 acres would be required for operation of the Project facilities.[4]

A general summary of land requirements for construction and operation of the Project is presented in table 3. Additional information about specific land use impacts is provided in section B.5.

To allow for adequate workspace for these activities, the typical construction right-of-way along Line B-105 would vary between 25 and 50 feet wide. In upland areas along Lines B-111 and K-270, Columbia would use a typical pipeline construction right-of-way width of 100 feet, which includes a permanent easement of 50 feet and a TWS width of 50 feet. In upland areas along Line B-121, Columbia would use a pipeline construction right-of-way width of 105 feet, which includes a permanent easement of 50 feet and a TWS width of 55 feet. Along Line B-130, Columbia would use a typical pipeline construction right-of-way width of 75 feet, which includes a permanent easement of 50 feet and a TWS width of 25 feet. At certain locations, ATWS may be required for construction activities (e.g., road bores and wetland and waterbody crossings) where site-specific conditions warrant additional space to construct the pipeline. ATWS are tabulated in appendix B. Within wetland areas, Columbia would ensure that its construction right-of-way width is limited to 75 feet, consistent with the FERC's *Wetland and Waterbody Construction and Mitigation Procedures* (FERC Procedures). See section A.7 for more information on Project construction procedures and appendix B for typical right-of-way configurations.

[4] Some of this acreage would consist of previously disturbed areas associated with the existing rights-of-way of Lines B-111, B-121, and B-130.

Table 3
Land Requirements for the Proposed B-System Project

Facility	Construction (acres)	Operation (acres)
Line B-105 Abandonment		
Existing permanent right-of-way, TWS, staging area, and access roads a/	72.0	0.3 c/
Line B-111 Replacement		
Existing and new permanent right-of-way, TWS, ATWS, staging area, and access roads b/	200.1	91.2
Line B-121 Replacement		
Existing permanent right-of-way, TWS, ATWS, staging area, and access roads	0.8	0.3
Line B-130 Replacement		
Existing and new permanent right-of-way, TWS, ATWS, staging area, and access roads b/	6.0	3.0
Proposed Line K-270		
New permanent right-of-way, TWS, ATWS, staging area, and access roads b/	103.6	52.7
Aboveground Facilities d/		
Line B-105: Remove valves/piping, install gas heater, remove/replace connections	5.2	0.0
Line B-111: Remove regulation set between Line B-105 and Line B-93	0.4	0.0
Line B-111: Install launcher/receiver, replace connections, install MLVs	2.4	0.2
Line B-121: Replace valve and connection	0.6	0.0
Line B-130: Install launcher/receiver piping and replace connection	0.3	0.1
Line K-270: Install two 20-inch by 24-inch receivers, tie-in piping, gas heater, and regulator facility	2.0	1.3
TOTAL	**382.5**	**147.5**

a/ The acreage reflects the area of existing right-of-way used for construction workspace.

b/ ATWS comprise extra workspace typically related to special construction techniques (e.g., road bores and wetland and waterbody crossings), and other areas used for equipment staging and storage, spoil storage, and storage of construction materials including mats and pipe.

c/ Required for future maintenance, repair, and operation of B-System pipelines collocated with Line B-105.

d/ The acreages for the aboveground facilities overlap with the rights-of-way acreages for the corresponding pipeline segments; therefore, the required acreage for aboveground facilities is not duplicated in the total.

6. Construction Schedule and Workforce

Columbia requests to perform tree clearing activities for the Project between October 2017 and March 2018 to avoid potential direct impacts on federally listed bat species and migratory birds. Grubbing and major ground disturbance would not be performed during this time. Columbia has requested an in-service date of September 2018.

Columbia estimates that about 40 crew members would be needed for construction activities along Line B-105; 100 crew members along Line B-111; 10 crew members along Lines B-121 and B-130; and 125 crew members along Line K-270. No new permanent employees would be required for operation or maintenance of the Project.

7. Construction, Operation, and Maintenance Procedures

The proposed facilities would be designed, constructed, tested, operated, and maintained to conform with or exceed federal, state, and local requirements, including the DOT's Minimum Safety Standards in 49 CFR 192, "Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards," and 18 CFR 380.15, "Guidelines to be Followed by Natural Gas Pipeline Companies in the Planning, Clearing, and Maintenance of Rights-of-Way and the Construction of Aboveground Facilities."

Columbia has developed a Spill Prevention, Control, and Countermeasure Plan (SPCC Plan) and an Unanticipated Discovery Plan for cultural resources. In addition, Columbia has adopted FERC's *Upland Erosion Control, Revegetation, and Maintenance Plan* (FERC Plan) and the FERC Procedures, and has incorporated relevant portions into its overall *Environmental Construction Standards* (ECS), which factor in site-specific environmental resources and construction requirements of the Project area.

Columbia would maintain oversight of construction via environmental inspectors (EI). Columbia would assign at least one EI per construction spread. The role of each EI would be to ensure compliance with the mitigation and construction procedures identified in the FERC application/Certificate, as well as those identified in applicable federal, state, and county permits. Columbia would bring in additional inspectors if needed for specific areas or situations. In addition, FERC staff would inspect the Project throughout construction and restoration to independently verify compliance with any Certificate the Commission may issue for the Project. FERC staff would continue to monitor and inspect the Project until restoration and revegetation are deemed successful.

Columbia is requesting site-specific exceptions to sections V.B.2.a and VI.B.1.a of the Procedures related to locating extra workspaces within 50 feet of waterbodies and wetlands. Locations where these alternative measures are being proposed and Columbia's site-specific justifications are summarized in section B.3.2. Based on our review, we conclude that Columbia's requests are justified.

Prior to construction, Columbia would survey each pipeline route and stake the pipeline centerline, mark the presence of other utilities, and delineate approved workspaces as well as adjacent environmentally sensitive areas outside of approved workspaces.

Following issuance of the FERC Order, if approved, and receipt of the FERC notice to proceed with construction, crews would commence construction of the Project by performing tree clearing and other vegetation removal activities. Columbia proposes to perform tree clearing activities along the new and replacement pipeline corridors between October 2017 and March 2018 to minimize direct impacts on federally listed bat species and migratory birds. Grubbing and major ground disturbance would not be performed during this time.

In March 2018, Columbia proposes to begin excavating the trench for the new Line K-270 and replacement Lines B-111, B-121, and B-130 pipelines using backhoes, a rotary wheel-type trenching machine, or rippers. Each trench would be dug to a depth that meets the specifications for the DOT class requirement of the area. Columbia would install the new and replacement pipelines using conventional pipeline construction methods, which are illustrated in figure 2. Construction of each pipeline typically begins with the marking or staking of the construction work area. Once marking is completed, it is followed by these activities: clearing, fencing, grading, trenching, pipe laying, stringing, bending, welding, coating, lowering-in, backfilling, hydrostatic testing, and cleanup and restoration. Areas that typically require special construction techniques include agricultural areas with irrigated crops, drain tiles, or active croplands; crossings of rights-of-way including roads, railroads, pipelines, or other utilities; waterbodies and wetlands; unusual topographies; unstable soils that affect trenching; residential or urban areas; and areas requiring rock removal.

Project activities associated with Line B-105 include disconnecting all sources of supply, closing the valves on each end, blowing down and evacuating the remaining gas, and abandoning the approximately 17.5-mile-long segment of Line B-105 in place. Earth disturbances along Line B-105 would be limited to minor excavations where the pipeline transects a road and in locations where the B-105 pipe is exposed within streams. Portions of Line B-105 crossing beneath a road would be cut, capped, and filled with grout. Sections of Line B-105 that have been exposed in streams would be removed by means of hand excavations (see also section C.3.2). Columbia continues to obtain easement agreements with landowners; existing easement agreements allow for the in-place abandonment of Line B-105. Columbia would be required to request a formal variance from FERC for any landowner requests for pipe removal not identified or assessed in this EA.

Lines B-111, B-121, and B-130 would be constructed via the lift and lay method, whereby existing pipeline segments along these lines would be removed and replaced with new coated pipeline, except for approximately 2.0 miles of pipeline along Line B-111 that would be abandoned in place. Using the lift and lay method, the old pipeline segments would be blown down to evacuate the remaining gas and removed by sections, joints, and other pieces. The ditch remaining after removal of the old pipeline segments would then be further excavated as necessary to provide a proper alignment for the replacement pipeline as well as a safe work area. The new coated pipeline would then be installed in the same location.

Figure 2: General Pipeline Construction Sequence

If residual fluids are present in an abandoned pipeline segment, the section would first be cleaned using a cleaning pig. The cleaning procedure would be repeated from valve segment to valve segment along the pipeline until it has been properly prepared for abandonment by removal or abandonment in place.

The majority of Lines B-111, B-121, and B-130 would be placed within existing rights-of-way (see table 3), with the exception of locations where deviations were identified in areas of encroachment, environmental sensitivity, or other obstruction. At these locations, Columbia would obtain new permanent right-of-way for the replacement pipeline, and the corresponding segment of the old pipeline would be cut, capped, filled with inert gas, water, or grout, as appropriate, and abandoned in place.

Construction waste (e.g., old pipe, excess excavated materials, equipment mats, hazardous materials including any fluids obtained from pipe cleaning operations associated with abandonment activities, and all other materials unsuitable for backfill) would be disposed of in accordance with Columbia policies in accordance with its ECS and applicable local, state (OEPA), and federal regulations. In particular, existing pipeline facilities (e.g., pipe, valves, fittings) used in gas service, which have the potential for polychlorinated biphenyls (PCB) contamination, would be managed in accordance with U.S. Environmental Protection Agency (EPA) regulations found in 40 CFR 761, which specifically address requirements for removal and abandonment. See our discussion in section B.8.4, below.

In addition to the standard construction techniques described above, Columbia anticipates using specialized techniques for areas having difficult constructability issues, or within areas containing certain sensitive environmental features, such as wetlands and waterbodies. Such specialized construction techniques may include reducing workspace through limited areas, and implementing stove piping,[5] drag section,[6] and mini-crew construction methods. Columbia would also perform a total of five horizontal directional drills (HDD) to avoid sensitive resources, avoid certain highways and railroads, and address landowner concerns. Columbia would prohibit construction equipment, vehicles, hazardous materials, chemicals, fuels, lubricating oils, and petroleum products from being parked, refueled, stored, or serviced within a 200-foot radius of private water wells, within a 400-foot radius of public or municipal water wells, and within 100 feet of a waterbody, pond, wetland, spring, or seep area. An inspector would check equipment for leaks before use for construction activities in waterbodies or wetlands. Columbia would follow the mitigation measures outlined in its ECS, which incorporate the FERC's Plan and Procedures. The details on these specific types of resource crossings are provided in section B.2 of this EA.

[5] Stove pipe construction involves installing one joint of pipe at a time. The welding, weld inspection, and coating activities are performed in the open trench. At the end of each work day, after the pipe is installed, the trench is backfilled and/or covered with steel plates.

[6] Drag section construction involves the trenching, installation, and backfill of a prefabricated length of pipe containing several pipe joints pulled into the trench in one work day. At the end of each day, after the pipe is installed, the trench is backfilled and/or covered with steel plates or timber mats.

8. Permit Approvals and Regulatory Consultations

Table 4 summarizes the permits, approvals, and consultations applicable to the proposed Project. Columbia would be required to obtain all necessary permits regardless if they appear in the table or not.

Table 4
Anticipated Environmental Permits, Approvals, and Consultations for the Project

Permit/Approval/Consultation	Administering Agency	Filing Date (Anticipated)	Receipt Date (Anticipated)
Federal			
Certificate of Public Convenience and Necessity under section 7 of the NGA	FERC	September 2016	Pending
Section 10 of the Rivers and Harbors Act (Section 10) and Section 404 of the Clean Water Act (Section 404) Department of the Army Authorizations	Corps – Huntington District	October 11, 2016	(April 2017)
Threatened and Endangered Species Consultation and Clearance under Section 7 of the Endangered Species Act	FWS – Ohio Field Office	May 16, 2016 November 21, 2016 December 20, 2016	October 18, 2016 (February 2017 December 22, 2016
State			
Clean Water Act Section 401 Water Quality	OEPA	October 6, 2016	Pending
Construction Stormwater National Pollutant Discharge and Elimination System (NPDES)		Conditionally Exempt a/	NA
General Permit Authorization to Discharge Hydrostatic Test Water (NPDES) General Permit OHH000002		(December 2017)	(February 2018)
Section 106 of the National Historic Preservation Act Clearance	Ohio Historic Preservation Office	April 26, 2016 July 25, 2016 July 28, 2016 November 23, 2016 February 16, 2017 (April 2017)	May 26, 2016 August 17, 2016 August 22, 2016 December 28, 2016 February 17, 2017 (May 2017)
State Threatened and Endangered Species Consultation and Clearance	Ohio Department of Natural Resources	May 20, 2015 November 16, 2015 March 10, 2016 May 16, 2016 November 30, 2016	May 21, 2015 November 17, 2015 March 10, 2016 June 16, 2016 January 19, 2017
Tribal			
Section 106 of the NHPA	Absentee Shawnee Tribe of Oklahoma	March 10, 2016 August 19, 2016	No response to date
Section 106 of the NHPA	Eastern Shawnee Tribe of Oklahoma	March 10, 2016 August 19, 2016	No response to date
Section 106 of the NHPA	Miami Tribe of Oklahoma	March 10, 2016 August 2, 2016	May 27, 2016
Section 106 of the NHPA	Osage Nation	March 10, 2016	March 22, 2016
Section 106 of the NHPA	Peoria Tribe of Indians of Oklahoma	March 10, 2016 August 19, 2016	August 19, 2016
Local			
National Flood Insurance Program Permit	Franklin County	November 30, 2016	December 1, 2016
Floodplain Development Permit	City of Canal Winchester	November 30, 2016 (September 2017)	January 25, 2017 (December 2017)
Special Flood Hazard Area Development Permit	Fairfield County	November 30, 2016	December 15, 2016
Special Flood Hazard Area and Development Permit	City of Groveport	December 21, 2016	January 9, 2017
Construction Stormwater Review	City of Groveport	December 14, 2016 (April 2017)	March 10, 2017 (May 2017)
Floodplain Permit	City of Columbus	December 21, 2016	(April 2017)

a/ See https://www.epa.gov/npdes/oil-and-gas-stormwater-permitting and http://epa.ohio.gov/Portals/0/general%20pdfs/StormWaterPermittingforOilandGasRelatedOperations.pdf

9. Non-jurisdictional Facilities

Non-jurisdictional facilities are those facilities related to the Project that are constructed, owned, and operated by other entities that are not subject to FERC jurisdiction.

Work would occur at several Point of Delivery (POD) facilities associated with the Project. The work at all POD facilities, except the Lancaster Municipal Gas POD facility, is being coordinated by the local distribution companies and is therefore non-jurisdictional. These distribution companies have identified the design modifications required to meet the increased delivery pressure, subject to Columbia's approval. The scope of work for these POD facilities is being developed at the time of issuance of this EA and is expected to be completed in 2018. All non-jurisdictional work would be performed inside the POD facility boundaries; therefore, these activities are not evaluated in this EA.

B. ENVIRONMENTAL ANALYSIS

1. Geology

All portions of the Project are within the Central Lowland and the Appalachian Plateau Physiographic Provinces. Within the Central Lowland Physiographic Province, the Project is in two physiographic regions, including the Columbus Lowland Region and the Galion Glaciated Low Plateau Region. Within the Appalachian Plateau Physiographic Province, the Project is in three Physiographic Regions, the Killbuck-Glaciated Pittsburgh Plateau Region, the Illinoian Glaciated Allegheny Plateau Region, and the Shawnee-Mississippian Plateau Region (ODNR, 1998).

The Columbus Lowland Region is in central Ohio where Wisconsinan-age till and outwash have been deposited over shales, siltstones, and other carbonate rocks, Devonian to Mississippian in age. The Columbus Lowland Region is of moderately low relief and characterized by relatively flat lowland sloping broadly in the direction of the Scioto River Valley (ODNR, 1998). The Galion Glaciated Low Plateau Region is in central and northern Ohio where Wisconsinan-aged till overlays shales and sandstones, Mississippian in age. The Galion Glaciated Low Plateau Region is of moderate relief and characterized by gently rolling and hilly uplands (ODNR, 1998).

Within the Appalachian Physiographic Province, the Killbuck-Glaciated Pittsburgh Plateau Region is in northeast and central Ohio where Wisconsinan-aged clay and loam overlays shales, sandstones, conglomerates, and coals, Pennsylvanian in age. The Killbuck-Glaciated Pittsburgh Plateau Region is of moderate relief and characterized by flat uplands with areas of ridges and steep valley dissections (ODNR, 1998). The Illinoian Glaciated Allegheny Plateau Region is in central and northeast Ohio where Illinoian-aged till and colluvium overlays shales, siltstones, and sandstones, Devonian to Pennsylvanian in age. The Illinoian Glaciated Allegheny Plateau Region is of moderate relief and characterized by many dissected rugged hills similar to regions left unglaciated (ODNR, 1998). The Shawnee-Mississippian Plateau Region is in south-central Ohio where Pleistocene-aged fluvium and colluvium overlay shales, siltstones, and sandstone of Devonian to Mississippian age. The Shawnee-Mississippian Plateau Region is of high relief and characterized by a highly dissected plateau of rock sequences ranging dramatically in coarseness (ODNR, 1998).

1.1 Mineral Resources

Ohio is a state rich in mineral resources. Among the mineral resources are coal seams, limestone deposits, pottery clay, oil, and natural gas. Coal mining has a long history in Ohio, but as of 2014, coal was mined actively only in 14 counties in southern and eastern Ohio. No active coal mines exist in Franklin or Fairfield Counties. Active coal mining does occur east of Fairfield County (in Perry County) but the nearest active coal mining operation is about 19 miles from the Project area (ODNR, 2016a). No abandoned underground mines are present in Franklin or Fairfield Counties (ODNR, 2016a).

Oil and gas production in Ohio began nearly 150 years ago, and wells with varying degrees of productivity are located across much of the state. Today, the majority of Ohio's

production occurs in the eastern half of the state. No oil and gas fields are in Franklin County, and the oil and gas fields present in Fairfield County are concentrated primarily along the eastern half of the county (ODNR, 2016a; 2016b).

The vast majority of the Project falls outside of oil and gas fields, with only the easternmost portions of existing Line B-105 (to be abandoned in place) crossing the Sugargrove Consolidated gas field and the easternmost portion of proposed new Line K-270 occurring within, or adjacent to, the Thurston Consolidated gas field. Although a number of abandoned and active oil and gas wells are mapped in the Project vicinity, none is mapped within the specific Project area (Figure 3). Nine wells are within 500 feet of Project work areas. The closest well to a Project facility is 284 feet from Line B-105 (ODNR, 2016a; 2016c).

Industrial minerals, primarily crushed stone, sand, and gravel, are actively mined in Franklin and Fairfield Counties. Active stone, sand, and gravel mining operations in Franklin County are concentrated primarily in the south and central portions of the county along the Scioto River and lower reaches of Big Walnut Creek. Active stone, sand, and gravel mining operations in Fairfield County are more limited, but are present south and east of the City of Lancaster (ODNR, 2016a; U.S. Geological Survey [USGS], 2013). No industrial mines or quarries are present within the Project area; the nearest active industrial mines or quarries in Franklin and Fairfield Counties are 1.0 mile and 0.2 mile, respectively, from the proposed facilities (ODNR, 2016a).

Because of the distance to current oil and gas and mining activities, we conclude that the Project would not have an adverse impact on mineral resources.

1.2 Shallow Bedrock

As indicated by U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS) soils data, about 2 percent of the Project crosses shallow bedrock and shallow bedrock could be encountered for the installation of Line K-270, shown in figure 4 (NRCS, 2013). If shallow bedrock is encountered, Columbia would first attempt to use hydraulic hammers to break the rock. If the use of hydraulic hammers is not effective, blasting may be required. Where blasting may be required, Columbia would make the appropriate notifications and obtain necessary permits prior to blasting. Blasting activities would adhere to local, state, and federal regulations applying to controlled blasting and blast vibration limits concerning structures and underground and aboveground utilities. Columbia has prepared a Project-specific blasting plan, which is provided as appendix C of this EA, and includes measures to control, minimize, or eliminate detrimental impacts. Columbia's contractors would also be required to submit a site-specific blasting plan to Columbia for its approval prior to blasting activities, which Columbia would provide to the FERC for review.

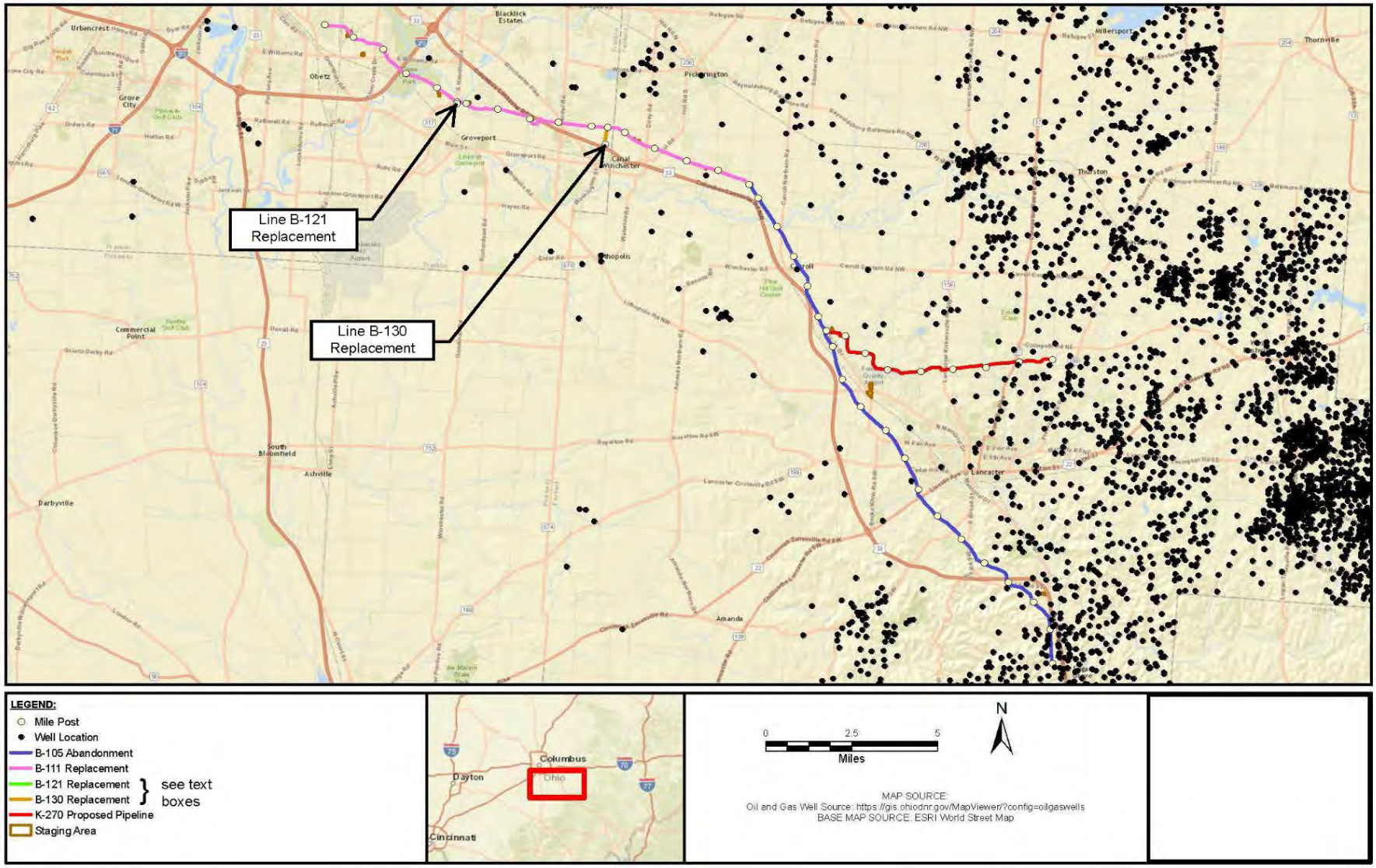

Figure 3: Oil and Gas Wells in the Project Area

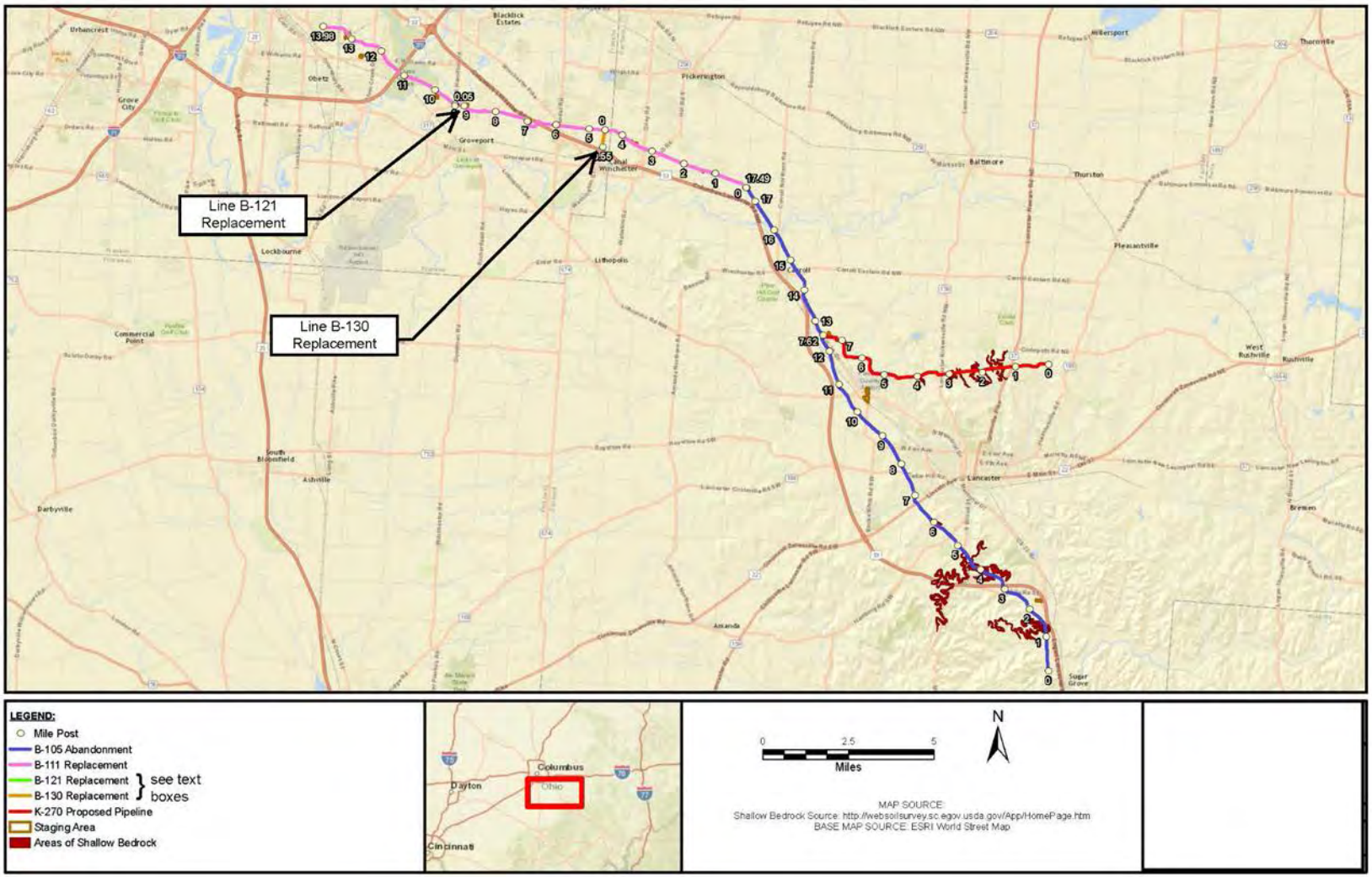

Figure 4: Areas of Shallow Bedrock in the Project Area

Blasting precautions include, but are not limited to, the following:

- inventorying public and private groundwater drinking wells and completing pre-blast water quality monitoring;
- completing pre-blast inspections of nearby residences and other structures;
- installing blasting mats in congested areas, in shallow waterbodies, or near structures that could be damaged by fly-rock;
- posting warning signals, flags, and barricades;
- notifying occupants of nearby buildings, stores, residences, places of business, and places of public gathering, as well as farmers, 48 hours in advance of blasting activities;
- notifying the local fire marshal of blasting activities prior to blasting (the fire marshal must be notified the day of blasting via phone or email);
- following procedures for safe storage, handling, loading, firing, and disposal of explosive materials;
- manning adjacent pipelines at valves for emergency response; and
- controlling excessive vibration by limiting the size of charges and using charge delays that stagger each charge in a series of explosions.

Columbia would conduct the pre-blasting inspections and water quality monitoring with landowner permission to assess the conditions of structures and water wells within 150 feet of the area in which blasting is anticipated. The survey may include:

- discussions with adjacent property owners to familiarize them with blasting effects and planned precautions to be taken by Columbia;
- identification of site-specific structures, utilities, and water wells;
- documentation of existing conditions including photographs, and/or video records of adjacent structures and utilities; and/or
- detailed mapping and measurement of large cracks, crack patterns, and other evidence of structural stress observed in specific structures, and potential monitoring of certain features.

In the event that property owners identify damage to properties, or if excessive peak particle velocities are recorded during the blasting operations, Columbia would perform an additional post-construction survey of affected properties to verify damage. Columbia would either repair any identified damages or fairly compensate the owner for blast-related damages. If a water well were damaged, Columbia would provide a temporary source of water until the well is repaired, or compensate the landowner.

With the implementation of the proposed measures above to minimize blasting impacts and monitoring during blasting, we do not anticipate significant impact from blasting activities.

1.3 Seismic Risk

Nine earthquakes with Richter magnitudes greater than 2.0 have occurred within 30 miles of the Project, three of which had epicenters in Fairfield County about 1.6 to 1.7 miles from the Project area (ODNR, 2016a). Details on these earthquakes, as well as their distances from the proposed Project, are summarized in table 5.

Table 5
Historical Earthquakes (from 1776 to 2015) within 30 Miles of the Project Area

Ohio County	Year	Magnitude (Richter's Scale)	Latitude	Longitude	Approximate Distance from Project Area (miles)
Morgan	1952	3.9	39° 38' 24 N	82° 01' 12" W	28.6
Athens	1886	3.8	39° 21' 3" N	82° 14' 24" W	25.3
Delaware	1873	3.8	40° 12' 00" N	83° 00' 00" W	20.6
Fairfield	1848	3.7	39° 39' 00" N	82° 31' 48" W	1.7
Fairfield	1967	3.7	39° 39' 00" N	82° 31' 48" W	1.7
Athens	2013	3.5	39° 26' 42" N	82° 12' 18" W	22.8
Fairfield	1870	2.9	39° 42' 36" N	82° 36' 00" W	1.6
Perry	1953	2.7	39° 42' 00" N	82° 06' 00" W	24.7
Pickaway	2013	2.0	39° 40' 03" N	83° 04' 23" W	16.8
Source: ODNR (2016a)					

The USGS identifies Project areas as having a 2 percent probability of exceeding a peak horizontal (ground) acceleration of between 4 and 6 percent of gravity in 50 years (USGS, 2008; 2016a; Petersen et al., 2014). Further, the USGS identifies the probability of an earthquake of magnitude greater than 5.0 occurring within 50 kilometers of the Project areas in the next 50 years is between 0 and 1 percent (USGS, 2016b).

Building codes provide design standards for buildings and infrastructure such as highways, bridges, and utilities (including natural gas pipelines). The seismic risk and earthquake probability risk at all Project sites is relatively low. In addition, the temporary staging areas are not at long-term risk to subsidence that could result from Project activities.

Due to the nature of the generally competent bedrock, low probability of significant earthquake activity, and low seismic risk in the Project area, we do not anticipate adverse impacts on Project facilities from seismic activity.

1.4 Faults

Based on review of the USGS database titled "Quaternary Faults and Folds by State and Region" (USGS, 2016c), there are no known Quaternary faults in the Project area. The nearest Quaternary fault, the Pembroke Fault, is about 200 miles south of the Project area near Blacksburg, Virginia (Wheeler, 1998).

Due to the lack of geologically recent movement along faults identified near any Project sites, the low occurrence of earthquakes in the region, and the relatively low seismic risk in the Project areas, we do not anticipate impacts on Columbia's facilities from fault lines in the region.

1.5 Liquefaction

Soil liquefaction is a process whereby the strength and stiffness of a soil is reduced because of earthquake shaking or similar rapid loading (e.g., blasting). Liquefaction may occur in saturated and sandy soils. The vast majority of soils along the Project area are ice-compacted glacial deposits of late-Pleistocene age. This characteristic and the general lack of saturated soils through much the Project area put the Project soils at a low risk for liquefaction hazard. The low likelihood of a high intensity earthquake (USGS, 2008), as discussed in section B.1.3, further reduces the likelihood of soil liquefaction. Consequently, we do not anticipate adverse impacts on the Project from soil liquefaction.

1.6 Subsidence

Subsidence is the local downward movement of surface material with little or no horizontal movement (Nuhfer et al., 1993). Subsidence is a potential geologic hazard in areas where karst terrain occurs and/or where underground mining has taken place. The Project area is outside of karst and potential karst areas (ODNR, 2006).

While mining subsidence hazards exist in Ohio, no active coal mines or abandoned underground mines are present in Franklin or Fairfield Counties (ODNR, 2016c). One active "room and pillar" underground limestone mine is present in Franklin County, but it is about 3.5 miles from the Project area (ODNR, 2016a). Consequently, we do not anticipate that the Project is at risk for subsidence related to karst or underground mine collapse.

1.7 Landslides

To assist in determining the potential for landslides in an area, the USGS developed a Landslide Overview Map of the Conterminous United States. The map units are classified into three incidence categories, according to the percentage of the area involved in landslide processes. Areas involved in landslide incidences were categorized as High (>15 percent), Medium (1.5-15 percent), or Low (<1.5 percent) (USGS, 2014a; 2014b). While Project facilities generally would involve small-scale, shallow excavations are in areas of low landslide incidence and low landslide susceptibility, areas of steep slopes present on Mississippian-aged bedrock and Pleistocene glacial deposits may be prone to landslides (ODNR, 1995).

To mitigate and avoid the possibility of a landslide, Columbia would implement its ECS, which incorporates the FERC Plan and Procedures. Columbia's ECS includes the use of trench plugs that would help prevent water from flowing downslope along the pipeline trench leading to landslides, and the use of water bars on slopes that would also direct water off the disturbed right-of-way to adjacent undisturbed areas thereby minimizing conditions influencing the frequency of landslides, such as soil saturation.

2. Soils

The properties and designations of individual soil map units from NRCS sources were used to describe the soil resources associated with the Project and assess potential limitations, impacts, and mitigation measures to be implemented to reduce impacts on soil resources. Most of the soils affected by the Project are classified as loamy, silty, or clayey. Many of the soils are considered prime farmland. Shallow bedrock occurs in 2 percent of the Project area.

Soil impacts resulting from construction, operation, and maintenance activities can be strongly influenced by the soil's characteristics. Some of the major potential adverse soil impacts include compaction, increased erosion, and decreased revegetation potential. Construction of the Project may increase the potential for temporary and long-term impacts on soils. Construction activities such as clearing, grading, trenching, backfilling, and movement of construction equipment may result in increased erosion and compaction. Table 6 summarizes the soil characteristics for the Project.

Erosion is the detachment and movement of soil material. The process may be natural or accelerated by human activity depending on the local landscape and weather conditions. Less than 1 percent of the soils crossed are classified as having severe erosion potential. During construction and restoration, Columbia would use the measures in its ECS to minimize erosion and sedimentation. These measures include:

- constructing temporary and permanent water bars to direct excess precipitation off the disturbed right-of-way;
- installing silt fence and hay bales to prevent sediment from moving off the right-of-way;
- using mulch to protect soil while it is unvegetated; and
- using measures to quickly revegetate the disturbed right-of-way after construction to permanently protect soil from precipitation and runoff.

Columbia is also developing a site-specific Erosion and Sediment Control Plan and Agricultural Mitigation Plan in consultation with the Fairfield and Franklin County Soil and Water Conservation Districts, including soil mitigation measures that Columbia would implement in tandem with its ECS for the Project. **We recommend that:**

- **<u>Prior to construction</u>, Columbia should file with the Secretary of the Commission (Secretary) its site-specific Erosion and Sediment Control Plan and Agricultural Mitigation Plan.**

Table 6
Summary of Soil Characteristics for the Proposed B-System Project in Acres (and Percent)

Proposed Replaced or New Pipeline Facility	Very Poorly/ Poorly Drained a/	High Soil Compaction Potential	Hydric or Predominantly Hydric Soils	Very Limited Revegetation Potential	Prime Farmland b/	Shallow Bedrock	Severe Erosion Potential
Line B-105	7.4 (11)	5.5 (8)	7.5 (11)	16.2 (25)	41.5 (63)	0.9 (1)	0
Line B-111	43.1 (21)	36.4 (18)	40.5 (20)	116.9 (57)	182.9 (90)	0	0
Line B-121	0.3 (38)	0	0.3 (38)	0.3 (38)	0.6 (75)	0	0
Line B-130	0.6 (12)	0.6 (12)	0.6 (12)	2.2 (43)	4.9 (96)	0	0
Line K-270	8.9 (9)	8.9 (9)	8.9 (9)	32.4 (31)	62.9 (61)	6.4 (6)	1.8 (2)
PROJECT TOTAL	**60.3 (16)**	**51.4(14)**	**57.8 (15)**	**168 (44)**	**292.8 (77)**	**7.3 (2)**	**1.8 (<1)**

a/ No soils in the Project area are characterized as excessively drained.
b/ Includes prime farmland that is drained or protected from flooding.

Columbia researched federal and state government databases to identify potentially contaminated sites in the vicinity of the proposed Project (Environmental Data Resources, Inc. [EDR], 2016), including, but not limited to, petroleum sites, non-hazardous solid waste sites, brownfield sites, and hazardous waste sites.

One location west and adjacent and upgradient to milepost 12.5 on Line B-105 does have potential for soil contamination; however, the boundaries of the contamination in relation to the Project boundaries are unknown at this time. During construction training, Columbia would inform workers that there is potential for soil contamination and would train workers on how to avoid or work with contaminated soils at this site. The training would also address worker safety, soils management and disposal, and other environmental concerns. See section B.5.2 for additional details.

The ECS provides the minimum requirements that Columbia would apply to all construction, operation, and maintenance activities. We conclude that Columbia's implementation of its ECS (including measures to be followed in the event that contaminated sediments or soils are encountered during construction), would minimize Project impacts on soils.

3. Water Resources

3.1 Groundwater

The Project facilities are within the Central Lowland and the Appalachian Plateau Physiographic Provinces, as discussed in section B.1.1. Underlying bedrock in the Project areas consists of Devonian- to Mississippian-age sandstone, shale, and limestone. The Project area is underlain by the Mississippian aquifer. The median depth of sand and gravel aquifers in this region is about 90 feet, and the median depth for carbonate aquifers is about 220 feet (Ohio Environmental Protection Agency [OEPA], 2014). Recharge to the aquifer is mostly from precipitation that falls on areas where the aquifer is exposed at the land surface or is overlain by a thin blanket of younger rocks or glacial deposits or both. Locally, the Mississippian aquifer receives some recharge by vertical leakage from the overlying glacial drift aquifers or the deeper Cambrian-Ordovician aquifer where the hydraulic head in the Mississippian aquifer is less than that of the adjacent aquifers. Most of the water in the Mississippian aquifer moves along flow paths that are of short or intermediate length from the three high areas on the potentiometric surface toward small to large streams, into which it discharges as base flow (USGS, 1995). According to EPA Region 5, no sole source aquifers are in the area of the Project (EPA, 2016a).

Based on a review of publicly available information from regulatory databases, sites with potentially contaminated conditions that could threaten the health of the aquifer were identified within close proximity of the proposed Project, which is further discussed in section B.5.2. As stated above, the median depth to fresh water aquifers in this region ranges from 90 to 200 feet, well below the depths at which construction activity would take place.

Columbia consulted with the OEPA to determine if the proposed Project would impact wellhead protection areas. The OEPA indicated that the Project area crosses Inner

Management Zones[7] and source water protection areas for groundwater for the public water well systems of the following municipalities: Village of Groveport, the Village of Canal Winchester, the Shalom United Methodist Church, Lancaster Sport Cycles, Joe Carson Motor Sales, the Brookdale Mobile Home Park, the Lancaster Country Club Maintenance Building, the City of Lancaster South Wellfield, and the Village of Sugar Grove. OEPA also indicated that the Project crosses the Source Water Protection Areas for groundwater for the Rager Road Church of Christ public water system well.

Columbia contacted landowners in the Project area to identify private water wells and water supplies within 150 feet of the Project. For landowners who are not affected by the Project but may own land (and potentially maintain wells) within 150 feet of the construction work area, Columbia would provide notifications of proposed construction and offer to perform pre-construction well sampling. Wells identified within 150 feet of the construction work area would be noted and placed on construction mapping, which Columbia has committed to provide to FERC prior to construction. The locations of 45 potable water wells and 41 septic systems within 150 feet of the Project are summarized in appendix D of this EA.

Columbia would offer pre- and post-construction well testing to the owners of these wells to determine if construction potentially affects water quality or yield. If well tests document impacts due to construction, Columbia would provide an alternative water source, mitigate the impact, or compensate the landowner.

As discussed in section B.1.2 above, Columbia has identified areas of shallow bedrock where blasting may be necessary, and has proposed mitigation measures. If Columbia identifies septic tanks that would be impacted by the Project, Columbia would work with the landowner to relocate the septic tank if blasting is required in the vicinity. Columbia's blasting mitigation measures, and commitment to compensate a landowner for impacts, would ensure that potential impacts on well and septic tank owners would not be significant.

Construction of the pipeline would involve shallow, temporary, and localized excavation, far above the depth at which potable water is obtained from wells. While excavation itself would not result in contamination of groundwater resources, it could temporarily disturb the typical recharge patterns of surficial aquifers, cause temporary increases in turbidity, and disrupt overland flow characteristics. Surficial aquifers, however, exhibit rapid recharge and are greatly influenced by short-term rain events. Therefore, once the pipeline construction is complete and the trench backfilled, we expect baseline conditions to return to their pre-construction state within a few weeks to months following establishment of vegetation on the right-of-way. Columbia's proposed installation of trench

[7] The Inner Management Zone is the surface and subsurface area surrounding a public water supply well(s) that will provide water to the well(s) within one year as delineated or endorsed by the OEPA under the Wellhead Protection Program and the Source Water Assessment and Protection Program.

plugs, in accordance with its ECS, would ensure the pipeline does not act as a new subsurface water conduit.

Construction could result in the contamination of groundwater if hazardous materials such as fuels or lubricants are spilled by construction personnel or leak from vehicles and equipment. To minimize the potential for groundwater contamination, Columbia has developed an SPCC Plan which outlines methods to prevent hazardous materials from reaching groundwater, such as storing fuels within secondary containment structures; refueling equipment at least 200 feet away from a private water well, and 100 feet from a waterbody, pond, wetland, spring or seep area; conducting regular maintenance and inspections of machinery and equipment; and training of all construction personnel. The SPCC Plan also identifies clean-up, testing, and monitoring procedures that would occur if a spill were to occur, as well as reporting requirements and protocols.

Based on Columbia's ECS and SPCC Plan measures, we conclude that construction and operation of the Project would not significantly impact groundwater.

3.2 Surface Water

For this EA, waterbodies are defined as any natural or artificial stream, river, or drainage with perceptible flow at the time of crossing, and other permanent waterbodies such as ponds and lakes. The Commission classifies waterbodies into three categories based on the width of the water level at the time of crossing. Minor waterbodies are those that are less than or equal to 10 feet wide, intermediate are those greater than 10 feet but less than 100 feet wide, and major waterbodies are those that are 100 feet or greater in width.

Columbia's proposed right-of-way crosses 50 waterbodies (26 perennial, 15 intermittent, 8 ephemeral, and 1 pond). Of these, 14 are classified as intermediate and 35 are minor (see appendix E). No waterbodies (or wetlands) would be crossed or affected by construction at the aboveground facilities. Waterbody impacts associated with the Line B-105 abandonment are limited to temporary equipment crossings, temporary access road crossings, and pipeline removal.

Columbia proposes to install new or replacement pipeline using an HDD under Sycamore Creek (Line B-111, milepost 1.6), Big Walnut Creek (Line B-111, milepost 10.7), and one pond (Line K-270, milepost 3.5). In addition, Columbia proposes a conventional bore under one unnamed tributary crossing of Big Walnut Creek (Line B-111, milepost 13.1). All other flowing waterbody crossings would be constructed using a dry-ditch crossing method (i.e., a dry flume or dam-and-pump crossing, as described below). Columbia would cross waterbodies with no perceptible flow at the time of crossing using standard open-cut construction techniques.

HDD: This crossing method is a trenchless construction technique involving drilling at some depth below the ground surface to install a pipeline well under the streambed. The process commences with the boring of a pilot hole beneath the waterbody and then enlarging the hole with one or more passes of a reamer until the hole is the necessary diameter to facilitate the pull-back (installation) of the pipeline. Once the reaming passes are completed,

a prefabricated pipe segment is then pulled through the hole to complete the crossing. Throughout the drilling process, a slurry of non-toxic, bentonite clay and water is pressurized and pumped through the drilling head to lubricate the drill bit, remove drill cuttings, and hold the hole open. Although requiring overall greater land disturbance on either side of a feature to accommodate the drilling and receiving equipment, the method reduces impacts on the feature (e.g., stream and riparian areas). This method is proposed for Sycamore Creek, Big Walnut Creek, and one pond to avoid sensitive areas.

Conventional Bore: A conventional bore is similar to an HDD in that it is a trenchless construction technique; however, conventional bores do not typically go as deep as an HDD. The conventional bore method involves excavating large bell holes on each side of the waterbody that are deep enough for the bore equipment to auger a hole horizontally from one bell hole to the other a minimum of 5 feet below the bed of a waterbody. Once the bell hole has been created, the pipeline is then pushed or pulled through the hole. This method is proposed for an unnamed tributary crossing of Big Walnut Creek due to its close proximity to a railroad.

Dry Flume Crossing: This type of crossing involves directing the flow of water through one or more flume pipes placed in the waterbody. Columbia would divert water into the pipe and seal the area around the pipe opening using sandbags or other structures. Once a seal is obtained and downstream flow is maintained, Columbia would excavate the trench beneath the flume, and install the pipe beneath it. After installation of the pipe, construction crews would backfill the trench using the material excavated from the trench. Finally, crews would remove the sandbags and flume pipe and restore the waterbody flow. Upon completion of the crossing, Columbia would begin stabilization and restoration of the waterbody banks using an approved seed mixture and a geotextile fabric and/or mulch.

Dam-and-pump Crossing: This crossing is similar to the flume crossing in that it is also a dry-ditch crossing; however, Columbia would divert water across the trench using pumps and hoses instead of a pipe laid in the waterbody. Crews would create temporary dams upstream and downstream of the area to be excavated. Then crews would pump water from the upstream side of the dams to the downstream side to maintain the waterbody flow. Once a dry area between the two dams is established, Columbia would excavate a trench and install the pipeline. Columbia would then backfill the trench, remove the dams, pumps, and hoses, and begin restoration and stabilization of the waterbody banks.

Columbia has identified eight sections of exposed pipe on Line B-105 (see appendix E). Columbia's procedures for these exposures would be to hand-dig the exposure out from either bank of the stream, cut and cap the pipe on either end, remove the cut pipe from the stream, and replace the dirt. Columbia would then hand carry the old section of pipe out of the waterbody.

Pipeline construction or removal activities within waterbodies could affect surface water resources, depending on the type of crossing used and the specific characteristics of the waterbody. The greatest impacts associated with dry-ditch open-cut crossings (flume or dam-and-pump) would be during the installation and removal of in-waterbody dams and water diversion structures. These impacts include increases in local sediment loading and

turbidity from in-waterbody construction activities, or construction adjacent to waterbody channels. Clearing and grading of waterbody banks and in-waterbody construction could result in temporary modifications of aquatic habitat and decreased dissolved oxygen concentration. In general, these impacts would be limited to the in-waterbody construction period and immediately thereafter. Columbia anticipates completing crossings of minor and intermediate waterbodies as expeditiously as possible (in 24 to 48 hours, where practicable) and we expect conditions to return to normal after waterbody restoration activities. In addition, backfilling and settling of the streambed trench over time could result in modified contours that lead to minor changes in waterbody flow patterns and velocity. These changes could further result in waterbody bed scouring and/or deposition in new areas. Hand excavation of abandoned pipe segments would result in minor in-water disturbances.

Columbia indicated that blasting may be required. During the pre-planning of waterbody crossings, an evaluation would be made concerning the need for blasting. If the evaluation is inconclusive, the waterbody bed would be tested for consolidated rock prior to trenching. If the need for in-water blasting is confirmed, Columbia would follow mitigation measures provided in the Project's Blasting Plan and Columbia's ECS to avoid or minimize impacts on surface waters. Blasting procedures are discussed further in section B.1.2.

Use of HDD greatly reduces the temporary and permanent impacts on waterbodies and wetlands by eliminating direct in-stream construction impacts. However, with the use of HDD, there is potential for inadvertent returns of drilling fluid, which is mostly non-toxic bentonite. The primary impact of losses of drilling fluid in waterbodies and wetlands is increased sedimentation and turbidity. Columbia has prepared an HDD Contingency Plan, which includes measures it would implement should there be inadvertent returns of drilling fluid while crossing Sycamore Creek and Big Walnut Creek. We have reviewed this plan and find it acceptable. Specific measures of the plan include:

- stopping pumps temporarily, or decreasing the pump pressure;
- containing the drilling fluid immediately by installing hay bales or silt fence and/or constructing dikes or pits;
- constructing no earthen dikes or berms within wetland or stream areas;
- removing the drilling mud from the ground surface and from the site to the greatest extent possible by manual means such as by use of shovels, wheelbarrows and/or vacuum hoses; and
- using earth-moving equipment such as backhoes or small bulldozers only if manual means prove to be impractical and only after appropriate measures authorized by the EI have been taken to minimize impacts to the resource.

All affected areas would be restored as closely as possible to their previous condition.

During operation, a buffer at least 25 feet wide adjacent to waterbodies would be revegetated to pre-construction conditions over the entire width of the right-of-way (except

for a 10-foot-wide strip centered over the pipeline to be maintained in an herbaceous state for pipeline inspection). In accordance with Columbia's ECS, trees would not be allowed to grow within 15 feet of the pipeline. Riparian cover on affected waterbody banks would be expected to recover over several months to several years. Columbia would monitor and maintain erosion controls throughout restoration and remove the controls once restoration is deemed successful.

Columbia would locate the ATWS a minimum of 50 feet from the edges of wetlands and waterbodies. However, Columbia has requested modifications to sections V.B.2.a and VI.B.1.a. of FERC's Procedures for five ATWS along Lines B-111 and B-105 that would be within 50 feet of a wetland and/or waterbody. Four ATWS would be within 50 feet of a waterbody. Due to the location of the existing pipelines and facilities, a 50-foot setback is not possible for the placement of these ATWS. Table 7 lists each location and purpose for the ATWS. We find the siting of these ATWS to be acceptable. Columbia would employ erosion control measures at these workspaces such as silt fence, straw/hay bales, or earthen berms to prevent sedimentation of wetlands and waterbodies.

Table 7
Workspaces Proposed to be Sited within 50 Feet of a Wetland or Waterbody

Line / Milepost	Wetland or Waterbody ID a/	Purpose of ATWS
B-105 / 3.7	S-SMJF-08	Need ATWS to cut and cap existing pipeline.
B-105 / 7.7	S-SMJF-23	ATWS needed to rebuild Lancaster West station.
B-105 / 9.9	S-SMJF-30	ATWS needed to rebuild Lancaster 5 station.
B-111 / 6.4	S-RJ-04	ATWS needed to remove existing pipe from casing.
B-111 / 11.1	W-RJ-05a, W-RJ-05	ATWS needed for HDD crossing at Interstate 270.

a/ Wetland and waterbody ID as shown on alignment sheets submitted February 7, 2017.

Columbia identified no surface water intakes within 3 miles of the Project. Further, no seeps or springs were identified during field surveys.

In accordance with the FERC Procedures sections V.B.4.a and V.C.5 and in compliance with the permit issued by the Corps, all temporary discharges of dredged and/or fill material into waters (including riprap for scour protection) would be removed upon Project completion.

Given Columbia's proposed waterbody crossing methods and adherence to its ECS and HDD Contingency Plan, and compliance with conditions of all applicable permits, we conclude that the Project's impacts on surface water quality would be adequately minimized.

Hydrostatic Testing

Columbia would hydrostatically test the new pipeline in accordance with the DOT pipeline safety regulations prior to commencing any service. Columbia would test the pipeline with water obtained from municipal sources, which would require a total of about 1,164,802 gallons of water. Line B-111 would be tested in sections, and hydrostatic test water would be moved from one test section to another, reducing the total volume of test water required for the Project. After testing, Columbia would discharge the water to a well-vegetated upland area through an energy dissipation device, and would install erosion control measures as necessary to prevent scour or runoff into nearby sensitive resources. Columbia's proposed hydrostatic discharge locations are shown in table 8.

Table 8
Hydrostatic Test Water Discharge Locations for the B-System Project a/, b/

Discharge Milepost	Station (Line B111)	Description
6.93	365+70	Line B-111 near Sims Road
3.20	169+00	Line B-111 near Diley Road
9.23	487+52 (Tap Valve)	Line B-121 near the Groveport-Lockbourne Point of Delivery
4.54	239+84 (Tap Valve)	Line B-130 near the Canal Winchester Point of Delivery

a/ All water would be obtained from municipal sources.
b/ The discharge location(s) for Line K-270 have not been determined.

Columbia would be required to dilute chlorine levels of the municipally sourced water in accordance with standards set by the OEPA, which Columbia proposes to accomplish by dissipation or sodium bisulfite treatment. Given that Columbia would conduct hydrostatic testing in accordance with its ECS and applicable permit conditions, we conclude that the impacts associated with hydrostatic testing would be minimal.

3.3 Wetlands

Wetlands are areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support a prevalence of wetland vegetation adapted for life in saturated soil conditions. Wetlands can be a source of substantial biodiversity and serve a variety of functions that include providing wildlife habitat, recreational opportunities, flood control, and naturally improving water quality.

Columbia conducted wetland delineation surveys during summer 2015 and spring 2016 in accordance with the *Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory, 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region* (Corps, 2012). The wetlands that were identified were further classified according to the FWS classification system (Cowardin et al., 1979), through which Columbia determined that palustrine forested (PFO), palustrine scrub-shrub (PSS), palustrine emergent (PEM), and palustrine

unconsolidated bottom (PUB) wetlands, and wetlands sharing characteristics of several types, would be crossed. Additional surveys were conducted during January 2017 for reroutes and workspace changes outside of the original survey corridor.

Typical PEM vegetation in the Project area includes the following species: box elder, smallspike false nettle, sedges, Northern Catalpa , yellow nutsedge, deertongue grass, purpleleaf willowherb, boneset, green ash, touch-me-not, rushes, northern spicebush, great blue lobelia, Morrow's honeysuckle (an invasive species), creeping jenny (an invasive species), Japanese stiltgrass (an invasive species), smartweeds, reed canarygrass (an invasive species), Eastern cottonwood, curly dock, sandbar willow, black willow, green bulrus, broadleaf cat-tail, narrowleaf cat-tail (an invasive species), and ironweed. Common PSS species include silver maple, black willow, box elder, touch-me-not, reed canarygrass, sweetflag, green arrow arum, yellow nutsedge, northern spicebush, green bulrush, narrowleaf cattail, and broadleaf cattail. Representative PFO tree species include pin oak, river birch, sedges, and reed canary grass.

Construction of the Project would temporarily impact about 4.8 acres of wetlands, of which about 0.9 acre would be within the permanent right-of-way. Within the permanent right-of-way, about 0.8 acre of forested wetlands would be permanently converted and maintained as scrub-shrub or emergent. About 0.1 acre of scrub-shrub wetlands would be converted and maintained as emergent (see appendix F and table 9). Columbia would install the pipeline using standard pipeline construction procedures (per Columbia's ECS) in wetlands with firm soils or without standing water. Columbia would segregate non-saturated topsoil over the trench to preserve the natural seedstock and encourage the growth of native plant species during restoration. Conversely, if soils were saturated at the time of construction, Columbia would use timber mats to support construction equipment to avoid rutting and subsurface mixing of soils.

As previously mentioned, Columbia has requested modifications to sections V.B.2.a and VI.B.1.a. of FERC's Procedures for five ATWS that would be within 50 feet of a wetland or waterbody (see table 7). One ATWS would be less than 50 feet from wetlands.

The primary impacts of construction on wetlands would be the alteration of wetland type and impacts on water quality within wetlands because of sediment loading or inadvertent spills of hazardous materials. As discussed in section B.3.2, inadvertent returns from HDD could increase sedimentation; however, Columbia would implement its HDD Contingency Plan to minimize impacts from a release. Construction in wetlands would convert PFO or PSS wetland types to PEM due to vegetation maintenance; however, these wetlands would still provide important ecological functions including flood control and providing wildlife habitat. The Project would result in no net loss of wetlands.

Columbia would minimize impacts on wetlands by incorporating the measures outlined in its ECS. Some of these measures include leaving root systems intact to hasten revegetation, installing hay bales and silt fence to prevent runoff from upland areas reaching wetlands, and installing trench breakers (physical barriers at the bottom of the trench) to maintain wetland hydrology. Columbia would limit the right-of-way width to 75 feet in wetlands to minimize the overall disturbance of construction. Columbia would be required to

complete wetland and waterbody restoration, which would be ensured during construction and restoration inspections. In addition, Columbia may be required to provide compensatory mitigation to the Corps and the OEPA as part of its permitting pursuant to sections 401 and 404 of the Clean Water Act. These measures are currently under review and subject to final approval by both agencies.

Table 9
Summary of Wetlands Impacts by Project Facility

Pipeline	Cowardin Classification	Length of Crossing at Centerline (feet) a/	Wetland Impacts b/	
			Construction [acre(s)]	Operation (acre)
Line B-105	PEM	1,695	2.14	0.00
Line B-105	PFO	440	0.58	0.58
Line B-105	PSS	144	0.25	0.00
Line B-111	PEM	701	0.91	0.00
Line B-111	PFO	28	0.18	0.18
Line B-121	PEM	37	0.02	0.00
Line B-121	PUB	0	0.02	0.00
Line K-270	PEM	393	0.43	0.00
Line K-270	PSS	0	0.26	0.11
Total		**3,438**	**4.79**	**0.87**

a/ A length of crossing at centerline equal to zero indicates that a wetland is not crossed by the Project centerline, but is within the Project workspace.

b/ Construction acreage of wetlands impacts is equivalent to acres of wetlands impacted during construction within the permanent easement and TWS. Operational acreage of wetland impacts is equivalent to acres of impacts to PSS and PFO wetlands within the permanent easement and that may be maintained in an herbaceous state, as specified by the FERC Procedures. Operation of the Project would not impact PEM wetlands because there is no change in the pre- and post-construction vegetation cover type.

Given Columbia's proposed construction procedures, the limited overall land disturbance to wetlands, and Columbia's mitigation measures associated with its SPCC Plan, HDD Contingency Plan, as well as its Corps and OEPA permitting, we conclude that the Project would not result in significant impacts on wetlands.

4. Vegetation and Wildlife

4.1 Vegetation

In general, vegetation within the Project area is characterized by agricultural, forested upland, open land, maintained land, and wetland habitat types. Table 10 below provides representative upland vegetation species found in each category. (Wetlands in the Project area are discussed in section B.3.3).

Agricultural land consists of cultivated crops. About 130 acres of agricultural land would be temporarily impacted by the Project. Of this, 55 acres would be within the existing permanent easement. Permanent impacts on agricultural lands would not be expected, as farming and grazing activities would be permitted over the easement. However, some temporary impacts would occur, such as losses of a viable crop during the growing season. Columbia would compensate landowners for damages caused by construction for current and subsequent growing seasons.

About 49 acres of upland forest and woodland would be impacted by the Project. Of this, 19 acres would be within the existing permanent easement.

Open lands include uncultivated cleared lands, pasture, and scrub-shrub land, and may support herbaceous and low-level woody vegetation, offering protective cover and forage food sources for a wide variety of wildlife. Maintained land within the Project area consists of maintained turf grass and landscape trees and shrubs in residential and commercial use.

No vegetation communities of special concern would be affected by the Project.

The primary impact on vegetation from the Project facilities would be the new permanent conversion of about 19 acres of forested upland to open land, comprised of maintained right-of-way and permanent access roads (see section B.5.1, table 12). In addition, about 30 acres of forested land would be cleared for temporary construction workspaces, of which 3 acres have been previously cleared and are within the existing pipeline easement. This would be considered a long-term impact as it would take more than 20 years for forested vegetation to return to pre-construction conditions.

Table 10
Representative Upland Vegetation Species

Vegetation Habitat Category	Representative Upland Vegetation Species
Agricultural	corn, soybean
Forested Upland	shingle oak, bitternut hickory, maple, tuliptree, shagbark, pine, hemlock, American beech, oak, cherry, hackberry, honey locust, yellow wood sorrel, rhododendron, Christmas fern, Virginia creeper
Open Land	Fuller's teasel, fescue, pokeweed, Canadian thistle, wingstem, curly dock, white clover, orchard grass, black raspberry
Maintained Land	red clover, white clover, plantain, common dandelion, common lawn grasses

4.1.1 Pollinator Habitat

On June 20, 2014, President Barack Obama signed the Presidential Memorandum *Creating a Federal Strategy to Promote the Health of Honey Bees and Other Pollinators* (The White House-Office of the Press Secretary, 2014). According to the memorandum, "there has been a significant loss of pollinators, including honey bees, native bees, birds, bats, and butterflies, from the environment." The memorandum also states, "given the

breadth, severity, and persistence of pollinator losses, it is critical to expand Federal efforts and take new steps to reverse pollinator losses and help restore populations to healthy levels." In response to the Presidential Memorandum, the federal Pollinator Health Task Force published a National Strategy to Promote the Health of Honey Bees and Other Pollinators in May 2015. This strategy established a process to increase and improve pollinator habitat.

The Project would temporarily impact about 201 acres of pollinator habitat including upland open land, forested land, forested wetland, emergent wetland, and scrub-shrub wetland. The temporary loss of this habitat would increase the rates of stress, injury, and mortality experienced by honey bees and other pollinators. Columbia would revegetate both the TWS and permanent rights-of-way immediately after the pipeline facilities are installed with herbaceous and riparian seed mixes in consultation with the local NRCS. Once revegetated, the restored workspace and permanent rights-of-way could provide pollinator habitat in the Project area. On May 16, 2016, the FWS commented that revegetation of disturbed areas should include nectar-producing plants and milkweed endemic to the area in order to assist butterflies, bees, and other pollinators. To ensure impacts on pollinator habitat are sufficiently minimized and consistent with the FWS recommendation and Presidential Memorandum and subsequent strategy regarding pollinators, **we recommend that:**

- **Prior to construction, Columbia should file with the Secretary a plan describing the feasibility of incorporating plant seeds that support pollinators into the seed mixes used for restoration of construction workspaces. The plan should also describe Columbia's consultations with the relevant federal and/or state agencies.**

4.1.2 Invasive Species and Noxious Weeds

Invasive species are those that display rapid growth and spread, becoming established over large areas (USDA, 2006). Most commonly, invasive species are exotic species that have been introduced from another part of the United States, another region, or another continent, although some species that exhibit rapid growth and spread are also considered invasive. Similar to invasive species, noxious weeds are defined as those that are injurious to commercial crops, livestock, or natural habitats, and typically grow aggressively in the absence of natural controls (USDA, 2016). Noxious weeds are frequently introduced but occasionally are native. Noxious weeds and invasive species can change or degrade natural vegetation communities which can reduce the quality of habitat for wildlife and native plant species.

Removal of existing vegetation and disturbance of soils during construction of the Project could create conditions conducive to the establishment of noxious weeds and invasive species. Columbia has incorporated measures to minimize the introduction of noxious weeds and invasive species in its ECS. Specific measures include:

- minimizing sediment movement and the associated movement of noxious weed seeds;
- using construction techniques that minimize the time that bare soil is exposed and, therefore, minimize the opportunity for invasive species to become established;

- in wetland construction areas where conditions allow (i.e., non-saturated, no standing water), removing topsoil from the excavation areas and storing it to the side for replacement once construction is complete to help minimize the introduction of noxious weeds and maintain the existing plant community seed bank;
- seeding according to the ECS to establish a quick cover crop for stability and to allow native species in the soil to quickly establish to assure that a suitable growing substrate for noxious weeds is not available for long periods of time; and
- monitoring the pipeline right-of-way and disturbed sites following construction to verify that re-vegetation of the areas has been successful and that invasive species have not become widely established.

We find these measures to be acceptable.

After construction, Columbia would revegetate the right-of-way and TWS according to its ECS. Staging areas would also be restored as close as practicable to previous conditions or left in an improved state if requested by the landowner. Given that Columbia would use existing rights-of-way as much as possible and that all staging areas and TWS would be revegetated, we conclude that the Project would not have a significant impact on vegetation.

4.2 Wildlife

The Project consists of agricultural, forested upland, open land, maintained land, and wetland habitat types. Common wildlife in the area include a wide variety of mammal, amphibian, birds, and reptile species that have adapted to human-influenced environments. Examples include white-tailed deer, red fox, garter snake, American toad, raccoon, gray squirrel, American robin, and European starling.

Potential impacts on wildlife include habitat removal, construction-related ground disturbance, and noise. Some individuals could be inadvertently injured or killed by construction equipment. However, more mobile species such as birds and larger mammals would likely relocate to other nearby suitable habitat and avoid the Project area once construction activities commence. The temporary disturbance of local habitat is not expected to have population-level effects on wildlife because the amount of habitat crossed represents only a small portion of the habitat available to wildlife throughout the Project area, and much of the disturbed habitat would return to preconstruction condition after construction. Long-term impacts from habitat alteration would be further minimized by the implementation of Columbia's ECS, which would ensure revegetation of most areas disturbed by construction.

Given the abundance of similar habitat adjacent to the Project area and Columbia's commitment to revegetate the right-of-way, we conclude that the Project would not have a significant impact on wildlife or wildlife habitat in the Project area.

4.3 Migratory Birds

Migratory birds are species that nest in the United States and Canada during the summer and then migrate to and from the tropical regions of Mexico, Central and South

America, and the Caribbean for the non-breeding season. Migratory birds are protected under the Migratory Bird Treaty Act ([MBTA] – 16 U.S. Code 703-711), and bald and golden eagles are additionally protected under the Bald and Golden Eagle Protection Act ([BGEPA] – 16 U.S Code 668-668d). The MBTA, as amended, prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests. Executive Order 13186 was enacted in 2001 to, among other things, ensure that environmental analyses of federal actions evaluate the impacts of actions on migratory birds. Executive Order 13186 directs federal agencies to identify where unintentional take is likely to have a measurable negative effect on migratory bird populations and avoid, minimize, or mitigate adverse impacts on migratory birds through enhanced collaboration with the FWS, and emphasizes species of concern, priority habitats, and key risk factors, with particular focus given to population-level impacts.

On March 30, 2011, the FWS and FERC entered into a Memorandum of Understanding regarding implementation of Executive Order 13186 that focuses on migratory birds and strengthening migratory bird conservation through enhanced collaboration between the two agencies. This voluntary memorandum does not waive legal requirements under the MBTA, BGEPA, the Endangered Species Act (ESA), or any other statutes, and does not authorize the take of migratory birds.

This Project falls within Bird Conservation Regions 22 and 28: Eastern Tallgrass Prairie and Appalachian Mountains (North American Bird Conservation Initiative, 2016). The Appalachian Mountains are characterized by rugged terrain dominated by forests. These forests typically consist of oak-hickory and other deciduous species at low elevations and evergreen forests at higher elevations. Species typically found in the evergreen forests include pine, hemlock, spruce, and fir. Lower elevations are dominated by agricultural land. The largest threat to migratory birds in this region is land use change (Appalachian Mountains Joint Venture, 2016).

According to Partners in Flight (2016), the Eastern Tallgrass Prairie bird conservation region, which extends from eastern Nebraska and Kansas to Central Ohio, consists of rolling plains in its western extent and flatter terrain in the eastern extent, where this Project occurs. Historically, typical habitats included prairies, oak opening, savannah, and forest. Recent development has limited all of these habitat types, particularly prairie.

Due largely to the effects of significant loss of these habitats, the Ohio Bird Conservation Initiative has identified 10 bird species of the highest priority and 26 high priority bird species (2016). Priority bird species identified by this Initiative are tabulated in appendix G.

Columbia sent a letter to the FWS on May 16, 2016, requesting comments on potential impacts on migratory bird species within the Project area. Columbia received a response from FWS on October 18, 2016. In its letter, the FWS confirmed that the primary nesting season in Ohio occurs between April 1 and July 15. The FWS recommended that any tree, shrub, or grassland removal occur outside the nesting season to prevent impacts on migratory birds.

Columbia plans to complete tree clearing outside the nesting season to the greatest extent practicable in order to minimize impacts on bird species protected under the MBTA. The Project would be collocated with Columbia's existing B-System and other non-Columbia-owned rights-of-way to the greatest extent practicable, thus reducing the fragmentation of large forest tracts within the Project area. Furthermore, the portions that are not collocated with existing rights-of-way would be within primarily agricultural areas and open areas that are already frequently maintained.

Columbia anticipates beginning construction of the Project in March 2018. Tree and brush clearing is anticipated to occur between October 2017 to March 2018 to avoid the migratory bird nesting season. However, it is possible that some tree clearing and other activities may be delayed into the nesting season. Columbia stated that it would work with the FWS to determine measures necessary (e.g., surveys for nesting birds) to avoid adverse impacts on migratory birds if tree and brush clearing activities are delayed into the migratory bird nesting season. However, Columbia has not yet identified the measures that would be taken in the event tree clearing occurs during the migratory bird nesting season. Therefore**, we recommend that:**

- **Prior to construction *and* if right-of-way clearing would take place between April 1 and July 15, Columbia should file with the Secretary a Migratory Bird Conservation Plan incorporating avoidance and mitigation measures and file documentation of its consultation with the FWS.**

Implementation of the construction and restoration measures in Columbia's ECS would reduce the extent and duration of impacts on migratory bird habitat by restoring a great majority of the construction right-of-way to pre-construction conditions. Such measures include co-locating the proposed pipeline with existing right-of-way, environmental training for all on-site workers and environmental inspectors, and avoidance and minimization techniques, such as clearing outside of the nesting season as much as practicable prior to construction.

During operation of the Project, vegetation maintenance clearing would occur outside of the nesting season in accordance with Columbia's ECS. The majority of the forested land consists of small tracts that are primarily segmented and non-continuous, which has a decreased likelihood of fostering migratory bird habitat.

Bald Eagle

Based on information provided by an ODNR database request on May 19, 2016, and the FWS comments on October 18, 2016, a documented bald eagle nest was identified within 660 feet of the proposed Project within Three Creeks Metro Park in Madison Township, Franklin County. However, Columbia conducted a bald eagle nest survey on December 7, 2016, and the documented bald eagle nest was no longer present at this location. Survey results were provided to the ODNR and FWS,and both agencies concurred with the survey findings on December 21 and 22, 2016, respectively. In the event that a bald eagle nest is observed during construction, Columbia would coordinate with the FWS to determine appropriate avoidance or minimization measures.

Line B-105 would be abandoned in place with minimal land disturbance. Lines B-111, B-121, and B-130 would be constructed in each respective line's existing right-of-way to the greatest extent practicable, thus reducing the additional fragmentation of large forest tracts within the Project area. Furthermore, the portions not collocated with existing rights-of-way would be primarily within open land that consists of either vegetation in the form of lawn grasses or agricultural areas used for the production of annual crops. Additionally, and as previously noted, Columbia plans to clear trees outside the nesting season to the greatest extent practicable.

While the Project would not likely result in population-level impacts on migratory bird species, we acknowledge that pipeline construction during the migratory bird breeding season could impact individual birds and/or nests. Habitat loss could have a greater impact on Birds of Conservation Concern species due to their limited populations in the area and more restrictive habitat needs. However, with the implementation of the measures mentioned previously and our recommendation, we conclude that the proposed Project would not have a significant impact on migratory birds in the Project area.

4.4 Fisheries

Under Ohio State Water Quality Standards, the OEPA assigns each waterbody in the state one or more aquatic life habitat use designations. Each waterbody may be assigned one or more water supply use designations and/or one recreational use designation. Examples of aquatic life habitat use designations include public water supply, primary contact recreation, and aquatic life uses (OEPA, 2015). The aquatic life use designations are broken down into seven subcategories: warmwater, limited warmwater, exceptional warmwater, modified warmwater, seasonal salmonid, coldwater, and limited resource water. Big Walnut Creek is designated as exceptional warmwater habitat. All other streams crossed by the Project are either warmwater habitat or modified warmwater habitat (OEPA, 2015).

High quality waterbodies in Ohio can have special use designations, including cold-water habitat, exceptional warmwater habitat, reference reach waters, Outstanding State Waters, Ohio Scenic Rivers, Ohio Wild and Scenic Rivers, Ohio Scenic and Recreational Rivers, and federal wild and scenic rivers (OEPA, 2003; ODNR, Division of Watercraft, 2016; National Wild and Scenic Rivers System, 2016). Big Walnut Creek is designated as exceptional warmwater habitat. The Project crosses no other waterbodies that have a special use classification.

The waters of Ohio, including Lake Erie, support more than 160 species of fish. Twenty-eight of the sport fish common in Ohio may be found throughout the Project area (ODNR Division of Wildlife, 2016).

Columbia's consultations with the ODNR did not identify any state-designated fisheries of special concern. In addition, no Essential Fish Habitat is present in the Project vicinity; accordingly, we do not anticipate that the Project would affect special concern fisheries or habitat.

As previously mentioned, Sycamore Creek and Big Walnut Creek would be crossed by HDD and an unnamed tributary to Big Walnut Creek would be crossed by conventional bore. Therefore, no impacts are anticipated for these waterbodies. However, when using HDD, there is potential for inadvertent returns of drilling fluid (mostly bentonite), which could lead to an increase in turbidity as mentioned in section B.3.2. Columbia would implement measures outlined in its HDD Contingency Plan to stop, contain, and clean up any returns.

As discussed in section B.3.2, all other waterbodies would be crossed with a dry-ditch construction method (dam-and-pump or flume). In-water construction and removal of riparian vegetation may cause a temporary increase in turbidity levels, which can increase the sedimentation rate immediately downstream of the work area. Temporary habitat alteration and substrate disturbance could also occur resulting in potential impacts on fish populations. Loss of riparian vegetation in forested areas could affect fish populations that may be present downstream of construction activities by reducing shade and cover, and increasing water temperature. Refueling of construction equipment and storage of fuel oil or other hazardous materials near waterbodies could contaminate waterbodies if a spill were to occur. Therefore, Columbia would not refuel equipment within 100 feet of these resources without secondary containment. Columbia also would ensure that all equipment is parked overnight at least 100 feet from a waterbody and that hazardous materials, including chemicals, fuels, and lubricating oils are not stored within 100 feet of a waterbody unless the location is designated for such use by an appropriate governmental authority, in accordance with the Procedures.

As described above, dry-ditch, expedited crossing methods for waterbodies would reduce the impacts of waterbody crossings by reducing the amounts of turbidity, which is generally limited to short periods before and after the crossing when the dam structure is installed and removed. Columbia would also restore waterbody banks to pre-construction contours and promptly re-seed and stabilize banks, in accordance with the Procedures.

Seasonal timing restrictions for construction activities within streams crossed by the Project will be provided by the Corps section 404 Permit that must obtained for the Project prior to construction. Columbia expects that the section 401 Water Quality Permit issued by the OEPA will impose additional in-stream construction restrictions on the Project. However, in accordance with Columbia's ECS, the FERC timing window for construction through warmwater fisheries (June 1-November 30) would be implemented unless the Corps or OEPA provides written approval for an alternate timing window.

With Columbia's proposed measures, we conclude that fishery impacts would not be significant.

4.5 Special Status Species

Special status species are those species for which state or federal agencies provide an additional level of protection by law, regulation, or policy. Included in this category are federally listed species that are protected under the ESA, species considered as candidates for

such listing by the FWS, those species that are state-listed as threatened or endangered, and state species of special concern.

The bald eagle, while no longer federally listed, is protected under the BGEPA. The potential of the Project to impact the bald eagle is discussed in section B.4.3.

4.5.1 Federally Listed Species

Columbia, acting as a non-federal representative for FERC, in accordance with Section 7(a)(2) of the ESA initiated informal consultation with the FWS to identify federally listed threatened and endangered species that may occur in the Project area. These species are identified in table 11 and discussed in the following sections.

Columbia has developed a Multi-Species Habitat Conservation Plan (MSHCP) in coordination with the FWS, which identifies common pipeline activities that may take place within potential federally listed species habitat. The MSHCP outlines detailed monitoring, reporting, and management protocols for multiple ESA-listed species known to occur in the Project area including the Indiana bat, northern long-eared bat, and clubshell mussel. We have reviewed the MSHCP, Biological Opinion, and associated concurrence letters issued by an inter-agency effort on September 13, 2013. An amendment to the MSHCP, approved by the FWS on May 1, 2015, documents the analysis of impacts, incidental take, and mitigation for the northern long-eared bat. Through the MSHCP, Columbia and the FWS have developed standard mitigation measures that would reduce impacts on listed species to less than significant levels.

Columbia provided the Interagency Endangered Species Act Consultation Checklist for the MSHCP for FERC review and approval upon completion of consultation with the FWS. This checklist is included in appendix H.

Table 11
Federally Listed Species Potentially Occurring within the Project Area

Common Name (Federal Status)	Scientific Name	County of Occurrence	MSHCP Status	General Habitat Notes
Bats				
Indiana Bat (Endangered)	*Myotis sodalis*	Fairfield, Franklin	MSHCP	Hibernate in caves and abandoned mines. Roost in exfoliating/loose tree bark of living and dead trees, or cavities and hollows of dead trees. Consultation complete as per the MSHCP.
Northern Long-Eared Bat (Threatened)	*Myotis septentrionalis*	Fairfield, Franklin	MSHCP	Hibernate in caves and abandoned mines. Roost in exfoliating/loose tree bark of living and dead trees, or cavities and hollows of dead trees. Consultation complete as per the MSHCP.
Fish				
Scioto Madtom (Endangered)	*Noturus trautmani*	Franklin	MSHCP	Prefers streams with gravel bottoms, moderate currents, and riffles. *No effect* determination according to the MSHCP.
Mussels				
Clubshell (Endangered)	*Pleurobema clava*	Franklin	MSHCP	May inhabit the Hocking River near the Project site. This species is generally found in small to medium rivers, buried in clean, course sand and gravel in runs. Cannot tolerate mud or slackwater conditions. Consultation complete as per the MSHCP.
Northern Riffleshell (Endangered)	*Epioblasma torulosa rangiana*	Franklin	MSHCP	This species is generally found in riffles on a bottom on firmly packed fine gravel in swift flowing, shallow water. Consultation complete as per the MSHCP.
Rabbitsfoot (Threatened)	*Quadrula cylindrica cylindrica*	Franklin	Non-MSHCP	May inhabit the Hocking River near the Project site. Found in shallow areas along banks and shoals with sand and gravel. *Not likely to adversely affect*.
Rayed Bean (Endangered)	*Villosa fabalis*	Franklin	Non-MSHCP	Prefer small to medium streams with fast moving current. *Not likely to adversely affect*.
Snuffbox (Endangered)	*Epioblasma triquetra*	Franklin	Non-MSHCP	Found in riffles of medium and large rivers with stony or sandy bottoms and swift currents, usually deeply buried. *Not likely to adversely affect*.
Purple cat's paw pearlymussel (Endangered)	*Epioblasma obliquata*	Franklin	MSHCP	Gravel riffles of medium to large rivers. *No effect* determination according to the MSHCP.
Reptiles				
Eastern Massasauga (Threatened)	*Sistrurus catenatus*	Fairfield	Non-MSHCP	No modeled habitat for the eastern massasauga. Found in wet prairies, marshes and low lying areas along waterbodies. *No effect*, due to lack of habitat.
Birds				
Bald Eagle (Delisted, Federal Monitoring)	*Haliaeetus leucocephalus*	Franklin	N/A	Nests near large bodies of water, in secluded areas. ODNR documented nest near Line B-111 in Franklin County. Surveys determined nest is no longer present. No adverse impacts anticipated.
Insects				
Rusty patched bumble bee	*Bombus affinis*	Franklin	N/A	Primarily uses underground habitats for overwintering queens and active-season nesting and nearby areas with diverse floral resources. Project not within a high potential zone. *No effect.*

Sources: Columbia (2014); FWS (2015); NatureServe (2016)

4.5.2 Indiana Bat and Northern Long-eared Bat

The Indiana bat is a federally listed endangered species that roosts in trees in riparian, bottomland, and upland forests from approximately April 15 to September 15. Indiana bats may summer in a wide range of habitats, from highly altered landscapes to intact forests. Roost trees are generally large and dead or dying. Roost trees can also be live trees with peeling or exfoliating bark, favoring exposure to the sun.

The northern long-eared bat is a federally listed threatened species that is threatened by white-nose syndrome. The northern long-eared bat hibernates during the winter months in caves and mines referred to as hibernacula. Northern long-eared bats may summer in a wide range of habitats, from underneath tree bark, or in crevices of both live and dead trees. Roost trees are generally based on suitability to retain bark or provide cavities or crevices.

Columbia conducted mist net surveys for Indiana and northern long-eared bats between July 7 and July 25, 2016. One northern long-eared bat was captured along Walnut Creek. Columbia's MSHCP identified two existing buffers associated with known occurrences of the Indiana bat at the southern end of the Project and the northern end of the Project. Mist net surveys were not completed within these known presence buffers.

As agreed upon with the FWS, Columbia would follow the measures outlined in the MSHCP for avoiding and minimizing impacts on the Indiana bat and northern long-eared bat. The primary impact on these species and associated habitat would be through the clearing of trees. Columbia would avoid impacts on listed bats by clearing trees between October 2017 and March 2018. The ODNR agreed that by adhering to the tree clearing window, direct impacts on the Indiana bat and northern long-eared bat are not likely. Additional avoidance and minimization measures would be implemented as outlined in Columbia's MSHCP and ECS. We conclude that the proposed activities are consistent with the MSHCP and consultation letters; therefore, section 7 consultation is complete for these two species.

4.5.3 Mussels

The MSHCP identifies five federally listed mussel species as potentially occurring within the Project area: clubshell, northern riffleshell, rabbitsfoot, rayed bean, and snuffbox. The ODNR also identified the purple cat's paw pearlymussel as potentially occurring in the Project area. In September 2016, per the request of the ODNR, Columbia utilized an approved mussel surveyor to examine six stream crossing locations in the Project area: Sycamore Creek, George Creek (two separate reaches), Big Walnut Creek, Hunters Run, and the Hocking River. Relic mussel shells were found in all streams examined. Live mussels were found in Sycamore Creek and two reaches along George Creek. Because live mussels were identified in these two streams, a species-specific mussel survey was conducted. No federally listed mussels were identified during this survey. During the examination at Big Walnut Creek, relic shells of five federally endangered species were identified, including snuffbox, northern riffleshell, clubshell, rabbitsfoot, and rayed bean. The shells in Big Walnut Creek appeared to have been dead for many years. Non-listed mussels found were relocated outside of the Project area.

The clubshell, northern riffleshell, and purple cat's paw pearlymussel are MSHCP covered species. Specifically for the purple cat's paw pearlymussel, covered activities in the MSHCP would have *no effect*. Further, only relic shells of clubshell and northern riffleshell were found during surveys; therefore, Project activities *may affect*, but are *not likely to adversely affect* these mussel species. For the clubshell, northern riffleshell, and purple cat's paw pearlymussel, we conclude that the proposed activities are consistent with the MSHCP and consultation letters; therefore, no further consultation is necessary.

The rabbitsfoot, rayed bean, and snuffbox are non-MSHCP species and require additional consultation with FWS. Because no live federally listed mussel species were found during surveys, we conclude that the Project *may affect*, but is *not likely to adversely affect* the rabbitsfoot, rayed bean, and snuffbox. Columbia provided the survey report to the FWS on November 20, 2016 and requested concurrence. To date, no response from FWS has been received. Our recommendation below would ensure that section 7 consultation is complete prior to any authorization of construction.

4.5.4 Fish

The MSHCP identifies the scioto madtom as potentially occurring in waterbodies in the Project area. Covered activities under the MSHCP would have *no effect* on the scioto madtom. We conclude that the proposed activities are consistent with the MSHCP and consultation letters; therefore, no further section 7 consultation is necessary.

4.5.5 Reptiles

The eastern massasauga is a non-MSHCP species that was recently listed in January 2017 as threatened under the ESA. The MSHCP identified the Project area as being within the general range of the eastern massasauga. However, according to the MSHCP, no modeled habitat for the eastern massasauga is within the specific Project area; therefore, the Project would have *no effect* on the eastern massausauga.

In compliance with section 7 of the ESA, we are requesting concurrence from the FWS for the Project-related impacts on federally listed species. Because this consultation has not yet been completed for three non-MSHCP species (rabbitsfoot, rayed bean, and snuffbox)**, we recommend that**:

- **Columbia <u>should not begin construction</u> of the Project <u>until</u>:**

  a. FERC staff receives comments from the FWS regarding the proposed action;

  b. FERC staff completes any necessary section 7 consultation with the FWS; and

  c. Columbia receives written notification from the Director of the Office of Energy Projects (OEP) that construction and/or use of the mitigation (including implementation of conservation measures) may begin.

4.5.6 Insects

The rusty patched bumble bee is listed as endangered under the ESA. The rusty patched bumble bee is known or believed to occur within Franklin County, Ohio; however, it has a restricted distribution. FWS has adapted a habitat connectivity model to identify zones around current records (2007-2016) where there is a high potential for the species to be present. These high potential zones are areas of known locations with buffers for foraging and also include about half of the area to which they may disperse. High potential zones average about 2.5 miles from known observation points. The maximum dispersal distance of the rusty patched bumble bee is likely about 0.6 to 6 miles (FWS 2017a). The nearest high potential zone to the Project is about 14 miles northwesterly of Line B-111 (FWS 2017b). Therefore, we conclude that the Project would have *no effect* on the rusty patched bumble bee.

4.5.7 State-listed Species

Columbia consulted with the ODNR to identify federally and state-listed species in the Project area. Columbia sent an Ohio Diversity Request to the ODNR on May 20, 2015, November 16, 2015, and March 10, 2016, for information on known occurrences of federally and state listed species within a 1-mile radius the Project area. On May 21, 2015, November 17, 2015, and March 10, 2016, the ODNR provided geographic information system data that outlined known records of state- and federally listed species within the vicinity of the Project (ODNR Division of Wildlife, 2015). Federally listed species are discussed above (all of the federally listed species identified by the ODNR are also state-listed).

On May 30, 2016, Columbia provided a state-listed species impact assessment to the ODNR. Columbia received a response on June 16, 2016. In that letter, the ODNR stated that the Project would fall within the ranges of a number of state-listed mussel and fish species, plants, and the upland sand piper.

Project workspaces associated with the abandonment of Line B-105 from approximate milepost 0.01 to 0.03 cross Rhododendron Cove State Nature Preserve. This nature preserve is home to the largest population of great rhododendron in Ohio, as well as a population of the state-listed flame azalea (ODNR, Division of Natural Areas and Preserves, 2016). Populations of great rhododendron were identified by the ODNR and by Columbia during field investigations; however, where the populations of great rhododendron are located, Line B-105 would be abandoned in place; therefore, the identified populations of great rhododendron would not be impacted by the Project.

Crinkled hair grass, green adder's mouth, and primrose-leaved violet are state-listed plants that were also identified as potentially occurring within the Project area, but known occurrences were outside of proposed Project workspace areas.

The ODNR identified seven state-listed fish species as potentially occurring in waterbodies crossed by the Project: popeye shiner, northern brook lamprey, spotted darter, shortnose gar, tonguetied minnow, paddlefish, and tippecanoe darter. The ODNR recommended that no in-stream work be conducted in perennial streams from April 15 to

June 30 to reduce impacts on indigenous aquatic species and their habitat. Two perennial stream crossings (Big Walnut Creek and Sycamore Creek) would be crossed via HDD, while a dry-ditch crossing method (flume or dam-and-pump) would be used at other perennial stream crossings.

On November 30, 2016, Columbia submitted a consultation letter to the ODNR to address state-listed species. In this letter, Columbia requested a waiver of the in-stream work timing restriction to allow work in perennial streams during the restricted timeframe. On January 19, 2017, the ODNR responded by recommending a 24 or 48-hour time window for each stream crossing depending on their respective FERC designation of minor or intermediate waterbody. This would allow in-stream work to occur during the restricted period, provided that each crossing is completed within the 24 or 48 hour period and the appropriate best management practices are implemented. No live federally or state-listed mussel species were identified during mussel surveys; therefore, impacts on mussel species are not likely. Further, in its response to Columbia's consultation letter, the ODNR acknowledged that the mussel surveys and relocations were performed in accordance with the Ohio Mussel Survey Protocol and that Big Walnut Creek would be crossed by HDD. For these reasons, the ODNR concurs that impacts on mussels are not likely.

The ODNR recommended avoidance of the upland sandpiper habitat (includes seeded grassland, grazed and ungrazed pasture, and hayfield) during the species nesting period of April 15 to July 31. The Project's workspace includes this general habitat within open land areas and existing pipeline right-of-way, as much of the pipeline replacement parallels or overlaps the existing B-System right-of-way. While clearing activities for the Project are currently anticipated to occur between October 2017 and March 2018, Columbia plans to begin active construction in March 2018 and therefore acknowledged that it would not be able to avoid all potential nesting habitat during the nesting period. In its response, the ODNR recommended that the habitat be removed by grading or graveling prior to April 15. If the habitat cannot be removed prior to April 15, surveys should be conducted prior to construction in the areas identified as potential habitat. Columbia's review of suitable upland sandpiper habitat within the Project area and the feasibility of clearing or grading these areas prior to April 15 is ongoing.

The ODNR also stated that the Project is within the range of the black bear, a state endangered species, but also acknowledged that due to the mobility of this species, the Project is not likely to impact this species.

Based on the above discussion, we conclude that the Project could impact certain state-listed species. However, because much of the Project is lift and lay replacement and/or is collocated with existing rights-of-way, the habitat disturbed by the Project would be minimized. The majority of impacts would be temporary in nature, and TWS would be allowed to revert to pre-construction conditions. Should other federal- or state-listed threatened and endangered species be positively identified within or adjacent to the construction workspace, Columbia would work with the appropriate agencies to determine avoidance and minimization measures, which may include:

- avoiding or minimizing disturbance wherever feasible;

- staging construction to limit disturbance during sensitive periods;
- assigning EIs to monitor for specific species during periods of active construction; and
- managing the temporary removal of the species by an approved scientist following established protocols.

The ODNR has provided recommendations for minimizing impacts on state-listed species. However, Columbia has not yet provided a response to the recommendation, specific to the upland sandpiper and for the in-stream work time window to protect state-listed fish species. Therefore, **we recommend that:**

- **Prior to construction, Columbia should file with the Secretary any additional mitigation measures it intends to implement for state-protected species, developed in consultation with the ODNR.**

5.0 Land Use, Recreation, and Visual Resources

5.1 Land Use

The Project is within Franklin and Fairfield Counties, Ohio and traverses multiple land use types. With the exception of wetland and stream categories, current land use categories potentially impacted by the Project were derived from the National Land Cover Database (NLCD) (Jin et al., 2013). Streams and wetlands in the Project area were documented by Columbia during ground surveys and are discussed in sections B.3.2 and B.3.3, above.

The following section provides a listing and description of all upland (non-aquatic) land uses crossed by the Project.

- **Agricultural:** areas used for the production of annual crops, such as corn, soybeans, vegetables, tobacco, hay, cotton, and perennial woody crops such as orchards and vineyards.
- **Residential:** areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 20 to 79 percent of total cover. These areas most commonly include single-family housing units but also include apartment complexes and row houses.
- **Commercial:** highly developed areas where people reside or work in high numbers such as commercial/industrial areas. Impervious surfaces account for 80 to 100 percent of the total cover.
- **Open Land:** areas with a mixture of some constructed materials, but mostly vegetation in the form of lawn grasses. Impervious surfaces account for less than 20 percent of total cover. These areas most commonly include parks, golf courses, and vegetation planted in developed settings for recreation, erosion control, or aesthetic purposes. This category also includes areas dominated by graminoid or herbaceous vegetation, generally greater than 80 percent of total vegetation. These areas are not

subject to intensive management, such as tilling, but can be used for grazing, including pastures.

- **Forested Upland:** tracts of upland forest, including evergreen forest, deciduous forest, and mixed forest. Upland scrub/shrub areas also are included.

The permanent and temporary impacts associated with the proposed Project on land use are provided in table 12. This table also provides a summary of impacts for each pipeline segment by county and a total pipeline impact summary. A discussion of land requirements and existing land uses is provided below followed by a discussion of the potential construction and operation impacts of the Project and proposed mitigation measures.

The permanent easement for all lines would be 50 feet wide. The TWS along Line B-105 would vary between 25 to 50 feet wide, the Line B-130 TWS would be 25 feet wide, and along Lines B-111 and K-270 the TWS would be 50 feet wide. The TWS along Line B-121 would be 55 feet wide. Where the pipeline is collocated, use of the existing right-of-way for TWS would be maximized. In non-forested lands, the permanent right-of-way would generally be allowed to revert to its previous use. However, some uses would be prohibited, such as the construction of buildings within the easement and growth of trees. Additionally, to facilitate periodic inspections as required by the DOT, Columbia would conduct routine maintenance operations on the permanent right-of-way, generally consisting of mowing a 50-foot-wide strip centered over the pipeline in upland areas. In wetland areas, Columbia would only keep clear a 10-foot-wide strip centered over the pipeline, and selectively cut any trees taller than 15 feet that are within 15 feet of the pipeline.

Columbia would require a total of about 383 acres of land to construct the Project, of which about 148 acres would be retained as permanent easement. Of the 148 acres of permanent easement, 74 acres are already an existing previously disturbed right-of-way; Columbia would create 59 acres of new permanent right-of-way.

Of the 383 acres of land to construct the Project, Columbia would allow 235 acres of land (composed of temporary construction right-of-way, ATWS, staging areas, and portions of its existing right-of-way) to revert to previous uses following construction, as summarized in table 12.

Table 12
Land Use Affected by Construction and Operation of the Project

Land Use by County by Pipeline a/	Operation (acres)			Construction (acres)					Total Construction (acres) c/	Total Operation (acres)
	Access Roads	Existing Perm. ROW	New Perm. ROW	Access Roads	ATWS	Staging Areas	TWS	TWS Previously Disturbed b/		
Line B-105										
Fairfield County										
Agricultural	-	-	-	2.00	-	1.17	1.59	5.16	9.92	-
Commercial	-	-	-	-	-	-	0.92	-	0.92	-
Delineated Waterbody	-	-	-	0.02	-	0.07	0.01	0.17	0.27	-
Delineated Wetland-PEM	-	-	-	0.22	-	-	0.36	2.70	3.28	-
Delineated Wetland-PFO	-	-	-	0.04	-	-	0.07	0.45	0.56	-
Delineated Wetland-PSS	-	-	-	-	-	-	0.06	0.17	0.23	-
Forested Upland	-	-	-	6.03	-	0.09	0.72	3.09	9.93	-
Open Land	0.06	0.19	-	5.19	-	17.35	3.42	10.10	36.31	0.25
Residential	-	-	-	1.23	-	6.39	1.15	1.82	10.59	-
Line B-105 and Fairfield County Total	**0.06** d/	**0.19** d/	**-**	**14.73**	**-**	**25.07**	**8.30**	**23.66**	**72.01**	**0.25**
Line B-111										
Fairfield County										
Agricultural	0.18	11.66	0.02	-	0.84	-	10.56	-	23.26	11.86
Commercial	-	0.10	-	-	-	-	-	-	0.10	0.10
Delineated Waterbody	-	0.14	-	-	-	-	0.04	-	0.20	0.16
Delineated Wetland-PEM	-	0.11	-	-	-	-	0.01	-	0.12	0.11

Table 12 (Contd.)
Land Use Affected by Construction and Operation of the Project

Land Use by County by Pipeline a/	Operation (acres)			Construction (acres)					Total Construction (acres) c/	Total Operation (acres)
	Access Roads	Existing Perm. ROW	New Perm. ROW	Access Roads	ATWS	Staging Areas	TWS	TWS Previously Disturbed b/		
Forested Upland	0.00	1.73	0.01	-	0.11	-	1.30	-	3.15	1.74
Open Land	0.62	11.56	0.34	0.24	1.19	0.37	9.47	0.35	24.14	12.52
Residential	0.48	3.79	0.07	-	0.10	-	0.88	0.02	5.34	4.34
Line B-111 and Fairfield County Total	**1.28**	**29.11**	**0.44**	**0.24**	**2.24**	**0.37**	**22.26**	**0.37**	**56.31**	**30.83**
Franklin County										
Agricultural	0.01	10.86	5.63	0.04	1.35	5.00	18.13	1.31	42.33	16.50
Commercial	-	0.93	0.49	-	1.64	0.14	1.69	0.06	4.95	1.42
Delineated Waterbody	0.02	0.20	0.05	-	-	0.06	0.13	0.03	0.49	0.27
Delineated Wetland-PEM	0.00	0.07	0.37	-	-	0.17	0.13	0.08	0.82	0.44
Delineated Wetland-PFO	-	0.06	-	-	-	-	0.11	-	0.17	0.06
Delineated Wetland-PSS	-	-	0.30	-	-	-	0.02	-	0.32	0.30
Forested Upland	0.87	5.86	1.96	-	0.66	1.53	8.67	0.31	19.86	8.69
Open Land	1.99	14.02	4.61	0.01	2.05	9.98	14.60	1.06	48.32	20.62
Residential	0.81	9.67	1.59	-	2.76	5.55	5.24	0.91	26.53	12.07
Line B-111 and Franklin County Total	**3.70**	**41.67**	**15.00**	**0.05**	**8.46**	**22.43**	**48.72**	**3.76**	**143.79**	**60.37**
Line B-111 Total	**4.98**	**70.78**	**15.44**	**0.29**	**10.70**	**22.80**	**70.98**	**4.13**	**200.10**	**91.20**

Table 12 (Contd.)
Land Use Affected by Construction and Operation of the Project

Land Use by County by Pipeline a/	Operation (acres)			Construction (acres)					Total Construction (acres) c/	Total Operation (acres)
	Access Roads	Existing Perm. ROW	New Perm. ROW	Access Roads	ATWS	Staging Areas	TWS	TWS Previously Disturbed b/		
Line B-121										
Franklin County										
Delineated Wetland-PEM	-	0.01	-	-	-	-	-	-	0.01	0.01
Delineated Wetland-PUB	-	0.02	-	-	-	-	-	-	0.02	0.02
Open Land	-	-	-	-	0.11	-	-	-	0.11	-
Residential	-	0.26	-	-	0.28	-	0.10	-	0.64	0.26
Line B-121 and Franklin County Total	**-**	**0.29**	**-**	**-**	**0.39**	**-**	**0.10**	**-**	**0.78**	**0.29**
Line B-130										
Franklin County										
Agricultural	-	0.03	-	-	-	-	0.04	-	0.07	0.03
Commercial	-	-	-	-	-	-	-	0.07	0.07	-
Delineated Waterbody	-	0.01	0.00	-	-	-	0.00	-	0.01	0.01
Delineated Wetland-PEM	-	-	0.00	-	-	-	0.00	-	0.00	0.00
Forested Upland	-	0.40	-	-	-	-	0.18	-	0.58	0.40
Open Land	-	1.98	0.55	0.10	0.12	-	1.39	0.13	4.27	2.53
Residential	-	0.00	-	0.15	-	-	-	0.11	0.26	0.00
Line B-130 and Franklin County Total	**-**	**2.42**	**0.55**	**0.25**	**0.12**	**-**	**1.61**	**0.31**	**5.26**	**2.97**

Table 12 (Contd.)
Land Use Affected by Construction and Operation of the Project

Land Use by County by Pipeline a/	Operation (acres)			Construction (acres)					Total Construction (acres) c/	Total Operation (acres)
	Access Roads	Existing Perm. ROW	New Perm. ROW	Access Roads	ATWS	Staging Areas	TWS	TWS Previously Disturbed b/		
Line K-270										
Fairfield County										
Agricultural	3.25	-	23.12	-	1.41	2.21	23.22	0.25	53.46	26.37
Delineated Waterbody	0.02	-	0.41	-	-	-	0.37	0.00	0.80	0.43
Delineated Wetland-PEM	0.00	-	0.36	-	-	-	0.07	-	0.43	0.36
Delineated Wetland-PSS	-	-	0.13	-	-	-	0.15	-	0.28	0.13
Forested Upland	0.77	-	6.92	-	0.37	-	6.99	0.04	15.09	7.69
Open Land	1.85	-	15.84	-	1.23	0.64	13.92	-	33.48	17.69
Residential	0.05	-	0.01	-	-	-	-	-	0.06	0.06
K-270 and Fairfield County Total	**5.94**	**-**	**46.79**	**-**	**3.01**	**2.85**	**44.72**	**0.29** e/	**103.6**	**52.73**
Grand Total	**10.98**	**73.68**	**62.78**	**15.27**	**14.22**	**50.72**	**125.71**	**28.39**	**381.75**	**147.44**

Note: A value of 0.00 represents a calculated acreage less than 0.005 acre, and (-) is used to indicate that a specific land use was not present for a particular area.

a/ NLCD (Homer et al., 2015); Columbia's 2015/2016 field surveys.

b/ For the Line B-105 abandonment, the acreage in this table only reflects the area of existing right-of-way used for Project construction.

c/ Figures include all areas that would be disturbed during construction, operation, and maintenance including access roads, permanent right-of-way, TWS, ATWS, and staging yards/pipe storage areas. The acreages for the aboveground facilities (see table 2) overlap with the rights-of-way acreages for the corresponding pipeline segments; therefore, the required acreage for aboveground facilities is not duplicated in the total.

d/ Required for future maintenance, repair, and operation of additional B-System pipelines collocated within the Line B-105 right-of-way.

e/ Associated with existing permanent right-of-way on the far eastern side of Line K-270.

Columbia would use 54 proposed or existing access roads during construction and operation of the Project, 19 (11 existing; 8 new) of which would be maintained for permanent use. All access roads associated with the Project would be left in an improved state if requested by the landowner; otherwise, temporary access roads would be restored to pre-existing conditions.

To accommodate the movement of pipe trucks and other heavy equipment, Columbia would grade and widen access roads to a maximum of 25 feet and clear vegetation at sharp turns and bends. Columbia's proposed access roads are tabulated in appendix B.

Columbia has identified some areas where ATWS may be necessary to perform specialized construction techniques such as where the pipeline route would cross wetlands and waterbodies, existing utilities, roads, pipeline interconnections, and steep side slopes, tabulated in appendix A. Columbia has provided the necessary justification for these workspaces. Columbia would follow the restoration measures outlined in its ECS for these areas and prior use of these areas would continue following restoration.

Columbia has proposed to use 11 staging areas varying in size from 0.1 to 10.1 acres in open land, with the exception of a proposed staging area on Line B-111 (at milepost 13.1), which may require some minor upland forest clearing. In general, these staging areas would be used to accommodate temporary offices, provide parking, and to store pipe and other construction-related materials. Columbia would restore these areas in accordance with the restoration measures outlined in its ECS.

5.1.1 Agricultural

Construction would affect about 129 acres of agricultural land, of which 23 acres are within existing permanent easement and previously disturbed by pipeline construction. The presence of the pipeline and permanent easement would not prohibit farming of agricultural lands; however, farmers would not be able to produce a crop within the construction area during the spring and summer of 2018 if construction takes place during that time.

Columbia would adhere to its ECS to ensure that the effects of construction are temporary and that the productivity of agricultural lands would not be permanently impacted. Specifically, Columbia would segregate the upper 12 inches of topsoil from subsoil, and ensure that drain tiles, if encountered, remain in working condition or are replaced/repaired if damaged.

5.1.2 Wetlands and Waterbodies

These impacts are discussed in detail in sections B.3.2 and B.3.3.

5.1.3 Forested Uplands

Construction of the Project would affect a total of about 29 acres of upland forest. Of this, 8 acres have been previously disturbed and are within the existing pipeline easement.

Of the remaining 21 acres, 9 acres would be new permanent impact, while the remaining 12 acres would be allowed to return to a forested state.

Columbia would conduct maintenance of its right-of-way not more than every 3 years in upland areas. Continued maintenance of vegetation would interrupt normal forest succession and vegetation within the full width of the permanent right-of-way, permanently altering 9 acres of forested habitat. The clearing of 17 acres of forest for TWS would represent a long-term impact as it may take 20 to 30 years for mature forest recovery. Potential impacts on forested lands would be minimized by the collocation of the pipeline with Columbia's existing pipeline right-of-way for the majority of its length (see table 3; section A.5). Furthermore, the non-collocated portions would be primarily within open land, which consists primarily of vegetation in the form of lawn grasses and also agricultural areas used for the production of annual crops.

5.1.4 Open Land

About 147 acres of open land would be affected by the Project. Following construction, a maximum of 54 acres could be retained as permanent right-of-way and access roads depending upon landowner requests. The remaining 93 acres would be restored and allowed to return to pre-construction conditions.

Temporary impacts, such as removal of fences and vegetation clearing, would be minimized and mitigated by application of the measures contained in Columbia's ECS by restoring these sites to pre-construction conditions as soon as practicable. Temporary impacts on open land would be largely limited to the duration of construction. Permanent impacts would include limited routine clearing of the pipeline right-of-way for maintenance activities, and a prohibition on the erection of structures on the permanent right-of-way.

5.1.5 Residential and Commercial

The Project workspaces would be within 50 feet of approximately 210 residences, as well as other structures such as garages, barns, stores, and warehouses. One of the residences is near the newly proposed K-270 pipeline route; all other structures are within 50 feet of proposed workspaces associated with Line B-105 abandonment activities and the replacement portions of Lines B-111 and B-130.

Construction in residential areas would result in short-term impacts on residents living in the areas immediately surrounding the workspaces. Impacts would include disturbance of lawns; temporary removal of fences and mailboxes; and temporary or permanent removal of trees and other ornamental landscaping. Some roads, driveways, and sidewalks would be closed temporarily during the period of lowering in the pipeline. Other short-term impacts would include the presence of heavy machinery and construction personnel, intermittent noise, and fugitive dust.

In response to our NOI, we received comments from six landowners. Mr. Michael Haemmerle expressed a concern about a portion of the existing Line B-105 pipeline on his land that is currently exposed within a creek. Mr. Haemmerle requested an opinion of whether this pipeline should be abandoned in place due to the potential of further erosion and

corrosion. In areas along the Line B-105 stream crossings where the existing pipe is exposed, Columbia proposes to remove the segment of pipe via hand excavations, as described in section B.3.2 above. Removing the exposed pipeline could cause minor increases in local sediment loading and turbidity from in-waterbody construction activities. However, these impacts would be limited to the in-waterbody construction period and immediately thereafter, and should not contribute to "further erosion or corrosion" once the streambanks are restored. The benefits of removing the exposed pipeline include the minimization of future erosional impacts on the waterbody and a decreased potential for rust from the pipe to enter the waterbody. As such, we find that the temporary impacts from the removal of the exposed pipeline would be minor compared to the benefits of removal.

Mr. Steven Wharton, a landowner, commented on the proposed relocation of replacement Line B-111 on his property and expressed concerns that relocation of the pipeline would disturb an existing sewer system and potentially contaminate drinking water obtained from his and adjacent properties. Columbia proposes to relocate Line B-111 from its current alignment to parallel its existing Line B-93 and make perpendicular crossings of Pickerington Road and Basil Western Road. The collocation of Line B-111 with existing Line B-93 at a 25-foot offset would require an additional 25 feet of permanent right-of-way, thereby reducing permanent impacts. Based on information obtained from the Fairfield County Health Department including the location of Mr. Wharton's septic and leach beds, the Project would likely not cause damage to these beds. However, Columbia would provide Mr. Wharton with compensation to repair any damage to the septic and leach beds resulting from Project construction.

Mr. Todd Cooper provided comments regarding alternate routes through his property for the proposed new K-270 pipeline and requested clarification of the selected route. Responses to Mr. Cooper's comments, as well as three other landowners, are provided in section C.3.2.

Columbia has prepared site-specific residential plans for all residential dwellings within 50 feet of the construction workspace. These plans are included in appendix I of this EA. Our review of these plans find that Columbia's mitigation measures would adequately minimize the impacts on residents in the Project area. We encourage affected landowners to review these site-specific residential plans and file with the Secretary any comments or concerns during the EA comment period. Some of the mitigation measures that Columbia has proposed are as follows:

- install safety fencing along the edge of the workspace adjacent to residences for a distance of 100 feet on either side of the residence;
- preserve as many trees as possible on residential properties;
- restore or replace lawns and landscaping to pre-construction conditions (trees removed during construction activities will not be replaced within the permanent easement due to the potential of the root system to jeopardize the future integrity of the Project and the potential for it to impede access by pipeline personnel for operation and maintenance activities);

- repair, as necessary, walls and other structures as negotiated with the landowner;
- segregate topsoil where appropriate or as negotiated with the landowner;
- prohibit equipment refueling within 200 feet of any water wells;
- maintain utility service during construction activities;
- clean up and backfill the area immediately after pipeline installation;
- use stovepipe construction installation method as needed in areas to limit the number of people and of equipment used to excavate the trench, weld, inspect, and backfill the pipeline by only installing one segment of pipe at a time;
- cover trenches and bellholes with steel plate mats at the end of the work day;
- spray the construction right-of-way with water to reduce potential fugitive dust during dry conditions;
- limit construction activities to between 7:00 am and 5:00 pm except where special conditions or construction measures dictate; and
- revegetate at the first seasonal opportunity.

While construction would result in temporary impacts and inconveniences to landowners, Columbia's mitigation measures would reduce these impacts to the greatest extent practicable. To address the possibility that Columbia may receive complaints from landowners affected by Project construction, we are recommending in section D that Columbia develop and implement an environmental complaint resolution procedure.

We received comments about the impact of the Project on property values. The impact that a natural gas project could have on the value of any land parcel depends on many factors. These include the size of the parcel, the parcel's current value and land use, and the value of other nearby properties. However, subjective valuation is generally not considered in appraisals. This is not to say that the Project would not affect resale values. Potential purchasers may make a decision based on intended future use and, if the presence of the Project facilities in the general area would make that use undesirable, it is possible that the potential purchaser would not acquire that parcel. However, each potential purchaser has differing criteria and means.

5.2 Recreation and Special Use Areas

Project workspace associated with an abandonment by removal segment of Line B-105 crosses a section of Rhododendron Cove State Nature Preserve (milepost 0.0) and would impact about 0.2 acre of open land during construction. Additionally, the right-of-way of Line B-111 crosses the Groveport Cruiser Park (milepost 8.9), Three Creeks Metropark (milepost 11.0), and Williams Creek Park (milepost 11.8). About 1.2 acres of the Cruiser

Park, 16.2 acres of Three Creeks Metropark,[8] and 1.3 acres of Williams Creek Park would be disturbed to replace the pipeline. Additionally, 10 conservation easements (confirmed and unconfirmed) have been identified as being directly affected by the construction and operation of the Project.

The primary concern when crossing recreation and special interest areas is the impact of construction on the purpose for which the area was established (e.g., the recreational activities, public access, or resources the area aims to protect). Construction would temporarily limit recreational use in a specific area; could generate dust and noise, which could be a nuisance to recreational users; and could interfere with or diminish the quality of the recreational experience by affecting wildlife movements or disturbing trails and their users. Construction could also alter visual aesthetics by removing existing vegetation and disturbing soils.

In general, Project impacts on recreational and special interest areas occurring outside of forest/woodland would be minor and temporary (limited to the period of active construction), which typically would last only several days to several weeks in any one area. These impacts would primarily be minimized by implementing Columbia's ECS, which describes topsoil and subsoil segregation, erosion control measures, waterbody and wetland crossings, etc. In addition, construction activities for replacement activities would require minimal new clearing. Following construction, most land uses disturbed would be restored and able to revert to their former uses.

Columbia is working with the facility managers to confirm the procedures that would be followed to restore the parks to pre-existing conditions. However, we have not seen the final measures proposed for each recreation or conservation easement. Therefore, **we recommend that:**

- **Prior to construction, Columbia should file with the Secretary for review and written approval by the Director of OEP any site-specific crossing plans or mitigation measures developed with recreation and conservation easement managers or landowners.**

Hazardous Waste Sites

Columbia researched federal and state government databases to identify potentially contaminated sites in the vicinity of the proposed Project (EDR, 2016), including but not limited to petroleum sites, non-hazardous solid waste sites, brownfield sites, and hazardous waste sites. These computerized radius searches review federal and state environmental record databases to identify any sites with potentially adverse environmental conditions that

[8] Columbia proposes to cross Big Walnut Creek using the HDD method, which may change the overall land impacts in the Three Creeks Metropark; however, Columbia has not yet finalized its design for the HDD across Big Walnut Creek and these numbers are not available as of the date of issuance of this EA.

have the potential to negatively impact the Project during construction or operation of the facilities.

A total of 150 potentially contaminated sites were identified within 0.5 mile of the Project area. Of this total, 126 sites were determined to have no reported leaks, spills, or releases; therefore, it is unlikely that Project activities would occur within contaminated areas or contaminated groundwater plumes originating at any of these 126 sites.

The 24 remaining sites have reported spills or releases are on or adjacent to the Project areas based on the mapped locations and addresses (EDR, 2016). Based on a review of the available information, including type or volume of reported release, topographic proximity and/or regulatory status, it is unlikely that 23 of the identified sites would have an adverse impact on Project activities.

The one remaining site, "Dogwood Crossing Travel Center" located west and adjacent and upgradient to milepost 12.5 on Line B-105, has the potential for soil contamination; however, boundaries of the contamination in relation to the Project boundaries are unknown at this time. During construction training, Columbia would inform workers that there is potential for soil contamination and would train workers on how to avoid or work with contaminated soils at this site. The training would also address worker safety, soils management and disposal, and other environmental concerns. We find these measures to be acceptable.

5.3 Visual Resources

The Project would result in temporary and long-term impacts on visual resources. Visual impacts would vary based on the vantage point of the viewer and proximity to the activities.

The Project's primary impacts on visual resources would occur during active construction and affect agricultural, forest, open lands, and wetlands. The impacts would include the removal of vegetation, disturbance and exposure of bare soils, the presence of personnel and heavy construction equipment, and storage of construction materials. These construction impacts would be temporary, as Columbia expects that construction of the pipeline would take about 12 months, beginning with tree clearing activities in October 2017 and concluding in September 2018 (see section A.6). During restoration, the rights-of-way would be characterized by a patchwork of new vegetation and bare soils. Vegetation would begin to emerge on the rights-of-way in early fall 2018 and would return to pre-construction conditions within 2 to 3 years in agricultural lands, wetlands (shrub-scrub and emergent), and open lands.

The clearing of forested lands would result in long-term and permanent visual changes. Tree clearing would be accomplished through mechanical means and may be performed from October 2017 through March 2018 to avoid potential direct impacts on federally listed bat species and migratory birds. Visual impacts could result from the removal of large trees with particular aesthetic value that also provide visual barriers to roadways or industrial facilities. Because portions of the Project would be collocated along

existing rights-of-way, new visual impacts would be minimized; however, local residents could notice a widening of the corridor.

Visual impacts from construction of the Greenfield Regulator RS-7944 Facility, MLV, and pig launcher/receivers would be minor. The Greenfield Regulator RS-7944 Facility and MLV assemblies would be graveled, fenced, and within the proposed permanent right-of-way. The pig launcher and receivers would be installed at the existing meter stations and sites within the existing rights-of-way and would be surfaced with gravel. The existing facility footprints would be expanded to contain the new pig launcher/receivers and to accommodate fencing for security purposes. Visual impacts associated with the aboveground appurtenances are expected to be minimal due to the small size of each facility and limited visual access. If requested, Columbia would work with individual landowners to discuss options available to mitigate potential visual impacts.

As mentioned above, some residential areas would experience tree screening loss from construction and operation of the Project. To mitigate this loss, Columbia's Project design narrows the construction workspace where possible to avoid trees. Columbia would work with individual landowners on a case-by-case basis to address concerns regarding privacy due to loss of trees and existing landscaping. Landowners would be compensated for the loss of landscaping and timber due to Project construction in both permanent and temporary easement areas, as negotiated during easement acquisitions.

In conclusion, construction of the Project would result in some changes to the visual landscape due to tree removal. However, the collocation of Project rights-of-way with existing rights-of-way, the limited number and size of proposed new aboveground facilities, and the use screening to mitigate for potential visual impacts would minimize overall Project impacts on visual resources to less than significant levels.

6.0 Cultural Resources

Section 106 of the National Historic Preservation Act, as amended, requires the FERC to take into account the effects of its undertakings on properties on or eligible for listing on the National Register of Historic Places (NRHP) and to afford the Advisory Council on Historic Preservation an opportunity to comment. Columbia, as a non-federal party, is assisting the FERC in meeting our obligations under section 106 and the implementing regulations at 36 CFR 800.

Columbia completed Phase I archaeological surveys for the Project, including a 300-foot-wide corridor for the pipelines, as well as expanded work areas, staging areas, and access roads. The resulting Phase I survey report and an Addendum Phase I survey report were provided to the FERC and Ohio State Historic Preservation Office (SHPO).

Cultural resources identified during the Phase I archaeological survey included 23 newly recorded archaeological sites and re-evaluation of 10 previously identified archaeological sites. Of the identified archaeological sites, only Site 33FA2204 was recommended as potentially eligible for the NRHP, and either avoidance or Phase II testing was recommended. Columbia indicated it would avoid this resource by using HDD installation methods, and install exclusion fencing around the site and provide monitoring of

the site by an EI to ensure protection. In a letter dated May 26, 2016, the SHPO concurred with the eligibility recommendations for 32 of the sites (including 33FA2204), and the avoidance option for 33FA2204, but requested additional information, including additional testing at one of the sites recommended as not NRHP-eligible. This information was provided to the SHPO in a July 25, 2016 letter report. Following review, in a letter dated August 22, 2016, the SHPO requested further information, which Columbia provided in a November 23, 2016 letter report. In a letter dated December 28, 2016, the SHPO indicated that based on the information submitted, the Project would have no effect on properties listed on or eligible for listing on the NRHP.

No archaeological sites were identified as a result of the addendum survey, which included one new staging area and three small reroutes. However, one previously documented cemetery (Gray/Grey Herderick Cemetery) was identified just outside the southwestern edge of Staging Area 10. This cemetery was defined by a small grove of trees, although there were no grave markers, surface depressions, or any visible evidence of the cemetery. In a letter dated August 17, 2016, the SHPO indicated there would be "no effect" regarding the surveyed Project components, but requested additional work to confirm the boundaries of the cemetery. Columbia indicated it would not use Staging Area 10, thus avoiding the cemetery. Columbia provided this information to the SHPO in its November 23, 2016 letter report. In its December 28, 2016 letter, the SHPO acknowledged that the staging area had been removed from the Project.

Columbia completed a file review and visual drive-over survey to identify previously recorded architectural resources and locate any previously unrecorded resources within a 500-foot-buffer surrounding the Project corridor, and provided the results to the FERC and SHPO in its July 25, 2016 letter report. Twenty-one previously recorded architectural resources were identified, only one of which was determined eligible for and listed on the NRHP. The visual survey did not reveal any new architectural resources. Seven of the previously recorded buildings were no longer extant, including the lone NRHP-listed property, the Conrad House/Moore House (FRA0383624). Given the nature of the construction activities and the planned restoration of the areas following construction, Columbia recommended that none of the extant resources would be impacted either structurally or visually, and no further work was recommended. In its August 22, 2016 letter, the SHPO requested additional information (including photographs) for the architectural resources, which Columbia provided in its November 23, 2016 letter report.

Subsequently, Columbia identified revisions to the Project, which would require additional cultural resources survey. Columbia has not yet provided a survey report for these Project revisions. **Therefore, we recommend that:**

- **Columbia <u>should not begin construction</u> activities and/or use of staging, storage, or temporary work areas and new or to-be-improved access roads <u>until</u>:**

a. Columbia files with the Secretary the cultural resources survey report for the project revisions, and the Ohio SHPO's comments on the report; and

b. the FERC staff reviews and the Director of OEP approves the cultural resources survey report, and notifies Columbia in writing that construction may proceed.

All materials filed with the Commission containing location, character, and ownership information about cultural resources must have the cover and any relevant pages therein clearly labeled in bold lettering: "CONTAINS PRIVILEGED INFORMATION – DO NOT RELEASE."

Columbia provided a second addendum report for survey of a newly identified staging area and associated access road. The survey covered 21.2 acres, and the resulting survey report indicated no cultural resources were identified. However, in a review letter dated February 21, 2017, the Ohio SHPO noted a portion of an extant potentially NRHP-eligible canal prism along the southern boundary of the staging area. The SHPO concluded however, that the staging area activities were unlikely to adversely affect this resource.

In March 2016, Columbia sent Project information to five federally recognized Native American tribes that were identified as having a potential interest in Project effects. These tribes included the Absentee Shawnee Tribe of Oklahoma, the Eastern Shawnee Tribe of Oklahoma, the Miami Tribe of Oklahoma, the Osage Nation, and the Peoria Tribe of Indians of Oklahoma. On March 22, 2016, the Osage Nation responded that it was not reviewing projects in Franklin and Fairfield Counties. No other responses were received. In August 2016, Columbia completed additional follow-up with the four tribes that had not responded to the March 2016 project information submittal. The Peoria Tribe of Indians of Oklahoma indicated no interest in the Project, but requested to be notified if human remains were encountered. The Unanticipated Discovery Plan (see below) provides for Native American notification in the event of such an occurrence.

We sent our NOI to these same tribes. The Miami Tribe of Oklahoma responded on May 27, 2016 requesting copies of the survey report(s), which Columbia provided. No other responses to our NOI have been received.

Columbia provided a plan to address the unanticipated discovery of cultural resources and human remains during construction. We reviewed the plan and found it acceptable.

7.0 Air Quality and Noise

7.1 Air Quality

Air quality would be affected by construction and operation of the Project. The Project would result in temporary emissions of regulated air pollutants and other air contaminants during construction. Operation of three small gas heaters, pipeline blowdown, and pig launching and receiving would also produce emissions of air contaminants.

7.1.1 Existing Air Quality Conditions

As described below, the Project would result in temporary emissions of regulated air pollutants during construction. Temporary impacts would be minimized as described in the following sections.

7.1.2 National Ambient Air Quality Standards

The Clean Air Act (CAA) of 1970, as amended in 1977 and 1990, is the basic federal statute governing air quality. The provisions of the CAA that are potentially relevant to the Project include National Ambient Air Quality Standards (NAAQS) and General Conformity. The provisions of the CAA that are potentially relevant to natural gas transmission projects include the following:

- NAAQS;
- New Source Review Standards including non-attainment New Source Review and the Prevention of the Significant Deterioration of Air Quality (PSD);
- Federal Class I Area Protection;
- New Source Performance Standards;
- National Emission Standards for Hazardous Air Pollutants including Maximum Achievable Control Technology;
- Title V (Part 70) Operating Permits (Title V);
- Chemical Accident Prevention Provisions;
- General Conformity;
- PSD and Title V Greenhouse Gas Tailoring Rule; and
- Greenhouse Gas Reporting Program.

Attainment Status

The CAA designates seven criteria pollutants for which NAAQS are promulgated to protect public health and welfare: nitrogen oxides (NO_x); carbon monoxide (CO); particulate matter less than 10 microns in diameter (PM_{10}); particulate matter less than 2.5 microns in diameter ($PM_{2.5}$); sulfur dioxide (SO_2); ozone; and lead. The NAAQS are codified in 40 CFR 50. Areas of the country in violation of the NAAQS are designated as nonattainment areas and new sources to be in or near these areas may be subject to more stringent air permitting requirements. Once the EPA sets a new air quality standard, or revises an existing standard, the CAA requires the EPA to designate areas as meeting the standards (attainment areas) or not meeting them (nonattainment areas) based on local air quality.

Both Franklin and Fairfield Counties currently are designated as NAAQS attainment areas for NO_2, CO, SO_2, PM_{10}, $PM_{2.5}$, and lead (EPA, 2016b). Both counties are part of the Columbus Air Quality Control Region, which is designated as a marginal nonattainment area for the 2008 8-hour ozone standard. Additionally, Franklin County, while designated attainment for the $PM_{2.5}$ annual standard, is a maintenance area for that standard since attainment has been demonstrated for less than 10 years.

7.1.3 Regulatory Applicability

The proposed natural gas heaters do not individually exceed a heat input rating of 10 million BTU per hour, the threshold at or above which NSPS Subpart Dc, *Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units* would potentially apply. In addition, no other NSPS, or NESHAP, Title V, or PSD requirements would apply to the Project.

On September 22, 2009, the EPA issued its Mandatory Reporting of Greenhouse Gases rule, establishing the Greenhouse Gas Reporting Program (GHGRP) codified in 40 CFR 98.[9] Since 2011, the GHGRP has required large direct emitters of greenhouse gases (GHG) and certain suppliers (e.g., of fossil fuels, petroleum products, industrial gases, and carbon dioxide [CO_2]) to report GHGs. Subpart C of 40 CFR 98 applies to combustion units, and Subpart W applies to petroleum and natural gas systems, including onshore and offshore petroleum and natural gas production; onshore natural gas processing; natural gas transmission compression; underground natural gas storage; LNG storage; and import and export facilities that emit greater than or equal to 25,000 metric tons of GHGs, as carbon dioxide equivalents (CO_2e), per year. According to EPA's GHGRP webpage, the data reported "can be used by businesses and others to track and compare facilities' greenhouse gas emissions, identify opportunities to cut pollution, minimize wasted energy, and save money" (EPA, 2016d).

Potential GHG emissions associated with operation of the Project, further discussed below, are summarized in table 15. Potential GHG emissions associated with Project operation would not exceed 25,000 metric tons per year; therefore, the Project facilities are not subject to the requirements of 40 CFR 98.

The EPA's Natural Gas STAR Methane Challenge Program is a voluntary program for the reduction of methane emissions in the U.S. oil and gas sectors whereby companies make specific and transparent commitments to reduce methane emissions. The Program provides a platform for partners to showcase efforts to reduce methane emissions, improve air quality, and monetize savings made as a result of this participation. Columbia has agreed to participate in the EPA's Methane Challenge Program by opting to carry over commitments made as an existing member of Our Nation's Energy Future Coalition, Inc. Emissions Intensity (ONE Future). As an existing ONE Future member, Columbia implements ongoing best management practices in an effort to reduce methane emissions throughout its natural gas production, processing, transmission, and distribution operations to less than 1.0 percent by 2025. To meet its commitments for the Methane Challenge Program, Columbia reports the data it gathers to meet its commitments for the ONE Future Program.

No air quality permits would be required by the OEPA for proposed emission sources associated with the Project. No federally designated Class I areas, the nearest of which is the Otter Creek Wilderness Area, approximately 160 miles southeast of the Project area, would be impacted by the Project's *de minimis* emission sources. No county or local air quality

[9] Amended on July 12, 2010, November 29, 2011, and December 23, 2011.

regulations have been identified as being potentially applicable to the Project. The Project would not require the handling or storage of hazardous substances above threshold quantities for which a risk management plan would be required under the Chemical Accident Prevention Provisions specified in 40 CFR 68; however, Columbia would be required to comply with all applicable requirements including the general duty clause of 40 CFR 68 for its existing and proposed facilities.

7.1.4 Greenhouse Gases

GHGs occur in the atmosphere both naturally and as a result of human activities, such as the burning of fossil fuels. These gases are the integral components of the atmosphere's greenhouse effect that warms the earth's surface and moderates day/night temperature variation. In general, the most abundant GHGs are water vapor, CO_2, methane, nitrous oxide (N_2O), and ozone. On December 7, 2009, the EPA defined air pollution to include the mix of six long-lived and directly-emitted GHGs, finding that the presence of the following GHGs in the atmosphere may endanger public health and public welfare through climate change: CO_2; methane; N_2O; hydrofluorocarbons; perfluorocarbons; and sulfur hexafluoride.

As with any fossil-fuel fired activity, the Project would contribute GHG emissions during construction and operation. The principal GHGs that would be produced during Project construction and operation consist of CO_2, methane, and N_2O. Emissions of GHGs are quantified and regulated in units of CO_2e. The CO_2e unit of measure takes into account the global warming potential (GWP) of each GHG. The GWP is based on the properties of the GHG's ability to absorb solar radiation as well as its residence time within the atmosphere. Thus, CO_2 has a GWP of one, methane has a GWP of 21, and N_2O has a GWP of 310. The CO_2e values for all GHGs are summed to obtain the total CO_2e GHG emissions. As illustrated in tables 12 through 14, the Project would emit about 2,338 tons of GHGs as CO_{2e} during construction in 2017, 19,107 tons of CO_{2e} during construction in 2018, and 5,280 tons per year (tpy) of CO_{2e} during operation.

7.1.5 Conformity of Federal Actions

The EPA promulgated the General Conformity Rule on November 30, 1993, to implement the conformity provision of Title I, Section 176(c)(1) of the CAA. Section 176(c)(1) requires that the federal government not engage, support, or provide financial assistance for licensing or permitting, or approve any activity not conforming to an approved CAA implementation plan.

The General Conformity Rule is codified in Title 40 CFR 51 Subpart W and Part 93 Subpart B, determining Conformity of General Federal Actions to State or Federal Implementation Plans. A General Conformity Determination must be conducted by the lead federal agency if a federal action's activities are likely to generate direct and indirect emissions that would exceed the conformity threshold levels (*de minimis*) of the pollutant(s) for which an air basin is in nonattainment or maintenance.

Because the area is a nonattainment area for the ozone NAAQS and a maintenance area for the 1997 annual $PM_{2.5}$ NAAQS, the General Conformity Rule applies to both the

Project's construction and operation emissions. As shown in tables 13 and 14, potential emissions from the Project for calendar years 2017 and 2018 are currently estimated to be below the *de minimis* levels for the nonattainment area pollutants of volatile organic compounds (VOC) and NO_x and the maintenance area pollutant $PM_{2.5}$ for direct $PM_{2.5}$ emissions and NO_x, VOCs, and sulfur oxides precursors. However, it is noted that On October 1, 2015, the EPA revised the primary and secondary ozone standard levels to 0.070 ppm. For the revised 2015 ozone standard, the EPA will designate attainment and nonattainment areas in late 2017. If the nonattainment status of either Fairfield or Franklin Counties is affected by the new designation, including any changes made to conformity threshold levels, Project construction emissions during calendar year 2018 (table 13) must be compared to the new applicable thresholds. Therefore, **we recommend that:**

- **Prior to construction activities occurring during calendar year 2018, Columbia should file documentation demonstrating compliance with general conformity for any revisions to the nonattainment status of Fairfield or Franklin Counties.**

Table 13
Calendar Year 2018 Construction Emissions for the B-System Project (tons) a/

	NO_X	CO	SO_2	VOC	HAP	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	CO_2e
Construction Equipment Exhaust	45.42	23.26	0.08	5.63	2.07	3.31	3.21	15,239	0.85	0.39	15,376
Delivery Truck Exhaust	12.44	5.44	0.02	0.73	0.10	1.03	0.71	2,202	0.04	--	2,203
Worker Commute Exhaust	1.05	11.79	0.01	0.26	0.02	0.18	0.05	1,148	0.01	1,148	0.00
Fugitive Dust from Travel on Unpaved Roads	--	--	--	--	--	38.92	3.87	--	--	--	--
Fugitive Dust from Travel on Paved Roads	--	--	--	--	--	2.29	0.56	--	--	--	--
Fugitive Dust from Construction Activities	--	--	--	--	--	38.50	8.01	--	58.18	--	1,454
HDD Activities	0.74	0.30	0.00	0.06	0.02	0.26	0.06	144.4	0.00	0.00	145.6
Total	**59.7**	**40.8**	**0.11**	**6.68**	**2.21**	**84.5**	**16.47**	**18,734**	**59.09**	**1,149**	**19,180**
General Conformity Rule *De Minimis* Levels	**100**	**NA**	**100**	**100**	**NA**	**NA**	**100**	**NA**	**NA**	**NA**	**NA**

a/ Construction equipment, delivery truck, and worker commute exhaust emissions estimated using the EPA NONROAD2008 and MOVES 2014a models. Fugitive dust from travel on paved roads, travel on unpaved roads, and construction activities estimated using EPA AP-42 Section 13.2.1, Section 13.2.2, and Table 11.9-4, respectively. The estimated emissions from the proposed Walnut Creek HDD are assumed to be equivalent to the emissions that would be generated for the Sycamore Creek HDD.

NA = Not Applicable

Table 14
Calendar Year 2017 Construction Emissions for the B-System Project (tons) a/

	NO_X	CO	SO_2	VOC	HAP	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	CO_2e
Construction Equipment Exhaust	7.19	3.71	0.01	0.80	0.30	0.53	0.52	2,011	0.11	0.05	2,029
Delivery Truck Exhaust	1.35	0.59	< 0.01	0.08	0.01	0.11	0.08	220.7	< 0.01	--	220.8
Worker Commute Exhaust	0.09	0.94	< 0.01	0.02	< 0.01	0.01	< 0.01	87.04	< 0.01	--	87.07
Fugitive Dust from Travel on Unpaved Roads	--	--	--	--	--	3.16	0.31	--	--	--	--
Fugitive Dust from Travel on Paved Roads	--	--	--	--	--	0.19	0.05	--	--	--	--
Fugitive Dust from Construction Activities	--	--	--	--	--	1.13	0.24	--	--	--	--
Total	**8.63**	**5.25**	**0.01**	**0.90**	**0.31**	**5.14**	**1.20**	**2,320**	**0.12**	**0.05**	**2,338**
General Conformity Rule *De Minimis* Levels	**100**	**NA**	**100**	**100**	**NA**	**NA**	**100**	**NA**	**NA**	**NA**	**NA**

a/ Construction equipment, delivery truck, and worker commute exhaust emissions estimated using the EPA NONROAD2008 and MOVES 2014a models. Fugitive dust from travel on paved roads, travel on unpaved roads, and construction activities estimated using EPA AP-42 Section 13.2.1, Section 13.2.2, and Table 11.9-4, respectively.

NA = Not Applicable

7.1.6 Air Quality Impacts and Mitigation

Construction would result in emissions of fugitive dust from vehicular traffic and soil disturbance, and combustion emissions from diesel- and gasoline-fired construction equipment. Large earth-moving equipment and other mobile sources are sources of combustion-related emissions, including criteria pollutants and small amounts of hazardous air pollutants (HAP).

Construction emission estimates for both exhaust and fugitive dust were based on a typical construction equipment list, hours of operation, and vehicle miles traveled for the construction equipment and supporting vehicles on a typical pipeline construction spread. Construction equipment would include earth-moving equipment, cranes, delivery trucks, and worker vehicles, and would produce combustion emissions including NO_X, VOCs, PM_{10} and $PM_{2.5}$, CO, small amounts of SO_2, and GHGs. Pipeline blowdowns prior to abandonment of old pipeline and replacement pipeline construction along Lines B-105, B-121, and B-130 would also result in the venting of GHGs consisting mainly of CO_2 and methane. Tables 13 and 14 summarize the estimated emissions from Project construction activities. Construction equipment would also generate fugitive dust due to soil disturbance and the operation of equipment and vehicles. Where necessary, fugitive dust emissions would be controlled by the use of water, calcium chloride, or other suitable material. Columbia would not conduct open burning during Project construction. Columbia would use offsite parking and shuttle buses to minimize emissions from construction worker traffic. Construction emissions would be temporary, intermittent, minor, and localized, and would cease after all construction activities are complete.

The Project would include several new operational sources of emissions, including two natural gas preheaters rated at approximately 0.5 million British thermal units per hour (MMBtu/hr), one natural gas preheater rated at approximately 9.5 MMBtu/hr, pipeline blowdown events, and pig launching and receiving activities.

Blowdowns would be conducted on a very infrequent basis as needed for maintenance of the new and replacement pipelines. Potential emissions from Project operation are summarized in table 15. The Project's operational emissions would be minor and intermittent, would not exceed any applicable NAAQS standard, and would dissipate within a short distance of each source emission point.

In conclusion, with Columbia's commitments to control fugitive dust, minimize construction worker traffic, and prohibit open burning operations, the Project's construction and operation would have minimal impacts on regional air quality.

Table 15
Potential Operational Emissions for the B-System Project (tons per year) a/

	NO_X	CO	SO_2	VOC	HAP	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	CO_2e
Gas heaters	2.13	3.57	0.03	0.23	0.10	0.32	0.32	5,109	0.10	0.01	5,114
Blowdowns b/	--	--	--	--	--	--	--	--	6.57	--	164.3
Pigging operations	--	--	--	--	--	--	--	--	0.01	--	1.68
Fugitive emissions from pipeline transmission b/	--	--	--	--	--	--	--	0.03	0.09	--	2.23
Total	**2.13**	**3.57**	**0.03**	**0.23**	**0.10**	**0.32**	**0.32**	**5,109**	**6.68**	**0.01**	**5,280**
General Conformity Rule *De Minimis* Levels	**100**	**NA**	**100**	**100**	**NA**	**NA**	**100**	**NA**	**NA**	**NA**	**NA**
NSR Thresholds	**100**	**NA**	**NA**	**100**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
PSD Thresholds	**NA**	**250**	**250**	**NA**	**25**	**250**	**250**	**NA**	**NA**	**NA**	**NA**

a/ Gas heater emissions are estimated using EPA AP-42 emission factors, Chapter 1-4 (Natural Gas Combustion). Pigging operations emissions assume a volume of 61 cubic feet for Line B-111 and 90 cubic feet for Line K-270. Blowdown and fugitive emissions estimated using Interstate Natural Gas Association of America's Greenhouse Gas Emission Estimation Guidelines for Natural Gas Transmission and Storage, 2005.

b/ Blowdown emissions are estimated for the proposed new Line K-270 only; emissions attributable to replacement Lines B-111, B-121, and B-130 are not included in this total. We do not expect blowdown or fugitive emissions from proposed replaced pipeline segments Lines B-111, B-121, or B-130 to change over existing levels. In addition, abandonment including the ceasing of all operations (including blowdowns) on approximately 17.5 miles of Line B-105 would offset blowdown emissions during the operation of the proposed new Line K-270 estimated in this table; therefore, no net increase in blowdown or fugitive emissions on Columbia's B-System is expected to occur as a result of the Project.

NA = Not Applicable

Non-Jurisdictional Facilities

The size and scope of the non-jurisdictional facility construction, further described in section A.9, is not known as of the time of issuance of this EA. The non-jurisdictional facility construction activities would result in the release of emissions from operation of vehicles and other construction equipment; however, such activities are expected to be minor, temporary, and localized to the immediate construction sites, and would not violate any applicable air quality standard.

7.2 Noise

Construction of the Project would affect the local noise environment.

The ambient sound level of a region is defined by the total noise generated within the specific environment, usually comprised of sounds emanating from natural and artificial sources. At any location, both the magnitude and frequency of environmental noise may vary considerably over the course of a day and throughout the week. This variation is caused in part by changing weather conditions and the effect of seasonal vegetation cover.

Two measurements used by some federal agencies to relate the time-varying quality of environmental noise to its known effects on people are the equivalent sound level (L_{eq}) and the day-night sound level (L_{dn}). The L_{eq} is an A-weighted sound level in decibels (dB) containing the same sound energy as the instantaneous sound levels measured over a specific time period. Noise levels are perceived differently, depending on length of exposure and time of day. The L_{dn} takes into account the duration and time the noise is encountered. Late night and early morning (10:00 pm to 7:00 am) noise exposures are penalized +10 dB to account for people's greater sensitivity to sound during the nighttime hours.

In 1974, the EPA published its *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety.* This document provides information for state and local governments to use in developing their own ambient noise standards. The EPA has indicated that an L_{dn} of 55 decibels on the A-weighted scale (dBA) protects the public from indoor and outdoor activity interference. We have adopted this criterion and use it to evaluate the potential noise impact from the operation of permanent facilities as well as construction equipment that operates on a continuous (24 hours per day) basis, such as an HDD rig.

During construction of the Project, adjacent noise-sensitive areas (NSA) would be subject to noise at varying levels, depending upon the construction phase. Impacts on noise-sensitive areas from construction activities (other than HDD operations, which are further discussed below) would be temporary and intermittent. Pipeline construction would primarily be limited to daytime hours (7:00 am to 10:00 pm); therefore, nighttime noise levels would remain unaffected by most construction activities.

Columbia proposes to use the HDD method for a crossing beneath Sycamore Creek along Line B-111 at milepost 1.6, under Big Walnut Creek within the Three Creeks Metropark at milepost 10.7, beneath Interstate 270 at milepost 11.1, beneath the Norfolk Southern Railroad Watkins Yard at milepost 13.4, and beneath a pond on the property of Mr.

Richard Paulus along Line K-270 at milepost 3.5. Columbia indicates that the Sycamore Creek HDD would operate on a 24-hour basis for approximately 12 days. For the remaining HDD sites, Columbia also anticipates 24-hour drilling; based on the length of these HDDs, we anticipate that these HDDs could be continuously operated for up to several days. Nearby NSAs are within 70 feet of the HDD exit point and within 730 feet of the HDD entry point. Estimated L_{dn} noise levels from the Sycamore Creek HDD operation at nearby NSAs are summarized in table 16.

The predicted noise levels summarized in table 16 below incorporate noise mitigation including using muffled equipment in accordance with manufacturer's recommendations, engine enclosures, positioning stationary equipment as far away from NSAs as possible, and erecting temporary barriers to reduce noise levels by a minimum of 10 dBA under uncontrolled levels. Columbia states it would make "all reasonable efforts" to limit HDD noise to less than an L_{dn} of 55 dBA at nearby NSAs; however, because the predicted noise levels with mitigation exceed 55 dBA, Columbia would also offer temporary accommodations to residents impacted by noise greater than an L_{dn} of 55 dBA during the drilling period.

Columbia is finalizing its design of an HDD under Big Walnut Creek within the Three Creeks Metropark at approximate milepost 10.7 along Line B-111. Our review of available mapping suggests there may be a residence or other structure within about 0.2 mile of the HDD exit point. No other structures are evident. However, to ensure that the Big Walnut Creek HDD would not result in significant noise impacts on nearby NSAs, **we recommend that:**

- **If the proposed Walnut Creek HDD entry or exit locations are within 0.5 mile of any NSAs, Columbia should provide the following information <u>prior to construction</u>, for the review and written approval by the Director of OEP:**

  a. identify all NSAs;
  b. the estimated number of days of drilling required for each location, and whether drilling would be done 24 hours per day;
  c. a topographic map showing the distance and direction of the nearest NSAs;
  d. the existing L_{dn} at the nearest NSAs and the estimated noise impacts at the NSAs during drilling activities; and
  e. a description of noise mitigation (or alternate measures such as temporary relocation, compensation, etc. that would be implemented during short term drilling operations) which would be implemented during drilling activity to reduce noise impacts at the NSAs below 55 dBA L_{dn}, or 10 dBA over background if ambient levels are above 55 dBA L_{dn}.

Table 16
Estimated Noise Impacts of HDDs at Nearby NSAs a/

HDD Location	Approx. milepost	Distance to nearest NSA (ft)	Direction	Ambient L_{dn} noise (dBA)	L_{dn} noise at nearest NSA with noise mitigation (dBA)	Noise increase above ambient (dB)
Line B-111 Sycamore Creek (exit)	1.5	70	northeast	47	77	+30
Line B-111 Sycamore Creek (entry)	1.7	130	northeast and south	47	62	+15
Line B-111 I-270 (exit)	11.3	290	northwest	57	75	+18
Line B-111 I-270 (entry)	11.1	840	northwest	57	71	+14
Line B-111 Watkins Yard (exit)	13.6	550	west	52	59	+7
Line B-111 Watkins Yard (entry)	13.3	1,440	west	52	56	+4
Line K-270 Paulus Pond (exit)	3.5	380	south	47	60	+13
Line K-270 Paulus Pond (entry)	3.8	990	southwest	47	59	+12

a/ Columbia has not yet provided information regarding the potential noise impact of the Big Walnut Creek HDD on any nearby NSAs. In this EA, we are recommending that Columbia file this information prior to any Project construction.

The regulation facility would be a source of noise during operation. Columbia predicts that its final design of this facility would limit L_{eq} noise attributable to the facility to approximately 74 dBA at a distance of 50 feet. At the nearest NSA approximately 1,000 feet away, noise attributable to the regulation facility is predicted to attenuate to a level of approximately 48.0 dBA L_{eq}, which is equivalent to approximately 54.4 dBA L_{dn}, below the 55 dBA L_{dn} noise criterion. In order to verify that noise from the regulation facility does not exceed an L_{dn} of 55 dBA, **we recommend that:**

- **Columbia should file a noise survey with the Secretary no later than 60 days after placing the Greenfield Regulator RS-7944 Facility in service. If a full load condition noise survey is not possible, Columbia should provide an interim survey at the maximum possible load and provide the full load survey within 6**

months. If the noise attributable to the operation of all of the equipment at the Greenfield Regulator RS-7944 Facility under interim or full load conditions exceeds an L_{dn} of 55 dBA at any nearby NSAs, Columbia should file a report on what changes are needed and should install the additional noise controls to meet the level within 1 year of the in-service date. Columbia should confirm compliance with the above requirement by filing a second noise survey with the Secretary no later than 60 days after it installs the additional noise controls.

Each of the proposed preheaters are expected to produce noise equivalent to an L_{dn} of 55 dBA at 30 feet; the nearest NSA to any proposed preheater is approximately 175 feet away. Therefore, we expect that the operation of the preheaters would contribute minimally to existing noise levels at nearby NSAs. Columbia does not anticipate changes in operational noise levels from existing aboveground facilities following proposed Project construction.

Based on the analysis above and Columbia's compliance with our regulations, we conclude that noise impacts from operation of the Project would not be significant.

8.0 Reliability and Safety

The transportation of natural gas by pipeline involves some incremental risk to the public due to the potential for accidental release of natural gas. The greatest hazard is a fire or explosion following a major pipeline rupture.

Methane, the primary component of natural gas, is colorless, odorless, and tasteless. It is not toxic, but is classified as a simple asphyxiate, possessing a slight inhalation hazard. If breathed in high concentration, oxygen deficiency can result in serious injury or death.

Methane has an auto-ignition temperature of 1,000 °F and is flammable at concentrations between 5.0 percent and 15.0 percent in air. An unconfined mixture of methane and air is not explosive; however, it may ignite and burn if there is an ignition source. A flammable concentration within an enclosed space in the presence of an ignition source can explode. It is buoyant at atmospheric temperatures and disperses rapidly in air.

8.1 Safety Standards

The DOT is mandated to prescribe minimum safety standards to protect against risks posed by pipeline facilities under Title 49, U.S.C. Chapter 601. The DOT's Pipeline and Hazardous Materials Safety Administration (PHMSA) administers the national regulatory program to ensure the safe transportation of natural gas and other hazardous materials by pipeline. It develops safety regulations and other approaches to risk management that ensure safety in the design, construction, testing, operation, maintenance, and emergency response of pipeline facilities. Many of the regulations are written as performance standards, which set the level of safety to be attained and allow the pipeline operator to use various technologies to achieve safety. PHMSA's safety mission is to ensure that people and the environment are protected from the risk of pipeline incidents. This work is shared with state agency partners and others at the federal, state, and local level.

Title 49, U.S.C. Chapter 601 provides for a state agency to assume all aspects of the safety program for intrastate facilities by adopting and enforcing the federal standards. A state may also act as DOT's agent to inspect interstate facilities within its boundaries; however, the DOT is responsible for enforcement actions.

For the B-System Project, the state of Ohio has delegated authority to inspect interstate pipeline facilities.

The DOT pipeline standards are published in 49 CFR 190-199. Part 192 specifically addresses natural gas pipeline safety issues.

Under a Memorandum of Understanding on Natural Gas Transportation Facilities dated January 15, 1993, between the DOT and the FERC, the DOT has the exclusive authority to promulgate federal safety standards used in the transportation of natural gas. Section 157.14(a)(9)(vi) of the FERC's regulations require that an applicant certify that it will design, install, inspect, test, construct, operate, replace, and maintain the facility for which a Certificate is requested in accordance with federal safety standards and plans for maintenance and inspection. Alternatively, an applicant must certify that it has been granted a waiver of the requirements of the safety standards by the DOT in accordance with section 3(e) of the Natural Gas Pipeline Safety Act. The FERC accepts this certification and does not impose additional safety standards. If the Commission becomes aware of an existing or potential safety problem, there is a provision in the Memorandum to promptly alert the DOT. The Memorandum also provides for referring complaints and inquiries made by state and local governments and the general public involving safety matters related to pipelines under the Commission's jurisdiction.

The FERC also participates as a member of the DOT's Technical Pipeline Safety Standards Committee which determines if proposed safety regulations are reasonable, feasible, and practicable.

The pipeline and aboveground facilities associated with the B-System Project must be designed, constructed, operated, and maintained in accordance with the DOT Minimum Federal Safety Standards in 49 CFR 192. The regulations are intended to ensure adequate protection for the public and to prevent natural gas facility accidents and failures. The DOT specifies material selection and qualification; minimum design requirements; and protection from internal, external, and atmospheric corrosion.

The DOT also defines area classifications, based on population density in the vicinity of the pipeline, and specifies more rigorous safety requirements for populated areas. The class location unit is an area that extends 220 yards on either side of the centerline of any continuous 1-mile length of pipeline. The four area classifications are defined below:

- Class 1: Location with 10 or fewer buildings intended for human occupancy.
- Class 2: Location with more than 10 but less than 46 buildings intended for human occupancy.
- Class 3: Location with 46 or more buildings intended for human occupancy or where the pipeline lies within 100 yards of any building, or small well-defined outside area

occupied by 20 or more people on at least 5 days a week for 10 weeks in any 12-month period.

- Class 4: Location where buildings with four or more stories aboveground are prevalent.

Class locations representing more populated areas require higher safety factors in pipeline design, testing, and operation. For instance, pipelines constructed within Class 1 locations must be installed with a minimum depth of cover of 30 inches in normal soil and 18 inches in consolidated rock. Class 2, 3, and 4 locations, as well as drainage ditches of public roads and railroad crossings, require a minimum cover of 36 inches in normal soil and 24 inches in consolidated rock.

Class locations also specify the maximum distance to a sectionalizing block valve (*e.g.*, 10.0 miles in Class 1, 7.5 miles in Class 2, 4.0 miles in Class 3, and 2.5 miles in Class 4). Pipe wall thickness and pipeline design pressures, hydrostatic test pressures, maximum allowable operating pressure, inspection and testing of welds, and frequency of pipeline patrols and leak surveys must also conform to higher standards in more populated areas. Preliminary class locations for the B-System Project have been developed based on the relationship of the pipeline centerline to other nearby structures and manmade features. The Project would consist of 9.65 miles of Class 1, 3.31 miles of Class 2, and 9.61 miles of Class 3 pipe.

If a subsequent increase in population density adjacent to the right-of-way results in a change in class location for the pipeline, Columbia would reduce the maximum allowable operating pressure or replace the segment with pipe of sufficient grade and wall thickness, if required to comply with the DOT requirements for the new class location.

The DOT Pipeline Safety Regulations require operators to develop and follow a written integrity management program that contain all the elements described in 49 CFR 192.911 and address the risks on each transmission pipeline segment. The rule establishes an integrity management program that applies to all high consequence areas (HCA).

The DOT has published rules that define HCAs where a gas pipeline accident could do considerable harm to people and their property and requires an integrity management program to minimize the potential for an accident. This definition satisfies, in part, the Congressional mandate for DOT to prescribe standards that establish criteria for identifying each gas pipeline facility in a high-density population area.

The HCAs may be defined in one of two ways. In the first method an HCA includes:

- current class 3 and 4 locations,

- any area in Class 1 or 2 where the potential impact radius[10] is greater than 660 feet and there are 20 or more buildings intended for human occupancy within the potential impact circle,[11] or
- any area in Class 1 or 2 where the potential impact circle includes an identified site.

An identified site is an outside area or open structure that is occupied by 20 or more persons on at least 50 days in any 12-month period; a building that is occupied by 20 or more persons on at least 5 days a week for any 10 weeks in any 12-month period; or a facility that is occupied by persons who are confined, are of impaired mobility, or would be difficult to evacuate.

In the second method, an HCA includes any area within a potential impact circle which contains:

- 20 or more buildings intended for human occupancy, or
- an identified site.

Once a pipeline operator has determined the HCAs along its pipeline, it must apply the elements of its integrity management program to those segments of the pipeline within HCAs. The DOT regulations specify the requirements for the integrity management plan at section 192.911. For the proposed Project, HCAs have been determined based on the relationship of the pipeline centerline to other nearby structures and identified sites. Of the 22.57 miles of proposed new and replacement pipeline, Columbia has identified approximately 3.37 miles that would be classified as an HCA. The pipeline integrity management rule for HCAs requires inspection of the pipeline every 7 years.

The DOT prescribes the minimum standards for operating and maintaining pipeline facilities, including the requirement to establish a written plan governing these activities. Each pipeline operator is required to establish an emergency plan that includes procedures to minimize the hazards of a natural gas pipeline emergency. Key elements of the plan include procedures for:

- receiving, identifying, and classifying emergency events, gas leakage, fires, explosions, and natural disasters;
- establishing and maintaining communications with local fire, police, and public officials, and coordinating emergency response;
- emergency system shutdown and safe restoration of service;
- making personnel, equipment, tools, and materials available at the scene of an emergency; and
- protecting people first and then property, and making them safe from actual or potential hazards.

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[10] The potential impact radius is calculated as the product of 0.69 and the square root of: the maximum allowable operating pressure of the pipeline in psig multiplied by the square of the pipeline diameter in inches.

[11] The potential impact circle is a circle of radius equal to the potential impact radius.

The DOT requires that each operator establish and maintain liaison with appropriate fire, police, and public officials to learn the resources and responsibilities of each organization that may respond to a natural gas pipeline emergency, and to coordinate mutual assistance. The operator must also establish a continuing education program to enable customers, the public, government officials, and those engaged in excavation activities to recognize a gas pipeline emergency and report it to appropriate public officials. Columbia would provide the appropriate training to local emergency service personnel before the pipeline is placed in service.

8.2 Pipeline Accident Data

The DOT requires all operators of natural gas transmission pipelines to notify the DOT of any significant incident and to submit a report within 30 days. Significant incidents are defined as any leaks that:

- caused a death or personal injury requiring hospitalization; or
- involve property damage of more than $50,000 (1984 dollars).[12]

During the 20-year period from 1996 through 2015, a total of 1,310 significant incidents were reported on the more than 300,000 total miles of natural gas transmission pipelines nationwide.

Additional insight into the nature of service incidents may be found by examining the primary factors that caused the failures. Table 17 provides a distribution of the causal factors as well as the number of each incident by cause.

[12] $50,000 in 1984 dollars is approximately $112,955.73 as of May 2015 (CPI, Bureau of Labor Statistics, 2015).

Table 17
Natural Gas Transmission Pipeline Significant Incidents by Cause (1996-2015) a/

Cause	Number of Incidents	Percentage
Pipeline material, weld, or equipment failure	354	27.0
Corrosion	311	23.7
Excavation	210	16.0
All other causes b/	165	12.6
Natural forces c/	146	11.1
Outside force d/	84	6.4
Incorrect operation	40	3.1
Total	**1,310**	**100**

a/ All data gathered from PHMSA's Oracle BI Interactive Dashboard website for Significant Transmission Pipeline Incidents, https://hip.phmsa.dot.gov/analyticsSOAP/saw.dll?Portalpages&NQUser=PDM_WEB_USER&NQPassword=Public_Web_User1&PortalPath=%2Fshared%2FPDM%20Public%20Website%2F_portal%2FSC%20Incident%20Trend&Page=Significant&Action=Navigate&col1=%22PHP%20-%20Geo%20Location%22.%22State%20Name%22&val1=%22%22 (DOT, 2016a). Accessed on 2/17/2016.

b/ All other causes include miscellaneous, unspecified, or unknown causes.

c/ Natural force damage includes earth movement, heavy rain, floods, landslides, mudslides, lightning, temperature, high winds, and other natural force damage.

d/ Outside force damage includes previous mechanical damage, electrical arcing, static electricity, fire/explosion, fishing/maritime activity, intentional damage, and vehicle damage (not associated with excavation).

The dominant causes of pipeline incidents are corrosion and pipeline material, weld or equipment failure constituting 50.7 percent of all significant incidents. The pipelines included in the data set in table 17 vary widely in terms of age, diameter, and level of corrosion control. Each variable influences the incident frequency that may be expected for a specific segment of pipeline.

The frequency of significant incidents is strongly dependent on pipeline age. Older pipelines have a higher frequency of corrosion incidents and material failure, because corrosion and pipeline stress/strain is a time-dependent process.

The use of both an external protective coating and a cathodic protection system,[13] required on all pipelines installed after July 1971, significantly reduces the corrosion rate compared to unprotected or partially protected pipe.

Outside force, excavation, and natural forces are the cause in 33.5 percent of significant pipeline incidents. These result from the encroachment of mechanical equipment such as bulldozers and backhoes; earth movements due to soil settlement, washouts, or geologic hazards; weather effects such as winds, storms, and thermal strains; and willful damage. Table 18 provides a breakdown of external force incidents by cause.

Older pipelines have a higher frequency of outside forces incidents partly because their location may be less well known and less well marked than newer lines. In addition, the

[13] Cathodic protection is a technique to reduce corrosion (rust) of the natural gas pipeline through the use of an induced current or a sacrificial anode (like zinc) that corrodes at faster rate to reduce corrosion.

older pipelines contain a disproportionate number of smaller-diameter pipelines; which have a greater rate of outside forces incidents. Small diameter pipelines are more easily crushed or broken by mechanical equipment or earth movement.

Since 1982, operators have been required to participate in "One Call" public utility programs in populated areas to minimize unauthorized excavation activities in the vicinity of pipelines. The "One Call" program is a service used by public utilities and some private sector companies (*e.g.*, oil pipelines and cable television) to provide preconstruction information to contractors or other maintenance workers on the underground location of pipes, cables, and culverts.

8.3 Impact on Public Safety

The service incidents data summarized in table 18 include natural gas transmission system failures of all magnitudes with widely varying consequences.

Table 19 presents the annual injuries and fatalities that occurred on natural gas transmission lines from incidents for the 5-year period between 2011 and 2015. The majority of fatalities from pipelines are due to local distribution pipelines not regulated by FERC. These are natural gas pipelines that distribute natural gas to homes and businesses after transportation through interstate natural gas transmission pipelines. In general, these distribution lines are smaller diameter pipes and/or plastic pipes which are more susceptible to damage. Local distribution systems do not have large rights-of-way and pipeline markers common to the FERC regulated natural gas transmission pipelines. Therefore, incident statistics inclusive of distribution pipelines are inappropriate to use when considering natural gas transmission projects.

The nationwide totals of accidental fatalities from various anthropogenic and natural hazards are listed in table 20 in order to provide a relative measure of the industry-wide safety of natural gas transmission pipelines. Direct comparisons between accident categories should be made cautiously, however, because individual exposures to hazards are not uniform among all categories. The data nonetheless indicate a low risk of death due to incidents involving natural gas transmission pipelines compared to the other categories. Furthermore, the fatality rate is much lower than the fatalities from natural hazards such as lightning, tornados, or floods.

Table 18
Excavation, Natural Forces, and Outside Force Incidents by Cause (1996-2015) a/

Cause	Number of Excavation, Natural Forces, and Outside Force Incidents	Percentage of All Incidents b/,c/
Third party excavation damage	172	13.1
Heavy rain, floods, mudslides, landslides	74	5.7
Vehicle (not engaged with excavation)	49	3.7
Earth movement, earthquakes, subsidence	32	2.4
Lightning, temperature, high winds	27	2.1
Operator/contractor excavation damage	25	1.9
Unspecified excavation damage/previous damage	13	1.0
Other or unspecified natural forces	13	1.0
Fire/explosion	9	0.7
Fishing or maritime activity	9	0.7
Other outside force	9	0.7
Previous mechanical damage	6	0.5
Electrical arcing from other equipment/facility	1	0.1
Intentional damage	1	0.1
Total	**440**	**33.5**

a/ All data gathered from PHMSA's Oracle BI Interactive Dashboard website for Significant Transmission Pipeline Incidents, https://hip.phmsa.dot.gov/analyticsSOAP/saw.dll?Portalpages&NQUser=PDM_WEB_USER&NQPassword=Public_Web_User1&PortalPath=%2Fshared%2FPDM%20Public%20Website%2F_portal%2FSC%20Incident%20Trend&Page=Significant&Action=Navigate&col1=%22PHP%20-%20Geo%20Location%22.%22State%20Name%22&val1=%22%22 (DOT, 2016a). Accessed on 2/17/2016.

b/ Percentage of all incidents was calculated as a percentage of the total number of incidents natural gas transmission pipeline significant incidents (i.e., all causes) presented in table 17.

c/ Due to rounding, column does not equal 33.6 percent.

Table 19
Injuries and Fatalities – Natural Gas Transmission Pipelines a/

Year	Injuries		Fatalities	
	Employees	Public	Employees	Public
2011	1	0	0	0
2012	3	4	0	0
2013	0	2	0	0
2014	1	0	1	0
2015	12	2	6	0

a/ All data gathered from PHMSA Pipeline Incident Flagged Files website on March 6, 2015 http://phmsa.dot.gov/pipeline/library/data-stats/flagged-data-files (DOT, 2015).

Table 20
Nationwide Accidental Fatalities by Cause

Type of Accident	Annual Number of Deaths
Motor vehicle a/	35,369
Poisoning a/	38,851
Falls a/	30,208
Drowning a/	3,391
Fire, smoke inhalation, burns a/	2,760
Floods b/	81
Tornado b/	72
Lightning b/	49
Hurricane b/	47
Natural gas distribution lines c/	13
Natural gas transmission pipelines c/	2

a/ Accident data presented for motor vehicle, poisoning, falls, drowning, fire, smoke inhalation, and burns represent the annual accidental deaths recorded in 2013 (Centers for Disease Control and Prevention, 2013; Deaths: Final Data for 2013; http://www.cdc.gov/nchs/data/nvsr/nvsr64/nvsr64_02.pdf. Accessed 2/17/2016.)

b/ Accident data presented for floods, tornados, lightning, and hurricanes represent the 30 year average of accidental deaths between 1985 and 2014 (NOAA, 2016. National Weather Service, Office of Climate, Water and Weather Services, National Hazard Statistics, 30 year average (1985-2014); Available at: **Error! Hyperlink reference not valid.**http://www.nws.noaa.gov/om/hazstats.shtml. Accessed 2/17/2016.

c/ Accident data presented for natural gas distribution lines and transmission pipelines represent the 20-year average between 1996 and 2015 (DOT, 2016. PHMSA, Pipeline Significant Incident 20 Year Trend: 20-Year Average (1996-2015); Available at: http://opsweb.phmsa.dot.gov/primis_pdm/significant_inc_trend.asp. Accessed 2/17/2016.

The available data show that natural gas transmission pipelines continue to be a safe, reliable means of energy transportation. From 1996 to 2015, there were an average of 65.8 significant incidents, 9.1 injuries, and 2.3 fatalities per year. The number of significant incidents over the more than 303,000 miles of natural gas transmission lines indicates the risk is low for an incident at any given location. The operation of the new K-270 pipeline facilities associated with the B-System Project would represent a slight increase in risk to the nearby public.

8.4 Polychlorinated Biphenyls

For many years from approximately 1950 to the early 1970s, PCB-containing compounds were used by some interstate natural gas transmission companies as a lubricant, hydraulic fluid, or sealant for turbines and air compressors. As part of normal operation, PCBs could leak or blow by pressure seals and enter the transmission pipeline. PCBs may also be present in natural gas pipelines due to the historical practice of oil fogging, performed in the late 1940s through 1960s (EPA, 2004). Older pipeline segments and associated facilities in operation at the time that PCBs were employed in the natural gas transmission industry may be contaminated with PCBs at levels requiring abandonment and disposal procedures consistent with EPA's regulations found in 40 CFR 761.

Columbia's ECS does not provide details for the handling of construction waste materials that may be contaminated with PCBs, including a specific procedure to either dispose of, destroy, or store the facilities in accordance with the EPA's regulations. To ensure Columbia would test and dispose of any PCB contaminated facilities in compliance with 40 CFR 761, **we recommend that**:

- **<u>Prior to any abandonment by removal activities</u>, Columbia should file the following information with the Secretary, for review and written approval by the Director of OEP:**

  a. identify any facilities to be abandoned or disturbed that may be contaminated with PCBs;
  b. verify that the appropriate PCB testing will be conducted on these facilities, and discuss how any abandoned PCB contaminated facilities will be properly disposed of; and
  c. identify measures to be implemented to provide adequate worker safety for handling PCB contaminated materials.

9.0 Cumulative Impacts

In accordance with NEPA, we identified other actions in the vicinity of the Project facilities and evaluated the potential for a cumulative impact on the environment. As defined by the Council on Environmental Quality, a cumulative effect is the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions. The Council on Environmental Quality guidance[14] states that an adequate cumulative effects analysis may be conducted by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions. In this analysis, we consider the impacts of past projects within defined areas of influence as part of the affected environment (environmental baseline) which were described and evaluated in the preceding environmental analysis. However, present effects of past actions that are relevant and useful are also considered. Table 21 summarizes the resource-specific geographic scopes that were considered in this analysis.

As described in section B of this EA, constructing and operating the Project would temporarily and permanently affect the environment. The Project would affect geology, soils, water resources, wetlands, vegetation, fish, wildlife, some land uses, recreation, visual resources, air quality, and noise. However, throughout this EA, we determined that the Project would have only minimal or temporary impacts on these resources, with the exception of impacts on forested land and some forested and scrub-shrub wetlands. We also concluded that nearly all of the Project-related impacts would be contained within or adjacent to the temporary construction rights-of-way and ATWS.

As discussed in section B, geology and soil impacts would be highly localized and limited primarily to the Project footprint during the period of construction. In addition, Project-related construction activities would not result in significant impacts on groundwater resources because the majority of construction would involve shallow, temporary, and

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[14] Council on Environmental Quality, 1997. Considering Cumulative Effects Under the National Environmental Policy Act. Accessed at: https://energy.gov/sites/prod/files/nepapub/nepa_documents/RedDont/G-CEQ-ConsidCumulEffects.pdf

localized excavation. For other resources, the contribution to regional cumulative impacts is lessened by the expected recovery of ecosystem function. For example, non-forested vegetation communities and wildlife habitats would be cleared, but restoration would proceed immediately following construction. Land use and visual impacts associated with the Project would be minimized to the greatest extent practicable because as summarized in table 3 in section A, the majority of the replacement pipelines and new Line K-270 are proposed to be adjacent to and/or within existing pipeline rights-of-way. Activities associated with the abandonment of Line B-105 would have minimal impact on environmental resources. Additionally, we determined that the Project would not generate significant air emissions during operation. Both construction-related air quality and noise impacts would be temporary and not result in significant impacts, and no reasonably present or foreseeable projects with concurrent construction schedules are expected within the geographic scope for construction-related air quality and noise impacts. However, potential cumulative impacts from GHG emissions associated with the Project and climate change are discussed in section B.9.2.

Based on: the Project being adjacent to and/or within existing pipeline rights-of-way; Columbia's implementation of impact avoidance, minimization, and mitigation measures as described in its construction and restoration plans; and our recommendations; we find that most of the Project impacts would be largely limited to the temporary construction workspace and permanent easement.[15] Therefore, we conclude that Project impacts would not be significant and would not contribute cumulatively to most resource areas.

9.1 Identified Actions

Columbia contacted the Project counties (Franklin and Fairfield), select adjacent counties within the Project Hydrologic Unit Code (HUC) 12 Watershed or within 2 miles of the Project (Pickaway, Hocking and Licking Counties, Ohio), select major cities (Columbus and Lancaster), and the Ohio Department of Transportation (ODOT) to obtain information regarding recent, ongoing, or planned projects in their areas. In addition, at the suggestion of Franklin and Licking Counties, Etna Township and the Cities of Pickerington, Pataskawa, Canal-Winchester, and Groveport also were contacted. To date, no response has been received from Columbus, Groveport, Canal-Winchester, or Pickerington.

In addition, we reviewed the Corps, FERC, Columbia Pipeline Group, Spectra Energy Corporation, and TransCanada Corporation websites for projects in the vicinity of the proposed Project that could contribute to cumulative impacts.

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[15] Note: this narrow corridor is not the expanded area of our cumulative impacts review, but rather the area directly affected by the Project.

Table 21
Cumulative Impact Resource-Specific Geographic Scope

Resource	Cumulative Impact Geographic Scope
Geology and Soils	For geological resources, potential impacts include the area of disturbance of the Project (i.e., the construction workspaces) overlapping or immediately abutting other project workspaces. Potential soils impacts would be limited to within 0.25 mile of the Project workspaces.
Water Resources, Wetlands, Vegetation and Wildlife	HUC-12 watershed boundaries
Land Use and Recreation	1-mile radius from Project work areas
Visual	Areas where clearing of mature trees or installation of new aboveground facilities would occur. Potential cumulative impacts could occur at a distance of approximately 500 feet, or greater depending on surrounding topography.
Traffic and Transportation	Affected counties or cities/townships
Cultural Resources	Project disturbance area. NRHP-eligible sites would be avoided and no historic districts would be crossed; therefore, the Project would not contribute to cumulative impacts on cultural resources.
Air Quality	0.25 mile from pipeline or aboveground facilities for evaluation of construction-related impacts. However, no projects were identified within 0.25 mile of the Project that overlap the proposed Project construction timeframe. As the Project would have minimal operational air quality impacts, cumulative air quality impacts outside the construction window were not assessed.
Noise	Operational impacts: other projects that would contribute a noise impact on any NSA within 1 mile of the proposed Greenfield Regulator RS-7944 Facility. For construction-related impacts, 0.25 mile from earth-disturbing equipment work (0.5 mile from HDD). (However, no such projects were identified).
Socioeconomics and Environmental Justice	The Project does not include construction of significant aboveground facilities and would therefore not have an appreciable impact on socioeconomic factors; therefore, the Project would not contribute to cumulative impact on socioeconomics.
HUC = Hydrologic Unit Code	

Appendix J tabulates the past, present, and reasonably foreseeable projects or actions identified as occurring within the geographic scopes outlined in table 21. Actions outside the geographic scope were not evaluated because their potential to contribute to a cumulative impact diminishes with increasing distance from the Project. Only projects with either ongoing impacts (from past or current projects) or that are "reasonably foreseeable" future actions were evaluated. For example, based on wetland restoration monitoring timeframes for the Project area, projects resulting in wetland impacts within the past 5 years were considered, as beyond 5 years it is assumed that wetland functions and values would be completely restored. Existing or reasonably foreseeable future actions that would be expected to affect similar resources during similar periods as the Project were considered

further. The anticipated cumulative impacts of the Project and any proposed mitigation are discussed in section B.9.2.

Based on the geographic scope outlined in table 21, we identified projects that were considered in the cumulative impact assessment (see appendix J). These include the following types of actions/projects:

- industrial developments, including FERC-regulated pipeline projects;
- transportation improvement projects;
- subdivision developments; and
- other local projects.

9.1.1 Industrial Developments

Six pipeline projects are within the geographic scope identified in table 21. These projects (and project sponsors) include:

- Line G (Columbia);
- R601 Integrity (Columbia);
- R701 (Columbia);
- Leach XPress (Columbia);
- Bluegrass Pipeline (Boardwalk Pipeline Partners, LP and Williams Companies, Inc.); and
- Appalachia-to-Texas Express (ATEX) (Enterprise Products Partners, LP).

Of the above projects, all but the ATEX project are under FERC jurisdiction. Additional details about each of these projects is provided below and summarized in appendix J.

The Line G, R601 Integrity, R701, Leach XPress, and ATEX projects are proposed in close proximity to Line B-105; however, Line B-105 would be abandoned largely in place, requiring only minor ground disturbances to remove aboveground appurtenances and exposed pipe. Project activities associated with the B-105 abandonment would result in negligible cumulative impacts when combined with impacts from Line G, R601 Integrity, R701, Leach XPress, and any ongoing restoration associated with the ATEX project. Therefore, details concerning these pipeline projects are not discussed further.

Boardwalk Pipeline Partners and Williams are proposing the construction of the Bluegrass Pipeline in Fairfield County. This proposed project includes a pipeline to transport natural gas liquids from the Marcellus and Utica shale formations in Ohio, West Virginia, and Pennsylvania to the Gulf Coast. This project has been on hold since 2014. Due to the unknown construction timeframe, this project was excluded from our cumulative impacts analysis.

The approximately 1,230-mile-long ATEX pipeline crosses the proposed Line K-270 route north of Lancaster, Ohio and transports natural gas liquids from the Marcellus-Utica Shale region of Pennsylvania, West Virginia, and Ohio to the Texas Gulf Coast near

Houston. This project has been in service since 2013. Due to its proximity to proposed Line K-270, the ATEX pipeline was assumed to have impacted similar resources affected by the proposed Project and possibly contribute to cumulative impacts, and therefore was included in our analysis below.

9.1.2 Transportation Improvement Projects

We identified the following planned, proposed, or reasonably foreseeable transportation improvement projects in the geographic scope for cumulative impacts. These include:

- U.S. Route 33 (US 33) Carroll Interchange;
- US 33 Southwest Side;
- US 33 Intersection Reconfigurations;
- Winchester Pike and Bixby Road/Brice Road;
- Winchester Pike at Shanon-Ebright;
- Ety Road Extension; and
- various smaller road and bridge improvement projects.

The ODOT, Franklin County, and the City of Lancaster are leading the above transportation improvement projects.

The US 33 Carroll Interchange and Reconfiguration projects (ODOT), and the Ety Road Extension (City of Lancaster) fall within the geographic scope of the proposed B-System Line B-105 abandonment. However, as discussed in section A.5, Line B-105 would be abandoned largely in place, requiring only minor ground disturbances to remove aboveground appurtenances and exposed pipe at discrete locations where necessary. This would result in negligible cumulative impacts when combined with impacts from the other respective projects' construction and operation. Therefore, details concerning these road projects are not discussed further.

The potential for the remainder of the Project to result in cumulative impacts with the above transportation projects is discussed below.

ODOT

The US 33 project on Southwest Side includes repaving 5.11 miles of US 33 in southeastern Franklin County using a "mill and fill" technique. This project would add left turn lanes on US 33 in both directions and prohibit through movement on Bixby Road. The project would also place deck overlays on the bridges over Blacklick Creek. The proposed B-System Project crosses US 33 within the proposed ODOT project area at milepost 6.6 along Line B-111. Construction of the US 33 project on Southwest Side completed in 2016, outside of the anticipated construction schedule for the Project (ODOT, 2017a).

Another project is planned to begin construction in 2017 that would add a lane along approximately 2.0 miles of US 33 from north of I-270 to Hamilton Road (ODOT, 2017a). This lane addition project is approximately 2.0 miles north of milepost 9.0 along Line B-111. In addition, the ODOT is leading various road and bridge improvement projects within the

City of Columbus. These improvement projects are approximately 5 miles northwest of milepost 13.9 on Line B-111. Construction is currently underway on a number of these improvement projects with completion expected by the end of 2017. The construction timeline for these projects could overlap with proposed Project tree clearing activities, expected to begin in late 2017. The Line B-111 replacement would disturb previously disturbed areas before being restored to previous conditions; therefore, although Project vehicle traffic may cumulatively add to changes in traffic patterns resulting from these road and bridge improvement projects (see also section B.9.2.5), the overall cumulative impacts would be minimal.

Franklin County

The Winchester Pike and Bixby Road/Brice Road project is approximately 0.53 mile north of milepost 6.4 on Line B-111. Franklin County is currently installing new drainage pipes and temporary pavement along Winchester Pike. Upcoming work will include constructing a new road alignment to connect Bixby Road to Brice Road. Construction began in fall 2016 and is expected to continue through June 2017 (ODOT, 2017b). The construction timeline of this project does not overlap with the anticipated construction schedule for the B-System Project. Therefore, the Project would result in negligible cumulative impacts when combined with impacts from this road alignment project.

The Winchester Pike at Shanon-Ebright project includes an intersection improvement approximately 1.58 miles north of milepost 8.1 on Line B-111. Construction is planned to begin as early as spring 2017 and continue through November 2017 (ODOT, 2017b). The construction timeline could overlap with proposed Project tree clearing activities, expected to begin in late 2017. The Line B-111 replacement would disturb previously disturbed areas before being restored to previous conditions; therefore, although Project vehicle traffic may cumulatively add to changes in traffic patterns resulting from this road improvement project (see also section B.9.2.5), the overall cumulative impacts would be minimal.

Franklin County is leading various other road and bridge improvement projects. Construction of these projects is scheduled from 2014 through 2017. The construction timeline of these projects does not overlap with the anticipated construction schedule for the B-System Project. We also expect that improvement projects would result in ground disturbance to largely previously disturbed areas, rather than disturb new areas. Therefore, these projects were determined to have minimal impact on resources affected by the Project and would not contribute to cumulative impacts.

In summary, each of the transportation improvement projects detailed above would have minimal impact on resources near the Project and would not contribute to cumulative impacts for the Project. As a result, these projects were not evaluated further.

9.1.3 Subdivision and other Local Project Developments

The following planned, proposed, or reasonably foreseeable subdivision developments were identified in the geographic scope for cumulative impacts. These include:

- River Valley Highlands Subdivision;
- Preston Trails Residential Development;
- Heron Crossing Subdivision;
- Violet Meadows Subdivision;
- Misty Meadows Subdivision;
- Lancaster City School junior high school; and
- Main Street Lowehead Dam Removal.

As discussed in section B.8.1.1, Line B-105 would be abandoned largely in place, requiring only minor ground disturbances to remove aboveground appurtenances and exposed pipe at discrete locations where necessary. Although the Heron Crossing Subdivision, Misty Meadows Subdivision, and Lancaster City School junior high school have been identified to fall within the geographic scope of Project activities associated with the Line B-105 abandonment, only the Misty Meadows Subdivision has been determined to have a construction timeline that may overlap with proposed Line B-105 abandonment activities. Line B-105 abandonment activities would result in negligible cumulative impacts on soils, traffic, air quality, and noise when combined with impacts from Misty Meadows Subdivision construction and operation. Therefore, details concerning these local projects are not discussed further.

The River Valley Highlands Subdivision currently covers approximately 390 acres approximately 0.55 mile south of milepost 3.9 on Line K-270. There is a proposed expansion of the subdivision including a new elementary school and green space. This project is currently under construction and will be completed in the fall of 2017. Further details regarding the proponent of the project were not readily available. Although the construction timeline for this project does not overlap with the proposed construction schedule for the Project, it is in close proximity to the proposed Line K-270 right-of-way and has the potential to impact certain environmental resources similar to those impacted by the Project. Therefore, this project is included in the cumulative impact analysis provided in section B.9.2.

The Preston Trails Residential Development is being led by Westport Homes and is approximately 1.0 mile north of milepost 2.8 on Line B-111. The Violet Meadows Subdivision is approximately 5 miles north of milepost 0.5 on Line B-111 and includes a revision to an existing subdivision section. Further details regarding these developments were not available for our analysis, and it is unknown if the construction timeline for either of these projects will overlap with the proposed construction schedule for the B-System Project. The Project involves the replacement of Line B-111 in the same trench, which mostly would disturb previously disturbed areas within Columbia's existing Line B-111 pipeline easement. Therefore, the Project would likely result in minimal cumulative impacts when combined with impacts from these residential development projects.

The Main Street Dam Removal project is being led by the Columbus Downtown Development Corporation and is approximately 4.5 miles northwest of milepost 13.98 on Line B-111. Details of the project schedule were not available for our analysis. It is unknown if the construction timeline of this project would overlap with the anticipated construction schedule for the B-System Project. The Project involves the replacement of Line B-111 in the same trench, which mostly would disturb previously disturbed areas within Columbia's existing Line B-111 pipeline easement. Therefore, the Project would likely result in negligible cumulative impacts when combined with impacts from this dam removal project.

9.2 Potential Cumulative Impacts

Based on the geographic scope outlined in table 21, we identified projects (tabulated in appendix J) that were considered in the cumulative impact assessment for the B-System Project. We determined that the potential for the Project to result in cumulative impacts with most of these projects is minimal for the following reasons: the disturbances and activities associated with the Line B-105 abandonment are very limited in size and scope; the replacement of Lines B-111, B-121, and B-130 would occur almost entirely within previously disturbed existing rights-of-way; and proposed Project construction would not take place concurrently with most of these identified projects. For these reasons, the potential for the Project to result in cumulative impacts with these projects is not evaluated further in this EA.

As noted in section B.9.1 above, the Project is expected to have long-term or permanent impacts on certain resources, including forested land and some forested and scrub-shrub wetlands, as well as some minor land use conversions. The following projects in close proximity to Line K-270 were determined to have the potential to impact environmental resources similar to those impacted by the Project:

- the previously constructed ATEX project; and
- the River Valley Highlands subdivision, currently under construction.

These projects were evaluated in further detail in this EA and included in the cumulative impact analysis discussed below. Geographic scope-specific information regarding impacts on upland forests, wetlands, and waterbodies was not readily available for the ATEX project and River Valley Highlands subdivision. Therefore, a desktop analysis was conducted using the NLCD, National Wetlands Inventory (NWI), and Columbia's survey data for these projects.

9.2.1 Forested Areas

Impacts on forested lands include long-term construction impacts and permanent operational impacts from clearing and maintenance activities. This analysis considers cumulative impacts on forested areas from the ATEX project, River Valley Highlands subdivision, and proposed Project construction associated with Line K-270 within the HUC 12 watershed. Forested impacts associated with Line K-270 within the HUC 12 watershed include 6.7 acres of construction impacts and 3.3 acres of operational impacts. Potential cumulative impacts on forested areas in the geographic scope could occur from construction

and operation of Line K-270 in combination with the ATEX and River Valley Highlands Subdivision projects. The cumulative forested impacts associated with these projects are summarized in table 22 and are based on available land use data (Homer et al., 2015).

Table 22

Summary of Cumulative Upland Forest Impacts within the HUC 12 Watershed a/

Activity	Upland Forest (acres)	
	Construction b/	Operation
Line K-270 (Project)	6.7	3.3
ATEX project c/	10.1	5.6
River Valley Highlands subdivision	12.1	12.1
Total	**28.9**	**21.0**

a/ The activities in the table fall within the HUC 12 watershed identified as HUC 050302040401.

b/ Land affected during construction includes both temporary and permanent work areas.

c/ Calculations are based on the NLCD within a 90-foot-wide construction right-of-way and 50-foot-wide permanent right-of-way.

The HUC 12 watershed geographic scope includes approximately 4,987 acres of forested land (Homer et al., 2015). Construction of the proposed projects in table 22 (including the Project's Line K-270) would remove approximately 0.6 percent of the forested acres within the watershed. The primary impact on forests would be the permanent conversion of forested land to open land for the maintained right-of-way and permanent access roads. Approximately 0.4 percent (21.0 acres) would remain cleared for the operation of these facilities. Approximately 0.2 percent (7.9 acres) would be allowed to revegetate and gradually return to forested conditions. This would be considered a long-term impact as it would take more than 20 years for forested vegetation to return to preconstruction conditions. Although the ATEX project, River Valley Highlands subdivision, and the Project's Line K-270 could result in some forest fragmentation within the HUC 12 watershed, this would only incrementally affect the cumulative impacts on regional forests. In terms of forested land functioning as migratory bird habitat, the majority of the forested land consists of small tracts that are already fragmented by agriculture and residential development, which has a decreased likelihood of fostering migratory bird habitat. Therefore, we conclude that the overall impact of these projects on forested lands within the geographic scope is not cumulatively significant.

9.2.2 Wetlands

The proposed Project's impacts on wetlands range from short-term to permanent. Specifically, impacts on forested and scrub-shrub wetlands include long-term construction impacts and permanent operational impacts from clearing and routine maintenance activities. Emergent wetlands would be impacted by the Project, but are expected to transition relatively quickly back to a community with functionality similar to that of the pre-construction state (typically within 1 to 3 years). Line K-270 would not impact forested wetlands within the HUC 12 watershed; therefore, the Project would not have cumulative impacts on forested

wetlands. For these reasons, this analysis considers cumulative impacts on scrub-shrub wetlands from the ATEX project, River Valley Highlands subdivision, and the Project (Line K-270) within the HUC 12 watershed.

Scrub-shrub wetland impacts associated with Line K-270 within the HUC 12 watershed total 0.3 acre of construction impacts, including 0.1 acre of permanent operational impacts. Potential cumulative impacts on scrub-shrub wetlands in the geographic scope could occur from construction and operation of Line K-270 in combination with the existing ATEX project footprint and ongoing construction of the River Valley Highlands subdivision. The cumulative wetland impacts associated with these projects are summarized in table 23 and are based on available land use data (Homer et al., 2015), NWI (FWS, 2010), and Columbia's survey data.

Table 23

Summary of Cumulative Wetland Impacts within the HUC 12 Watershed a/

Activity	Forested Wetland (acres)		Scrub-Shrub Wetland (acres)	
	Construction	Operation	Construction	Operation
Line K-270 (Project)	0.0	0.0	0.3	0.1
ATEX project b/	0.0	0.0	0.0	0.0
River Valley Highlands Subdivision	0.6	0.6	0.0	0.0
Total	**0.6**	**0.6**	**0.3**	**0.1**

a/ The activities in the table fall within the HUC 12 watershed identified as HUC 050302040401.

b/ Calculations are based on data obtained from the NWI and NLCD within a 90-foot-wide construction right-of-way and 50-foot-wide permanent right-of-way.

Columbia would minimize impacts on wetlands due to Line K-270 construction by implementing the measures outlined in its ECS. In addition, Columbia would construct pipeline segments and mitigate unavoidable impacts on wetlands in accordance with the conditions and requirements of state and federal wetland permits. Although construction of the Project along with the other projects in the geographic scope could result in the conversion of scrub-shrub wetlands or a reduction in the amount of existing scrub-shrub wetlands in the vicinity, these impacts are expected to be appropriately mitigated, which would minimize any cumulative wetland effects.

Based on the above, we conclude that the Project would not contribute significantly to long-term cumulative impacts on forested and scrub-shrub wetlands. In addition, Columbia's adherence to its ECS, which incorporates best management practices and FERC's Procedures, along with other applicable regulatory requirements from the Corps and OEPA would mitigate longer-term impacts from Project construction to less than significant levels.

9.2.3 Waterbodies

As discussed in section B.3.2 of this EA, the Project's impacts on water resources are expected to be short term and minor. This analysis considers cumulative impacts on waterbodies from the ATEX project, River Valley Highlands subdivision, and Line K-270 of the Project within the HUC 12 watershed.

Projects that occur in the same watershed as the Project and that could be under construction during the same time as the Project could result in cumulative impacts on waterbodies. Both the ATEX project and the River Valley Highland Subdivision are within the geographic scope. However, the ATEX project has been in service since 2013 and is assumed to have permit and authorization requirements similar to those required for the Project. Therefore, any impacts to waterbodies from the ATEX project would have been temporary and minor, assuming that waterbody crossings and associated riparian areas have been restored successfully. The River Valley Highlands subdivision is currently under construction and is expected to be completed by Fall 2017, before construction of the Project is proposed to begin. Cumulative impacts could occur in the event that more than one project affects the same waterbody within a similar period of time, or residual effects from previous projects are present at the same time as construction of the B-System Project. However, because of the minimal and temporary impacts of the Project on water resources, we conclude that any cumulative impact contribution by the Project on waterbodies would also be temporary and minor and not be cumulatively significant.

9.2.5 Traffic

Construction of the Project would generate traffic associated with delivery of pipe sections and other construction materials and supplies, worker commutes, and movement of construction equipment. This added traffic could increase congestion on public roads. Operation of the Project would not create new traffic.

Traffic impacts would typically be localized to the specific Project pipeline segment under construction for the duration of that segment's construction. Other projects that occur within a few miles of the Project and that could be under construction at the same time could result in cumulative traffic impacts. There are no known projects within the geographic scope planned for construction concurrently with the Project. Roads crossed by the Project typically carry less than 75,000 vehicles per day on the interstate, U.S. and state highway system routes, and less than 10,000 vehicles per day on the county and local roads (ODOT, 2016a). Should construction of the Project and other currently unknown proposed infrastructure projects occur concurrently, cumulative traffic impacts could occur on public roads. Additional traffic resulting from the construction of the Project would minimally contribute to the total number of vehicles that travel per day on the surrounding roads.

While detailed construction traffic data are not available for the Project or for other projects within the geographic scope, it is unlikely that these projects, either individually or in combination, would exceed the carrying capacity of affected roads. Some minor traffic impacts may occur during Project construction; however, due to the availability of other public roadways in the area, we conclude that the Project would not result in significant cumulative traffic impacts.

9.2.6 Climate Change

Climate change is the change in climate over time, whether due to natural variability or as a result of human activity, and cannot be represented by single annual events or individual anomalies. For example, a single large flood event or particularly hot summer are not indications of climate change, while a series of floods or warm years that statistically change the average precipitation or temperature over years or decades may indicate climate change. Changes are being driven by accumulation of GHG in the atmosphere through combustion of fossil fuels (coal, petroleum, and natural gas), combined with agriculture and clearing of forests. Although climate change is a global concern, for this analysis, we will focus on the potential cumulative impacts in the B-System Project area.

The following observations of environmental impacts with a high or very high level of confidence are attributed to climate change in the Midwest region:

- average temperatures have risen about 1.5 °F between 1900 and 2010 and are projected to increase another 4 to 5 °F over the next several decades;
- an increase in health risks due to projected additional heat stress and poor air quality;
- the agricultural crop growing season has lengthened since 1950 and is projected to continue lengthening due to the earlier occurrence of the last spring freeze, potentially increasing crop production in the short-term;
- increased temperature stress, wetter springs, and the continued occurrence of springtime cold air outbreaks may reduce crop yields overall in the long-term (particularly corn and soybeans);
- a change in range and/or elevation is projected for many tree species with potential declines in paper birch, quaking aspen, balsam fir, and black spruce and increases in oaks and pines;
- tree species in flat terrain may have difficultly migrating the long distances needed to reach temperatures suitable for the species, resulting in some potential decline in forests;
- increased insect outbreaks, forest fire, and drought may result in increased tree mortality and the reduction in beneficial carbon sinks; and
- annual precipitation has increased by about 20 percent over the past century, particularly from increased high intensity rainfall events, and this trend is projected to continue.

The rate and magnitude of expected changes will exceed those experienced in the last century. Existing adaptation and planning efforts are inadequate to respond to these projected impacts.

The FERC staff has presented the direct and indirect GHG emissions associated with construction and operation of the B-System Project in sections B.7.1.4 and B.7.1.6. Currently, there is no standard methodology to determine how the proposed Project's construction and operational GHG emissions would translate into physical climate change effects on the global, regional, or local environment. The emissions would increase the atmospheric concentration of GHGs, in combination with past and future emissions from all other sources, and contribute incrementally to future climate change impacts. The Project would not change Columbia's certificated capacity and hence would not increase the downstream GHG emissions from the combustion of natural gas transported by Columbia's pipeline system. Because we cannot determine the Project's incremental physical impacts on the environment caused by climate change, we cannot determine whether the Project's contribution to cumulative impacts on climate change would be significant.

9.3 Conclusion on Cumulative Impacts

We identified recently completed, ongoing, and planned projects (appendix J) in the Project area that were within the Project's cumulative impact geographic scopes identified in table 21.

Based on our analysis, we concluded that the potential exists for cumulative impacts on forested lands, wetlands, and traffic. However, our analysis concluded that the effects of the Project on these resources, when combined with impacts from other projects in the geographic scope, would not result in significant impacts.

C. ALTERNATIVES

In preparing this EA, we evaluated several alternatives to Columbia's proposed action to determine if they would be reasonable and environmentally preferable to constructing the Project as proposed. These alternatives include the no-action alternative, system alternatives, and route variations. The following are our evaluation criteria for selecting potentially preferable alternatives:

- technical feasibility and practicability;
- significant environmental advantage over the proposed Project; and
- meets Columbia's stated objectives of the proposed Project as further described in section A.2 (i.e., implement the required modernization program for its existing B-System, while continuing to provide reliable natural gas service to the greater Columbus, Ohio area).

1.0 No-Action Alternative

Although a decision by FERC to deny the proposed action would avoid the environmental impacts addressed in this EA, the Project would be forced by "no action" to forego or delay upgrading a portion of Columbia's pipeline system that is nearing the end of its useful life, thus jeopardizing reliable service to Columbia's customers. The pipeline system currently includes aged, coated pipe. Any substituted projects could require the construction of additional or new pipeline facilities in the same or other locations, which would have environmental impacts equivalent to or greater than those of the proposed Project.

The no-action alternative would result in continued natural gas transmission through pipelines that are not equipped for using internal pipeline inspection devices. Pursuant to 49 CFR 192.917, new pipelines, including replacement pipelines, must be constructed to accommodate the passage of internal pipeline inspection devices. This requirement involves installing a vessel at the end of each pipeline segment for launching or receiving an internal inspection device, commonly referred to as a "smart pig." Smart pigs serve an important function by enabling the periodic internal inspection of pipelines, as required by DOT pipeline safety regulations. In addition to using smart pigs to inspect pipeline conditions, cleaning pigs also are used periodically to clean the pipe interior. Columbia proposes to modernize Line B-111 to make it pig-capable, which allows Columbia to monitor effectively the integrity of the pipeline and identify areas of concern that may require maintenance.

Although the no-action alternative would eliminate potential temporary impacts on environmental resources and the surrounding communities, it would not meet the Project objective. The no-action alternative also could result in greater long-term environmental and community impacts associated with piecemeal pipeline operations and maintenance projects that likely would occur if the B-System were not upgraded. Therefore, we do not recommend the no-action alternative.

2.0 System Alternatives

System alternatives would use other existing, modified, or proposed natural gas systems to meet the objective of the proposed Project. System alternatives are evaluated in order to determine if potential environmental impacts could be avoided or reduced by using another pipeline system or configuration.

Columbia assessed the possibility of replacing Line B-105 as an alternative to constructing Line K-270. We used the information provided by Columbia to evaluate this replacement as a potential alternative. This alternative would result in the interruption of service in the existing pipeline, requiring removal of the existing aged pipeline in order to install the modern replacement pipeline in the same location. Table 24 provides a summary of the environmental impacts that would result from this system alternative.

As shown in table 24, replacing Line B-105 would require a considerable amount of additional acreage of land and would result in greater impacts on forested areas, wetlands, and waterbodies. In addition, Line B-105 has more residences within 50 feet of its corridor and would require 48 additional road crossings.

During consultations with the ODNR, populations of state-listed great rhododendron were identified in and near the existing Line B-105 pipeline route. During field investigations, additional great rhododendron were identified outside the mapped areas provided by the ODNR and proximal to the existing Line B-105 pipeline route. Individual rhododendrons in this population would likely be impacted by the Line B-105 system alternative.

Table 24

Environmental Impact Comparison: Line B-105 Replacement System Alternative and Proposed Line K-270

Environmental Impact Feature	Proposed Line K-270	Line B-105 Replacement System Alternative
Length of route (mile)	7.6	17.5
Total area affected by construction a/ (acres)	103.6	212.2
Length adjacent to existing ROW (percentage)	45	100
Previously disturbed areas crossed (miles)	6.4 b/	17.5 c/
Total area of upland forest clearing a/ (acres)	15.1	42.5
State and public lands crossed (miles)	0.00	0.02
Conservation easements (acres) d/	0	0
Number of waterbodies crossed by pipeline centerline[e]	8	30
Combined linear crossing distance of waterbodies e/ (feet)	132	318
Number of wetlands crossed by pipeline centerline e/	6	35
Total area of wetlands affected a/, e/ (acre)	0.7	17.1
Number of residences within 50 feet of pipeline centerline	1	46
Number of access roads	12	16
Number of road crossings	8	56

a/ Calculations assume a corridor width of 100 feet and do not include areas of extra workspace or access roads.

b/ Calculation is based on the NLCD 2011 (Homer et al., 2015). Previously disturbed areas include land use defined as cultivated crops, pasture/hay, developed open space, and developed low intensity.

c/ Calculation is based on the assumption that the existing pipeline would be removed and replaced with a new pipeline within the same trench.

d/ Data obtained from the National Conservation Easement Database (U.S. Endowment for Forestry and Communities, 2016).

e/ Data obtained from wetland field delineations.

Replacing Line B-105 would result in more and greater environmental impact than would constructing the new K-270 pipeline; therefore, we do not recommend this alternative.

3.0 Alternative Pipeline Routes

The primary objective in evaluating route alternatives is to avoid, minimize, or mitigate adverse effects, while satisfying the objectives of the Project. Alternative pipeline routes can be characterized as major, involving reroutes of considerable distances to avoid

impacts on large resource areas and construction issues; or minor, involving relatively short route variations to avoid impacts on local resources or addressing construction issues.

For the B-System Project, Columbia evaluated one major route alternative (the Thurston to Lockville alternative route) to its proposed Line K-270 route. The Thurston to Lockville alternative route is described in Columbia's application and can be viewed on the Commission's eLibrary under Docket No. CP16-498-000. Columbia concluded, and we agree, that the Thurston to Lockville alternative route would result in an overall greater environmental impact than Columbia's proposed route for Line K-270. In addition, we received no comments during scoping which requested that we consider alternatives to the proposed Line K-270 route. Our review of the proposed Project found no significant environmental impacts that would drive an evaluation of additional major route alternatives.

3.1 Minor Route Variations or Other Project Modifications to Address Landowner Concerns

During the pre-filing process, Columbia obtained feedback from landowners potentially impacted by the Project and used this input to inform its route development and to solve certain routing issues. Following Columbia's filing of its application for the Project, we received additional comments from Mr. Aaron Begley who requested a route variation. A discussion of Columbia's route development and our evaluation of Mr. Begley's requested route variation is presented below.

Mr. Michael Haemmerle expressed a concern about a portion of the B-105 pipeline on his land that is exposed within a creek and questioned whether the exposed portion should be abandoned in place due to the potential of further erosion and corrosion. As discussed in section 5.1.5 above, Columbia would remove the segment of exposed pipe via hand excavations, which would minimize disturbance. Columbia continues to obtain easement agreements with landowners affected by the Project, and we note that existing easement agreements allow for the in-place abandonment of Line B-105. While we conclude that removal of the exposed pipe segment would not result in adverse environmental impact, and believe it is the preferable option, we acknowledge the possibility of leaving it in place, if based on a mutual agreement between Columbia and the landowner.

Mr. Todd Cooper commented regarding alternate routes for Line K-270 through his property. The Line K-270 route Columbia planned during the pre-filing process included crossing Mr. Cooper's property at a 45-degree angle in the direction of an existing (non-Columbia) pipeline corridor. To address Mr. Cooper's concerns, Columbia altered the Line K-270 route to parallel the existing pipeline through Mr. Cooper's property.

Mr. Richard Paulus expressed concerns to Columbia about the Line K-270 pipeline route through his property. To address Mr. Paulus' concerns, Columbia proposes to perform an HDD, which avoids a pond on Mr. Paulus' property. Two property owners adjacent to Mr. Paulus' property concurred with this approach.

Mr. Jon R. Bright commented on the need for additional information regarding placement of the proposed Line K-270 pipeline on his property, the impact of the Line K-270 pipeline on property values, and recommended a minor route variation of Line K-270.

Columbia is currently evaluating whether an HDD can be accommodated beneath a pond on a landowner's property adjacent to Mr. Bright's property, which would be impacted by Line K-270 construction; if an HDD can be performed at this location, Columbia would have the ability to adjust the route on Mr. Bright's property in an effort to honor Mr. Bright's route preferences.

Victory Hill Church (Mr. Aaron Begley) commented on the proposed Project's impact on its property values and suggested a minor route alternative. Columbia has discussed Mr. Begley's requested route alternative with the adjacent landowner (Mount Caramel Hospital), whose response is currently pending as of the date of issuance of this EA. We evaluated Victory Hill Church's proposed minor route variation, which is depicted in general terms in figure 5.

Figure 5: Victory Hill Church proposed minor route variation alternative for proposed Line K-270

Victory Hill Church proposes the minor route variation as an alternative to the proposed route K-270 since it believes that the proposed route would "limit [its] future expansion plans along with greatly decreasing [its] current property values." Victory Hill Church's proposed minor route variation would impact other landowners and increase the length of pipeline required, resulting in greater land disturbance. In addition, Victory Hill

Church's proposed minor route variation may result in similar impacts on adjacent landowners, and is not in and of itself justification for this alternative. See section B.5.1.5 for a discussion on the Project's potential to impact property values. Therefore, we do not recommend the adoption of Victory Hill Church's proposed minor route variation, since it does not present a significant environmental advantage over the proposed route.

D. CONCLUSIONS AND RECOMMENDATIONS

Based on the analysis in the EA, we have determined that if Columbia constructs and operates the proposed facilities and completes the proposed abandonment activities in accordance with its application and supplements and our recommended mitigation measures, approval of this proposal would not constitute a major federal action significantly affecting the quality of the human environment. We recommend that the Order contain a finding of no significant impact and include the mitigation measures listed below as conditions to any Certificate the Commission may issue.

1. Columbia shall follow the construction procedures and mitigation measures described in its application and supplements (including responses to staff data requests) and as identified in the EA, unless modified by the Order. Columbia must:

    a. request any modification to these procedures, measures, or conditions in a filing with the Secretary;
    b. justify each modification relative to site-specific conditions;
    c. explain how that modification provides an equal or greater level of environmental protection than the original measure; and
    d. receive approval in writing from the Director of OEP **before using that modification**.

2. The Director of OEP has delegated authority to take whatever steps are necessary to ensure the protection of all environmental resources during construction and operation of the new and replacement Project facilities and activities associated with abandonment. This authority shall allow:

    a. the modification of conditions of the Order; and
    b. the design and implementation of any additional measures deemed necessary (including stop-work authority) to assure continued compliance with the intent of the environmental conditions as well as the avoidance or mitigation of adverse environmental impact resulting from Project construction and operation.

3. **Prior to any construction**, Columbia shall file an affirmative statement with the Secretary, certified by a senior company official, that all company personnel, EIs, and contractor personnel will be informed of the EI's authority and have been or will be trained on the implementation of the environmental mitigation measures appropriate to their jobs **before** becoming involved with construction and restoration activities.

4. The authorized facility locations shall be as shown in the EA, as supplemented by filed alignment sheets. **As soon as they are available, and before the start of construction**, Columbia shall file with the Secretary any revised detailed survey alignment maps/sheets at a scale not smaller than 1:6,000 with station positions for all facilities approved by the Order. All requests for modifications of environmental conditions of the Order or site-specific clearances must be written and must reference locations designated on these alignment maps/sheets.

Columbia's exercise of eminent domain authority granted under NGA section 7(h) in any condemnation proceedings related to the Order must be consistent with these authorized facilities and locations. Columbia's right of eminent domain granted under NGA section 7(h) does not authorize it to increase the size of its natural gas pipeline facilities to accommodate future needs or to acquire a right-of-way for a pipeline to transport a commodity other than natural gas.

5. Columbia shall file with the Secretary detailed alignment maps/sheets and aerial photographs at a scale not smaller than 1:6,000 identifying all route realignments or facility relocations, and staging areas, pipe storage yards, new access roads, and other areas that would be used or disturbed and have not been previously identified in filings with the Secretary. Approval for each of these areas must be explicitly requested in writing. For each area, the request must include a description of the existing land use/cover type, documentation of landowner approval, whether any cultural resources or federally listed threatened or endangered species would be affected, and whether any other environmentally sensitive areas are within or abutting the area. All areas shall be clearly identified on the maps/sheets/aerial photographs. Each area must be approved in writing by the Director of OEP **before construction in or near that area**.

   This requirement does not apply to extra workspace allowed by the FERC Plan and/or minor field realignments per landowner needs and requirements which do not affect other landowners or sensitive environmental areas such as wetlands.

   Examples of alterations requiring approval include all route realignments and facility location changes resulting from:

   a. implementation of cultural resources mitigation measures;
   b. implementation of endangered, threatened, or special concern species mitigation measures;
   c. recommendations by state regulatory authorities; and
   d. agreements with individual landowners that affect other landowners or could affect sensitive environmental areas.

6. **At least 60 days before construction and abandonment by removal activities begin**, Columbia shall file an Implementation Plan with the Secretary for review and written approval by the Director of OEP. Columbia must file revisions to the plan as schedules change. The plan shall identify:

   a. how Columbia will implement the construction procedures and mitigation measures described in its application and supplements (including responses to staff data requests), identified in the EA, and required by the Order;
   b. how Columbia will incorporate these requirements into the contract bid documents, construction contracts (especially penalty clauses and specifications), and construction drawings so that the mitigation required at each site is clear to onsite construction and inspection personnel;

c. the number of EIs assigned per spread, and how the company will ensure that sufficient personnel are available to implement the environmental mitigation;
d. company personnel, including EIs and contractors, who will receive copies of the appropriate material;
e. the location and dates of the environmental compliance training and instructions Columbia will give to all personnel involved with construction and restoration (initial and refresher training as the Project progresses and personnel change, with the opportunity for OEP staff to participate in the training sessions;
f. the company personnel (if known) and specific portion of Columbia's organization having responsibility for compliance;
g. the procedures (including use of contract penalties) Columbia will follow if noncompliance occurs; and
h. for each discrete facility, a Gantt or PERT chart (or similar project scheduling diagram), and dates for:

(1) the completion of all required surveys and reports;
(2) the environmental compliance training of onsite personnel;
(3) the start of construction; and
(4) the start and completion of restoration.

7. Columbia shall employ at least one EI per construction spread. The EIs shall be:

a. responsible for monitoring and ensuring compliance with all mitigation measures required by the Order and other grants, permits, certificates, or other authorizing documents;
b. responsible for evaluating the construction contractor's implementation of the environmental mitigation measures required in the contract (see condition 6 above) and any other authorizing document;
c. empowered to order correction of acts that violate the environmental conditions of the Order, and any other authorizing document;
d. a full-time position, separate from all other activity inspectors;
e. responsible for documenting compliance with the environmental conditions of the Order, as well as any environmental conditions/permit requirements imposed by other federal, state, or local agencies; and
f. responsible for maintaining status reports.

8. Beginning with the filing of its Implementation Plan, Columbia shall file updated status reports with the Secretary **on a biweekly basis** until all construction and restoration activities are complete. On request, these status reports will also be provided to other federal and state agencies with permitting responsibilities. Status reports shall include:

a. an update on Columbia's efforts to obtain the necessary federal authorizations;
b. the construction status of each spread, work planned for the following reporting period, and any schedule changes for stream crossings or work in other environmentally-sensitive areas;

c. a listing of all problems encountered and each instance of noncompliance observed by the EIs during the reporting period (both for the conditions imposed by the Commission and any environmental conditions/permit requirements imposed by other federal, state, or local agencies);
d. a description of the corrective actions implemented in response to all instances of noncompliance, and their cost;
e. the effectiveness of all corrective actions implemented;
f. a description of any landowner/resident complaints which may relate to compliance with the requirements of the Order, and the measures taken to satisfy their concerns; and
g. copies of any correspondence received by Columbia from other federal, state, or local permitting agencies concerning instances of noncompliance, and Columbia's response.

9. Columbia shall develop and implement an environmental complaint resolution procedure. The procedure shall provide landowners with clear and simple directions for identifying and resolving their environmental mitigation problems/concerns during construction of the Project and restoration of the right-of-way. **Prior to construction**, Columbia shall mail the complaint procedures to each landowner whose property would be subject to ground disturbance by the Project.

a. In its letter to affected landowners, Columbia shall:
   (1) provide a local contact that the landowners should call first with their concerns; the letter should indicate how soon a landowner should expect a response;
   (2) instruct the landowners that if they are not satisfied with the response, they should call Columbia's Hotline; the letter should indicate how soon to expect a response; and
   (3) instruct the landowners that if they are still not satisfied with the response from Columbia's Hotline, they should contact the Commission's Landowner Helpline at 877-337-2237 or at LandownerHelp@ferc.gov.

b. In addition, Columbia shall include in its weekly status report a copy of a table that contains the following information for each problem/concern:

   (1) the identity of the caller and date of the call;
   (2) the location by milepost and identification number from the authorized alignment sheet(s) of the affected property;
   (3) a description of the problem/concern; and
   (4) an explanation of how and when the problem was resolved, will be resolved, or why it has not been resolved.

10. **Prior to receiving written authorization from the Director of OEP to commence construction or abandonment by removal of any Project facilities**, Columbia shall file with the Secretary documentation that it has

received all applicable authorizations required under federal law (or evidence of waiver thereof).

11. Columbia must receive written authorization from the Director of OEP **before placing the Project into service**. Such authorization will only be granted following a determination that rehabilitation and restoration of the right-of-way and other areas affected by the Project are proceeding satisfactorily.

12. **Within 30 days of placing the authorized facilities in service**, Columbia shall file an affirmative statement with the Secretary, certified by a senior company official:

    a. that the facilities have been constructed or abandoned in compliance with all applicable conditions, and that continuing activities will be consistent with all applicable conditions; or
    b. identifying which of the conditions in the Order Columbia has complied with or will comply with. This statement shall also identify any areas affected by the Project where compliance measures were not properly implemented, if not previously identified in filed status reports, and the reason for noncompliance.

13. **Prior to construction**, Columbia shall file with the Secretary its site-specific Erosion and Sediment Control Plan and Agricultural Mitigation Plan.

14. **Prior to construction**, Columbia shall file with the Secretary a plan describing the feasibility of incorporating plant seeds that support pollinators into the seed mixes used for restoration of construction workspaces. The plan shall also describe Columbia's consultations with the relevant federal and/or state agencies.

15. **Prior to construction *and* if right-of-way clearing would take place between April 1 and July 15**, Columbia shall file with the Secretary a Migratory Bird Conservation Plan incorporating avoidance and mitigation measures and file documentation of its consultation with the FWS.

16. Columbia **shall not begin construction** of the Project **until**:

    a. FERC staff receives comments from the FWS regarding the proposed actions;

    b. FERC staff completes any necessary section 7 consultation with the FWS; and

    c. Columbia receives written notification from the Director of OEP that construction and/or use of the mitigation (including implementation of conservation measures) may begin.

17. **Prior to construction,** Columbia shall file with the Secretary any additional mitigation measures it intends to implement for state-protected species, developed in consultation with the ODNR.

18. **Prior to construction**, Columbia shall file with the Secretary for the review and written approval by the Director of OEP any site-specific crossing plans or mitigation

measures developed with recreation and conservation easement managers or landowners.

19. Columbia **shall not begin construction** activities and/or use of staging, storage, or temporary work areas and new or to-be-improved access roads **until**:

    a. Columbia files with the Secretary the cultural resources survey report for the Project revisions, and the Ohio SHPO's comments on the report; and
    b. the FERC staff reviews and the Director of OEP approves the cultural resources survey report, and notifies Columbia in writing that construction may proceed.

    All materials filed with the Commission containing location, character, and ownership information about cultural resources must have the cover and any relevant pages therein clearly labeled in bold lettering: **"CONTAINS PRIVILEGED INFORMATION – DO NOT RELEASE."**

20. **Prior to construction activities occurring during calendar year 2018**, Columbia shall file documentation demonstrating compliance with General Conformity for any revisions to the nonattainment status of Fairfield or Franklin Counties.

21. If the proposed Walnut Creek HDD entry or exit locations are within 0.5 mile of any NSAs, the following shall be provided **prior to construction** for the review and written approval by the Director of OEP:

    a. identify all NSAs;
    b. the estimated number of days of drilling required for each location, and whether drilling would be done 24 hours per day;
    c. a topographic map showing the distance and direction of the nearest NSAs;
    d. the existing L_{dn} at the nearest NSAs and the estimated noise impacts at the NSAs during drilling activities; and
    e. a description of noise mitigation (or alternate measures such as temporary relocation, compensation, etc. that would be implemented during short term drilling operations) which would be implemented during drilling activity to reduce noise impacts at the NSAs below 55 dBA L_{dn}, or 10 dBA over background if ambient levels are above 55 dBA L_{dn}.

22. Columbia shall file a noise survey with the Secretary **no later than 60 days** after placing the Greenfield Regulator RS-7944 Facility in service. If a full load condition noise survey is not possible, Columbia shall provide an interim survey at the maximum possible horsepower load and provide the full load survey **within 6 months**. If the noise attributable to the operation of all of the equipment at the Greenfield Regulator RS-7944 Facility under interim or full horsepower load conditions exceeds an L_{dn} of 55 dBA at any nearby NSAs, Columbia shall file a report on what changes are needed and shall install the additional noise controls to meet the level **within 1 year** of the in-service date. Columbia shall confirm compliance with the above requirement by filing a second noise survey with the Secretary **no later than 60 days** after it installs the additional noise controls.

23. **Prior to any abandonment by removal activities**, Columbia shall file the following information with the Secretary, for review and written approval by the Director of OEP:

    a. identify any facilities to be abandoned or disturbed that may be contaminated with PCBs;
    b. verify that the appropriate PCB testing will be conducted on these facilities, and discuss how any abandoned PCB contaminated facilities will be properly disposed of; and
    c. identify measures to be implemented to provide adequate worker safety for handling PCB contaminated materials.

E. REFERENCES

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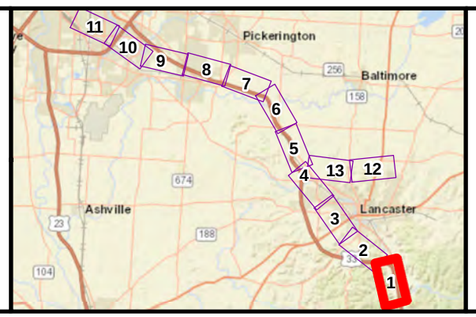
APPENDIX A

Topographic Maps



LEGEND:

- Mile Post
- B-105 Abandonment
- B-111 Replacement
- B-121 Replacement
- B-130 Replacement
- K-270 Proposed Pipeline
- Permanent ROW
- ATWS
- TWS
- Staging Area
- Access Road

MAP SOURCE:
USGS 7.5 Minute Topographic Quadrangles:
Lancaster, Rockbridge
BASE MAP SOURCE: ESRI, USA Topo Maps

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Feet

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Columbia Gas Transmission

B-System
Fairfield & Franklin Counties, Ohio

APPENDIX 1.A
USGS TOPOGRAPHIC MAP
SHEET 1 OF 13

PN: 663744	DATE: 7/26/2016
CREATED BY: GT	ch2m.
REVIEWED BY: KF	

CS: NAD 1983 StatePlane Ohio South FIPS 3402 Feet Units: Foot US

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LEGEND:

- Mile Post
- B-105 Abandonment
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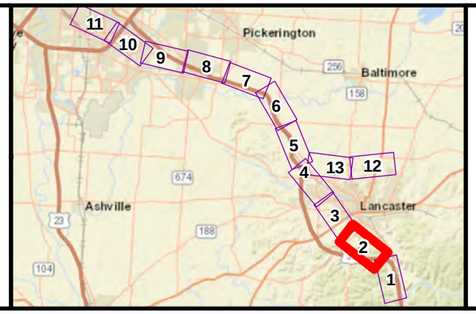

MAP SOURCE:
USGS 7.5 Minute Topographic Quadrangles:
Lancaster, Amanda
BASE MAP SOURCE: ESRI, USA Topo Maps

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Columbia Gas Transmission

B-System
Fairfield & Franklin Counties, Ohio

APPENDIX 1.A
USGS TOPOGRAPHIC MAP
SHEET 2 OF 13

PN: 663744	DATE: 7/26/2016
CREATED BY: GT	ch2m.
REVIEWED BY: KF	

CS: NAD 1983 StatePlane Ohio South FIPS 3402 Feet Units: Foot US

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- Access Road

MAP SOURCE:
USGS 7.5 Minute Topographic Quadrangles:
Lancaster, Amanda
BASE MAP SOURCE: ESRI, USA Topo Maps

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Feet

Columbia Gas Transmission

B-System
Fairfield & Franklin Counties, Ohio

APPENDIX 1.A
USGS TOPOGRAPHIC MAP
SHEET 3 OF 13

PN: 663744	DATE: 7/26/2016
CREATED BY: GT	ch2m.
REVIEWED BY: KF	

CS: NAD 1983 StatePlane Ohio South FIPS 3402 Feet Units: Foot US

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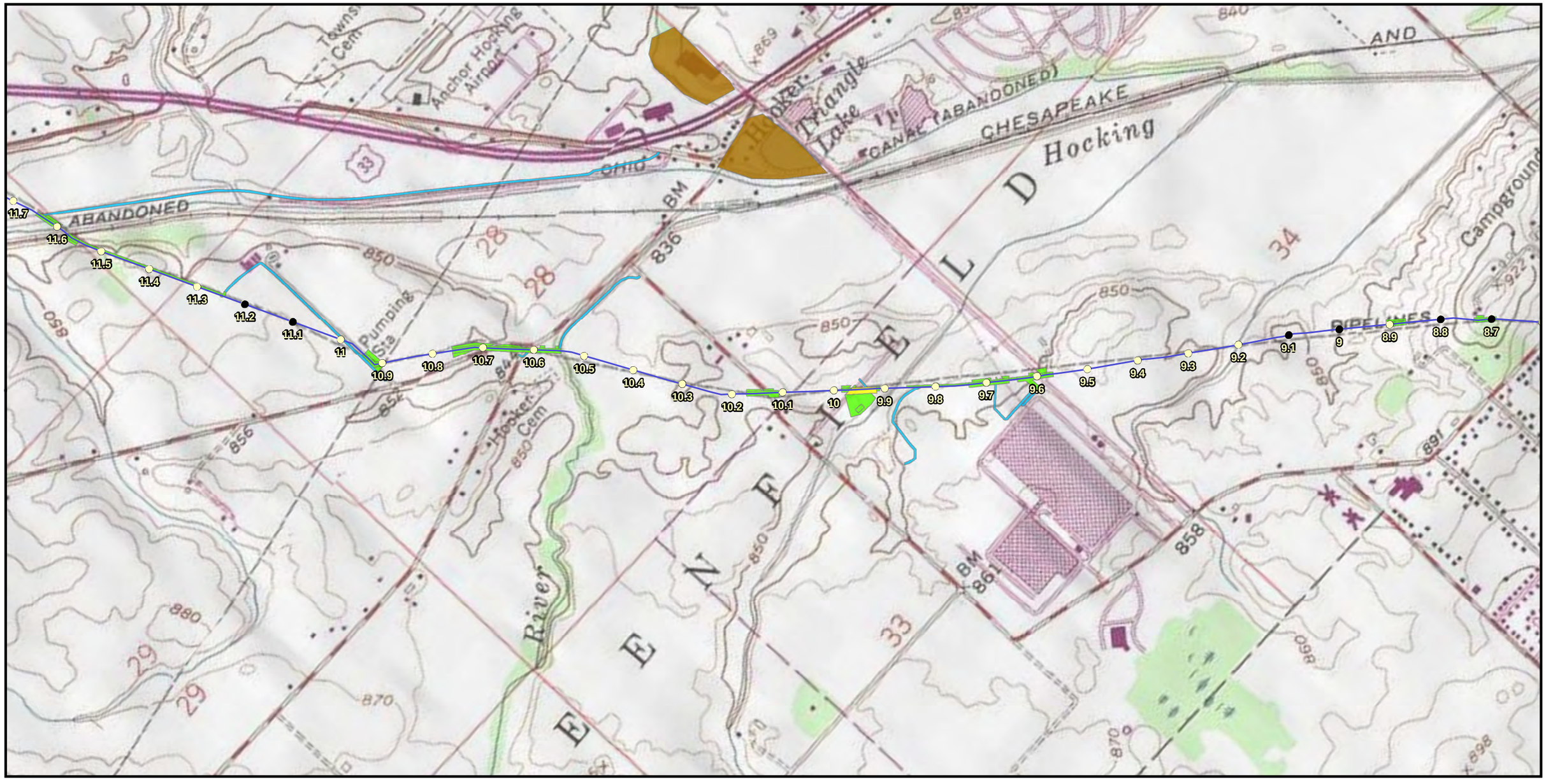

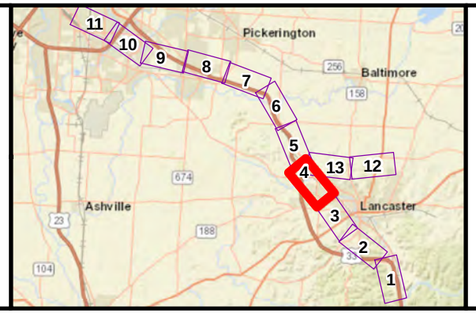

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- ATWS
- TWS
- Staging Area
- Access Road

MAP SOURCE:
USGS 7.5 Minute Topographic Quadrangles:
Amanda, Carroll
BASE MAP SOURCE: ESRI, USA Topo Maps

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Feet

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Columbia Gas Transmission

B-System
Fairfield & Franklin
Counties, Ohio

APPENDIX 1.A
USGS TOPOGRAPHIC MAP
SHEET 4 OF 13

PN: 663744	DATE: 7/26/2016
CREATED BY: GT	ch2m:
REVIEWED BY: KF	

CS: NAD 1983 StatePlane Ohio South FIPS 3402 Feet Units: Foot US

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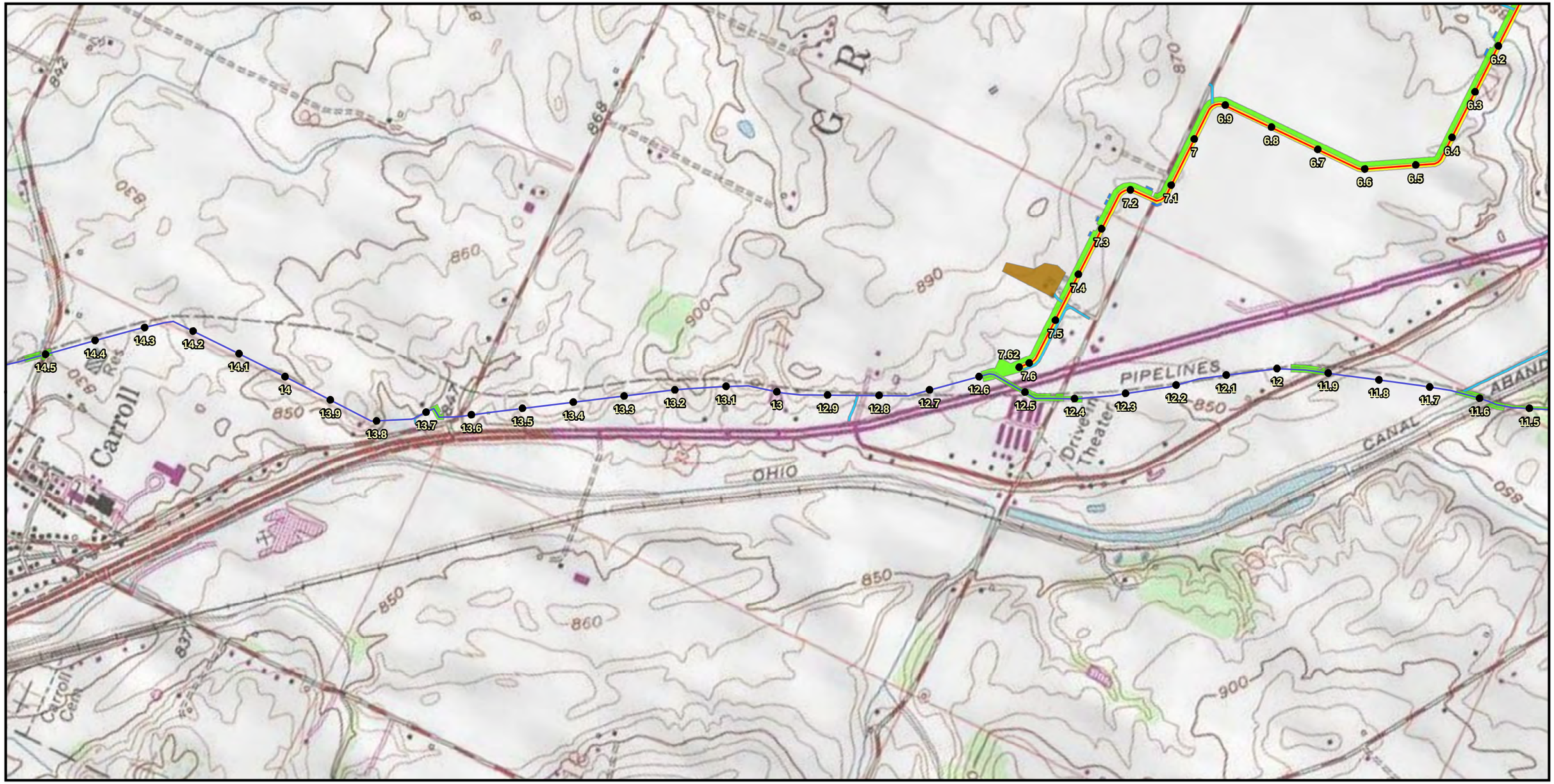

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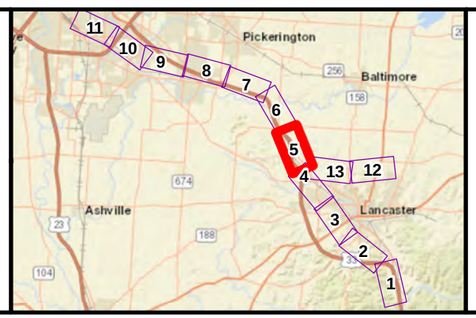

MAP SOURCE:
USGS 7.5 Minute Topographic Quadrangles:
Carroll
BASE MAP SOURCE: ESRI, USA Topo Maps

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Feet

Columbia Gas Transmission

B-System
Fairfield & Franklin
Counties, Ohio

APPENDIX 1.A
USGS TOPOGRAPHIC MAP
SHEET 5 OF 13

PN: 663744	DATE: 7/26/2016
CREATED BY: GT	ch2m.
REVIEWED BY: KF	

CS: NAD 1983 StatePlane Ohio South FIPS 3402 Feet Units: Foot US

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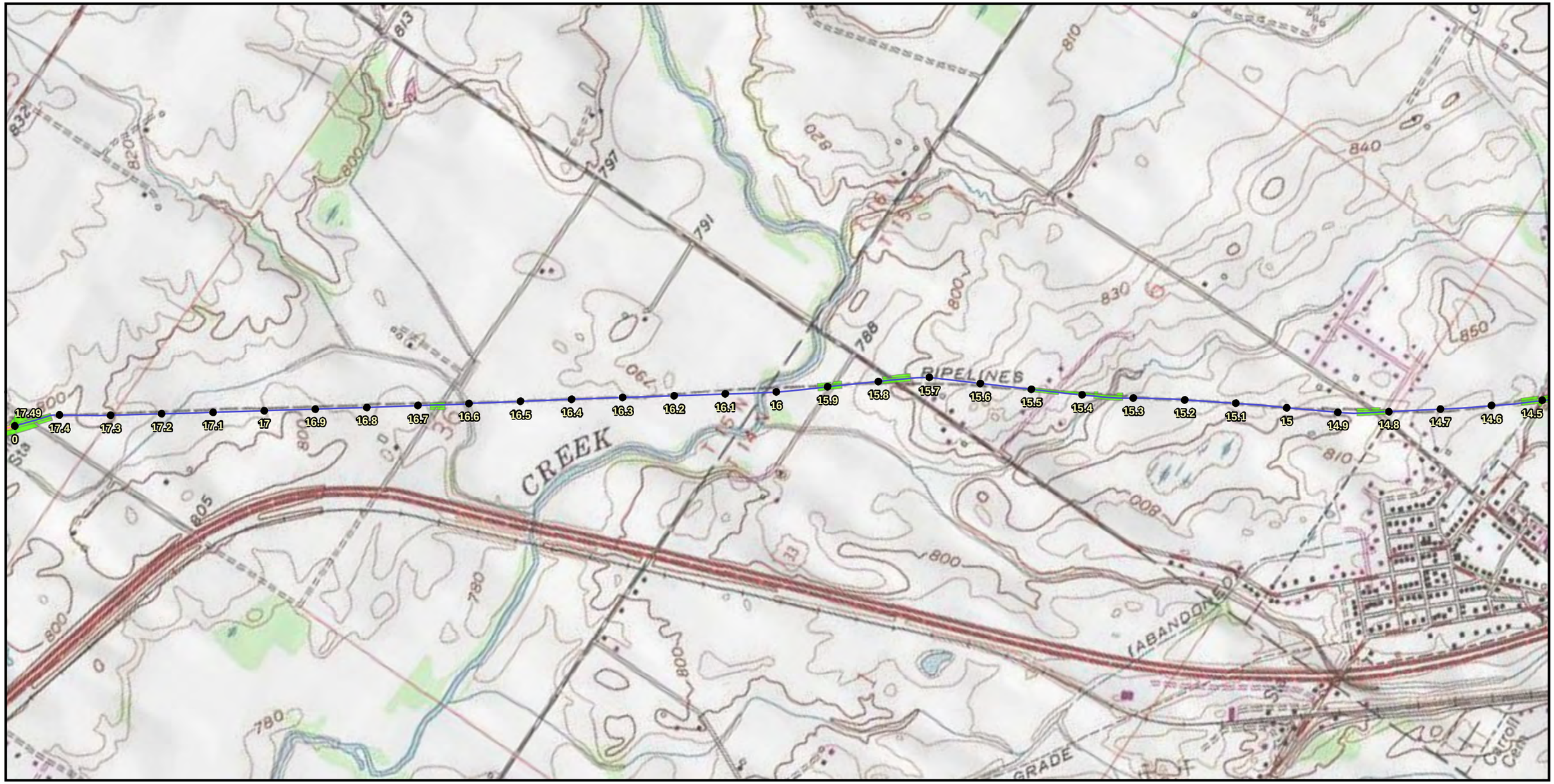

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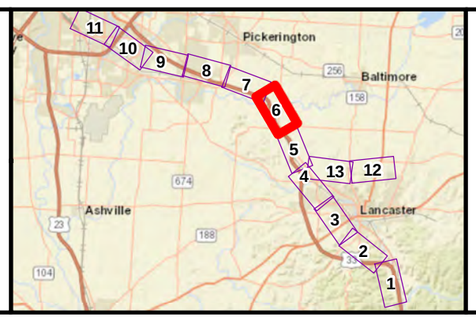

MAP SOURCE:
USGS 7.5 Minute Topographic Quadrangles:
Carroll
BASE MAP SOURCE: ESRI, USA Topo Maps

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Columbia Gas Transmission

B-System
Fairfield & Franklin
Counties, Ohio

APPENDIX 1.A
USGS TOPOGRAPHIC MAP
SHEET 6 OF 13

PN: 663744	DATE: 7/26/2016
CREATED BY: GT	ch2m.
REVIEWED BY: KF	

CS: NAD 1983 StatePlane Ohio South FIPS 3402 Feet Units: Foot US

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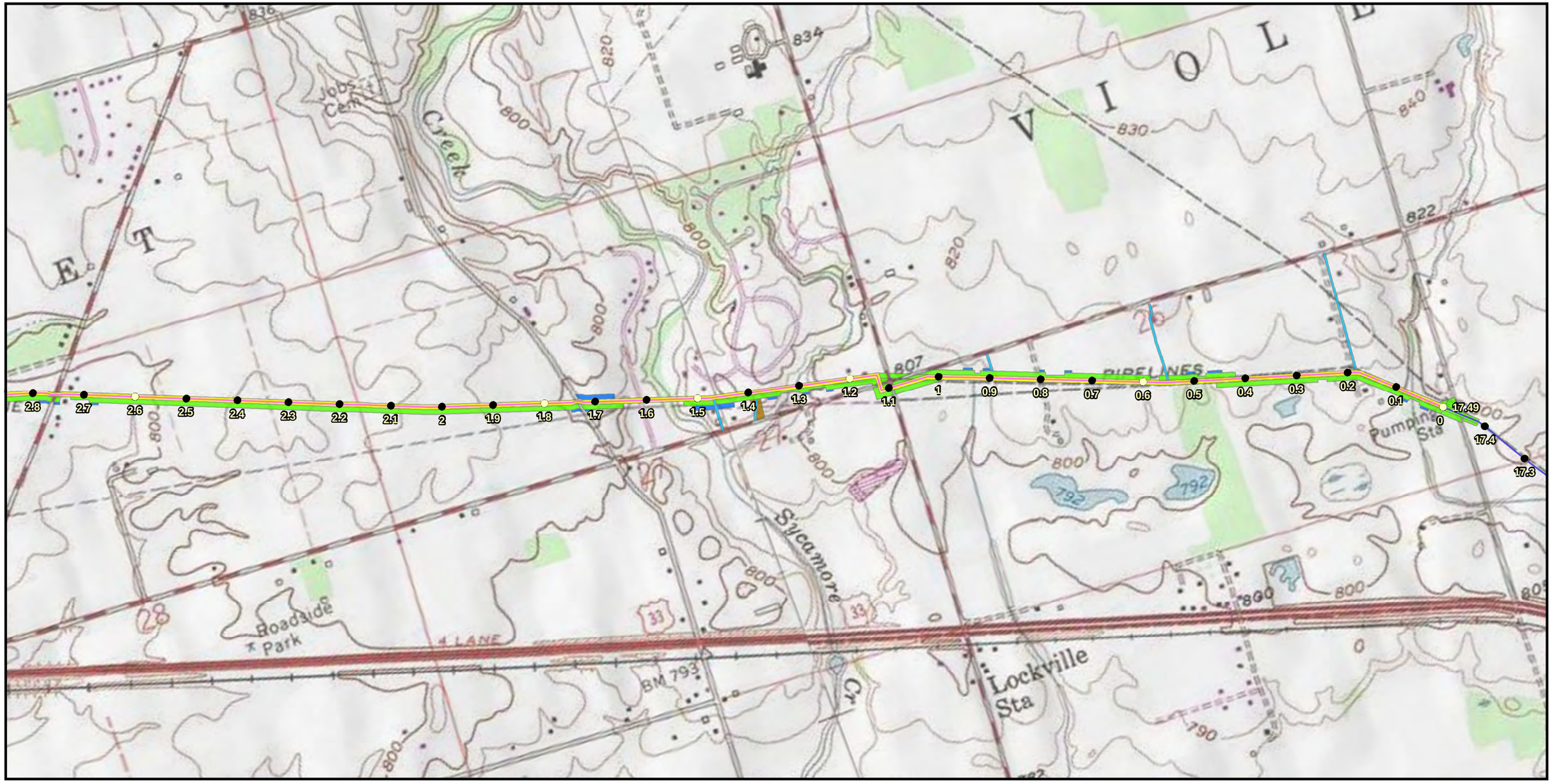

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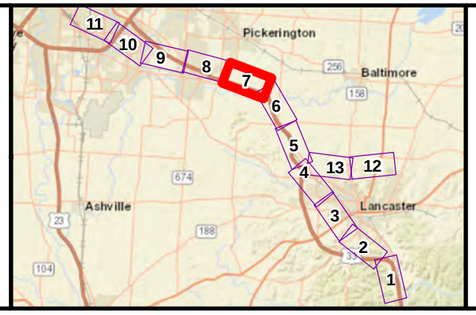

MAP SOURCE:
USGS 7.5 Minute Topographic Quadrangles:
Carroll, Canal Winchester
BASE MAP SOURCE: ESRI, USA Topo Maps

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Columbia Gas Transmission

B-System
Fairfield & Franklin
Counties, Ohio

APPENDIX 1.A
USGS TOPOGRAPHIC MAP
SHEET 7 OF 13

PN: 663744	DATE: 7/26/2016
CREATED BY: GT	ch2m:
REVIEWED BY: KF	

CS: NAD 1983 StatePlane Ohio South FIPS 3402 Feet Units: Foot US

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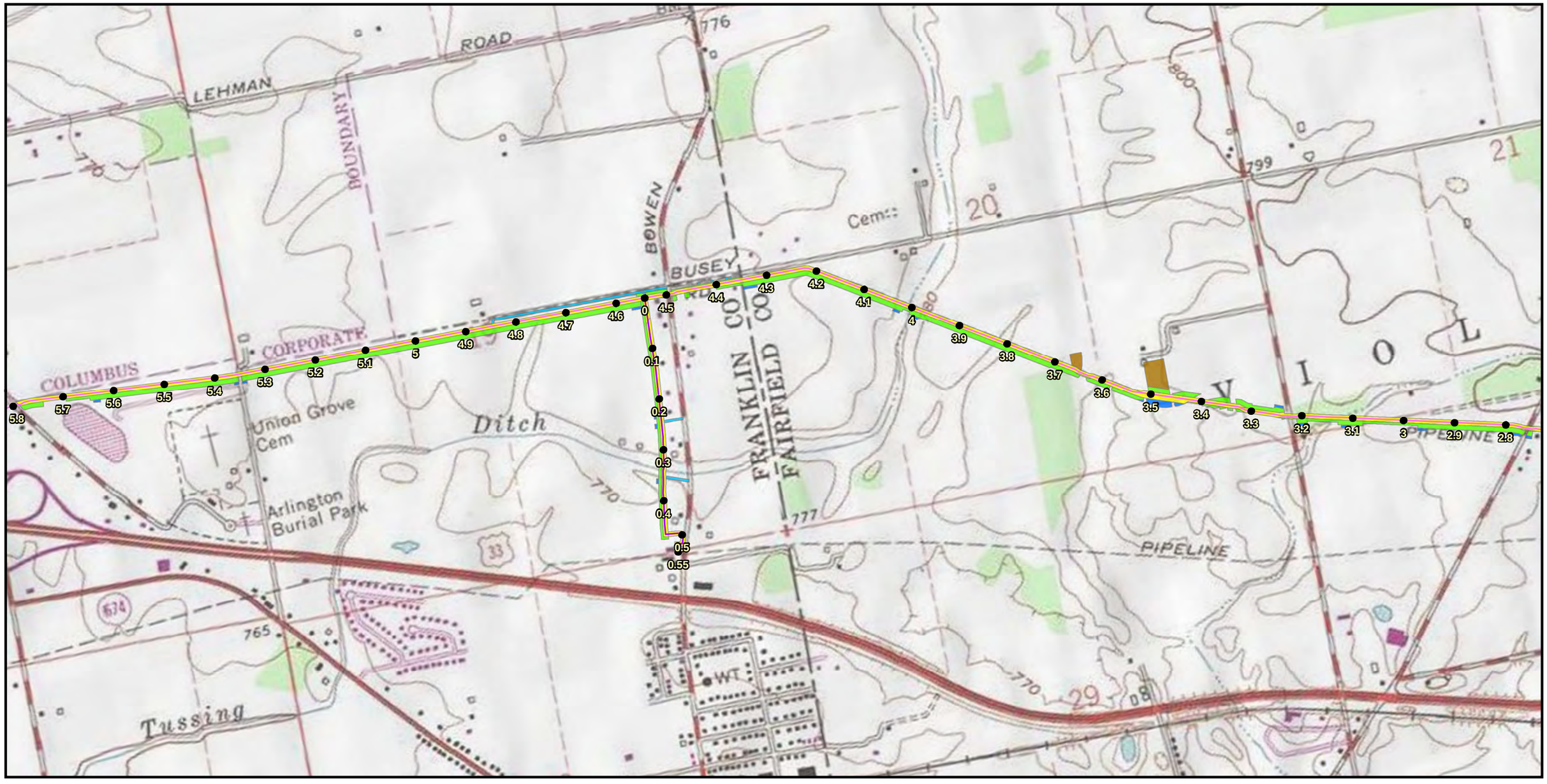

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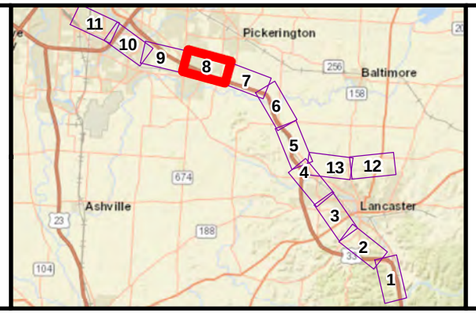
- Staging Area
- Access Road



MAP SOURCE:
USGS 7.5 Minute Topographic Quadrangles:
Canal Winchester
BASE MAP SOURCE: ESRI, USA Topo Maps

0 1,000 2,000
Feet

N

Columbia Gas Transmission

B-System
Fairfield & Franklin
Counties, Ohio

APPENDIX 1.A
USGS TOPOGRAPHIC MAP
SHEET 8 OF 13

PN: 663744	DATE: 7/26/2016
CREATED BY: GT	ch2m:
REVIEWED BY: KF	

CS: NAD 1983 StatePlane Ohio South FIPS 3402 Feet Units: Foot US

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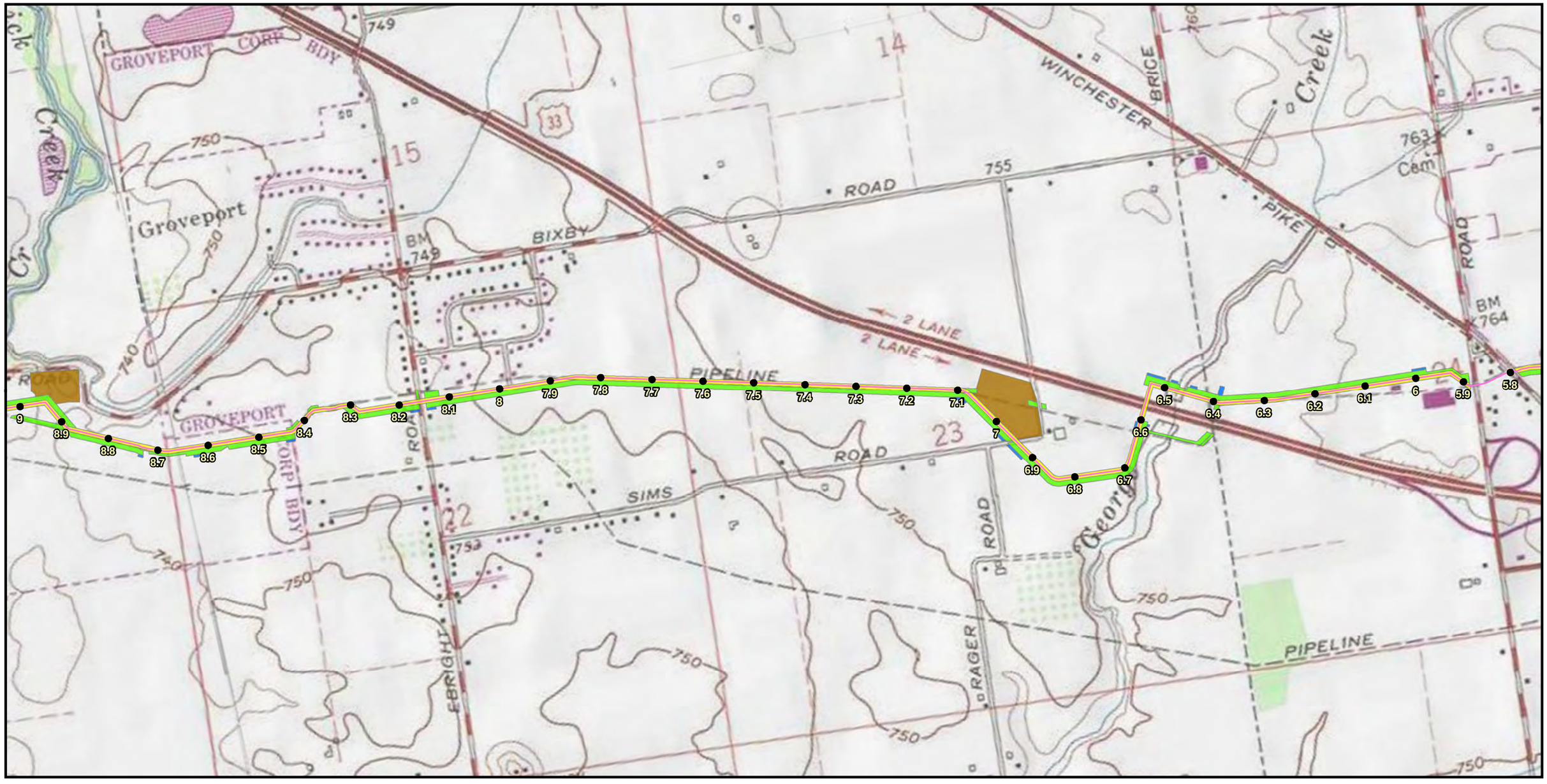
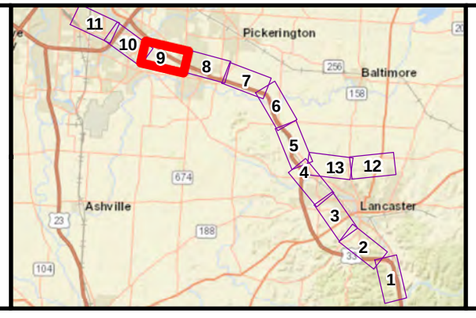


LEGEND:

- Mile Post
- B-105 Abandonment
- B-111 Replacement
- B-121 Replacement
- B-130 Replacement
- K-270 Proposed Pipeline
- Permanent ROW
- ATWS
- TWS
- Staging Area
- Access Road



MAP SOURCE:
USGS 7.5 Minute Topographic Quadrangles:
Canal Winchester, Lockbourne, Reynoldsburg, Southeast Columbus
BASE MAP SOURCE: ESRI, USA Topo Maps

0 1,000 2,000
Feet

N

Columbia Gas Transmission

B-System
Fairfield & Franklin
Counties, Ohio

APPENDIX 1.A
USGS TOPOGRAPHIC MAP
SHEET 9 OF 13

PN: 663744	DATE: 7/26/2016
CREATED BY: GT	ch2m.
REVIEWED BY: KF	

CS: NAD 1983 StatePlane Ohio South FIPS 3402 Feet Units: Foot US

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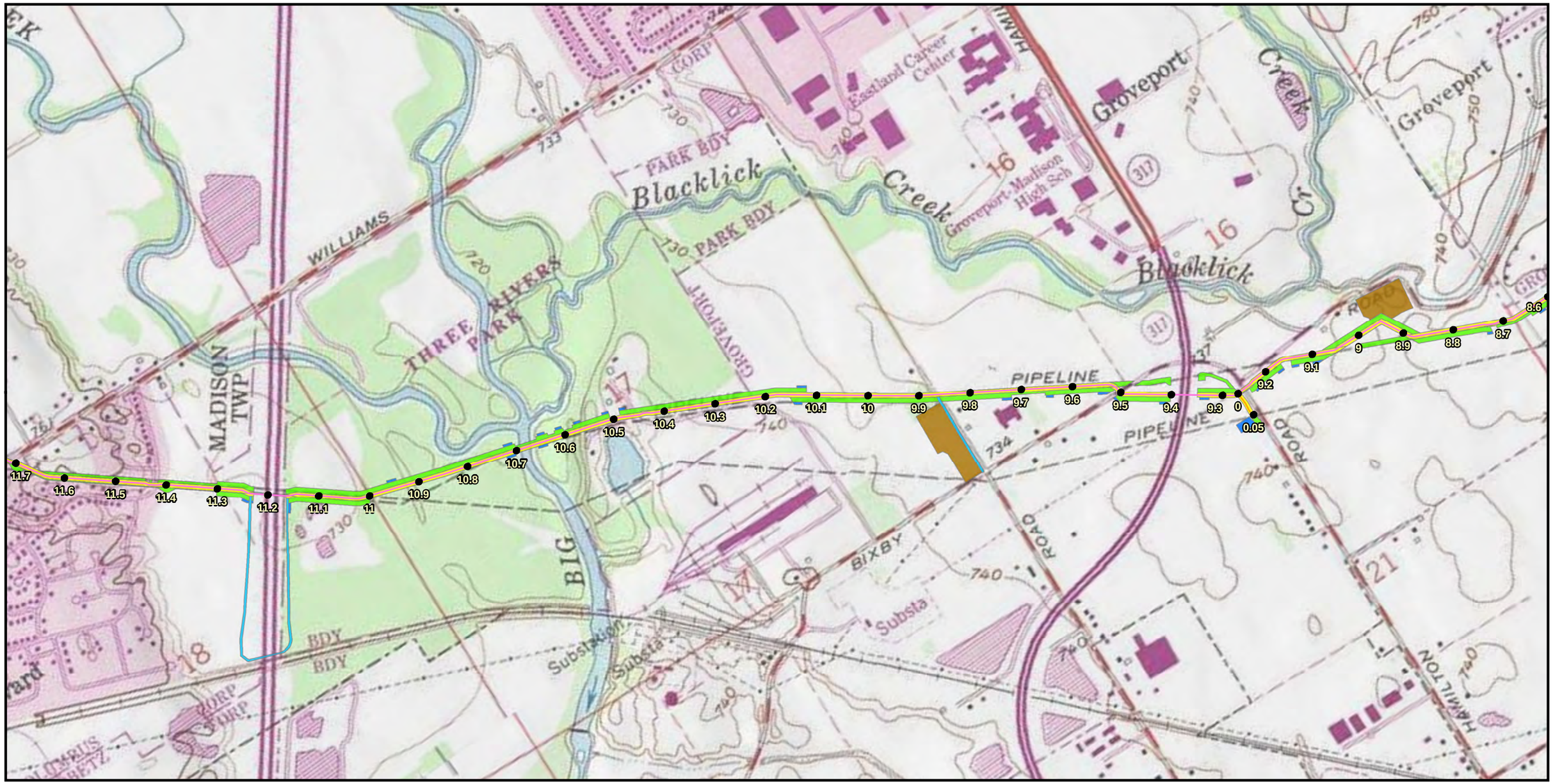
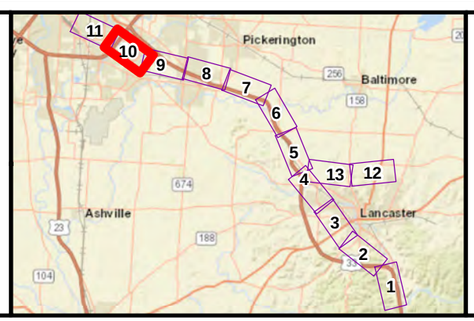


LEGEND:

- Mile Post
- B-105 Abandonment
- B-111 Replacement
- B-121 Replacement
- B-130 Replacement
- K-270 Proposed Pipeline
- Permanent ROW
- ATWS
- TWS
- Staging Area
- Access Road



MAP SOURCE:
USGS 7.5 Minute Topographic Quadrangles:
Canal Winchester, Lockbourne, Reynoldsburg, Southeast Columbus
BASE MAP SOURCE: ESRI, USA Topo Maps

0 1,000 2,000
Feet

Columbia Gas Transmission

B-System
Fairfield & Franklin Counties, Ohio

APPENDIX 1.A
USGS TOPOGRAPHIC MAP
SHEET 10 OF 13

PN: 663744	DATE: 7/26/2016
CREATED BY: GT	ch2m.
REVIEWED BY: KF	

CS: NAD 1983 StatePlane Ohio South FIPS 3402 Feet Units: Foot US

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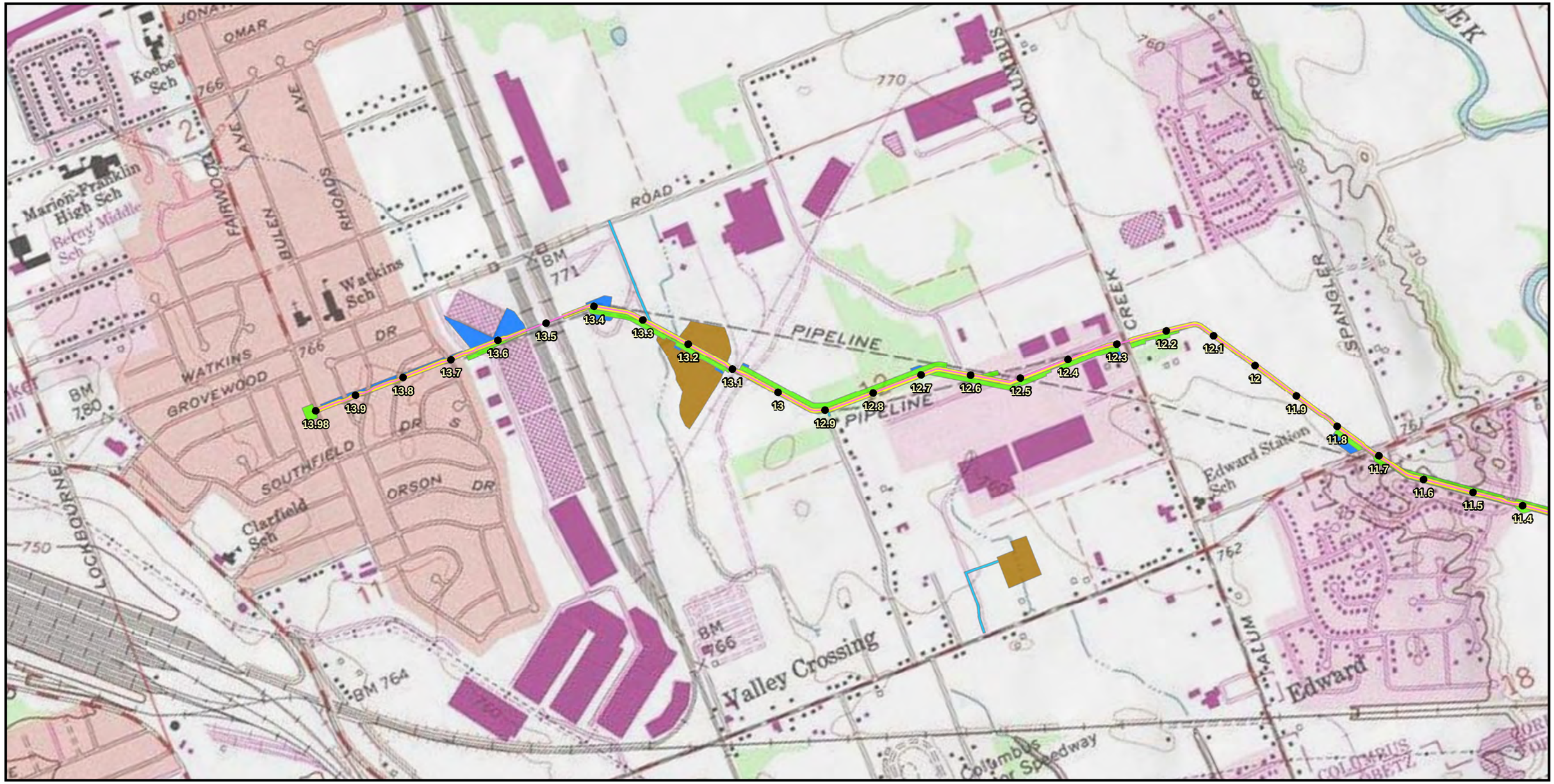
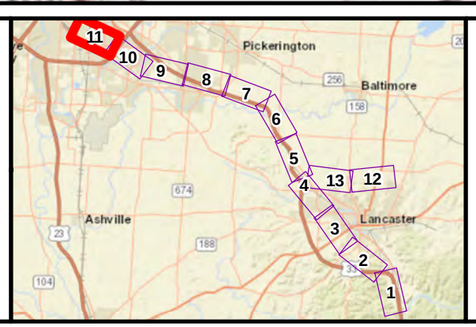


LEGEND:

- Mile Post
- B-105 Abandonment
- B-111 Replacement
- B-121 Replacement
- B-130 Replacement
- K-270 Proposed Pipeline
- Permanent ROW
- ATWS
- TWS
- Staging Area
- Access Road



MAP SOURCE:
USGS 7.5 Minute Topographic Quadrangles:
Southeast Columbus
BASE MAP SOURCE: ESRI, USA Topo Maps

0 1,000 2,000
Feet

Columbia Gas Transmission

B-System
Fairfield & Franklin Counties, Ohio

APPENDIX 1.A
USGS TOPOGRAPHIC MAP
SHEET 11 OF 13

PN: 663744	DATE: 7/26/2016
CREATED BY: GT	ch2m.
REVIEWED BY: KF	

CS: NAD 1983 StatePlane Ohio South FIPS 3402 Feet Units: Foot US

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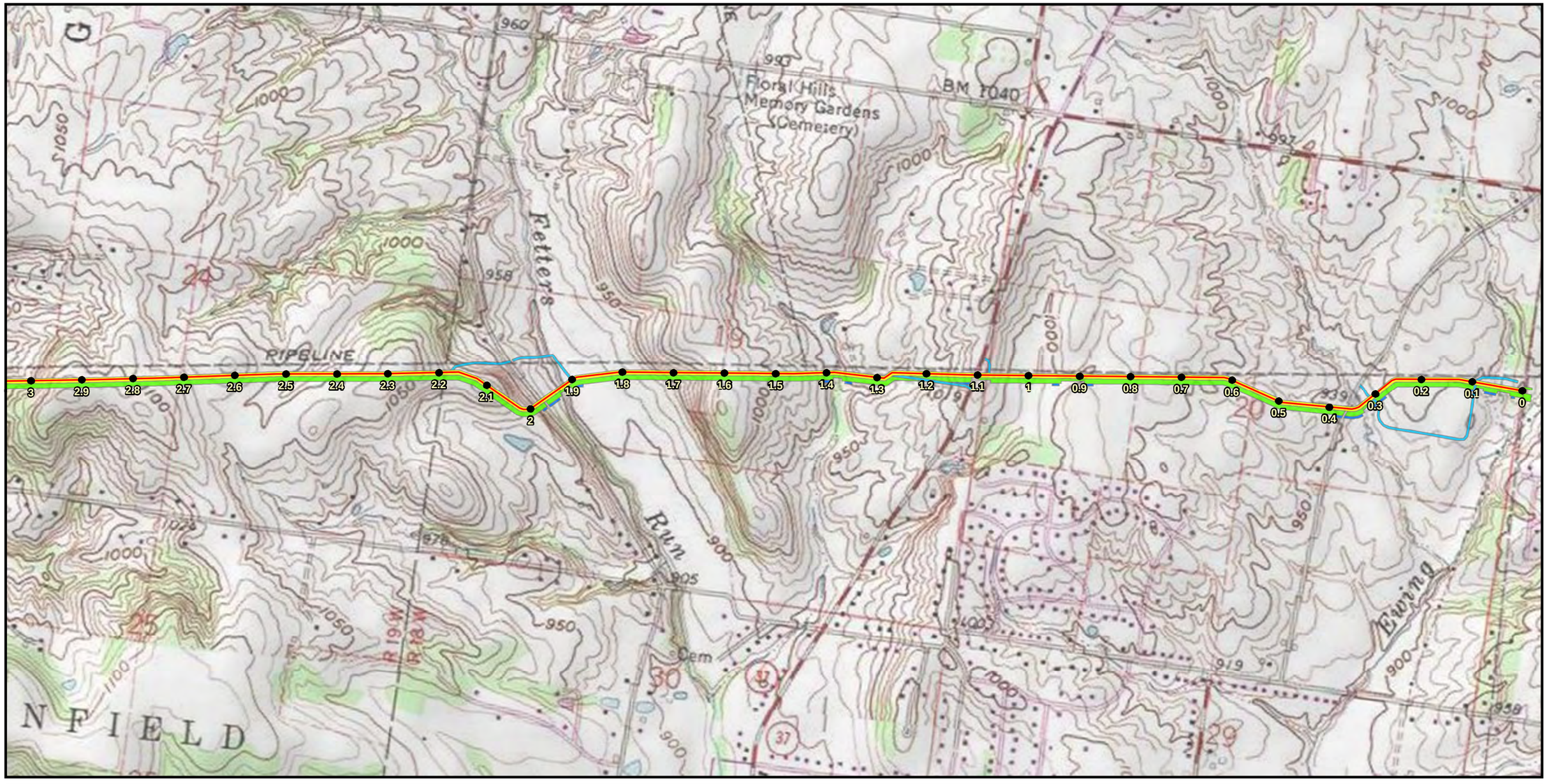
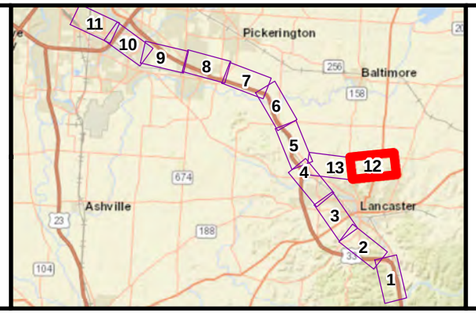


LEGEND:

- Mile Post
- B-105 Abandonment
- B-111 Replacement
- B-121 Replacement
- B-130 Replacement
- K-270 Proposed Pipeline
- Permanent ROW
- ATWS
- TWS
- Staging Area
- Access Road



MAP SOURCE:
USGS 7.5 Minute Topographic Quadrangles:
Baltimore, Lancaster
BASE MAP SOURCE: ESRI, USA Topo Maps

0 1,000 2,000
Feet

N

Columbia Gas Transmission

B-System
Fairfield & Franklin
Counties, Ohio

APPENDIX 1.A
USGS TOPOGRAPHIC MAP
SHEET 12 OF 13

PN: 663744	DATE: 7/26/2016
CREATED BY: GT	ch2m.
REVIEWED BY: KF	

CS: NAD 1983 StatePlane Ohio South FIPS 3402 Feet Units: Foot US

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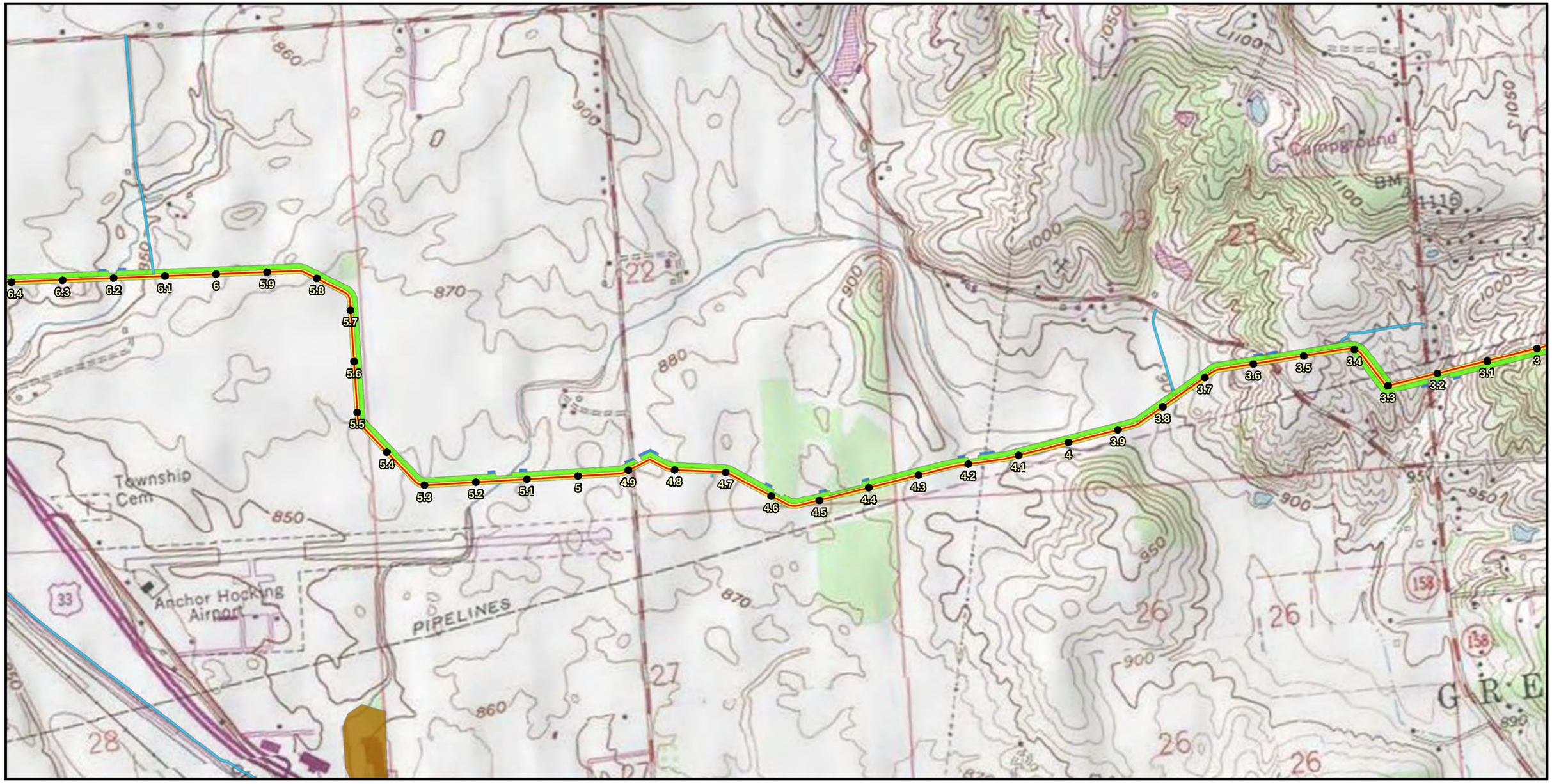

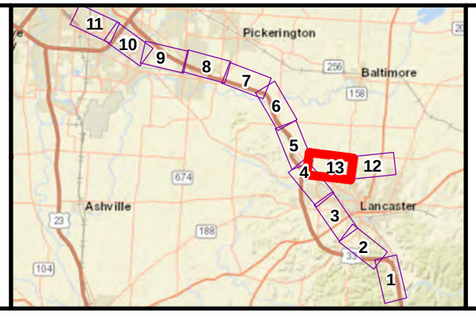

LEGEND:

- Mile Post
- B-105 Abandonment
- B-111 Replacement
- B-121 Replacement
- B-130 Replacement
- K-270 Proposed Pipeline
- Permanent ROW
- ATWS
- TWS
- Staging Area
- Access Road

MAP SOURCE:
USGS 7.5 Minute Topographic Quadrangles:
Baltimore, Lancaster, Amanda, Carroll
BASE MAP SOURCE: ESRI, USA Topo Maps

0 1,000 2,000
Feet

N

Columbia Gas Transmission

B-System
Fairfield & Franklin
Counties, Ohio

APPENDIX 1.A
USGS TOPOGRAPHIC MAP
SHEET 13 OF 13

PN: 663744	DATE: 7/26/2016
CREATED BY: GT	ch2m:
REVIEWED BY: KF	

CS: NAD 1983 StatePlane Ohio South FIPS 3402 Feet Units: Foot US

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APPENDIX B

Typical Right-of-Way Configurations

Additional Temporary Workspaces

Access Roads

Staging Areas

Figure 2 – Typical 75ft. Construction Right-of-Way

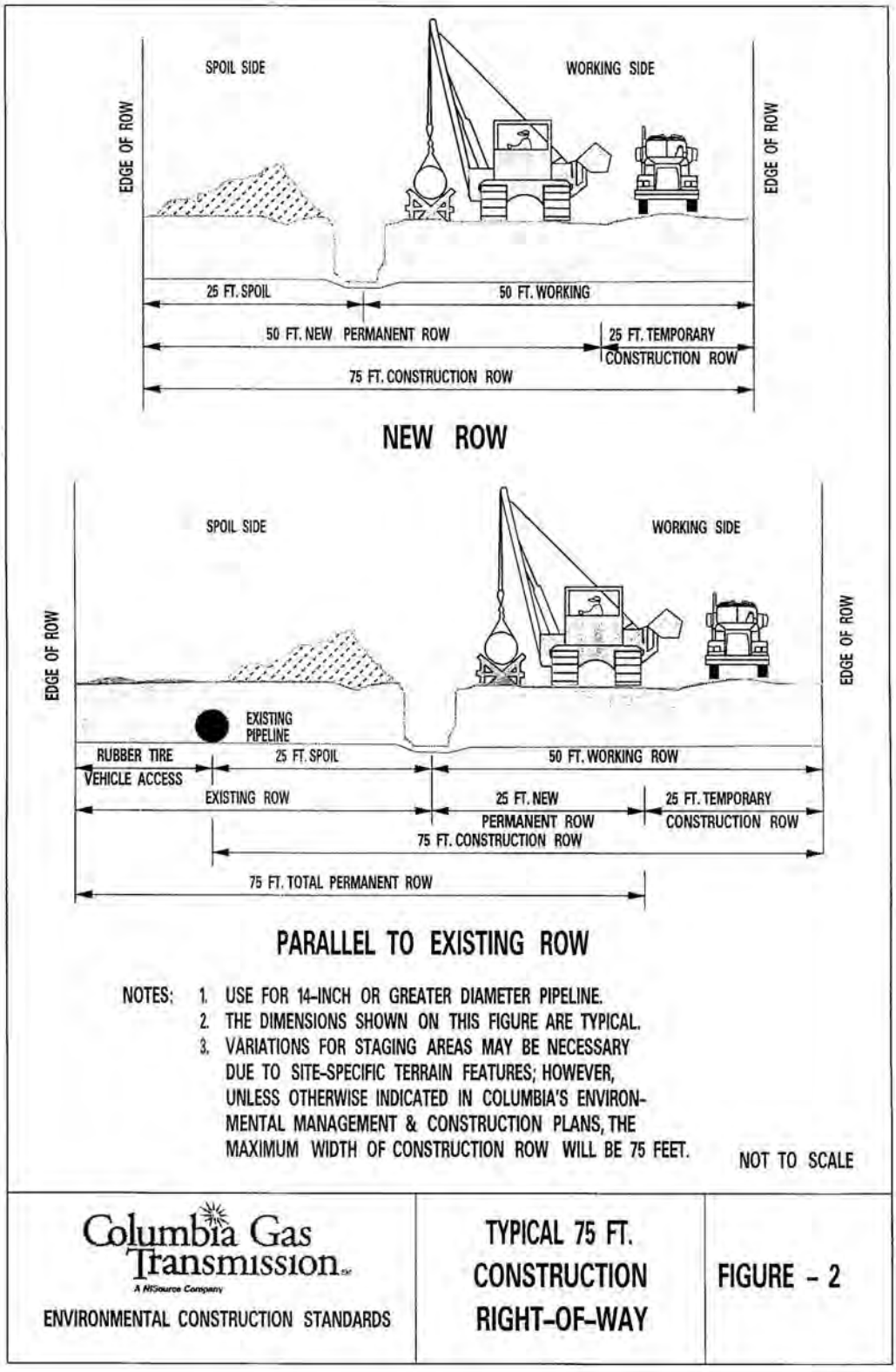
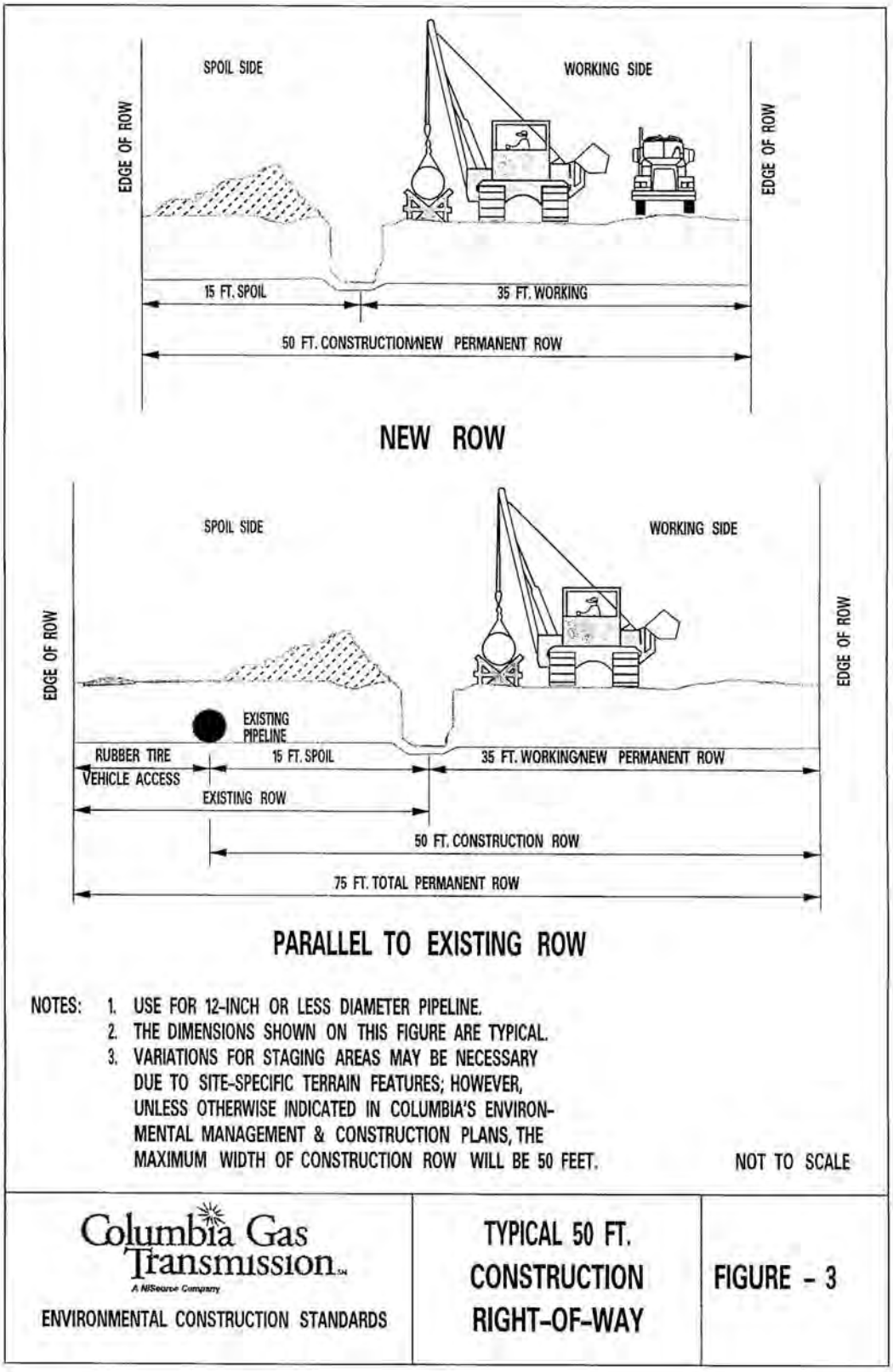


Figure 3 – Typical 50ft. Construction Right-of-Way



Additional Temporary Workspaces Required for the B-System Project						
ATWS ID	**County**	**Line**	**Approx. milepost**	**Approx. dimensions (feet)**	**Approx. area (acres) a/**	**Purpose**
1	Franklin	B-130	0.4	25x50	0.03	road crossing
3	Franklin	B-111	10.7	25x100	0.056	wetland
4	Franklin	B-111	10.7	25x100	0.06	wetland
5	Franklin	B-111	9.6	25x75	0.04	wetland
6	Fairfield	B-111	0.9	25x100	0.06	stream
7	Fairfield	B-111	0.5	25x150	0.09	stream
8	Fairfield	B-111	2.7	25x100	0.06	house
9	Franklin	B-111	10.6	25x70	0.04	stream
10	Franklin	B-111	12.7	25x140	0.08	pipe crossing
11	Fairfield	B-111	0.0	25x95	0.05	stream
12	Fairfield	B-111	0.1	25x90	0.06	stream
13	Fairfield	B-111	0.5	25x100	0.09	stream
14	Fairfield	B-111	0.7	25x75	0.04	road crossing
15	Fairfield	B-111	0.8	25x50	0.03	road crossing
16	Fairfield	B-111	0.9	25x85	0.05	stream
17	Fairfield	B-111	1.2	25x75	0.04	house
19	Fairfield	B-111	1.7	25x125	0.04	HDD
20	Fairfield	B-111	1.7	25x100	0.05	HDD
21	Fairfield	B-111	2.8	25x65	0.03	road crossing
23	Fairfield	B-111	3.0	25x100	0.06	wetland
24	Fairfield	B-111	3.2	25x100	0.06	road crossing
25	Fairfield	B-111	3.5	25x25	0.03	road crossing
26	Fairfield	B-111	4.0	25x75	0.04	Stream
27	Fairfield	B-111	4.0	25x75	0.04	Stream
28	Fairfield	B-111	4.3	25x150	0.09	houses
29	Franklin	B-111	4.6	25x100	0.05	lateral
30	Franklin	B-111	5.4	25x50	0.03	road crossing
31	Franklin	B-111	5.6	25x75	0.04	road crossing
32	Franklin	B-111	6.0	25x150	0.09	wetland
33	Franklin	B-111	6.5	25x200	0.11	road crossing
34	Franklin	B-111	6.6	25x25	0.01	stream
35	Franklin	B-111	6.9	25x200	0.12	road crossing

Additional Temporary Workspaces Required for the B-System Project						
ATWS ID	**County**	**Line**	**Approx. milepost**	**Approx. dimensions (feet)**	**Approx. area (acres) a/**	**Purpose**
36	Franklin	B-111	7.0	25x170	0.09	road crossing
37	Franklin	B-111	7.1	25x120	0.06	bends
38	Franklin	B-111	8.6	25x250	0.14	pond
40	Franklin	B-111	8.7	25x55	0.03	road crossing
41	Franklin	B-111	9.1	25x75	0.04	electric tower
42	Franklin	B-111	9.1	25x125	0.07	road crossing
43	Franklin	B-111	9.2	25x75	0.04	electric tower
44	Franklin	B-111	9.2	25x55	0.03	road crossing
45	Franklin	B-111	9.4	25x75	0.04	road crossing
46	Franklin	B-111	9.5	25x50	0.03	road crossing
47	Franklin	B-111	9.5	25x130	0.07	road crossing
48	Franklin	B-111	10.1	25x100	0.06	change working side
49	Franklin	B-111	9.7	25x100	0.06	wetland
50	Franklin	B-111	10.1	25x100	0.06	change working side
51	Franklin	B-111	10.5	25x70	0.04	building
52	Franklin	B-111	10.5	25x75	0.04	building
53	Franklin	B-111	10.6	25x75	0.04	stream
54	Franklin	B-111	10.6	25x100	0.06	stream
55	Franklin	B-111	10.6	25x85	0.05	Stream
56	Franklin	B-111	11.0	25x100	0.06	Stream
57	Franklin	B-111	11.2	25x75	0.04	bore
59	Franklin	B-111	11.8	70x315	0.50	Bore
60	Franklin	B-111	13.1	25x70	0.04	railroad crossing
61	Franklin	B-111	13.1	25x100	0.06	railroad crossing
62	Franklin	B-111	13.2	25x75	0.04	stream
63	Franklin	B-111	13.4	100x250	0.57	railroad crossing – HDD
64	Franklin	B-111	13.4	50x240	0.28	railroad crossing – HDD
65	Franklin	B-111	13.6	irregular	2.61	railroad crossing - HDD
66	Franklin	B-130	0.3	25x50	0.03	road crossing
67	Franklin	B-130	0.2	25x50	0.03	road crossing

Additional Temporary Workspaces Required for the B-System Project						
ATWS ID	**County**	**Line**	**Approx. milepost**	**Approx. dimensions (feet)**	**Approx. area (acres) a/**	**Purpose**
68	Franklin	B-130	0.3	25x50	0.03	Stream
69	Fairfield	B-111	3.1	25x100	0.06	Stream
70	Fairfield	B-111	1.3	25x75	0.04	avoid structure
71	Fairfield	B-111	1.7	50x400	0.46	HDD
72	Fairfield	B-111	1.4	50x180	0.21	HDD
73	Fairfield	B-111	1.5	50x190	0.23	HDD
74	Fairfield	B-111	3.2	25x100	0.05	road crossing
75	Franklin	B-111	6.5	25x75	0.04	stream
76	Franklin	B-111	6.4	25x75	0.04	stream
78	Franklin	B-111	8.2	25x100	0.06	road crossing
79	Franklin	B-111	8.1	25x100	0.06	road crossing
80	Franklin	B-121	0.1	100x230	0.50	rebuild station
81	Franklin	B-111	9.3	25x100	0.06	road crossing
88	Fairfield	K-270	0.3	25x100	0.06	road crossing
89	Fairfield	K-270	0.4	25x155	0.09	road/stream
90	Fairfield	K-270	0.4	25x110	0.06	road crossing
91	Fairfield	K-270	0.1	25x75	0.04	stream
92	Fairfield	K-270	0.1	25x125	0.07	stream
93	Fairfield	K-270	0.0	25x40	0.02	stream
94	Fairfield	K-270	1.4	25x75	0.04	stream
95	Fairfield	K-270	1.4	25x75	0.04	stream
97	Fairfield	K-270	2.0	25x50	0.03	road crossing
98	Fairfield	K-270	2.0	25x135	0.08	road/stream
99	Fairfield	K-270	3.2	25x75	0.04	stream
100	Fairfield	K-270	3.2	25x85	0.04	stream/road
101	Fairfield	K-270	3.2	25x95	0.04	road crossing
103	Fairfield	K-270	4.9	25x205	0.13	road crossing
106	Fairfield	K-270	4.9	25x105	0.06	road crossing
107	Fairfield	K-270	5.2	25x75	0.05	stream
108	Fairfield	K-270	6.2	25x75	0.04	stream
111	Fairfield	K-270	4.4	25x75	0.04	wetland
112	Fairfield	K-270	4.5	25x75	0.04	wetland

Additional Temporary Workspaces Required for the B-System Project						
ATWS ID	**County**	**Line**	**Approx. milepost**	**Approx. dimensions (feet)**	**Approx. area (acres) a/**	**Purpose**
113	Fairfield	K-270	5.1	25x75	0.05	stream
114	Fairfield	K-270	6.2	25x75	0.04	stream
115	Fairfield	K-270	0.9	25x75	0.04	stream
116	Fairfield	K-270	0.9	25x75	0.04	stream
117	Fairfield	K-270	1.1	25x260	0.07	road crossing
124	Franklin	B-111	5.4	25x50	0.03	road crossing
125	Fairfield	B-111	3.5	20x85	0.04	road crossing
126	Franklin	B-111	12.3	50x105	0.12	road crossing
127	Franklin	B-111	6.4	50x100	0.11	pipe removal
128	Franklin	B-111	11.2	25x100	0.06	road crossing
129	Franklin	B-111	11.2	25x20	0.01	road crossing
133	Fairfield	K-270	4.6	25x75	0.04	wetland
134	Fairfield	K-270	0.3	25x30	0.02	road/stream
135	Fairfield	K-270	4.2	25x75	0.04	pipeline crossing
136	Fairfield	K-270	4.2	25x150	0.09	pipeline crossing
137	Fairfield	K-270	1.9	25x100	0.05	stream
138	Fairfield	K-270	7.1	25x100	0.06	road crossing
139	Fairfield	K-270	7.2	25x75	0.04	road crossing
140	Fairfield	K-270	7.2	25x50	0.03	road crossing
141	Fairfield	K-270	7.3	25x50	0.03	road crossing
142	Fairfield	K-270	7.3	25x50	0.03	wetland
143	Fairfield	K-270	7.3	25x50	0.03	wetland
144	Franklin	B-111	1.0	25x160	0.06	limited TWS
145	Fairfield	B-105	10.9	200x200	0.34	rebuild station
146	Franklin	B-111	11.1	25x800	0.50	bore/HDD
147	Franklin	B-111	11.0	15x50	0.005	bore/HDD
148	Fairfield	B-111	2.7	25x115	0.06	road crossing
150	Franklin	B-111	6.6	25x40	0.02	pipeline crossing
151	Fairfield	B-111	1.14	15x75	0.01	road crossing
152	Fairfield	K-270	3.8	60x250	0.34	HDD
153	Fairfield	B-111	13.4	50x100	0.11	limited TWS
154	Fairfield	B-105	7.6	25x125	0.08	changing work side

Additional Temporary Workspaces Required for the B-System Project						
ATWS ID	**County**	**Line**	**Approx. milepost**	**Approx. dimensions (feet)**	**Approx. area (acres) a/**	**Purpose**
155	Franklin	B-111	12.7	25x300	0.18	pipeline crossing
156	Fairfield	K-270	7.6	8x17	0.004	limited TWS
157	Franklin	B-111	12.6	25x235	0.12	pipeline crossing
158	Fairfield	K-270	3.4	50x160	0.18	HDD
159	Fairfield	K-270	3.4	50x120	0.13	HDD
160	Franklin	B-111	12.4	55x145	0.09	limited TWS
161	Fairfield	K-270	3.4	40x340	0.31	HDD
162	Franklin	B-111	12.4	25x90	0.05	limited TWS
163	Franklin	B-130	0.47	80x120	0.12	limited TWS
164	Fairfield	K-270	2.2	20x25	0.01	limited access
165	Fairfield	K-270	2.2	25x55	0.03	limited access
166	Franklin	B-111	13.4	50x120	0.08	limited TWS
167	Franklin	B-111	4.8	25x30	0.02	limited access
168	Franklin	B-111	4.8	30x75	0.05	limited access
169	Fairfield	B-111	0.57	25x120	0.07	avoid structure
170	Franklin	B-111	9.5	70x480	0.79	road crossing / access
171	Fairfield	B-105	3.7	25x100	0.06	avoid stream
172	Franklin	B-111	8.5	25x155	0.09	avoid structure
173	Franklin	B-111	8.1	25x150	0.08	modify point of delivery
174	Franklin	B-111	8.1	25x25	0.01	road crossing
175	Franklin	B-111	8.1	25x25	0.02	road crossing
176	Fairfield	K-270	7.6	20x115	0.05	build station
177	Fairfield	B-105	7.7	70x185	0.15	rebuild station
178	Fairfield	B-105	12.6	20x300	0.15	build station
179	Fairfield	B-111	1.1	15x30	0.01	road crossing
180	Fairfield	B-111	1.1	25x75	0.06	road crossing
181	Fairfield	B-111	1.1	15x75	0.01	road crossing
182	Fairfield	B-111	1.1	15x100	0.02	road crossing
183	Franklin	B-111	11.2	60x340	0.47	bore/HDD
184	Fairfield	B-105	14.5	15x20	0.004	rebuild station
185	Fairfield	B-105	10,7	25x120	0.03	road crossing

Additional Temporary Workspaces Required for the B-System Project						
ATWS ID	**County**	**Line**	**Approx. milepost**	**Approx. dimensions (feet)**	**Approx. area (acres) a/**	**Purpose**
187	Fairfield	B-105	9.9	150x280	1.0	rebuild station
188	Franklin	B-111	11.7	40x95	0.08	avoid structure
189	Franklin	B-111	11.6	10x1,300	0.3	limited TWS
191	Fairfield	B-111	0.0	4x25	0.002	rebuild station
192	Franklin	B-111	6.6	30x160	0.1	access abandoned line
193	Franklin	B-111	13.6	300x500	1.2	road crossing / access
194	Franklin	B-111	13.6	200x350	0.82	access / equipment room
195	Franklin	B-111	6.6	25x40	0.02	pipeline crossing
Total ATWS: 19.66 acres						
a/ Area of ATWS is based on the actual geometry of the ATWS. Dimensions are approximate.						

Access Roads Required for the B-System Project										
Access Road ID	**Existing or Proposed**	**Temporary or Permanent**	**Line**	**Milepost** a/	**Approx. Length (feet)**	**Approx. Area (acres)** b/	**Land Use** c/	**Road Type**	**Modifications** d/, e/	**Point of Access**
PAR-001A	Existing	Permanent	B-105	0.0	31	0.01	Open	Gravel	I	Pump Station Road
PAR-009 f/	Proposed	Permanent	B-105	7.8	88	0.05	Open	Field	I	Lancaster Circleville Road (SR 188)
PAR-010B	Proposed	Permanent	B-105	9.6	76	0.05	Open	Field	None	Collins Road
TAR-001	Existing	Temporary	B-105	0.1	69	0.04	Open	Gravel	I	Pump Station Road
TAR-002	Existing	Temporary	B-105	0.2	1,099	0.51	Open	Gravel	I	Old Logan Road
TAR-002A	Existing	Temporary	B-105	0.4	1,035	0.59	Agricultural	Gravel	None	Old Logan Road
TAR-002B	Existing	Temporary	B-105	1.4	542	0.31	Agricultural	Gravel	I	Old Logan Road
TAR-003	Existing	Temporary	B-105	2.1	440	0.20	Open	Gravel	None	Brookdale Road
TAR-004	Existing	Temporary	B-105	2.4	767	0.44	Open	Gravel	None	Tarklin Road
TAR-005	Existing	Temporary	B-105	2.6	331	0.19	Open	Gravel	None	Tarklin Road
TAR-006	Existing	Temporary	B-105	3.2	1,480	0.85	Forested Upland	Field	I, ST	Unnamed road leading to Old Logan Road
TAR-007	Existing	Temporary	B-105	3.5	5,540	3.18	Forested Upland	Field	I, ST	Bis Road
TAR-007A	Existing	Temporary	B-105	4.8	371	0.21	Open	Gravel	None	Bis Road
TAR-007B	Existing	Temporary	B-105	5.2	91	0.05	Residential	Paved	None	Mill Road

Access Roads Required for the B-System Project										
TAR-007C	Existing	Temporary	B-105	5.2	16	0.01	Residential	Gravel	None	Mill Road
TAR-008	Existing	Temporary	B-105	6.7	774	0.43	Open	Field	I, ST	Cincinnati Zanesville Road
TAR-010	Existing	Temporary	B-105	9.7	859	0.44	Forested Upland	Field	I	Access to railroad from pipeline
TAR-010A	Proposed	Temporary	B-105	9.8	1,057	0.61	Agricultural	Field	I	Unnamed road leading to Campground Road
TAR-011	Proposed	Temporary	B-105	9.9	113	0.05	Residential	Field	I	Unnamed road leading to Campground Road
TAR-011A	Proposed	Temporary	B-105	10.9	1,175	0.67	Agricultural	Field	I	Campground Road
TAR-012	Proposed	Temporary	B-105	10.6	185	0.08	Open	Field	I	Lithopolis Road (County Hwy 39)
TAR-013	Proposed	Temporary	B-105	11.2	2,256	1.29	Agricultural	Gravel	None	Schwartz Place
TAR-014	Existing	Temporary	B-105	11.6	6,459	3.71	Forested Upland	Gravel Field	I, ST	Old Columbus Road
TAR-015	Existing	Temporary	B-105	12.8	271	0.16	Open	Gravel	None	Columbus Lancaster Road (US 33)
TAR-016	Existing	Temporary	B-105	13.7	59	0.03	Residential	Gravel	None	Plum Road
TAR-016A	Proposed	Temporary	B-105	16.6	243	0.14	Open	Field	I	Allen Road
PAR-019	Existing	Permanent	B-111	0.6	823	0.47	Open / Residential	Field	Gravel / Field	Basil Western Road

Access Roads Required for the B-System Project										
PAR-022	Existing	Permanent	B-111	1.5	332	0.19	Open	Field	I, ST	Basil Western Road
PAR-023	Existing	Permanent	B-111	4.8	1,872	1.07	Open	Field	I	Bowen Road
PAR-023A	Proposed	Permanent	B-111	4.5	31	0.02	Open	Field	I	Unnamed road leading to Bowen Road
PAR-025	Existing	Permanent	B-111	11.2	3,595	1.94	Open	Field	I	Interstate 270
PAR-026	Proposed	Permanent	B-111	12.9	178	0.02	Forested Upland	Field	I, ST	Behm Road
PAR-027	Existing	Permanent	B-111	13.3	1,119	0.64	Residential	Paved / Gravel	None	Watkins Road
PAR-018	Existing	Permanent	B-111	0.2	1,244	0.63	Open / Residential	Gravel	None	Basil Western Road
TAR-020	Existing	Temporary	B-111	0.9	241	0.11	Open	Gravel	None	Basil Western Road
TAR-021	Existing	Temporary	B-111	1.4	278	0.13	Open	Field	I	Basil Western Road
TAR-022A	Existing	Temporary	B-111	4.4	21	0.01	Residential	Paved	None	Busey Road
TAR-022B	Existing	Temporary	B-111	4.4	21	0.01	Residential	Paved	None	Busey Road
TAR-022C	Existing	Temporary	B-111	4.4	21	0.01	Residential	Paved	None	Busey Road
TAR-022D	Existing	Temporary	B-111	4.4	21	0.01	Open	Paved	None	Busey Road
TAR-028	Existing	Temporary	B-130	0.2	199	0.11	Residential	Gravel	None	Bowen Road
TAR-029	Existing	Temporary	B-130	0.04	241	0.14	Open/ Residential	Gravel	None	Bowen Road

Access Roads Required for the B-System Project										
PAR-030	Existing	Permanent	K-270	0.1	2,299	1.32	Agricultural	Gravel	None	Old Millersport Road
PAR-031	Existing	Permanent	K-270	1.1	169	0.10	Open	Gravel	None	Lancaster Newark Road (SR 37)
PAR-032	Existing	Permanent	K-270	1.2	801	0.45	Open	Paved	None	Lancaster Newark Road (SR 37)
PAR-036	Existing	Permanent	K-270	4.7	31	0.02	Agricultural	Field	I	Election House Road
PAR-038	Proposed	Permanent	K-270	6.9	224	0.13	Open	Field	I	Coonpath Road
PAR-039	Proposed	Permanent	K-270	7.6	1,282	0.74	Agricultural	Field	I	Coonpath Road
PAR-039B	Proposed	Permanent	K-270	7.6	38	0.01	Agricultural	Field	I	Coonpath Road
PAR-040	Proposed	Permanent	K-270	3.8	785	0.45	Open	Field	I	Ross Road
TAR-033	Proposed	Temporary	K-270	2.2	629	0.36	Agricultural	Field	I	Stringtown Road
TAR-037	Existing	Temporary	K-270	7.4	2,496	1.43	Residential	Gravel	None	PAR-039 leading to Coonpath Road (CR 31)
TAR-039A	Existing	Temporary	K-270	7.4	194	0.11	Open	Gravel	None	PAR-039 leading to Coonpath Road (CR 31)
TAR-011B	Existing	Temporary	K-270	7.4	992	0.57	Residential	Paved	None	Collins Road

a/ Milepost is estimated based on the point where the access road enters the construction workspace.
b/ Acreage is based on a proposed 25-foot-wide maximum width.
c/ National Land Cover Database
d/ I = improve; ST = side trim
e/ In most cases, permanent modifications to existing access roads would not be made to the entire length of the access road.
f/ Required for future maintenance, repair, and operation of additional B-System pipelines collocated with Line B-105.

Required Staging Areas for the Proposed B-System Project						
Staging Area ID	**County**	**Line**	**Approx. Area for Temporary Use (acres)**	**Milepost**	**Surface Type** a/	**Land Use**
SA-01	Fairfield	K-270	5.8	2.1	C, D	Open
SA-02	Fairfield	B-111	9.2	10.1	R	Residential/ Open
SA-03	Fairfield	B-111	10.1	10.0	P, G	Commercial
SA-04	Fairfield	B-111	2.9	7.4	R	Agricultural
SA-05 b/	Fairfield	B-111	0.1	1.4	G	Open
SA-05 b/	Fairfield	B-111	0.3	1.4	G	Open
SA-08	Franklin	B-111	6.6	7.0	C	Agricultural
SA-09	Franklin	B-111	3.3	8.9	G	Agricultural/ Open
SA-10A	Franklin	B-111	3.4	12.9	R	Open
SA-12	Franklin	B-111	5.9	13.1	G,R	Open
SA-13	Franklin	B-111	2.9	13.1	G	Forested/ Open
Total Acres:			**50.9**			

a/ R = existing rock/gravel surface; G = existing grass field; C = cropland
b/ SA-05 is a single staging area divided by an access road.

APPENDIX C

Blasting Plan

BLASTING PLAN

B-System Project

Franklin and Fairfield Counties, Ohio

June 2016

Columbia Gas Transmission, LLC

BLASTING PLAN

TABLE OF CONTENTS

1.0 INTRODUCTION

This Blasting Plan outlines the procedures and safety measures that the Contractor will adhere to while implementing blasting activities along the pipeline right-of-way during construction of the B-System Project (Project), which will involve the modernization of Columbia's existing B-System through replacement of aged coated pipe with modern coated pipe, the installation of a new pipeline to connect the K-System to the B-System, the abandonment of one pipeline within the B-System, the installation of pig launchers and receivers, and installation of mainline valve (MLV) assemblies and fittings to facilitate pipeline maintenance. The Contractor will be required to submit a Blasting Specification Plan to Columbia Gas Transmission, LLC (Columbia) that is consistent with the provisions in this Blasting Plan. The Contractor's plan, when approved by Columbia will be incorporated into the Contractor's scope of work.

2.0 OBJECTIVE

This Blasting Plan is intended to identify blasting procedures, including safety, use, storage, and transportation of explosives that are consistent with minimum safety requirements as defined by federal (e.g., Title 27 CFR 181 -Commerce in Explosives; Title 49 CFR 177 -Carriage by Public Highway; Title 29 CFR 1926.900 et seq. Sub-part U -Safety and Health Regulations for Construction -Blasting and Use of Explosives; Title 29 CFR 1910.109 – Explosives and Blasting Agents (OSHA); 29 CFR 1926.900-General Provisions and sections 901, 902 and 904-911), state, and local regulations. Additionally this plan is intended to address environmental aspects of blasting activities, and to identify areas of concern along the proposed pipeline route.

3.0 GENERAL REQUIREMENTS

Blasting operations will be conducted by or under the direct and constant supervision of personnel legally licensed and certified to perform such activity in the jurisdiction where blasting occurs. Prior to any blasting activities, the contractor shall provide Columbia with appropriate information documenting the experience, licenses, and permits associated with blasting personnel.

Blasting-related operations including: obtaining, transporting, storing, handling, loading, detonating, and disposing of blasting material; drilling; and ground-motion monitoring shall comply with applicable federal, state, and local regulations, permit conditions and the construction contract.

Blasting for grade or trench excavation shall be used where deemed necessary by a construction expert after examination of the site and in other locations only after other reasonable means of excavation have been used and are unsuccessful in achieving the required results.

Before blasting, a site-specific Blasting Specification Plan must be submitted by the Contractor to Columbia for approval. The site-specific blasting plan must be reviewed by an engineer representing Columbia. The engineer will analyze the data to determine the combined stress level of each affected pipeline and will make recommendations and/or forward approval to Columbia before blasting may commence.

Drilling and blasting shall be done with a Columbia Construction Inspector present. Approval is required to proceed prior to each blast. Approval does not relieve the Contractor from responsibility or liability.

4.0 PRE-BLASTING REQUIRMENTS

Prior to the initiation of blasting operations, Columbia will coordinate with the Ohio Department of Natural Resources, Division of Mineral Resources to ensure compliance with local regulations. The Contractor shall comply with the following:

- Obtain required federal, state, and local permits relating to the transportation, storage, handling, loading, and detonation of explosives.
- Place necessary “one calls” a minimum of 48 hours prior to construction where one-call systems are in place.
- Be responsible for the protection of existing underground facilities.
- Before performing work on or accessing the right-of-way, verify with Columbia that applicable owners have been notified of the impending construction.
- Submit a site-specific Blasting Plan for Columbia’s approval 3 – 5 days prior to execution of blasting activity.
- Notify the local fire marshal of the locations of blasting activities prior to blasting and submit notification to the fire marshal the day of blasting by phone or email.

5.0 SITE-SPECIFIC BLASTING PLANS

Based on the analysis of the Soil Survey Geographic database, approximately 8,600 feet of the pipeline route may cross areas with bedrock at depths of less than 200 cm; however, the absence of recorded shallow bedrock does not preclude the potential of shallow bedrock to exist in other areas.[1] For each area determined to require blasting, a site-specific blasting plan will be created. The Contractor’s site-specific blasting plan shall include at a minimum the following information:

- Blast Supervisor’s name, blasting company name, copy of license, and statement of qualifications; also, the seismograph make and model, operator names, and equipment and sensor locations;
- Site location (milepost and stationing), applicable alignment sheet numbers, and associated rock type and geological structure (solid, layered, or fractured);
- Copies of required federal, state, and local permits (see above);
- Methods and materials, including explosive brand name; explosive type, size, weight per unit, and density; stemming material; tamping method; blasting sequence; use of non-electrical initiation systems for blasting operations; magazine type; and locations for storage of explosives and detonating caps;
- Site dimensions, including explosive depth, distribution, and maximum charge and weight per delay; hole depth, diameter, pattern, and number of holes per delay;
- Dates and hours of conducting blasting; distance and orientation to nearest aboveground and underground structures; schedule identifying when blasting would occur within each waterbody greater than 10 feet wide or within designated coldwater fisheries;

[1] The minimum excavation in areas of consolidated rock will exceed 60 inches to allow for a minimum of 6 inches of bedding or padding material.

- Blasting procedures for:
  - Storing, handling, transporting, loading, and firing explosives;
  - Prevention of misfires, flyrock, fires, noise, and stray current accidental-detonation;
  - Signs, flagmen, and warning signals prior to each blast;
- Locations where the pipeline route:
  - Parallels or crosses an electrical transmission corridor, cable, or pipeline;
  - Parallels or crosses a highway or road;
  - Is within or adjacent to treed areas;
  - Approaches within 150 feet of a water well or spring;
  - Approaches within 1,000 feet of a residence, building, or occupied structure;
- Local notification requirements;
- Procedures for inspections after each blast; and
- Procedures for disposal of waste blasting material.

6.0 MONITORING

During blasting operations the contractor will be required to monitor operations in the following manner:

- The Contractor shall provide seismographic equipment to measure the peak particle velocity (PPV) of blasts in the vertical, horizontal, and longitudinal directions. Seismic monitoring can only be discontinued if the blasting schedule and blasting performance consistently produce PPVs at the pipeline that are lower than the maximum allowable limit.
- The contractor shall measure the PPV at the adjacent pipeline, water wells, potable springs, and above ground structures within 150 feet of the blasting.
- The contractor shall complete a Blasting Log Record after each blast and submit a copy to a Columbia representative.

7.0 SAFETY

7.1 Protection of Aboveground and Underground Structures

Where blasting is determined to be required, Columbia will identify municipal water mains proposed for crossing and will consult the local water authority. Reports of identified crossings will include location by milepost, landowner, status, and results of contacts with the water authority.

The Contractor shall exercise control to prevent damage to aboveground and underground structures, including buildings, pipelines, utilities, springs, water wells, and septic systems. The Contractor shall implement the following procedures:

- If blasting occurs within 150 feet of an identified water well or potable spring, water flow performance and water quality testing shall be conducted before blasting. If the water well or spring is damaged, the well or spring shall be repaired or otherwise restored, or the well

owner shall be compensated for damages. The Contractor shall provide an alternative potable water supply to the landowner until repairs occur. Locations of water wells or systems within 150 feet of blasting activities are indicated on Columbia's construction alignment sheets. If blasting occurs within 150 feet of an identified septic system, and damage occurs to the septic system as a result of Columbia's blasting activity, Columbia will repair or replace the septic system or compensate the landowner, as appropriate.

- If blasting occurs within 150 feet of aboveground structures, the Contractor and Columbia's representative will inspect structures before and after blasting. If damage occurs to the aboveground structure as a result of Columbia's blasting activity, the owner will be compensated.
- The contractor shall be responsible for the ultimate resolution of damage claims resulting from blasting. Such liability is not restricted by the 150-foot inspection requirement cited above.
- Blasting will not be allowed within 15 feet of an existing pipeline, unless specifically authorized by Columbia.
- Holes that have contained explosive material shall not be re-drilled. Holes shall not be drilled where danger exists of intersecting another hole containing explosive material.
- Blasting mats or padding shall be used on shots where necessary to prevent scattering of loose rock onto adjacent property and to prevent damage to nearby structures and overhead utilities.
- Blasting shall not begin until occupants of nearby buildings, stores, residences, places of business, places of public gathering, and farmers have been notified by the contractor sufficiently in advance to protect personnel, property, and livestock. The contractor shall notify all such parties at least 48 hours prior to blasting.
- Blasting in or near environmentally sensitive areas, such as streams and wildlife areas, may include additional restrictions.
- Blasting shall be subject to the following limitations:
    - Maximum peak particle velocity shall be 5.0 inches per second in any of three mutually perpendicular axes, measured at the lesser distance of the nearest facility or the edge of the permanent easement;
    - Maximum drill size shall be 2.5 inches, unless approved by Columbia;
    - Maximum quantity of explosive per delay shall be governed by the recorded measurements as influenced by work site conditions;
    - Explosive agents and ignition methods shall be approved by Columbia. Ammonium nitrate-fuel oil and other free flowing explosives and blasting agents are not acceptable and shall not be used;
    - Drill holes shall not be left loaded overnight; and
    - Good stemming material shall be used in all holes.
- The drilling pattern shall be set in a manner to achieve smaller rock fragmentation in order to use as much of the blasted rock as possible for backfill material after the pipe has been padded in accordance with the specifications. The Contractor shall submit the proposed drilling pattern to Columbia for approval.

- Under pipeline crossings and other areas where drilling and blasting is required within 15 feet of existing facilities:
  - The diameter of drill holes shall be 3 inches and the maximum diameter of the charges shall be 2 inches;
  - The number of holes per shot shall range from 1 to 26 and shall be subject to review and approval by Columbia; and
  - There shall be an appropriate delay between charges to attain desired fragmentation.

7.2 Protection of Personnel

The Contractor shall include in its procedures the federal, state, county, and local safety requirements for blasting. The Contractor's procedures shall address, as a minimum, the following requirements:

- Only authorized, qualified, and experienced personnel shall handle explosives.
- No explosive materials shall be located where they may be exposed to flame, excessive heat, sparks, or impact. Smoking, firearms, matches, open flames, and heat-and spark-producing devices shall be prohibited in or near explosive magazines or while explosives are being handled, transported, or used.
- A code of blasting signals shall be established, posted in conspicuous places and utilized during blasting operations. Employee training shall be conducted on the use and implementation of the code.
- The contractor shall use every reasonable precaution, including, but not limited to, visual and audible warning signals, warning signs, flag person, and barricades, to ensure personnel safety.
- Warning signs with lettering a minimum of 4 inches in height on a contrasting background shall be erected and maintained at approaches to the blast area.
- Flaggers shall be stationed on roadways passing within 1,000 feet of the blast area to stop traffic during blasting operations.
- Personnel not involved in the actual detonation shall be moved to a safe distance away from the shot as determined by the Blaster-in-Charge. This distance can and will change from shot to shot, depending on site/rock conditions.
- No loaded holes shall be left unattended or unprotected. No explosives or blasting agent shall be abandoned.
- In the case of a misfire, the blaster shall provide proper safeguards for personnel until the misfire has been re-blasted or safely removed.
- The exposed areas of the blast shall be matted wherever practicable. In cases where such a procedure is not deemed to be feasible, the Contractor shall submit an alternative procedure for review by Columbia, and the site in question must be visited and examined by the consultant before approval is granted.
- Columbia may employ two-way radios for communication between vehicles and office facilities. The contractor shall advise Columbia and other pipeline contractors of any need to cease use of such equipment during blasting activities.

- Loading and blasting activity shall cease, and personnel in and around the blast area shall retreat to a position of safety during the approach and progress of an electrical storm irrespective of the type of explosives or initiation system used. THIS PROCEDURE IS A MAJOR SAFETY PRECAUTION AND WILL ALWAYS BE OBSERVED. Explosive materials, electrical initiation systems, and non-electric initiation systems are susceptible to premature initiation by lightning.
- Previous blast areas shall be inspected to verify the absence of misfires. No drilling may commence until such inspection occurs. If a misfire occurs adjacent to a hole to be drilled, the misfire shall be cleared by the blaster using whatever techniques are required by the situation prior to commencement of drilling. If a misfire occurs at some distance from the drilling area, drilling may be stopped while clearing preparations are underway. When the misfire is to be cleared by re-shooting, drilling shall be shut down and personnel evacuated to a place of safety prior to detonation.
- Transportation of explosives shall be in accordance with applicable federal, state, and local laws and regulations. Vehicles used to transport explosives shall be in proper working condition and equipped with tight wooden or non-sparking metal floors and sides. If explosives are carried in an open-bodied truck, they shall be covered with a waterproof and flame-resistant tarpaulin. Wiring shall be fully insulated to prevent short-circuiting and at least two fire extinguishers shall be carried. The truck shall be plainly marked to identify its cargo so that the public may be adequately warned. Metal, flammable, or corrosive substances shall not be transported in the same vehicle with explosives. There shall be no smoking, and unauthorized or unnecessary personnel shall not be allowed in the vehicle. Competent, qualified personnel shall load and unload explosives into or from the vehicle.
- No sparking metal tools shall be used to open kegs or wooden cases of explosives. Metallic slitters shall be used to open fiberboard cases, provided the metallic slitter does not come in contact with the metallic fasteners of the case. There shall be no smoking, no matches, no open lights, or other fire or flame nearby while handling or using explosives. Explosives shall not be placed where they are subject to flame, excessive heat, sparks, or impact. Partial cases or packages of explosives shall be re-closed after use. No explosives shall be carried in the pockets or clothing of personnel. The wires of an electric blasting cap shall not be tampered with in any way. Wires shall not be uncoiled. The use of electric blasting caps shall not be permitted during dust storms or near other sources of large charges of static electricity. Uncoiling of the wires or use of electric caps shall not be permitted near radio-frequency transmitters. The firing circuit shall be completely insulated from the ground or other conductors.
- No blast shall be fired without a positive signal from the person in charge. This person shall have made certain that surplus explosives are in a safe place; persons, vehicles, and/or boats are at a safe distance; and adequate warning has been given. Adequate warning of a blast shall consist of, but not be limited to, the following:
    - Notification to nearby homeowners and local agencies, if necessary;
    - Stopping of vehicular and/or pedestrian traffic near the blast site; and
    - Signal given by an air horn, whistle, or similar device, using standard warning signals.
- Only authorized and necessary personnel shall be present where explosives are being handled or used.
- Condition of the hole shall be checked with a wooden tamping pole prior to loading. Surplus explosives shall not be stacked near working areas during loading. Detonating fans shall be

cut from the spool before loading the balance of the charge into the hole. No explosives shall be forced into a bore hole past an obstruction. Loading shall be done by a blaster holding a valid license or by personnel under his direct supervision.

- Fly-rock leaving the right-of-way shall be collected and disposed of at disposal sites approved by Columbia. This work shall not be left to the cleanup crew.

7.3 Protection of Threatened and Endangered Species

NiSource/Columbia, in conjunction with with the U.S. Fish and Wildlife Service (USFWS), has developed a Habitat Conservation Plan (HCP) to streamline federal-listed species consultations. Columbia plans to utilize the HCP for this Project. Requests for information regarding the potential presence of state- and federal-listed threatened and endangered species were sent to the USFWS and the Ohio Department of Natural Resources. Several species were listed as potentially occurring in the Project area. Field surveys were conducted in 2015 and 2016 to ascertain the extent to which these species or their habitat are present. Columbia will continue to coordinate with the regulatory agencies to develop and implement a plan to minimize or avoid potential impacts. The contractor shall be responsible for following these plans in order to minimize or avoid potential impacts due to blasting.

7.4 Lightning Hazard

A risk of accidental detonation caused by lightning strikes exists at any time the workplace is experiencing an electrical storm and there are loaded holes on site. If this hazard is judged to exist by the Columbia representative, work shall discontinue at operations and workers shall be moved to secure positions away from the loaded holes. Furthermore, workers shall not return to the work site until the storm has passed and the Columbia representative has indicated it is clear to return.

Columbia’s Contractor shall have on site approved lightning detectors (model SD-2508 manufactured by Electronics Div. of S.D.I. International, Model 350 manufactured by Thomas Instruments Inc., Skyscan Lighting Detector manufactured by Skyscan Technologies or equivalent) capable of measuring the degree of electrical activity as a storm approaches and the distance to the storm front from the instrument on the right-of-way.

8.0 STORAGE REQUIREMENTS

Explosives, blasting agents, and initiation devices shall be stored in locked magazines that have been located, constructed, approved, and licensed in accordance with local, state, and federal regulations. Magazines shall be dry, well-ventilated, reasonably cool (painting of the exterior with a reflective color), bullet and fire resistant, and kept clean.

Initiation devices shall not be stored in the same box, container, or magazine with other explosives. Explosives, blasting agents, or initiation devices shall not be stored in wet or damp areas; near oil, gasoline, or cleaning solvents; or near sources of heat radiators, steam pipes, stoves, etc. No metal or metal tools shall be stored in the magazine. There shall be no smoking, matches, open lights, or other fire or flame inside or within 50 feet of storage magazines or explosive materials. The loading and unloading of explosive materials into or out of the magazine shall be done in a business-like manner with no loitering, horseplay, or prank playing.

Magazines shall be kept locked unless explosives are being delivered or removed by authorized personnel. Admittance shall be restricted to the magazine keeper, blasting supervisor, or licensed

blaster. Magazine construction shall meet the requirements of the Bureau of Alcohol, Tobacco and Fire Arms (ATF) P5400.7 “Explosives Law and Regulations” and shall be in accordance with local, state, or federal regulations and the Blaster’s Handbook.

Accurate and current records shall be kept of the explosive material inventory to ensure that oldest stocks are utilized first and to satisfy regulatory requirements for immediate notification of any loss or theft. Magazine records shall reflect the quantity of explosions removed, the amount returned, and the net quantity used at the blasting site.

When explosive materials are taken from the storage magazine, they shall be kept in the original containers until used. Small quantities of explosive materials may be placed in day boxes, powder chests, or detonator boxes. Any explosive material not used at the blast site shall be returned to the storage magazine and replaced in the original container as soon as possible.

Magazine locations shall be in accordance with local, state, or federal regulations. Where no regulations apply, magazines shall be located in accordance with the latest edition of the 175th Anniversary Edition of the Blaster’s Handbook and ATF P5400-7 Explosives Law and Regulations.

Magazines shall be marked in minimum 3-inch high letters with the words “DANGER EXPLOSIVES” prominently displayed on all sides and roof.

APPENDIX D

Water Supply Wells and Septic Systems within 150 feet of Project Workspaces

Water Supply Wells and Septic Systems within the Vicinity of the Project						
County	**Pipeline**	**Approx. MP**	**Feature Type**	**Approximate Distance from Proposed Workspace (feet)**	**Approximate Distance from Proposed Centerline (feet)**	**Direction from Centerline**
Fairfield	Line B-105	0.2	Water Well/Septic	75	85	East
Fairfield	Line B-105	0.7	Water Well/Septic	30	60	East
Fairfield	Line B-105	2.9	Water Well/Septic	50	62	West
Fairfield	Line B-105	0.8	Water Well/Septic	15	40	North
Fairfield	Line B-105	5.2	Water Well/Septic	50	85	North
Fairfield	Line B-105	6.1	Water Well/Septic	92	112	Northeast
Fairfield	Line B-105	6.1	Water Well/Septic	125	175	Southwest
Fairfield	Line B-105	6.1	Water Well/Septic	132	176	Southwest
Fairfield	Line B-105	6.1	Water Well/Septic	125	175	East
Fairfield	Line B-105	6.1	Water Well/Septic	120	140	Southeast
Fairfield	Line B-105	13.7	Water Well/Septic	150	175	East
Fairfield	Line B-105	15.4	Water Well/Septic	112	136	East
Fairfield	Line B-111	0.2	Water Well/Septic	130	201	Southwest
Fairfield	Line B-111	0.7	Water Well/Septic	100	125	South
Fairfield	Line B-111	0.9	Water Well/Septic	140	165	South
Fairfield	Line B-111	1.1	Water Well/Septic	125	135	South
Fairfield	Line B-111	1.1	Water Well/Septic	50	129	South
Fairfield	Line B-111	1.2	Water Well/Septic	50	75	North
Fairfield	Line B-111	1.3	Water Well/Septic	0	65	North
Fairfield	Line B-111	1.3	Water Well	22	57	South
Fairfield	Line B-111	1.4	Water Well	125	150	South

Water Supply Wells and Septic Systems within the Vicinity of the Project						
County	**Pipeline**	**Approx. MP**	**Feature Type**	**Approximate Distance from Proposed Workspace (feet)**	**Approximate Distance from Proposed Centerline (feet)**	**Direction from Centerline**
Fairfield	Line B-111	4.1	Water Well/Septic	125	150	East
Franklin	Line B-111	4.2	Water Well	22	57	West
Franklin	Line B-111	4.3	Septic/Water Well	125	150	West
Franklin	Line B-111	4.4	Water Well	75	100	West
Franklin	Line B-111	4.4	Water Well	25	0	West
Franklin	Line B-111	4.5	Septic	85	110	West
Franklin	Line B-111	4.9	Water Well/Septic	100	125	North
Franklin	Line B-111	8.1	Water Well/Septic	0	0	North
Franklin	Line B-111	9	Water Well/Septic	65	286	East
Franklin	Line B-130	0.0	Water Well/Septic	50	75	South
Franklin	Line B-130	0.1	Water Well/Septic	25	50	East
Franklin	Line B-130	0.1	Water Well/Septic	25	50	East
Franklin	Line B-130	0.1	Water Well/Septic	25	50	East
Franklin	Line B-130	0.1	Water Well/Septic	25	50	East
Franklin	Line B-130	0.2	Water Well/Septic	25	50	East
Franklin	Line B-130	0.2	Water Well/Septic	25	50	East
Franklin	Line B-130	0.2	Water Well/Septic	25	50	East
Franklin	Line B-130	0.3	Water Well/Septic	25	50	East
Franklin	Line B-130	0.4	Water Well/Septic	25	50	East
Franklin	Line B-130	0.5	Water Well/Septic	25	50	East
Franklin	Line B-130	0.53	Water Well/Septic	80	111	North

Water Supply Wells and Septic Systems within the Vicinity of the Project						
County	**Pipeline**	**Approx. MP**	**Feature Type**	**Approximate Distance from Proposed Workspace (feet)**	**Approximate Distance from Proposed Centerline (feet)**	**Direction from Centerline**
Fairfield	Line K-270	0.4	Water Well/Septic	117	225	South
Fairfield	Line K-270	1.1	Water Well/Septic	110	170	South
Fairfield	Line K-270	2	Water Well/Septic	120	227	Southeast
Fairfield	Line K-270	3.2	Water Well/Septic	146	146	North

APPENDIX E

Waterbodies Crossed by the Project

Waterbodies Crossed by the B-System Project						
Pipeline	**Approximate milepost**	**Waterbody Identification Number**	**Waterbody Name**	**Flow Regime**	**FERC Classification**	**Impact Type**
Line B-105	0.1	S-SMNY-02	UNT to Hocking River	Perennial	Minor	Pipeline Removal
Line B-105	1.4	S-SMNY-04	UNT to Hocking River	Intermittent	Minor	Pipeline Removal
Line B-105	3.2	S-SMJF-33	UNT to Hocking River	Ephemeral	Minor	Temporary Access Road
Line B-105	3.2	S-SJMF-32	UNT to Hocking River	Intermittent	Minor	Temporary Access Road
Line B-105	3.5	S-SMJF-09	UNT to Hocking River	Perennial	Minor	Temporary Equipment Crossing
Line B-105	6.7	S-SMJF-21	Hunters Run	Perennial	Intermediate	Pipeline Removal
Line B-105	7.7	S-SMJF-23	UNT to Hocking River	Perennial	Minor	Pipeline Removal
Line B-105	8.4	S-SMJF-24	UNT to Hocking River	Perennial	Minor	Pipeline Removal
Line B-105	10.6	S-SMJF-31	Hocking River	Perennial	Intermediate	Pipeline Removal
Line B-105	11.6	S-TQME-01	Abandoned Canal	Perennial	Minor	Pipeline Removal
Line B-105	15.4	S-TQME-02	UNT to Walnut Creek	Perennial	Minor	Pipeline Removal
Line B-111	0.1	S-TQME-09	UNT to Walnut Creek	Perennial	Intermediate	Open Cut - Dry Crossing
Line B-111	0.5	S-TQME-07	UNT to Walnut Creek	Intermittent	Minor	Open Cut - Dry Crossing
Line B-111	0.9	S-TQME-06	UNT to Walnut Creek	Intermittent	Minor	Open Cut - Dry Crossing
Line B-111	1.3	S-TQME-12	UNT to Sycamore Creek	Perennial	Intermediate	Open Cut - Dry Crossing
Line B-111	1.6	S-TQME-11	Sycamore Creek	Perennial	Intermediate	HDD
Line B-111	3.1	S-TQME-13	UNT to Walnut Creek	Perennial	Minor	Open Cut - Dry Crossing
Line B-111	3.2	S-TQME-13A	UNT to Walnut Creek	Ephemeral	Minor	Open Cut - Dry Crossing
Line B-111	3.2	S-TQME-13A	UNT to Walnut Creek	Ephemeral	Minor	Open Cut - Dry Crossing
Line B-111	4	S-TQME-14	Tussing Ditch	Intermittent	Minor	Open Cut - Dry Crossing
Line B-111	6.4	S-RJ-01	UNT to George Creek	Perennial	Minor	Open Cut - Dry Crossing
Line B-111	6.4	S-RJ-04	UNT to George Creek	Intermittent	Minor	Open Cut - Dry Crossing

Waterbodies Crossed by the B-System Project						
Pipeline	**Approximate milepost**	**Waterbody Identification Number**	**Waterbody Name**	**Flow Regime**	**FERC Classification**	**Impact Type**
Line B-111	6.5	S-DSJF-12	UNT to George Creek	Ephemeral	Minor	Open Cut - Dry Crossing
Line B-111	6.5	S-DSJF-10	George Creek	Perennial	Intermediate	Open Cut - Dry Crossing
Line B-111	6.5	S-DSJF-11	UNT to George Creek	Intermittent	Minor	Open Cut - Dry Crossing
Line B-111	6.6	S-DSJF-09	UNT to George Creek	Intermittent	Minor	Open Cut - Dry Crossing
Line B-111	6.6	S-RJ-03	George Creek	Perennial	Intermediate	Open Cut - Dry Crossing
Line B-111	6.6	S-RJ-02	UNT to George Creek	Intermittent	Minor	Open Cut - Dry Crossing
Line B-111	8.9	S-DSJF-13	UNT to Backlick Creek	Ephemeral	Minor	Open Cut - Dry Crossing
Line B-111	10.6	S-RJ-05	UNT to Big Walnut Creek	Intermittent	Intermediate	Open Cut - Dry Crossing
Line B-111	10.6	S-RJ-06	UNT to Big Walnut Creek	Intermittent	Minor	Open Cut - Dry Crossing
Line B-111	10.7	S-RJ-07	Big Walnut Creek	Perennial	Intermediate	HDD
Line B-111	13.1	S-RJ-10A	UNT to Big Walnut Creek	Intermittent	Minor	Conventional Bore
Line B-111	13.2	S-RJ-09	UNT to Big Walnut Creek	Ephemeral	Minor	Open Cut - Dry Crossing
Line B-130	0.3	S-DSJF-08	Tussing Ditch	Perennial	Minor	Open Cut - Dry Crossing
Line K-270	0	S-DSTQ-02	UNT to Ewing Run	Perennial	Minor	Open Cut - Dry Crossing
Line K-270	0	S-DSTQ-01	Ewing Run	Perennial	Intermediate	Open Cut - Dry Crossing
Line K-270	0	S-DSTQ-02	UNT to Ewing Run	Perennial	Minor	Open Cut - Dry Crossing
Line K-270	0.1	S-DSTQ-03	UNT to Ewing Run	Intermittent	Minor	Open Cut - Dry Crossing
Line K-270	0.3	S-DSTQ-05	UNT to Ewing Run	Perennial	Intermediate	Open Cut - Dry Crossing
Line K-270	0.3	S-DSTQ-04	UNT to Ewing Run	Ephemeral	Minor	Open Cut - Dry Crossing
Line K-270	0.9	S-DSTQ-08	UNT to Fetters Run	Intermittent	Minor	Open Cut - Dry Crossing
Line K-270	1.4	S-DSTQ-09	UNT to Fetters Run	Perennial	Minor	Open Cut - Dry Crossing
Line K-270	1.9	S-DSTQ-10	Fetters Run	Perennial	Intermediate	Open Cut - Dry Crossing

Waterbodies Crossed by the B-System Project						
Pipeline	**Approximate milepost**	**Waterbody Identification Number**	**Waterbody Name**	**Flow Regime**	**FERC Classification**	**Impact Type**
Line K-270	1.9	S-DSTQ-10	Fetters Run	Perennial	Intermediate	Open Cut - Dry Crossing
Line K-270	3.2	S-DSTQ-11	UNT to Hocking River	Ephemeral	Minor	Open Cut - Dry Crossing
Line K-270	3.2	S-SMJF-35	UNT to Hocking River	Intermittent	Minor	Open Cut - Dry Crossing
Line K-270	3.5	P-DSDQ-01	Pond	Pond	Major	HDD
Line K-270	5.4	S-TQSM-02A	UNT to Hocking River	Perennial	Minor	Open Cut - Dry Crossing
Line K-270	6.3	S-TQSM-03	UNT to Hocking River	Perennial	Intermediate	Open Cut - Dry Crossing
HDD = horizontal directional drill UNT = unnamed tributary						

APPENDIX F

Summary of Wetlands along the Project

Summary of Wetlands along the Project						
Pipeline	**Wetland identification number**	**Classification**	**Approximate milepost**	**Length of crossing at centerline (feet) a/**	**Wetland Impacts (acre) b/**	
					Construction	**Operation**
Line B-105	W-SMNY-05	PFO	1.4	82	0.05	0.05
Line B-105	W-SMNY-06	PEM	2	25	0.01	0.00
Line B-105	W-SMNY-12	PEM	3	160	0.05	0.00
Line B-105	W-SMNY-13	PEM	3.1	146	0.13	0.00
Line B-105	W-SMNY-13	PEM	3.2	234	0.46	0.00
Line B-105	W-SMNY-13	PFO	3.2	0	0.01	0.01
Line B-105	W-SMJF-05	PEM	3.5	451	0.58	0.00
Line B-105	W-SMJF-04	PEM	3.9	207	0.05	0.00
Line B-105	W-SMJF-12	PFO	6.7	67	0.10	0.10
Line B-105	W-SMJF-15	PEM	7.7	32	0.08	0.00
Line B-105	W-SMJF-17	PEM	8.4	81	0.08	0.00
Line B-105	W-SMJF-20	PEM	9.6	0	0.02	0.00
Line B-105	W-SMJF-21	PFO	9.6	241	0.30	0.30
Line B-105	W-SMJF-21	PFO	9.7	37	0.10	0.10
Line B-105	W-SMJF-21	PSS	9.7	144	0.25	0.00
Line B-105	W-SMJF-22	PEM	10.1	39	0.09	0.00
Line B-105	W-TQSM-002	PEM	10.7	0	0.01	0.00
Line B-105	W-TQSM-002	PEM	10.7	0	0.03	0.00
Line B-105	W-MBTP-01	PFO	11.6	13	0.02	0.02
Line B-105	W-TQME-1	PEM	11.6	236	0.49	0.00
Line B-105	W-TQME-7	PEM	14.9	84	0.06	0.00
Line B-111	W-TQME-12	PEM	3.1	47	0.02	0.00
Line B-111	W-TQME-11	PEM	3.2	70	0.04	0.00
Line B-111	W-TQME-15	PEM	4	48	0.05	0.00

Summary of Wetlands along the Project						
Pipeline	**Wetland identification number**	**Classification**	**Approximate milepost**	**Length of crossing at centerline (feet)** a/	**Wetland Impacts (acre)** b/	
					Construction	**Operation**
Line B-111	W-RJ-01	PSS	5.9	288	0.33	0.00
Line B-111	W-DSJF-09	PEM	6.5	18	0.02	0.00
Line B-111	W-SMJF-30	PEM	8.2	0	0.01	0.00
Line B-111	W-SMJF-31	PEM	8.3	220	0.37	0.00
Line B-111	W-DSJF-10	PEM	8.9	0	0.03	0.00
Line B-111	W-RJ-03	PFO	9.7	28	0.18	0.18
Line B-111	W-RJ-03a	PEM	9.7	10	0.02	0.00
Line B-111	W-RJ-05a	PEM	11.1	0	0.02	0.00
Line B-121	W-DSJF-12	PUB	0.05	0	0.02	0.00
Line B-121	W-DSJF-12	PEM	0.05	37	0.02	0.00
Line K-270	W-DSTQ-02	PEM	1.4	32	0.04	0.00
Line K-270	W-DSTQ-04	PEM	3.2	25	0.05	0.00
Line K-270	W-SMJF-26	PEM	4.2	84	0.13	0.00
Line K-270	W-SMJF-27	PEM	4.2	0	0.02	0.00
Line K-270	W-DSTQ-08	PSS	4.4	0	0.26	0.11
Line K-270	W-DSTQ-08	PEM	4.4	234	0.16	0.00
Line K-270	W-TQSM-04	PEM	7.3	18	0.03	0.00
Total:				**3,438**	**4.79**	**0.87**

a/ A length of crossing at centerline equal to zero indicates that a wetland is not crossed by the Project centerline, but is within the Project workspace.

b/ Construction acreage of wetlands impacts is equivalent to acres of wetlands impacted during construction that are within the permanent easement and temporary workspaces. Operational acreage of wetland impacts is equivalent to acres of impacts on PSS and PFO wetlands that are within the permanent easement and may be maintained in an herbaceous state, as specified by the FERC Procedures. There would be no operational impact on PEM wetlands, because there would be no change in the pre- and post-construction vegetation cover type.

APPENDIX G

Priority Bird Species within the Project Area

Priority Bird Species within the Project Area				
Species	**Appalachian Mountains (BCR 28)**	**Eastern Tallgrass Prairie (BCR 22)**	**Reason for Listing/Species Information**	**Habitat**
Highest Priority Species in Ohio				
American Black Duck	m	m	Habitat loss, competition and disease	Herbaceous and wooded wetlands
Short-billed Dowitcher	m	m	High conservation threats across range, regionally threatened	Forages in shallow water
Solitary Sandpiper	m	m	High conservation threats across range, regionally threatened	Forages on wet mudflats
American Woodcock	b, m	b, m	Habitat loss	Early successional forest
King Rail	m	b, m	Habitat loss	Wet meadow with open water
Blue-winged Warbler	b	b	Conversion and degradation of habitat	Scrub
Cerulean Warbler	b	b	High conservation threats across range, regionally threatened	Deciduous Forest
Worm-eating Warbler	b	b	Habitat loss	Deciduous Forest
Henslow's Sparrow	b	b	Loss and degradation of grasslands	Grassland
Wood Thrush	b	b	Degradation and fragmentation of breeding ground, predation and parasitism by brown-headed cowbird	Deciduous Forest/Mixed Forest
High Priority Species in Ohio				
Buff Breasted Sandpiper	m	m	High conservation threats across range, regionally threatened	Forages on dry mudflats
Greater Yellow Legs	m	m	High conservation threats across range, regionally threatened	Forages in shallow water
Piping Plover	-	m	Habitat alteration	Forages on beaches
Upland Sandpiper	m	b, m	Habitat loss and fragmentation, invasive species	Breeds and forages in prairies

Priority Bird Species within the Project Area				
Species	**Appalachian Mountains (BCR 28)**	**Eastern Tallgrass Prairie (BCR 22)**	**Reason for Listing/Species Information**	**Habitat**
Wilson's Phalarope	m	m	Loss of large grassland-wetland complexes	Forages in moderately deep water
Black Tern	m	b, m	Wetland loss and degradation from invasive species	Shallow semi-permanent marsh, hemi-marsh
Common Tern	m	b, m	Habitat loss and human disturbance	Islands with limited vegetation
American Bittern	b, m	b, m	Loss and degradation of habitat	Wet meadow with open water
Northern Bobwhite	y	y	Habitat loss	Open habitats including grassland and pine forests
Northern Harrier	y, b	y	Habitat loss and reduction in prey	Large tracts of wetlands and grasslands
Short-eared Owl	w	w	Habitat loss and fragmentation	Grassland
Whip-poor-will	b	b	Habitat loss, nest predation	Deciduous Forest/Mixed Forest/Jack Pine
Black-billed Cuckoo	b	b	Sensitive to pesticide use, urbanization	Deciduous forest
Red-headed Woodpecker	b, w	b, w	Lack of suitable nesting sites, fire suppression, invasive shrubs	Deciduous forest and savannah
Loggerhead shrike	b	b	Sensitive to pesticide use, urbanization, habitat loss	Open woodland and scrub
Bell's Vireo	-	b	High conservation threats across range, regionally threatened	Scrub
Acadian Flycatcher	b	b	Habitat loss and fragmentation	Mature deciduous forests along waterbodies
Prairie Warbler	b	b	Loss of breeding habitat	Scrub
Prothonotary Warbler	b	b	Loss and degradation of forested wetlands, nest parasitism	Forested Wetland

Priority Bird Species within the Project Area				
Species	**Appalachian Mountains (BCR 28)**	**Eastern Tallgrass Prairie (BCR 22)**	**Reason for Listing/Species Information**	**Habitat**
Kentucky Warbler	b	b	Loss and fragmentation of bottomland and upland forests, nest parasitism	Deciduous Forest
Hooded Warbler	b	b	High conservation threats across range, regionally threatened	Mature and scrubby forests
Louisiana Waterthrush	b	b	Loss and degradation of forested wetlands	Deciduous Forest
Bobolink	b	b	Habitat loss	Grassland and fields
Dickcissel	b	b	High conservation threats across range, regionally threatened	Grassland
Field Sparrow	y	y	Habitat loss, development	Open habitat with low perches
Grasshopper Sparrow	b	b	Habitat loss, fragmentation and degradation	Open grassland and prairie

b = breeding, m = migratory, w = winter resident, y = year-round resident

Sources: OBCI (2010; 2016)
Upper Mississippi River and Great Lakes Region Joint Venture (2007a-d)
The Cornell Lab of Ornithology (2016)

APPENDIX H

Multi-Species Habitat Conservation Plan Checklist

INTERAGENCY ENDANGERED SPECIES ACT CONSULTATION CHECKLIST FOR THE NISOURCE MULTI-SPECIES HABITAT CONSERVATION PLAN

APPLICANT SECTION

ACTION AGENCY (Recipient): Federal Energy Regulatory Commission

OTHER INVOLVED FEDERAL AGENCIES: US Army Corp of Engineers

PROJECT NAME: B System Project

PROJECT I.D. NO. (if applicable): CP-16-498-000

NiSource and Columbia Pipeline Group (Columbia) has provided the attached documentation to involved federal agencies in accordance with "Project Review and Documentation Protocols" of the NiSource/Columbia Pipeline MSHCP Consultation Implementation Guidance [4]. This documentation describes if and how the project is covered by the NiSource Multi-Species Habitat Conservation Plan (MSHCP), programmatic biological opinion (BO), and/or programmatic concurrence letters. In addition, the action agency could refer to the following sections and/or pages of the MSHCP, BO, and/or concurrence letters to verify that the activity is covered by the MSHCP and associated Section 7 consultation under the Endangered Species Act (ESA):

Reference:

- NiSource MSHCP Chapter 2.3 Covered Lands (pp 2-11)
- NiSource MSHCP Chapter 2.4 Covered Activities (pp 11- 25)
- NiSource/Columbia Pipeline MSHCP Consultation Implementation Guidance Quick Reference for Species Consultation Categories (pp 5-6)
- NiSource/Columbia Pipeline Group's, "Habitat Conservation Program Best Management Practices Guidebook", v.1.0, March 12, 2014 (specific pages for each species are referenced in the attached application material)

By signing below, Columbia certifies that its proposed activity, as outlined in the accompanying application or notification, is consistent with the MSHCP, BO, and/or concurrence letters.

William Simmons — November 16, 2016

Columbia Pipeline representative — Date

☒ By checking the box, Columbia is notifying the involved federal agencies that the proposed activity will require additional ESA Section 7 consultation because part of the activity may include: (1) any of the 10 Likely to Adversely Affect (LAA) species that are not included in the MSHCP[5], (2) species not addressed in the MSHCP, BO, or concurrence letters[5], (3) non-covered activities, (4) activities outside of the covered lands, or (5) activities otherwise deviating from the MSHCP, BO, and/or concurrence letters. Additional biological information about the species, habitat, or effects of the action may be required. The federal agencies can contact the U.S. Fish and

[4] See NiSource/Columbia Pipeline MSHCP Consultation Implementation Guidance. May 8, 2014. Pg 11.
[5] See NiSource/Columbia Pipeline MSHCP Consultation Implementation Guidance. May 8, 2014. Pg. 5.

Wildlife Service's NiSource/Columbia MSHCP Implementation Coordinator (Karen Herrington, 850.348.6495, karen_herrington@fws.gov) for more information.

FEDERAL AGENCY SECTION

This checklist serves as the official documentation that each action agency involved has completed its Section 7 responsibilities under the ESA for NiSource and Columbia Pipeline Group (Columbia) projects conducted as described in the MSHCP, BO, and/or concurrence letters. Every agency that receives a copy of this checklist should fill it out. The MSHCP, BO, and concurrence letters can be found on the U.S. Fish and Wildlife Service (FWS) NiSource website:

http://www.fws.gov/midwest/endangered/permits/hcp/nisource/index.html

Quick access to the required Avoidance and Minimization Measures (AMMs) and Best Management Practices (BMP) can be found in the Columbia BMP Guidebook, which is also posted on the above website.

1. Does the federal action occur entirely within the covered lands as described in the MSHCP?
   X Yes. Go to #2.
   _____ No. Additional consultation is required because the action is not consistent with the MSHCP, BO, and/or concurrence letters. If the project may affect listed species, contact your local FWS Field Office.

2. Is the proposed action as described in the MSHCP, programmatic BO, and/or concurrence letter?
   X Yes. Go to #3.
   _____ No. Additional consultation is required because the action is not consistent with the MSHCP, BO, and/or concurrence letters. If the project may affect listed species, contact your local FWS Field Office.

3. Does the proposed action pose any effects on species not included in the MSHCP, BO or concurrence letters[6]?
   _ Yes. Additional consultation is required because the species was not included in the MSHCP, BO, and/or concurrence letters. If the project may affect listed species not included in the consultation, contact your local FWS Field Office
   X No. Go to #4.

4. Does the proposed action include MSHCP species[6] only?
   _____ Yes. Go to #6.
   ___X__ No. Go to #5.

5. Does the proposed action include any of the 10 Likely to Adversely Affect (LAA) species that are not included in the MSHCP (i.e., LAA non-MSHCP species) as addressed in the BO?
   ___X__ Yes. Additional consultation is required. Enter into tiered consultation with your local FWS office for any LAA non-MSHCP species. Eastern Massasuga Rattlesnake- not in modeled habitat, Rayed Bean/ Rabbitsfoot/Snuffbox- Section 7 consultation is ongoing.
   _____ No. Go to #6.

[6] See NiSource/Columbia Pipeline MSHCP Consultation Implementation Guidance. May 8, 2014. Pg. 5

6. Are all mandatory AMMs and/or BMPs for each species included in the action?[7]
   __X___ Yes. Go to #7.
   _____ No. Additional consultation is required because the proposed action is not consistent with the MSHCP, BO, and/or concurrence letter. Request additional information from Columbia about AMMs.

7. Are all non-mandatory AMMs and/or BMPs for each species included in the action?
   ___X__ Yes. Consultation is complete because the proposed action is consistent with the MSHCP, BO, and/or concurrence letter.
   _____ No. Go to #8.

8. Are reasons provided for not including non-mandatory AMMs for each species?[8]
   _____ Yes. Consultation is complete.
   _____ No. Request justification from Columbia, and attach documentation here. Once justification is provided, consultation is complete.

It is the federal agency's responsibility to comply with ESA Section 7 requirements for this project. The programmatic BO and/or the concurrence letters cover most of Columbia's activities implemented under the MSHCP within the covered lands. By signing below, the federal agency verifies that the proposed action within the agency's authority complies with the programmatic BO, and/or concurrence letters. If additional Section 7 consultation is required, the U.S. Fish and Wildlife Service's supplemental concurrence letter or biological opinion will be attached to this documentation.

AGENCY COMMENTS:

Additional Section 7 consultation required for three non-MSHCP species (rabbitsfoot, rayed bean, and snuffbox). Completion of Section 7 consultation is required prior to construction (see condition #16).

Federal Agency representative

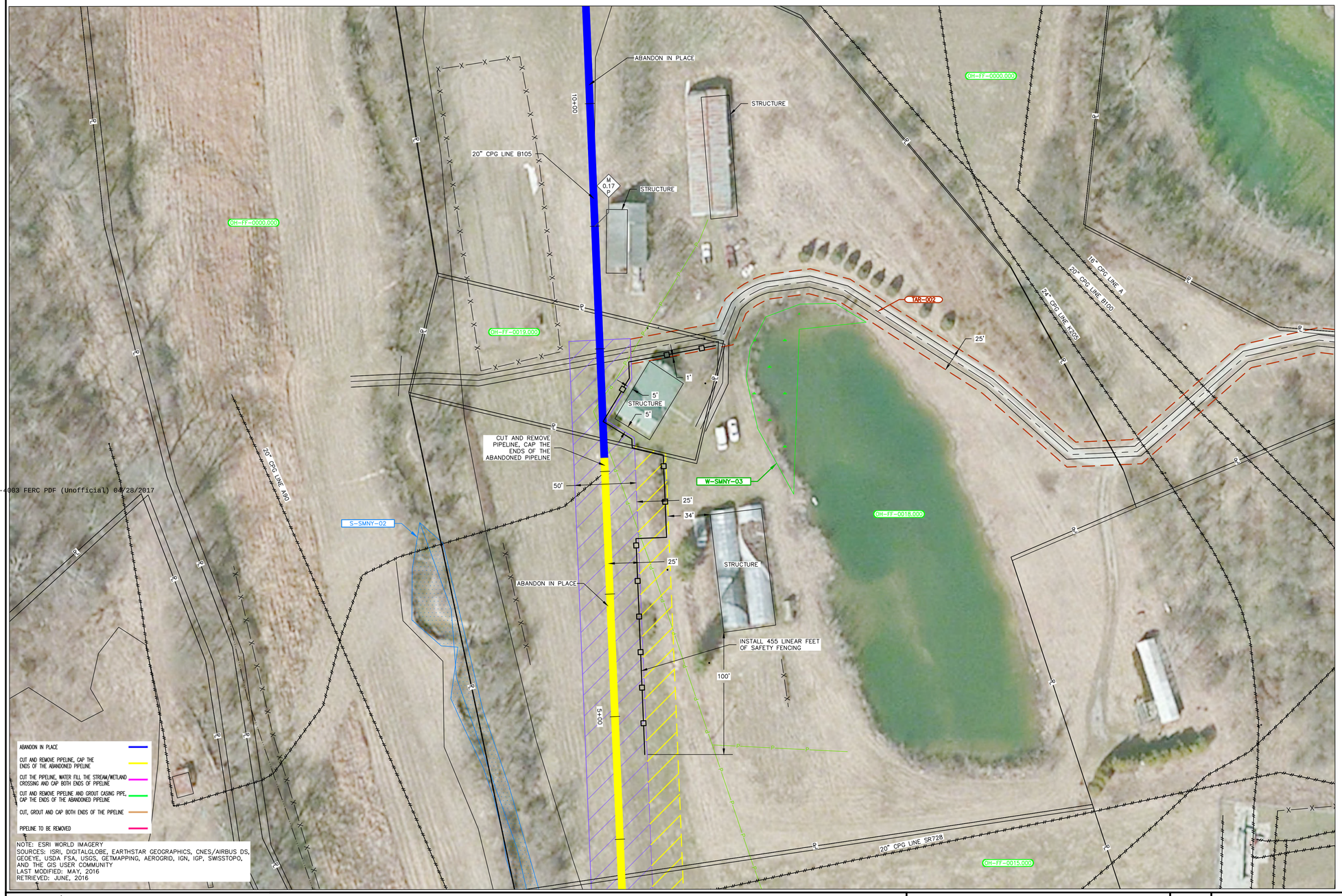
1/10/2017
Date

[7] See NiSource/Columbia Pipeline Group's, "Habitat Conservation Program Best Management Practices Guidebook", v.1.0, March 12, 2014.
[8] Per the MSHCP, explanation for non-mandatory AMM use is not required for the Indiana Bat.

APPENDIX I

Site-Specific Residential Construction Drawings

TRACTS OH-FF-0018.000 & OH-FF-0019.000
GEORGANNE K. DAUBENMIRE
FAIRFIELD COUNTY, OHIO



NOTE: ESRI WORLD IMAGERY
SOURCES: ISRI, DIGITALGLOBE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, GEOEYE, USDA FSA, USGS, GETMAPPING, AEROGRID, IGN, IGP, SWISSTOPO, AND THE GIS USER COMMUNITY
LAST MODIFIED: MAY, 2016
RETRIEVED: JUNE, 2016

DESCRIPTION

THIS DRAWING DOCUMENTS MITIGATION MEASURES THAT WILL BE IMPLEMENTED FOR ALL RESIDENCES WITHIN 50 FEET OF THE PROPOSED CONSTRUCTION WORK AREA. CONTRACTOR SHALL COMPLY WITH THE FOLLOWING CONSTRUCTION MITIGATION REQUIREMENTS IN ADDITION TO THOSE LISTED IN THE CONSTRUCTION SPECIFICATIONS.

CONSTRUCTION REQUIREMENTS

1. CONTRACTOR SHALL ERECT AND MAINTAIN A SAFETY FENCE BETWEEN THE CONSTRUCTION ZONE AND THE ADJACENT RESIDENCES EXTENDING 100 FEET ON EITHER SIDE OF THE RESIDENCE TO ENSURE THAT EQUIPMENT, MATERIALS AND SPOIL REMAIN WITHIN THE CONSTRUCTION WORK AREA.
2. A MINIMUM OF 25 FEET WILL BE MAINTAINED BETWEEN THE RESIDENCE AND CONSTRUCTION WORK AREA FOR A DISTANCE OF 100 FEET ON EITHER SIDE OF THE RESIDENCE. IF THE FACILITY MUST BE WITHIN 25 FEET OF A RESIDENCE, IT MUST BE INSTALLED SUCH THAT THE TRENCH DOES NOT REMAIN OPEN OVERNIGHT.
3. MATURE TREES AND LANDSCAPING WILL NOT BE REMOVED FROM WITHIN THE EDGE OF THE CONSTRUCTION WORK AREA UNLESS NECESSARY FOR SAFE OPERATION OF CONSTRUCTION EQUIPMENT OR AS SPECIFIED IN LANDOWNER AGREEMENTS.
4. OTHER EXISTING PHYSICAL FEATURES THAT NEED TO BE PROTECTED WILL BE ENCLOSED IN SAFETY FENCE TO AVOID DISTURBANCE DURING CONSTRUCTION.
5. TRENCH SHALL NOT BE EXCAVATED UNTIL PIPELINE IS READY FOR INSTALLATION AND SHALL BE BACKFILLED IN SAME DAY AS PIPE INSTALLATION IN THIS AREA. ALL OPEN DITCHES SHALL BE BARRICADED/FENCED OFF OR PLATED WHEN CONSTRUCTION ACTIVITIES ARE NOT IN PROGRESS.
6. IMMEDIATELY AFTER BACKFILLING THE TRENCH, ALL LAWN AND LANDSCAPING WILL BE RESTORED TO FINAL RESTORATION, OR TEMPORARY RESTORATION PENDING WEATHER AND SOIL CONDITIONS. IF SEASONAL OR WEATHER CONDITIONS PREVENT COMPLIANCE WITH THESE TIME FRAMES, TEMPORARY EROSION CONTROLS MUST BE MONITORED AND MAINTAINED UNTIL CONDITIONS ALLOW COMPLETION OF RESTORATION.
7. CONTRACTOR SHALL UTILIZE WATER TRUCKS AS NECESSARY TO MINIMIZE FUGITIVE DUST FROM CONSTRUCTION ACTIVITIES NEAR RESIDENCES/BUSINESSES.
8. ACCESS TO RESIDENCES BY CAR WILL BE MAINTAINED AT ALL TIMES, OR OTHER ACCOMMODATIONS WILL BE MADE WITH EACH RESPECTIVE LANDOWNER.
9. CONTRACTOR SHALL MAINTAIN AGREED UPON ACCESS TO THE IMPACTED AREA DURING CONSTRUCTION.
10. CONTRACTOR SHALL LIMIT WORK IN THIS AREA TO DAYLIGHT HOURS, UNLESS OTHERWISE AGREED UPON WITH LANDOWNER/OCCUPANT.
11. LANDOWNER/OCCUPANT SHALL BE NOTIFIED OF PROPOSED CONSTRUCTION ACTIVITIES PRIOR TO CONSTRUCTION WORK.

ISSUED FOR 90% REVIEW
DATE: 08/30/2016

Ohio Utilities Protection Service Call 811 before you dig

Hatch Mott MacDonald

LEGEND
- MILEPOST (N 1.00 P)
- ROUTE
- EXISTING COLUMBIA PIPELINE
- FOREIGN PIPELINE
- PERMANENT ROW
- X FENCE
- TEMPORARY WORKSPACE
- ADDITIONAL TEMPORARY WORKSPACE
- ACCESS ROAD
- B105 ABANDONMENT TEMPORARY WORKSPACE
- CONTRACTOR / PIPE YARD
- PAR-001 ACCESS ROAD NUMBER
- ST-CO-001.000 PROPERTY TRACT NUMBER
- WPADJC002 WETLAND ID
- SPADJC002 WATERBODY ID
- U UNDERGROUND CABLE
- P OVERHEAD POWER LINE
- W WATERLINE
- COUNTY BORDER
- WETLAND
- WATERBODY
- SAFETY FENCE

SCALE: 1" = 40'
40 0 20 40

No.	REVISIONS	APPROVED BY	DATE
P1	PRELIMINARY	MM	04/01/16
P2	ISSUED FOR 90% REVIEW	MM	08/30/16

DWG. NO.	REFERENCE
D7002-ALG-001	ALIGNMENT SHEET

PROJECT DELIVERY
PROJECT ENGINEERING
P.O. BOX 1273 CHARLESTON, WV 25325-1273
1700 MACCORKLE AVENUE SE, CHARLESTON, WV 25314

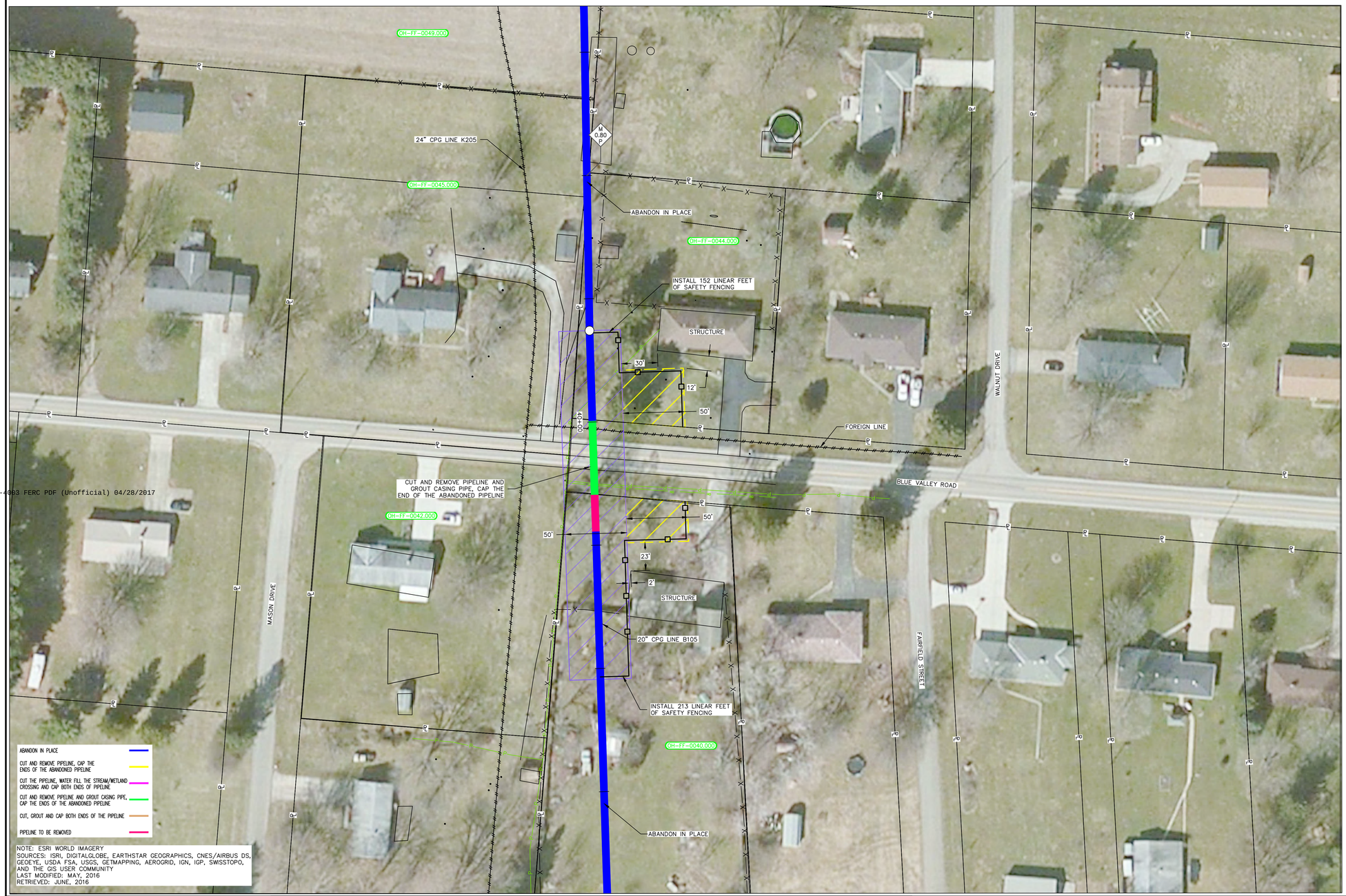
Columbia Gas Transmission

B-SYSTEM MODERNIZATION PROJECT

TITLE: MP 0.17 RESIDENTIAL – DETAIL
PROPOSED 20" LINE B105 ABANDONMENT
FAIRFIELD COUNTY, OHIO

DRAWN BY:	MM	DATE: 03/21/2016	DRAWING NUMBER	SHEET	ISSUE
PROJECT NUMBER	21506		D7002-RSD-001	1 OF 45	P2
WORK ORDER NUMBER	46256				

TRACTS OH-FF-0040.000 & OH-FF-0044.000
BEVERLY S. RATHBONE & HENRY O. & NANCY H. DUNG
FAIRFIELD COUNTY, OHIO



NOTE: ESRI WORLD IMAGERY
SOURCES: ISRI, DIGITALGLOBE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, GEOEYE, USDA FSA, USGS, GETMAPPING, AEROGRID, IGN, IGP, SWISSTOPO, AND THE GIS USER COMMUNITY
LAST MODIFIED: MAY, 2016
RETRIEVED: JUNE, 2016

DESCRIPTION

THIS DRAWING DOCUMENTS MITIGATION MEASURES THAT WILL BE IMPLEMENTED FOR ALL RESIDENCES WITHIN 50 FEET OF THE PROPOSED CONSTRUCTION WORK AREA. CONTRACTOR SHALL COMPLY WITH THE FOLLOWING CONSTRUCTION MITIGATION REQUIREMENTS IN ADDITION TO THOSE LISTED IN THE CONSTRUCTION SPECIFICATIONS.

CONSTRUCTION REQUIREMENTS

1. CONTRACTOR SHALL ERECT AND MAINTAIN A SAFETY FENCE BETWEEN THE CONSTRUCTION ZONE AND THE ADJACENT RESIDENCES EXTENDING 100 FEET ON EITHER SIDE OF THE RESIDENCE TO ENSURE THAT EQUIPMENT, MATERIALS AND SPOIL REMAIN WITHIN THE CONSTRUCTION WORK AREA.
2. A MINIMUM OF 25 FEET WILL BE MAINTAINED BETWEEN THE RESIDENCE AND CONSTRUCTION WORK AREA FOR A DISTANCE OF 100 FEET ON EITHER SIDE OF THE RESIDENCE. IF THE FACILITY MUST BE WITHIN 25 FEET OF A RESIDENCE, IT MUST BE INSTALLED SUCH THAT THE TRENCH DOES NOT REMAIN OPEN OVERNIGHT.
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11. LANDOWNER/OCCUPANT SHALL BE NOTIFIED OF PROPOSED CONSTRUCTION ACTIVITIES PRIOR TO CONSTRUCTION WORK.

ISSUED FOR 90% REVIEW
DATE: 08/30/2016

Ohio Utilities Protection Service Call 811 before you dig

Hatch Mott MacDonald

LEGEND

- MILEPOST (M 1.00 P)
- ROUTE
- EXISTING COLUMBIA PIPELINE
- FOREIGN PIPELINE
- PERMANENT ROW
- FENCE
- TEMPORARY WORKSPACE
- ADDITIONAL TEMPORARY WORKSPACE
- ACCESS ROAD
- B105 ABANDONMENT TEMPORARY WORKSPACE
- CONTRACTOR / PIPE YARD
- ACCESS ROAD NUMBER
- PROPERTY TRACT NUMBER
- WETLAND ID
- WATERBODY ID
- UNDERGROUND CABLE
- OVERHEAD POWER LINE
- WATERLINE
- COUNTY BORDER
- WETLAND
- WATERBODY
- SAFETY FENCE

SCALE: 1" = 40'

No.	REVISIONS	APPROVED BY	DATE
P1	PRELIMINARY	MM	04/01/16
P2	ISSUED FOR 90% REVIEW	MM	08/30/16

DWG. NO.	REFERENCE
D7002-ALG-001	ALIGNMENT SHEET

PROJECT DELIVERY
PROJECT ENGINEERING
P.O. BOX 1273 CHARLESTON, WV 25325-1273
1700 MACCORKLE AVENUE SE, CHARLESTON, WV 25314

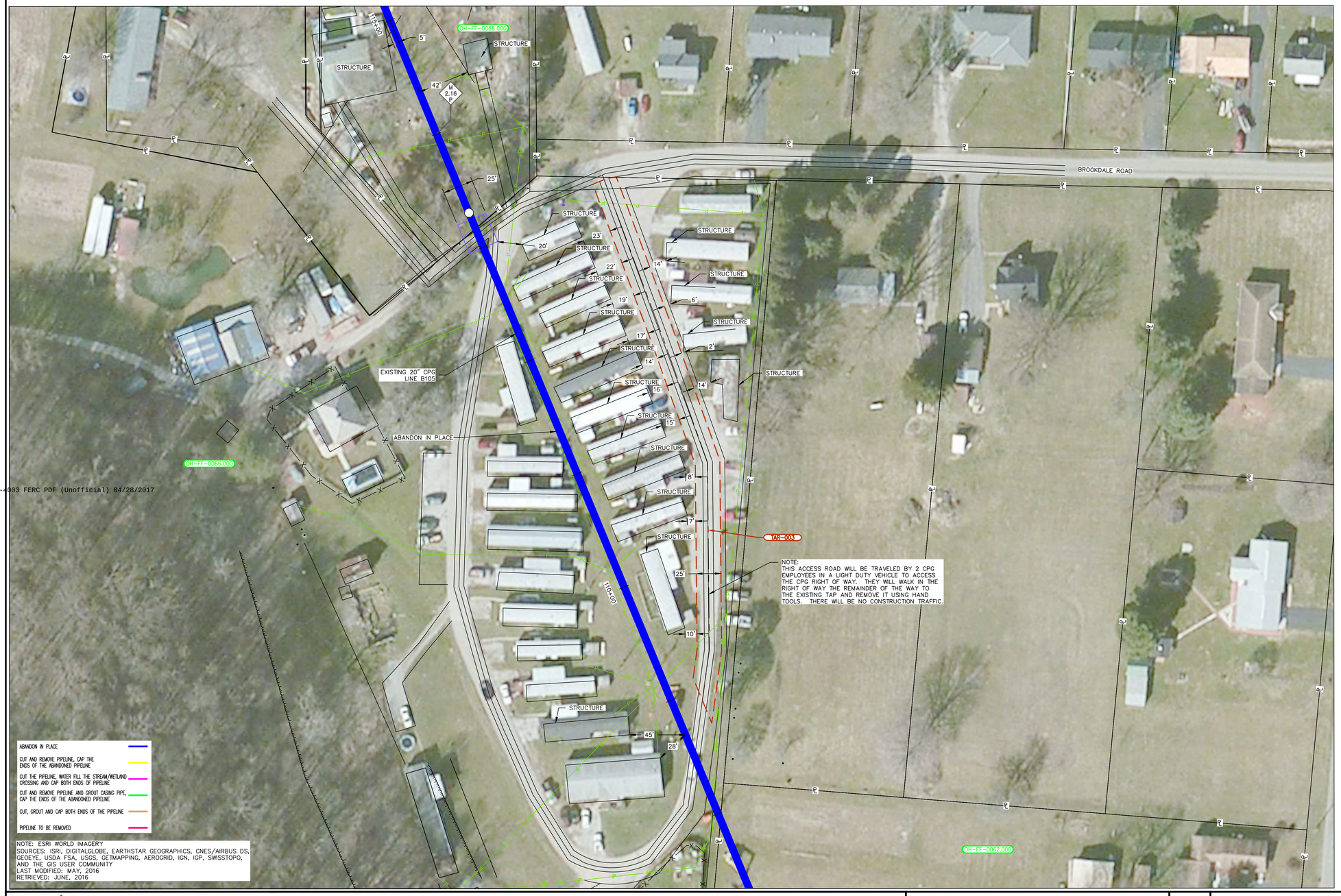
Columbia Gas Transmission

B-SYSTEM MODERNIZATION PROJECT

TITLE: MP 0.80 RESIDENTIAL – DETAIL
PROPOSED 20" LINE B105 ABANDONMENT
FAIRFIELD COUNTY, OHIO

DRAWN BY:	MM	DATE 03/23/2016	DRAWING NUMBER	SHEET	ISSUE
PROJECT NUMBER	21506		D7002-RSD-002	2 OF 45	P2
WORK ORDER NUMBER	46256				

TRACTS OH-FF-0066.000
SHARON K. CRIST
FAIRFIELD COUNTY, OHIO



DESCRIPTION

THIS DRAWING DOCUMENTS MITIGATION MEASURES THAT WILL BE IMPLEMENTED FOR ALL RESIDENCES WITHIN 50 FEET OF THE PROPOSED CONSTRUCTION WORK AREA. CONTRACTOR SHALL COMPLY WITH THE FOLLOWING CONSTRUCTION MITIGATION REQUIREMENTS IN addition TO THOSE LISTED IN THE CONSTRUCTION SPECIFICATIONS.

CONSTRUCTION REQUIREMENTS

1. CONTRACTOR SHALL ERECT AND MAINTAIN A SAFETY FENCE BETWEEN THE CONSTRUCTION ZONE AND THE ADJACENT RESIDENCES EXTENDING 100 FEET ON EITHER SIDE OF THE RESIDENCE TO ENSURE THAT EQUIPMENT, MATERIALS AND SPOIL REMAIN WITHIN THE CONSTRUCTION WORK AREA.
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ISSUED FOR 90% REVIEW
DATE: 08/30/2016

Ohio Utilities Protection Service Call 811 before you dig

Hatch Mott MacDonald

LEGEND

- MILEPOST (M 1.00 P)
- ROUTE
- EXISTING COLUMBIA PIPELINE
- FOREIGN PIPELINE
- PERMANENT ROW
- X FENCE
- TEMPORARY WORKSPACE
- ADDITIONAL TEMPORARY WORKSPACE
- ACCESS ROAD
- B105 ABANDONMENT TEMPORARY WORKSPACE
- CONTRACTOR / PIPE YARD
- PAR-001 ACCESS ROAD NUMBER
- ST-CO-001.000 PROPERTY TRACT NUMBER
- WPADJC002 WETLAND ID
- SPADJC002 WATERBODY ID
- U UNDERGROUND CABLE
- P OVERHEAD POWER LINE
- W WATERLINE
- COUNTY BORDER
- WETLAND
- WATERBODY
- SAFETY FENCE

SCALE: 1" = 40'
40 0 20 40

No.	REVISIONS	APPROVED BY	DATE
P1	PRELIMINARY	MM	04/01/16
P2	ISSUED FOR 90% REVIEW	MM	08/30/16

DWG. NO.	REFERENCE
D7002-ALG-003	ALIGNMENT SHEET

PROJECT DELIVERY
PROJECT ENGINEERING
P.O. BOX 1273 CHARLESTON, WV 25325-1273
1700 MACCORKLE AVENUE SE, CHARLESTON, WV 25314

Columbia Gas Transmission

B-SYSTEM MODERNIZATION PROJECT

TITLE: MP 2.16 RESIDENTIAL – DETAIL
PROPOSED 20" LINE B105 ABANDONMENT
FAIRFIELD COUNTY, OHIO

DRAWN BY:	MM	DATE: 03/23/2016	DRAWING NUMBER	SHEET	ISSUE
PROJECT NUMBER	21506		D7002-RSD-003	3 OF 45	P2
WORK ORDER NUMBER	46256				

TRACTS 1 & 2 OF 0040070000
KELLY W. MONTGOMERY
FAIRFIELD COUNTY, OHIO

DESCRIPTION

THIS DRAWING DOCUMENTS MITIGATION MEASURES THAT WILL BE IMPLEMENTED FOR ALL RESIDENCES WITHIN 50 FEET OF THE PROPOSED CONSTRUCTION WORK AREA. CONTRACTOR SHALL COMPLY WITH THE FOLLOWING CONSTRUCTION MITIGATION REQUIREMENTS IN ADDITION TO THOSE LISTED IN THE CONSTRUCTION SPECIFICATIONS.

CONSTRUCTION REQUIREMENTS

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11. LANDOWNER/OCCUPANT SHALL BE NOTIFIED OF PROPOSED CONSTRUCTION ACTIVITIES PRIOR TO CONSTRUCTION WORK.

ISSUED FOR 90% REVIEW
DATE: 08/30/2016

Ohio Utilities Protection Service Call 811 before you dig

Hatch Mott MacDonald

LEGEND

M 1.00 P MILEPOST
ROUTE
EXISTING COLUMBIA PIPELINE
FOREIGN PIPELINE
PERMANENT ROW
X FENCE
TEMPORARY WORKSPACE
ADDITIONAL TEMPORARY WORKSPACE
ACCESS ROAD
B105 ABANDONMENT TEMPORARY WORKSPACE
CONTRACTOR / PIPE YARD
PAR-001 ACCESS ROAD NUMBER
ST-CO-001.002 PROPERTY TRACT NUMBER
WPADJC002 WETLAND ID
SPADJC002 WATERBODY ID
U UNDERGROUND CABLE
P OVERHEAD POWER LINE
W WATERLINE
COUNTY BORDER
WETLAND
WATERBODY
SAFETY FENCE

SCALE: 1" = 40'
40 0 20 40

No.	REVISIONS	APPROVED BY	DATE
1	PRELIMINARY	MM	04/01/16
2	ISSUED FOR 90% REVIEW	MM	08/30/16

DWG. NO.	REFERENCE
D7002-ALG-003	ALIGNMENT SHEET
D7002-ALG-004	ALIGNMENT SHEET

PROJECT DELIVERY
PROJECT ENGINEERING
P.O. BOX 1273 CHARLESTON, WV 25325-1273
1700 MACCORKLE AVENUE SE, CHARLESTON, WV 25314

Columbia Gas Transmission

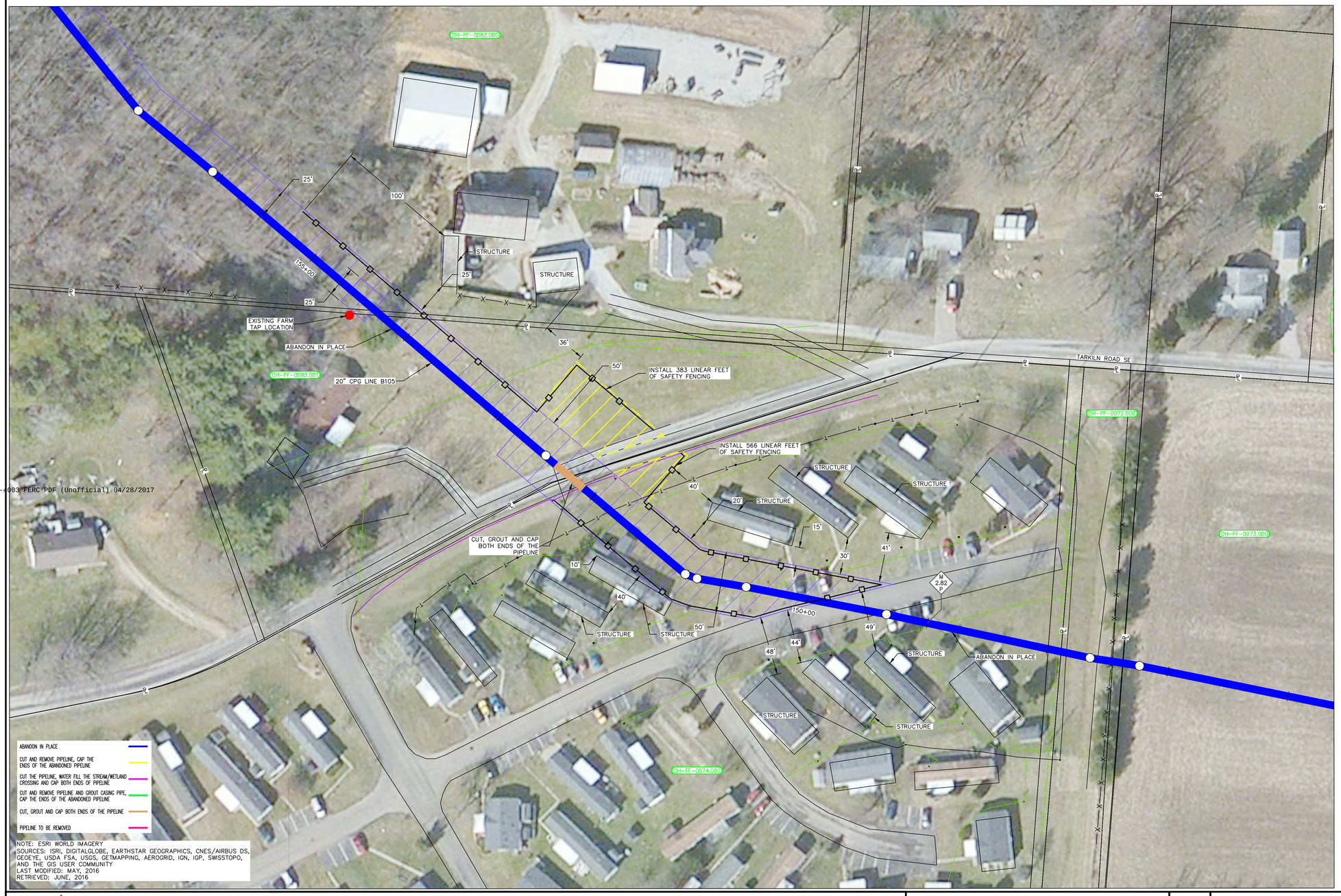
B-SYSTEM MODERNIZATION PROJECT

TITLE: MP 2.42 RESIDENTIAL – DETAIL
PROPOSED 20" LINE B105 ABANDONMENT
FAIRFIELD COUNTY, OHIO

DRAWN BY:	DATE	DRAWING NUMBER	SHEET	ISSUE
MM	03/23/2016	D7002-RSD-004	4 OF 45	P2

PROJECT NUMBER: 21506
WORK ORDER NUMBER: 46256

TRACTS OH-FF-0074.000, OH-FF-0083.000 & OH-FF-0083.001
RUSTIC RIDGE, LLC, ROBERT & SHAWNA S. VICKROY, LAWRENCE E. & REBECCA A. ALSPAUGH
FAIRFIELD COUNTY, OHIO



DESCRIPTION

THIS DRAWING DOCUMENTS MITIGATION MEASURES THAT WILL BE IMPLEMENTED FOR ALL RESIDENCES WITHIN 50 FEET OF THE PROPOSED CONSTRUCTION WORK AREA. CONTRACTOR SHALL COMPLY WITH THE FOLLOWING CONSTRUCTION MITIGATION REQUIREMENTS IN ADDITION TO THOSE LISTED IN THE CONSTRUCTION SPECIFICATIONS.

CONSTRUCTION REQUIREMENTS

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ISSUED FOR 90% REVIEW
DATE: 08/30/2016

Ohio Utilities Protection Service Call 811 before you dig

Hatch Mott MacDonald

LEGEND
MILEPOST; EXISTING COLUMBIA PIPELINE; FOREIGN PIPELINE; PERMANENT ROW; ROUTE; FENCE; TEMPORARY WORKSPACE; ADDITIONAL TEMPORARY WORKSPACE; ACCESS ROAD; B105 ABANDONMENT TEMPORARY WORKSPACE; CONTRACTOR / PIPE YARD; ACCESS ROAD NUMBER; PROPERTY TRACT NUMBER; WETLAND ID; WATERBODY ID; UNDERGROUND CABLE; OVERHEAD POWER LINE; WATERLINE; COUNTY BORDER; WETLAND; WATERBODY; SAFETY FENCE

SCALE: 1" = 40'

No.	REVISIONS	APPROVED BY	DATE
P1	PRELIMINARY	MM	04/01/16
P2	ISSUED FOR 90% REVIEW	MM	08/30/16

DWG. NO.	REFERENCE
D7002-ALG-004	ALIGNMENT SHEET

PROJECT DELIVERY
PROJECT ENGINEERING
P.O. BOX 1273 CHARLESTON, WV 25325-1273
1700 MACCORKLE AVENUE SE, CHARLESTON, WV 25314

Columbia Gas Transmission

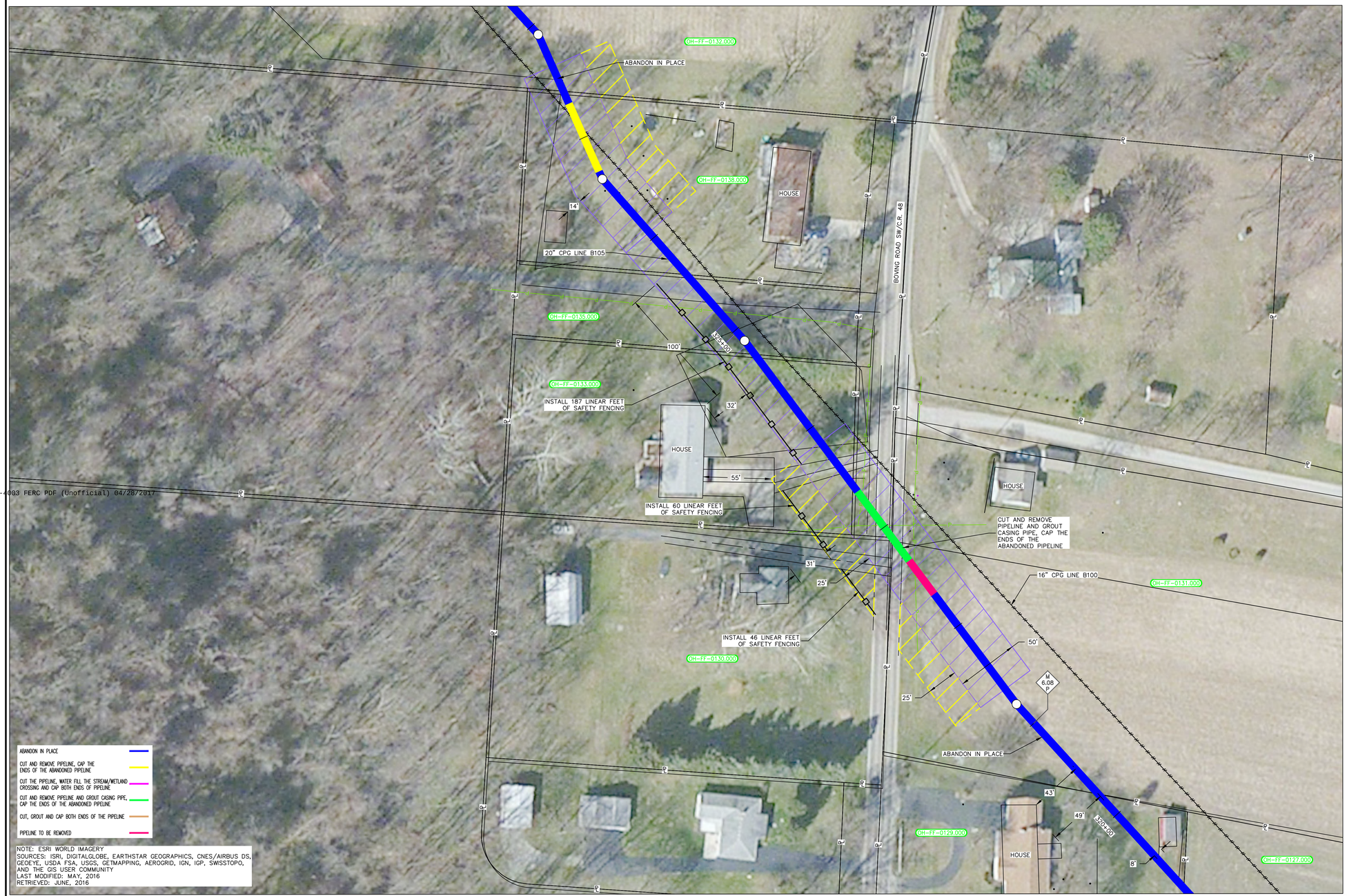
B-SYSTEM MODERNIZATION PROJECT

TITLE: MP 2.82 RESIDENTIAL – DETAIL
PROPOSED 20" LINE B105 ABANDONMENT
FAIRFIELD COUNTY, OHIO

DRAWN BY:	DATE	DRAWING NUMBER	SHEET	ISSUE
MM	03/24/2016	D7002-RSD-005	5 OF 45	P2

PROJECT NUMBER: 21506
WORK ORDER NUMBER: 46256

TRACTS OH-FF-0133.000, OH-FF-0130.000
ROGER T. & BARBARA K. SMITH, JOSEPH J. & PATRICIA A. PATTERSON
FAIRFIELD COUNTY, OHIO



DESCRIPTION

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ISSUED FOR 90% REVIEW
DATE: 08/30/2016

Ohio Utilities Protection Service Call 811 before you dig

Hatch Mott MacDonald

LEGEND

- M 1.00 P — MILEPOST
- ROUTE
- EXISTING COLUMBIA PIPELINE
- FOREIGN PIPELINE
- PERMANENT ROW
- X — FENCE
- TEMPORARY WORKSPACE
- ADDITIONAL TEMPORARY WORKSPACE
- ACCESS ROAD
- B105 ABANDONMENT TEMPORARY WORKSPACE
- CONTRACTOR / PIPE YARD
- PAR-001 — ACCESS ROAD NUMBER
- ST-CO-001.000 — PROPERTY TRACT NUMBER
- WPADJC002 — WETLAND ID
- SPADJC002 — WATERBODY ID
- UNDERGROUND CABLE
- P — OVERHEAD POWER LINE
- W — WATERLINE
- COUNTY BORDER
- WETLAND
- WATERBODY
- SAFETY FENCE

SCALE: 1" = 40'

40 0 20 40

No.	REVISIONS	APPROVED BY	DATE
P	PRELIMINARY	MM	04/01/16
P2	ISSUED FOR 90% REVIEW	MM	08/30/16

DWG. NO.	REFERENCE
D7002-ALG-007	ALIGNMENT SHEET

PROJECT DELIVERY
PROJECT ENGINEERING
P.O. BOX 1273 CHARLESTON, WV 25325-1273
1700 MACCORKLE AVENUE SE, CHARLESTON, WV 25314

Columbia Gas Transmission

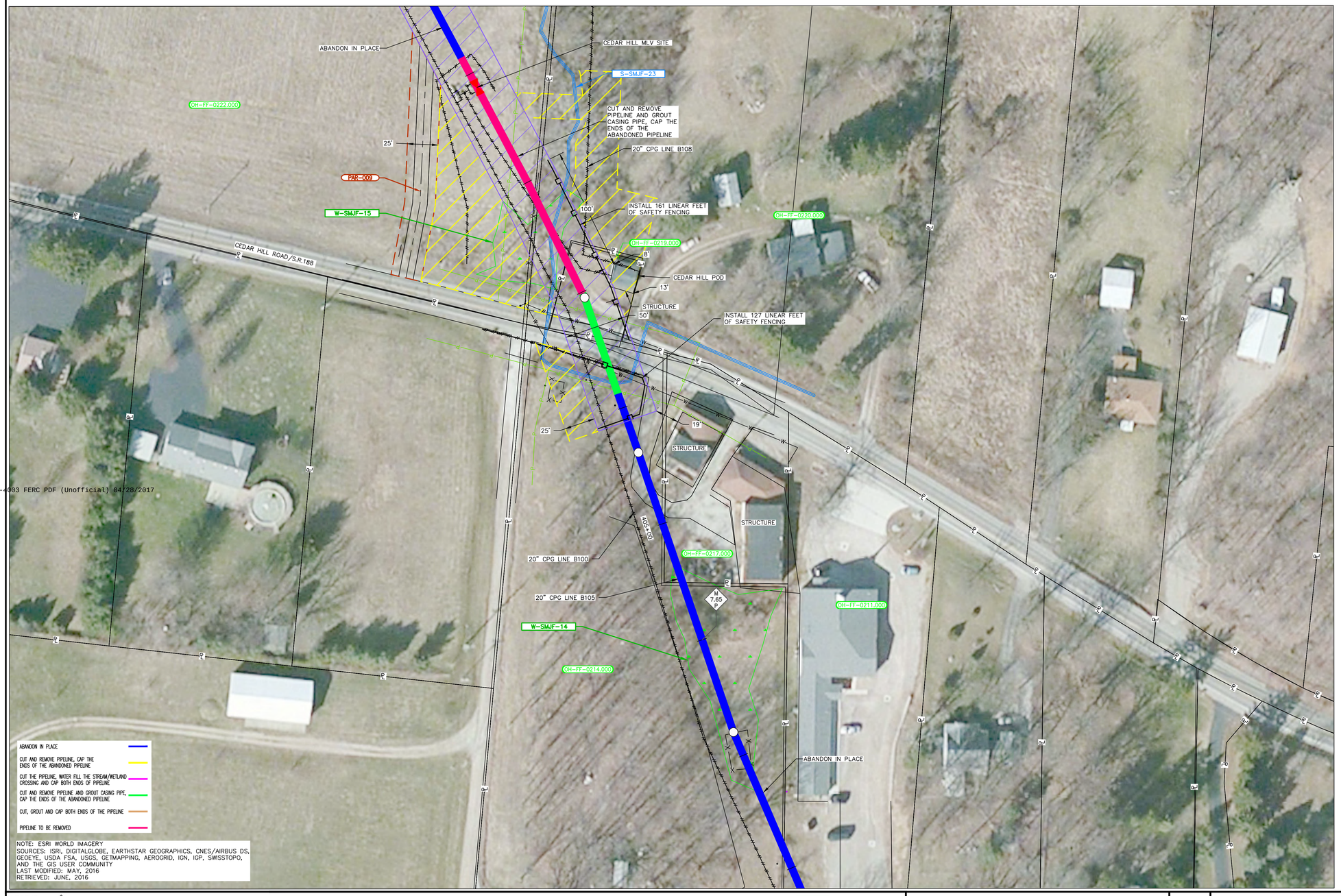
B-SYSTEM MODERNIZATION PROJECT

TITLE: MP 6.08 RESIDENTIAL – DETAIL
PROPOSED 20" LINE B105 ABANDONMENT
FAIRFIELD COUNTY, OHIO

DRAWN BY:	DATE	DRAWING NUMBER	SHEET	ISSUE
MM	03/24/2016	D7002-RSD-006	6 OF 45	P2

PROJECT NUMBER: 21506
WORK ORDER NUMBER: 46256

TRACTS OH-FF-0214.000, OH-FF-0217.000 & OH-FF-0219.000
PATRICK S. & SUSAN L MCCASHEN,
PAUL R. & MARY J. ACKERS & THE OHIO FUEL GAS COMPANY
FAIRFIELD COUNTY, OHIO



LEGEND

MILEPOST (M 1.00 P)
ROUTE
EXISTING COLUMBIA PIPELINE
FOREIGN PIPELINE
PERMANENT ROW
FENCE
TEMPORARY WORKSPACE
ADDITIONAL TEMPORARY WORKSPACE
ACCESS ROAD
B105 ABANDONMENT TEMPORARY WORKSPACE
CONTRACTOR / PIPE YARD
ACCESS ROAD NUMBER (PAR-001)
PROPERTY TRACT NUMBER (ST-CO-001.000)
WETLAND ID (WPADJC002)
WATERBODY ID (SPADJC002)
UNDERGROUND CABLE
OVERHEAD POWER LINE
WATERLINE
COUNTY BORDER
WETLAND
WATERBODY
SAFETY FENCE

SCALE: 1" = 40'
40 0 20 40

DESCRIPTION

THIS DRAWING DOCUMENTS MITIGATION MEASURES THAT WILL BE IMPLEMENTED FOR ALL RESIDENCES WITHIN 50 FEET OF THE PROPOSED CONSTRUCTION WORK AREA. CONTRACTOR SHALL COMPLY WITH THE FOLLOWING CONSTRUCTION MITIGATION REQUIREMENTS IN ADDITION TO THOSE LISTED IN THE CONSTRUCTION SPECIFICATIONS.

CONSTRUCTION REQUIREMENTS

1. CONTRACTOR SHALL ERECT AND MAINTAIN A SAFETY FENCE BETWEEN THE CONSTRUCTION ZONE AND THE ADJACENT RESIDENCES EXTENDING 100 FEET ON EITHER SIDE OF THE RESIDENCE TO ENSURE THAT EQUIPMENT, MATERIALS AND SPOIL REMAIN WITHIN THE CONSTRUCTION WORK AREA.
2. A MINIMUM OF 25 FEET WILL BE MAINTAINED BETWEEN THE RESIDENCE AND CONSTRUCTION WORK AREA FOR A DISTANCE OF 100 FEET ON EITHER SIDE OF THE RESIDENCE. IF THE FACILITY MUST BE WITHIN 25 FEET OF A RESIDENCE, IT MUST BE INSTALLED SUCH THAT THE TRENCH DOES NOT REMAIN OPEN OVERNIGHT.
3. MATURE TREES AND LANDSCAPING WILL NOT BE REMOVED FROM WITHIN THE EDGE OF THE CONSTRUCTION WORK AREA UNLESS NECESSARY FOR SAFE OPERATION OF CONSTRUCTION EQUIPMENT OR AS SPECIFIED IN LANDOWNER AGREEMENTS.
4. OTHER EXISTING PHYSICAL FEATURES THAT NEED TO BE PROTECTED WILL BE ENCLOSED IN SAFETY FENCE TO AVOID DISTURBANCE DURING CONSTRUCTION.
5. TRENCH SHALL NOT BE EXCAVATED UNTIL PIPELINE IS READY FOR INSTALLATION AND SHALL BE BACKFILLED IN SAME DAY AS PIPE INSTALLATION IN THIS AREA. ALL OPEN DITCHES SHALL BE BARRICADED/FENCED OFF OR PLATED WHEN CONSTRUCTION ACTIVITIES ARE NOT IN PROGRESS.
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9. CONTRACTOR SHALL MAINTAIN AGREED UPON ACCESS TO THE IMPACTED AREA DURING CONSTRUCTION.
10. CONTRACTOR SHALL LIMIT WORK IN THIS AREA TO DAYLIGHT HOURS, UNLESS OTHERWISE AGREED UPON WITH LANDOWNER/OCCUPANT.
11. LANDOWNER/OCCUPANT SHALL BE NOTIFIED OF PROPOSED CONSTRUCTION ACTIVITIES PRIOR TO CONSTRUCTION WORK.

ISSUED FOR 90% REVIEW
DATE: 08/30/2016

Ohio Utilities Protection Service Call 811 before you dig

Hatch Mott MacDonald

No.	REVISIONS	APPROVED BY	DATE
P1	PRELIMINARY	MM	04/01/16
P2	ISSUED FOR 90% REVIEW	MM	08/30/16

DWG. NO.	REFERENCE
D7002-ALG-009	ALIGNMENT SHEET

PROJECT DELIVERY
PROJECT ENGINEERING
P.O. BOX 1273 CHARLESTON, WV 25325-1273
1700 MACCORKLE AVENUE SE, CHARLESTON, WV 25314

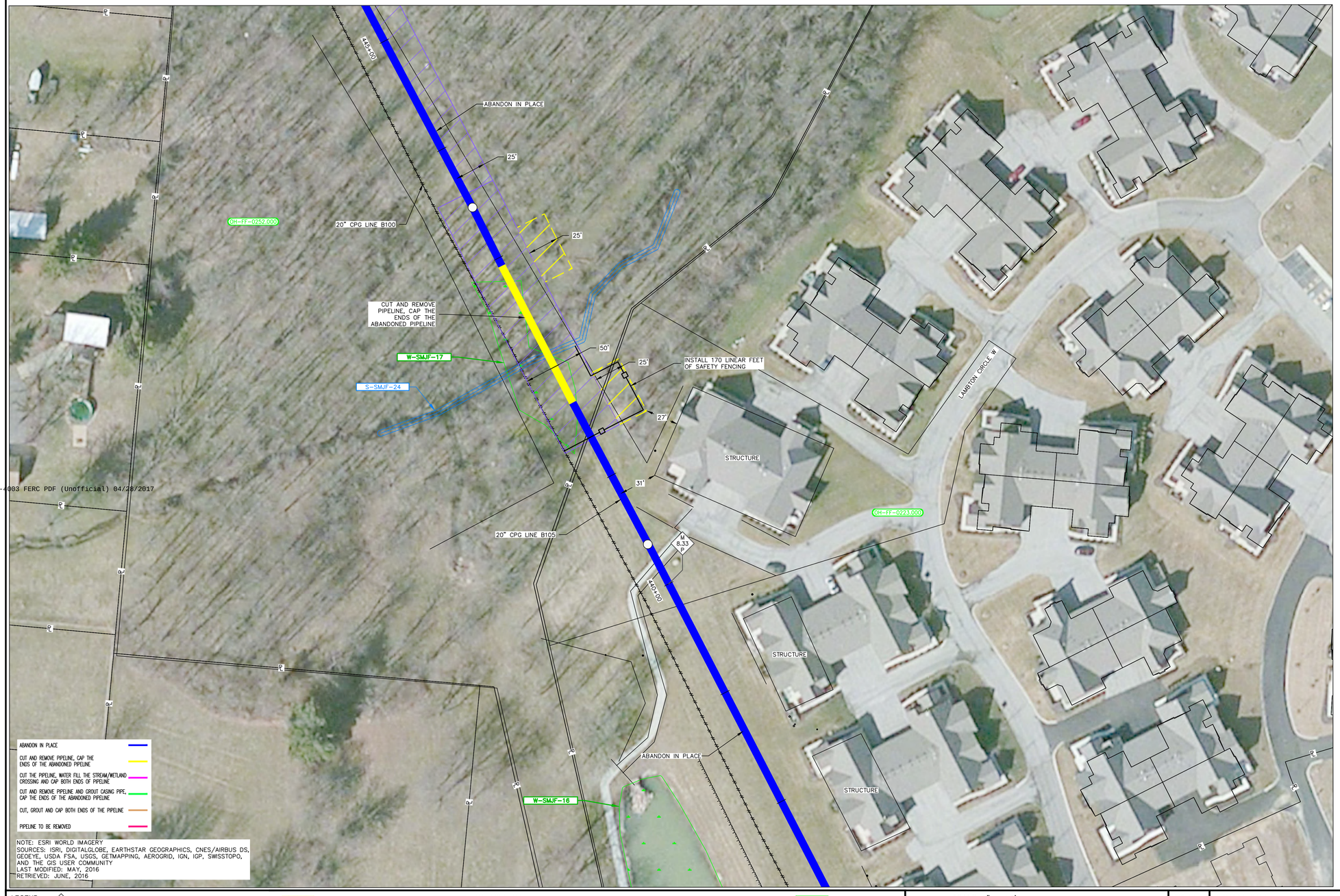
Columbia Gas Transmission

B-SYSTEM MODERNIZATION PROJECT

TITLE: MP 7.65 RESIDENTIAL – DETAIL
PROPOSED 20" LINE B105 ABANDONMENT
FAIRFIELD COUNTY, OHIO

DRAWN BY:	MM	DATE: 03/24/2016	DRAWING NUMBER	SHEET	ISSUE
PROJECT NUMBER	21506		D7002-RSD-007	7 OF 45	P2
WORK ORDER NUMBER	46256				

TRACT OH-FF-0223.000
DON C. & JUANITA CLAYPOOL
FAIRFIELD COUNTY, OHIO



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ISSUED FOR 90% REVIEW
DATE: 08/30/2016

Ohio Utilities Protection Service Call 811 before you dig

Hatch Mott MacDonald

LEGEND

- M 1.00 P — MILEPOST
- ROUTE
- EXISTING COLUMBIA PIPELINE
- FOREIGN PIPELINE
- PERMANENT ROW
- X FENCE
- TEMPORARY WORKSPACE
- ADDITIONAL TEMPORARY WORKSPACE
- ACCESS ROAD
- B105 ABANDONMENT TEMPORARY WORKSPACE
- CONTRACTOR / PIPE YARD
- PAR-001 ACCESS ROAD NUMBER
- ST-CO-001.002 PROPERTY TRACT NUMBER
- WPADJC002 WETLAND ID
- SPADJC002 WATERBODY ID
- P UNDERGROUND CABLE
- P OVERHEAD POWER LINE
- W WATERLINE
- COUNTY BORDER
- WETLAND
- WATERBODY
- SAFETY FENCE

SCALE: 1" = 40'
40 0 20 40

No.	REVISIONS	APPROVED BY	DATE
1	PRELIMINARY	MM	04/01/16
2	ISSUED FOR 90% REVIEW	MM	08/30/16

DWG. NO.	REFERENCE
D7002-ALG-009	ALIGNMENT SHEET
D7002-ALG-010	ALIGNMENT SHEET

PROJECT DELIVERY
PROJECT ENGINEERING
P.O. BOX 1273 CHARLESTON, WV 25325-1273
1700 MACCORKLE AVENUE SE, CHARLESTON, WV 25314

Columbia Gas Transmission

B-SYSTEM MODERNIZATION PROJECT

TITLE: MP 8.33 RESIDENTIAL – DETAIL
PROPOSED 20" LINE B105 ABANDONMENT
FAIRFIELD COUNTY, OHIO

DRAWN BY:	DATE	DRAWING NUMBER	SHEET	ISSUE
MM	03/25/2016	D7002-RSD-008	8 OF 45	P2

PROJECT NUMBER: 21506
WORK ORDER NUMBER: 46256

TRACT OH-FF-0312.000
CITY OF LANCASTER OHIO
FAIRFIELD COUNTY, OHIO

DESCRIPTION

THIS DRAWING DOCUMENTS MITIGATION MEASURES THAT WILL BE IMPLEMENTED FOR ALL RESIDENCES WITHIN 50 FEET OF THE PROPOSED CONSTRUCTION WORK AREA. CONTRACTOR SHALL COMPLY WITH THE FOLLOWING CONSTRUCTION MITIGATION REQUIREMENTS IN ADDITION TO THOSE LISTED IN THE CONSTRUCTION SPECIFICATIONS.

CONSTRUCTION REQUIREMENTS

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11. LANDOWNER/OCCUPANT SHALL BE NOTIFIED OF PROPOSED CONSTRUCTION ACTIVITIES PRIOR TO CONSTRUCTION WORK.

ISSUED FOR 90% REVIEW
DATE: 08/30/2016

Ohio Utilities Protection Service Call 811 before you dig

Hatch Mott MacDonald

LEGEND

M 1.00 P MILEPOST
ROUTE
EXISTING COLUMBIA PIPELINE
FOREIGN PIPELINE
PERMANENT ROW
X FENCE
TEMPORARY WORKSPACE
ADDITIONAL TEMPORARY WORKSPACE
ACCESS ROAD
B105 ABANDONMENT TEMPORARY WORKSPACE
CONTRACTOR / PIPE YARD
PAR-001 ACCESS ROAD NUMBER
ST-CO-001.000 PROPERTY TRACT NUMBER
WPADJC002 WETLAND ID
SPADJC002 WATERBODY ID
UNDERGROUND CABLE
P OVERHEAD POWER LINE
W WATERLINE
COUNTY BORDER
WETLAND
WATERBODY
SAFETY FENCE

SCALE: 1" = 40'
40 0 20 40

No.	REVISIONS	APPROVED BY	DATE
P1	PRELIMINARY	MM	04/01/16
P2	ISSUED FOR 90% REVIEW	MM	08/30/16

DWG. NO.	REFERENCE
D7002-ALG-011	ALIGNMENT SHEET

PROJECT DELIVERY
PROJECT ENGINEERING
P.O. BOX 1273 CHARLESTON, WV 25325-1273
1700 MACCORKLE AVENUE SE, CHARLESTON, WV 25314

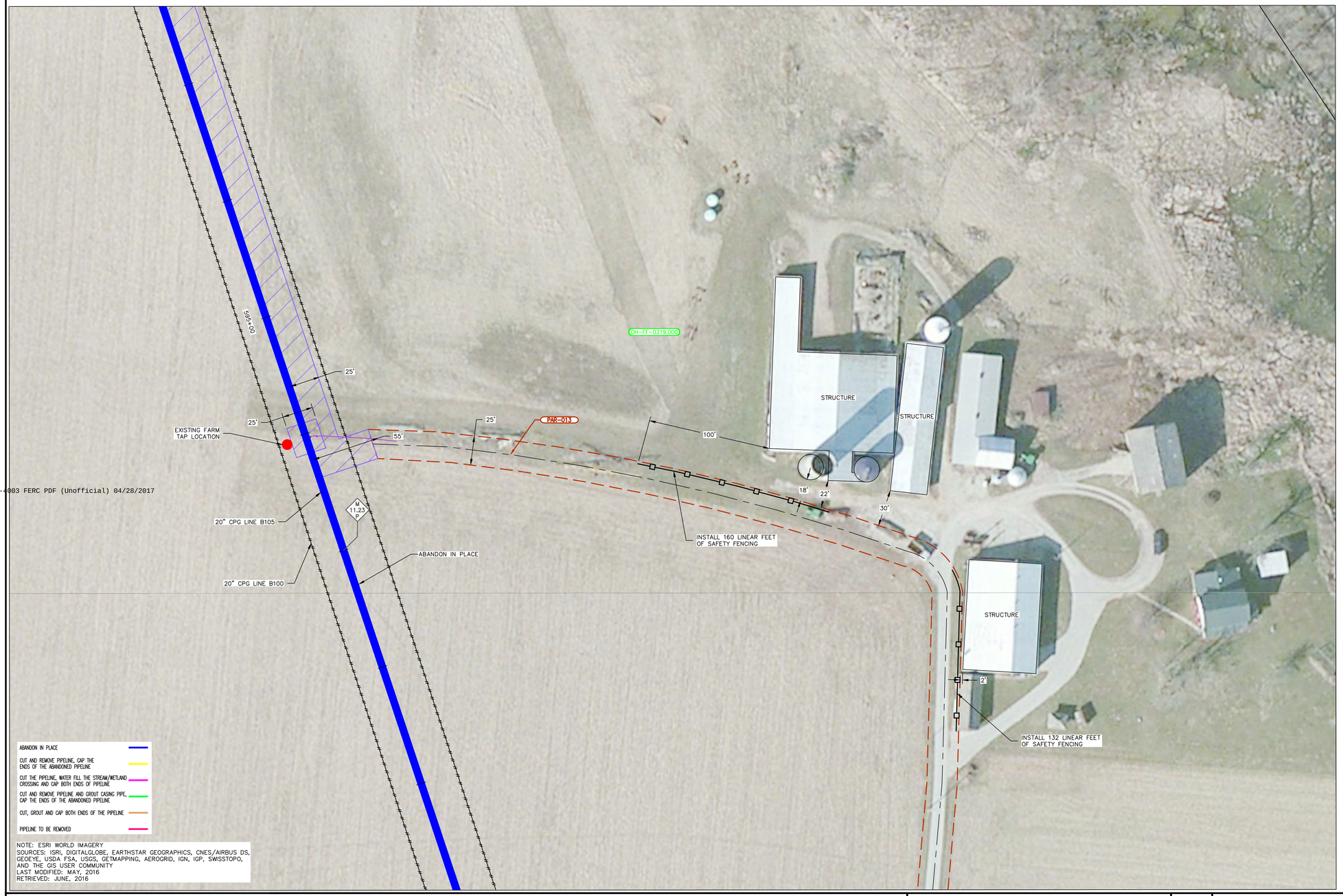
Columbia Gas Transmission

B-SYSTEM MODERNIZATION PROJECT

TITLE: MP 10.00 RESIDENTIAL – DETAIL
PROPOSED 20" LINE B105 ABANDONMENT
FAIRFIELD COUNTY, OHIO

DRAWN BY:	MM	DATE: 03/25/2016	DRAWING NUMBER	SHEET	ISSUE
PROJECT NUMBER	21506		D7002-RSD-009	9 OF 45	P2
WORK ORDER NUMBER	46256				

TRACT OH-FF-0319.000
THE GREENFIELD CORP.
FAIRFIELD COUNTY, OHIO



DESCRIPTION

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CONSTRUCTION REQUIREMENTS

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11. LANDOWNER/OCCUPANT SHALL BE NOTIFIED OF PROPOSED CONSTRUCTION ACTIVITIES PRIOR TO CONSTRUCTION WORK.

ISSUED FOR 90% REVIEW
DATE: 08/30/2016

Ohio Utilities Protection Service Call 811 before you dig

Hatch Mott MacDonald

LEGEND

- M 1.00 P — MILEPOST
- ROUTE
- EXISTING COLUMBIA PIPELINE
- FOREIGN PIPELINE
- PERMANENT ROW
- X — FENCE
- TEMPORARY WORKSPACE
- ADDITIONAL TEMPORARY WORKSPACE
- ACCESS ROAD
- B105 ABANDONMENT TEMPORARY WORKSPACE
- CONTRACTOR / PIPE YARD
- PAR-001 — ACCESS ROAD NUMBER
- SF-CO-001.000 — PROPERTY TRACT NUMBER
- WPADJC002 — WETLAND ID
- SPADJC002 — WATERBODY ID
- U — UNDERGROUND CABLE
- P — OVERHEAD POWER LINE
- W — WATERLINE
- COUNTY BORDER
- WETLAND
- WATERBODY
- SAFETY FENCE

SCALE: 1" = 40'
40 0 20 40

DWG. NO.	REFERENCE
D7002-ALG-012	ALIGNMENT SHEET
D7002-ALG-013	ALIGNMENT SHEET

No.	REVISIONS	APPROVED BY	DATE
P1	PRELIMINARY	MM	04/01/16
P2	ISSUED FOR 90% REVIEW	MM	08/30/16

PROJECT DELIVERY
PROJECT ENGINEERING
P.O. BOX 1273 CHARLESTON, WV 25325-1273
1700 MACCORKLE AVENUE SE, CHARLESTON, WV 25314

Columbia Gas Transmission

B-SYSTEM MODERNIZATION PROJECT

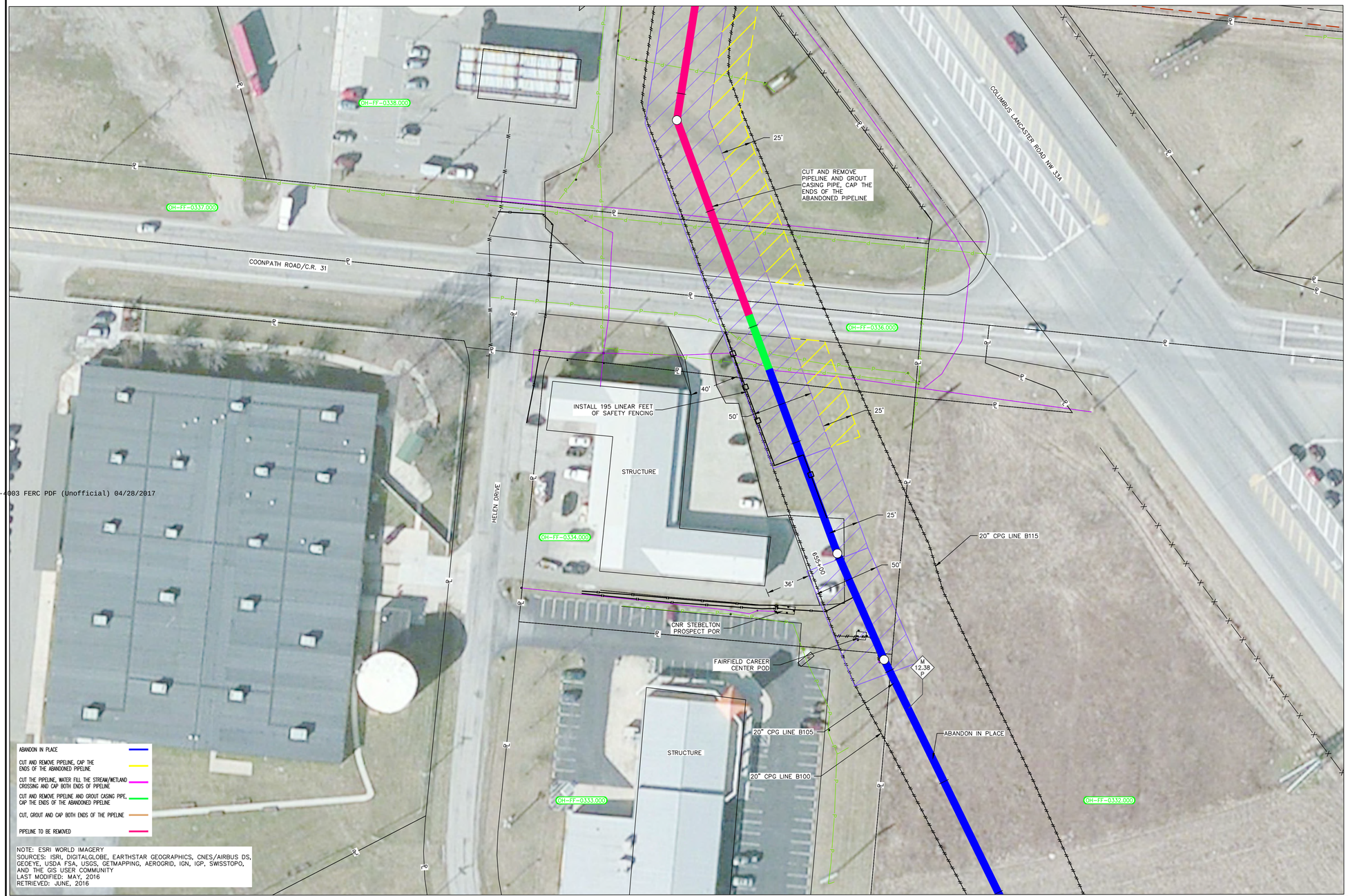
TITLE: MP 11.23 RESIDENTIAL – DETAIL
PROPOSED 20" LINE B105 ABANDONMENT
FAIRFIELD COUNTY, OHIO

DRAWN BY:	DATE	DRAWING NUMBER	SHEET	ISSUE
MM	03/25/2016	D7002-RSD-010	10 OF 45	P2

PROJECT NUMBER: 21506
WORK ORDER NUMBER: 46256

G:\Columbia\355773_CPG_Line_B105_and_B111\DataProd\Work\Drafting\Residential_Site_Specifics\D7002-RSD-010_B105 2016-08-20 12:40 PM

TRACT OH-FF-0334.000
BRET E. KING, DOUGLAS L. & PAMELA M. KUNSELMAN
FAIRFIELD COUNTY, OHIO



20170428-4003 FERC PDF (Unofficial) 04/28/2017

DESCRIPTION

THIS DRAWING DOCUMENTS MITIGATION MEASURES THAT WILL BE IMPLEMENTED FOR ALL RESIDENCES WITHIN 50 FEET OF THE PROPOSED CONSTRUCTION WORK AREA. CONTRACTOR SHALL COMPLY WITH THE FOLLOWING CONSTRUCTION MITIGATION REQUIREMENTS IN ADDITION TO THOSE LISTED IN THE CONSTRUCTION SPECIFICATIONS.

CONSTRUCTION REQUIREMENTS

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ISSUED FOR 90% REVIEW
DATE: 08/30/2016

Ohio Utilities Protection Service Call 811 before you dig

Hatch Mott MacDonald

LEGEND
- MILEPOST (N 1.00 P)
- ROUTE
- EXISTING COLUMBIA PIPELINE
- FOREIGN PIPELINE
- PERMANENT ROW
- FENCE
- TEMPORARY WORKSPACE
- ADDITIONAL TEMPORARY WORKSPACE
- ACCESS ROAD
- B105 ABANDONMENT TEMPORARY WORKSPACE
- CONTRACTOR / PIPE YARD
- PAR-001 ACCESS ROAD NUMBER
- ST-CO-001.000 PROPERTY TRACT NUMBER
- WPADJC002 WETLAND ID
- SPADJC002 WATERBODY ID
- UNDERGROUND CABLE
- OVERHEAD POWER LINE
- WATERLINE
- COUNTY BORDER
- WETLAND
- WATERBODY
- SAFETY FENCE

SCALE: 1" = 40'
40 0 20 40

D7002-ALG-013	ALIGNMENT SHEET
D7002-ALG-014	ALIGNMENT SHEET
D7002-ALG-044	ALIGNMENT SHEET

PROJECT DELIVERY
PROJECT ENGINEERING
P.O. BOX 1273 CHARLESTON, WV 25325-1273
1700 MACCORKLE AVENUE SE, CHARLESTON, WV 25314

Columbia Gas Transmission

B-SYSTEM MODERNIZATION PROJECT

TITLE: MP 12.38 RESIDENTIAL – DETAIL
PROPOSED 20" LINE B105 ABANDONMENT
FAIRFIELD COUNTY, OHIO

No.	REVISIONS	APPROVED BY	DATE
P1	PRELIMINARY	MM	04/01/16
P2	ISSUED FOR 90% REVIEW	MM	08/30/16

DRAWN BY: MM DATE: 03/25/2016
PROJECT NUMBER: 21506
WORK ORDER NUMBER: 46256
DRAWING NUMBER: D7002-RSD-011
SHEET: 11 OF 45
ISSUE: P2

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TRACT OH-FF-0352.000
SHALOM UNITED METHODIST CHURCH INC.
FAIRFIELD COUNTY, OHIO

DESCRIPTION

THIS DRAWING DOCUMENTS MITIGATION MEASURES THAT WILL BE IMPLEMENTED FOR ALL RESIDENCES WITHIN 50 FEET OF THE PROPOSED CONSTRUCTION WORK AREA. CONTRACTOR SHALL COMPLY WITH THE FOLLOWING CONSTRUCTION MITIGATION REQUIREMENTS IN ADDITION TO THOSE LISTED IN THE CONSTRUCTION SPECIFICATIONS.

CONSTRUCTION REQUIREMENTS

1. CONTRACTOR SHALL ERECT AND MAINTAIN A SAFETY FENCE BETWEEN THE CONSTRUCTION ZONE AND THE ADJACENT RESIDENCES EXTENDING 100 FEET ON EITHER SIDE OF THE RESIDENCE TO ENSURE THAT EQUIPMENT, MATERIALS AND SPOIL REMAIN WITHIN THE CONSTRUCTION WORK AREA.
2. A MINIMUM OF 25 FEET WILL BE MAINTAINED BETWEEN THE RESIDENCE AND CONSTRUCTION WORK AREA FOR A DISTANCE OF 100 FEET ON EITHER SIDE OF THE RESIDENCE. IF THE FACILITY MUST BE WITHIN 25 FEET OF A RESIDENCE, IT MUST BE INSTALLED SUCH THAT THE TRENCH DOES NOT REMAIN OPEN OVERNIGHT.
3. MATURE TREES AND LANDSCAPING WILL NOT BE REMOVED FROM WITHIN THE EDGE OF THE CONSTRUCTION WORK AREA UNLESS NECESSARY FOR SAFE OPERATION OF CONSTRUCTION EQUIPMENT OR AS SPECIFIED IN LANDOWNER AGREEMENTS.
4. OTHER EXISTING PHYSICAL FEATURES THAT NEED TO BE PROTECTED WILL BE ENCLOSED IN SAFETY FENCE TO AVOID DISTURBANCE DURING CONSTRUCTION.
5. TRENCH SHALL NOT BE EXCAVATED UNTIL PIPELINE IS READY FOR INSTALLATION AND SHALL BE BACKFILLED IN SAME DAY AS PIPE INSTALLATION IN THIS AREA. ALL OPEN DITCHES SHALL BE BARRICADED/FENCED OFF OR PLATED WHEN CONSTRUCTION ACTIVITIES ARE NOT IN PROGRESS.
6. IMMEDIATELY AFTER BACKFILLING THE TRENCH, ALL LAWN AND LANDSCAPING WILL BE RESTORED TO FINAL RESTORATION, OR TEMPORARY RESTORATION PENDING WEATHER AND SOIL CONDITIONS. IF SEASONAL OR WEATHER CONDITIONS PREVENT COMPLIANCE WITH THESE TIME FRAMES, TEMPORARY EROSION CONTROLS MUST BE MONITORED AND MAINTAINED UNTIL CONDITIONS ALLOW COMPLETION OF RESTORATION.
7. CONTRACTOR SHALL UTILIZE WATER TRUCKS AS NECESSARY TO MINIMIZE FUGITIVE DUST FROM CONSTRUCTION ACTIVITIES NEAR RESIDENCES/BUSINESSES.
8. ACCESS TO RESIDENCES BY CAR WILL BE MAINTAINED AT ALL TIMES, OR OTHER ACCOMMODATIONS WILL BE MADE WITH EACH RESPECTIVE LANDOWNER.
9. CONTRACTOR SHALL MAINTAIN AGREED UPON ACCESS TO THE IMPACTED AREA DURING CONSTRUCTION.
10. CONTRACTOR SHALL LIMIT WORK IN THIS AREA TO DAYLIGHT HOURS, UNLESS OTHERWISE AGREED UPON WITH LANDOWNER/OCCUPANT.
11. LANDOWNER/OCCUPANT SHALL BE NOTIFIED OF PROPOSED CONSTRUCTION ACTIVITIES PRIOR TO CONSTRUCTION WORK.

ISSUED FOR 90% REVIEW
DATE: 08/30/2016

Ohio Utilities Protection Service Call 811 before you dig

Hatch Mott MacDonald

LEGEND
- M 1.00 P — MILEPOST
- ROUTE
- EXISTING COLUMBIA PIPELINE
- FOREIGN PIPELINE
- PERMANENT ROW
- X — FENCE
- TEMPORARY WORKSPACE
- ADDITIONAL TEMPORARY WORKSPACE
- ACCESS ROAD
- B105 ABANDONMENT TEMPORARY WORKSPACE
- CONTRACTOR / PIPE YARD
- PAR-001 — ACCESS ROAD NUMBER
- ST-CO-001.000 — PROPERTY TRACT NUMBER
- WPADJC002 — WETLAND ID
- SPADJC002 — WATERBODY ID
- U — UNDERGROUND CABLE
- P — OVERHEAD POWER LINE
- W — WATERLINE
- COUNTY BORDER
- WETLAND
- WATERBODY
- SAFETY FENCE

SCALE: 1" = 40'
40 0 20 40

No.	REVISIONS	APPROVED BY	DATE
P1	PRELIMINARY	MM	04/01/16
P2	ISSUED FOR 90% REVIEW	MM	08/30/16

DWG. NO.	REFERENCE
D7002-ALG-014	ALIGNMENT SHEET
D7002-ALG-015	ALIGNMENT SHEET

PROJECT DELIVERY
PROJECT ENGINEERING
P.O. BOX 1273 CHARLESTON, WV 25325-1273
1700 MACCORKLE AVENUE SE, CHARLESTON, WV 25314

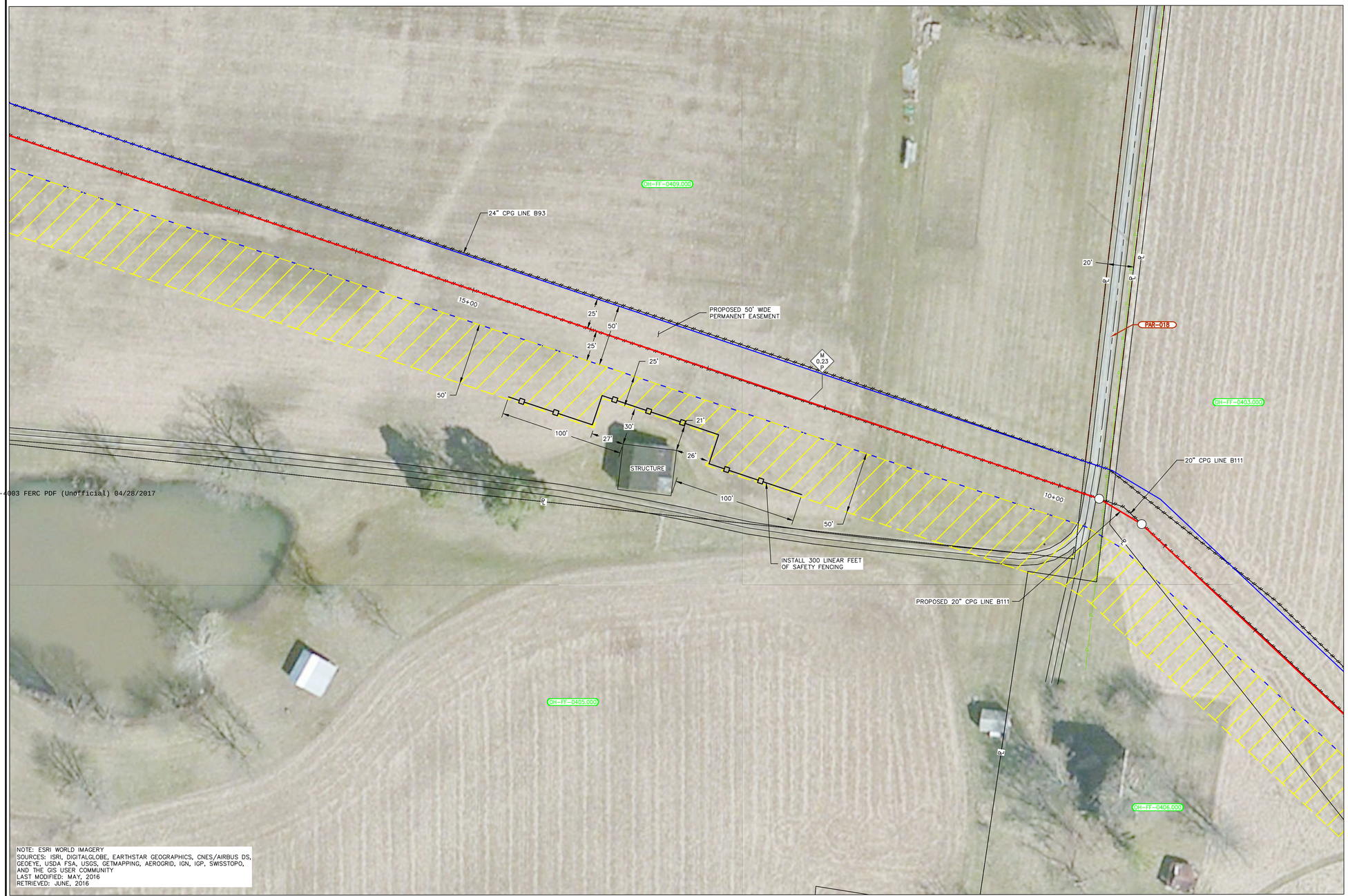
Columbia Gas Transmission

B-SYSTEM MODERNIZATION PROJECT

TITLE: MP 13.58 RESIDENTIAL – DETAIL
PROPOSED 20" LINE B105 ABANDONMENT
FAIRFIELD COUNTY, OHIO

DRAWN BY:	MM	DATE: 03/25/2016	DRAWING NUMBER	SHEET	ISSUE
PROJECT NUMBER	21506		D7002-RSD-012	12 OF 45	P2
WORK ORDER NUMBER	46256				

TRACT OH-FF-0409.000
TERRY DUNLAP
FAIRFIELD COUNTY, OHIO



NOTE: ESRI WORLD IMAGERY
SOURCES: ISRI, DIGITALGLOBE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, GEOEYE, USDA FSA, USGS, GETMAPPING, AEROGRID, IGN, IGP, SWISSTOPO, AND THE GIS USER COMMUNITY
LAST MODIFIED: MAY, 2016
RETRIEVED: JUNE, 2016

20170428-4003 FERC PDF (Unofficial) 04/28/2017

DESCRIPTION

THIS DRAWING DOCUMENTS MITIGATION MEASURES THAT WILL BE IMPLEMENTED FOR ALL RESIDENCES WITHIN 50 FEET OF THE PROPOSED CONSTRUCTION WORK AREA. CONTRACTOR SHALL COMPLY WITH THE FOLLOWING CONSTRUCTION MITIGATION REQUIREMENTS IN ADDITION TO THOSE LISTED IN THE CONSTRUCTION SPECIFICATIONS.

CONSTRUCTION REQUIREMENTS

1. CONTRACTOR SHALL ERECT AND MAINTAIN A SAFETY FENCE BETWEEN THE CONSTRUCTION ZONE AND THE ADJACENT RESIDENCES EXTENDING 100 FEET ON EITHER SIDE OF THE RESIDENCE TO ENSURE THAT EQUIPMENT, MATERIALS AND SPOIL REMAIN WITHIN THE CONSTRUCTION WORK AREA.
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ISSUED FOR 90% REVIEW
DATE: 08/30/2016

Ohio Utilities Protection Service Call 811 before you dig

Hatch Mott MacDonald

LEGEND

- MILEPOST (M 1.00 P)
- EXISTING COLUMBIA PIPELINE
- FOREIGN PIPELINE
- PERMANENT ROW
- ROUTE
- FENCE
- TEMPORARY WORKSPACE
- ADDITIONAL TEMPORARY WORKSPACE
- ACCESS ROAD
- B111 ABANDONMENT TEMPORARY WORKSPACE
- CONTRACTOR / PIPE YARD
- PAR-0001 ACCESS ROAD NUMBER
- ST-CO-001.000 PROPERTY TRACT NUMBER
- WPADJC002 WETLAND ID
- SPADJ0002 WATERBODY ID
- UNDERGROUND CABLE
- OVERHEAD POWER LINE
- WATERLINE
- COUNTY BORDER
- WETLAND
- WATERBODY
- SAFETY FENCE

SCALE: 1" = 40'
40 0 20 40

No.	REVISIONS	APPROVED BY	DATE
P1	PRELIMINARY	MM	04/01/16
P2	ISSUED FOR 90% REVIEW	MM	08/30/16

DWG. NO.	REFERENCE
D7002-ALG-019	ALIGNMENT SHEET

PROJECT DELIVERY
PROJECT ENGINEERING
P.O. BOX 1273 CHARLESTON, WV 25325-1273
1700 MACCORKLE AVENUE SE. CHARLESTON, WV 25314

Columbia Gas Transmission

B-SYSTEM MODERNIZATION PROJECT

TITLE: MP 0.23 RESIDENTIAL - DETAIL
PROPOSED 20" LINE B111 REPLACEMENT
FAIRFIELD COUNTY, OHIO

DRAWN BY:	DATE	DRAWING NUMBER	SHEET	ISSUE
MM	03/25/2016	D7002-RSD-013	13 OF 45	P2

PROJECT NUMBER: 21506
WORK ORDER NUMBER: 46257

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2016-08-20
12:36 PM

TRACTS OH-FF-0408.000 & OH-FF-0360029610
RICHARD & MEGAN MAZZARIN, CRAIG M. & BRET A. GESELI
FAIRFIELD COUNTY, OHIO

DESCRIPTION

THIS DRAWING DOCUMENTS MITIGATION MEASURES THAT WILL BE IMPLEMENTED FOR ALL RESIDENCES WITHIN 50 FEET OF THE PROPOSED CONSTRUCTION WORK AREA. CONTRACTOR SHALL COMPLY WITH THE FOLLOWING CONSTRUCTION MITIGATION REQUIREMENTS IN ADDITION TO THOSE LISTED IN THE CONSTRUCTION SPECIFICATIONS.

CONSTRUCTION REQUIREMENTS

1. CONTRACTOR SHALL ERECT AND MAINTAIN A SAFETY FENCE BETWEEN THE CONSTRUCTION ZONE AND THE ADJACENT RESIDENCES EXTENDING 100 FEET ON EITHER SIDE OF THE RESIDENCE TO ENSURE THAT EQUIPMENT, MATERIALS AND SPOIL REMAIN WITHIN THE CONSTRUCTION WORK AREA.
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ISSUED FOR 90% REVIEW
DATE: 08/30/2016

Ohio Utilities Protection Service Call 811 before you dig

Hatch Mott MacDonald

LEGEND

- MILEPOST (M 1.00 P)
- ROUTE
- EXISTING COLUMBIA PIPELINE
- FOREIGN PIPELINE
- PERMANENT ROW
- X FENCE
- TEMPORARY WORKSPACE
- ADDITIONAL TEMPORARY WORKSPACE
- ACCESS ROAD
- B111 ABANDONMENT TEMPORARY WORKSPACE
- CONTRACTOR / PIPE YARD
- PAR-0001 ACCESS ROAD NUMBER
- ST=CO-001.000 PROPERTY TRACT NUMBER
- WPADJC002 WETLAND ID
- SPADJC002 WATERBODY ID
- U UNDERGROUND CABLE
- P OVERHEAD POWER LINE
- W WATERLINE
- COUNTY BORDER
- WETLAND
- WATERBODY
- SAFETY FENCE

SCALE: 1" = 40'
40 0 20 40

No.	REVISIONS	APPROVED BY	DATE
P1	PRELIMINARY	MM	04/01/16
P2	ISSUED FOR 90% REVIEW	MM	08/30/16

DWG. NO.	REFERENCE
D7002-ALG-019	ALIGNMENT SHEET

PROJECT DELIVERY
PROJECT ENGINEERING
P.O. BOX 1273 CHARLESTON, WV 25325-1273
1700 MACCORKLE AVENUE SE, CHARLESTON, WV 25314

Columbia Gas Transmission

B-SYSTEM MODERNIZATION PROJECT

TITLE: MP 0.61 RESIDENTIAL – DETAIL
PROPOSED 20" LINE B111 REPLACEMENT
FAIRFIELD COUNTY, OHIO

DRAWN BY:	DATE	DRAWING NUMBER	SHEET	ISSUE
MM	03/25/2016	D7002-RSD-014	14 OF 43	P2

PROJECT NUMBER: 21506
WORK ORDER NUMBER: 46257

TRACT OH-FF-0412.000 & OH-FF-0418.000
MICHAEL & DARLENE M. KUZMIC & MARK R. KATTERHEINRICH & AMY D. CLEMONS
FAIRFIELD COUNTY, OHIO

20170428-4003 FERC PDF (Unofficial) 04/28/2017

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DESCRIPTION

THIS DRAWING DOCUMENTS MITIGATION MEASURES THAT WILL BE IMPLEMENTED FOR ALL RESIDENCES WITHIN 50 FEET OF THE PROPOSED CONSTRUCTION WORK AREA. CONTRACTOR SHALL COMPLY WITH THE FOLLOWING CONSTRUCTION MITIGATION REQUIREMENTS IN ADDITION TO THOSE LISTED IN THE CONSTRUCTION SPECIFICATIONS.

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ISSUED FOR 90% REVIEW
DATE: 08/30/2016

Ohio Utilities Protection Service Call 811 before you dig

Hatch Mott MacDonald

LEGEND

- MILEPOST (M 1.00 P)
- ROUTE
- EXISTING COLUMBIA PIPELINE
- FOREIGN PIPELINE
- PERMANENT ROW
- X FENCE
- TEMPORARY WORKSPACE
- ADDITIONAL TEMPORARY WORKSPACE
- ACCESS ROAD
- B111 ABANDONMENT TEMPORARY WORKSPACE
- CONTRACTOR / PIPE YARD
- PAR-0001 ACCESS ROAD NUMBER
- ST-CO-001.000 PROPERTY TRACT NUMBER
- WPADJC002 WETLAND ID
- SPADJC002 WATERBODY ID
- UNDERGROUND CABLE
- P OVERHEAD POWER LINE
- W WATERLINE
- COUNTY BORDER
- WETLAND
- WATERBODY
- SAFETY FENCE

SCALE: 1" = 40'
40 0 20 40

No.	REVISIONS	APPROVED BY	DATE
P1	PRELIMINARY	MM	04/01/16
P2	ISSUED FOR 90% REVIEW	MM	08/30/16

DWG. NO.	REFERENCE
D7002-ALG-019	ALIGNMENT SHEET

PROJECT DELIVERY
PROJECT ENGINEERING
P.O. BOX 1273 CHARLESTON, WV 25325-1273
1700 MACCORKLE AVENUE SE, CHARLESTON, WV 25314

Columbia Gas Transmission

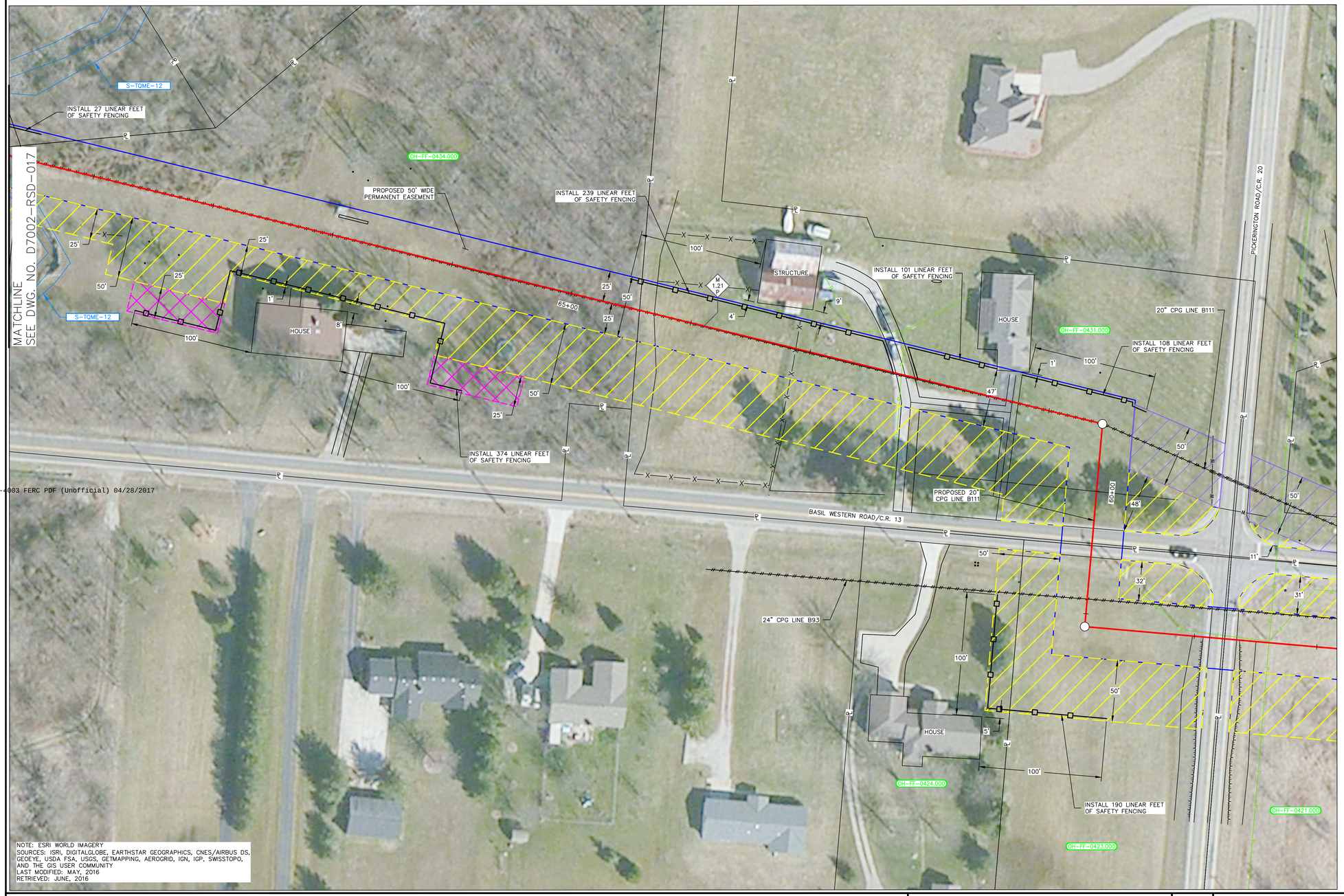
B-SYSTEM MODERNIZATION PROJECT

TITLE: MP 0.70 RESIDENTIAL - DETAIL
PROPOSED 20" LINE B111 REPLACEMENT
FAIRFIELD COUNTY, OHIO

DRAWN BY:	DATE	DRAWING NUMBER	SHEET	ISSUE
MM	03/28/2016	D7002-RSD-015	15 OF 45	P2

PROJECT NUMBER: 21506
WORK ORDER NUMBER: 46257

TRACTS OH-FF-0424.000, OH-FF-0431.000 & OH-FF-0434.000
GARY J. & NANCY K. HANDWERK, DOREL B. GRIGGS JR. & MALCOLM S. WHITE TRUSTEE
FAIRFIELD COUNTY, OHIO



DESCRIPTION

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ISSUED FOR 90% REVIEW
DATE: 08/30/2016

Ohio Utilities Protection Service Call 811 before you dig

Hatch Mott MacDonald

LEGEND

- MILEPOST (M 1.00 P)
- ROUTE
- EXISTING COLUMBIA PIPELINE
- FOREIGN PIPELINE
- PERMANENT ROW
- FENCE
- TEMPORARY WORKSPACE
- ADDITIONAL TEMPORARY WORKSPACE
- ACCESS ROAD
- B111 ABANDONMENT TEMPORARY WORKSPACE
- CONTRACTOR / PIPE YARD
- ACCESS ROAD NUMBER (PAR-0001)
- PROPERTY TRACT NUMBER (ST-CO-001.000)
- WETLAND ID (WPADJC002)
- WATERBODY ID (SPADJC002)
- UNDERGROUND CABLE
- OVERHEAD POWER LINE
- WATERLINE
- COUNTY BORDER
- WETLAND
- WATERBODY
- SAFETY FENCE

SCALE: 1" = 40'
40 0 20 40

No.	REVISIONS	APPROVED BY	DATE
P1	PRELIMINARY	MM	04/01/16
P2	ISSUED FOR 90% REVIEW	MM	08/30/16

No.	REVISIONS	APPROVED BY	DATE

No.	REVISIONS	APPROVED BY	DATE

DWG. NO.	REFERENCE
D7002-ALG-020	ALIGNMENT SHEET

PROJECT DELIVERY
PROJECT ENGINEERING
P.O. BOX 1273 CHARLESTON, WV 25325-1273
1700 MACCORKLE AVENUE SE, CHARLESTON, WV 25314

Columbia Gas Transmission

B-SYSTEM MODERNIZATION PROJECT

TITLE: MP 1.21 RESIDENTIAL - DETAIL
PROPOSED 20" LINE B111 REPLACEMENT
FAIRFIELD COUNTY, OHIO

DRAWN BY:	DATE	DRAWING NUMBER	SHEET	ISSUE
MM	03/28/2016	D7002-RSD-016	16 OF 45	P2

PROJECT NUMBER: 21506
WORK ORDER NUMBER: 46257

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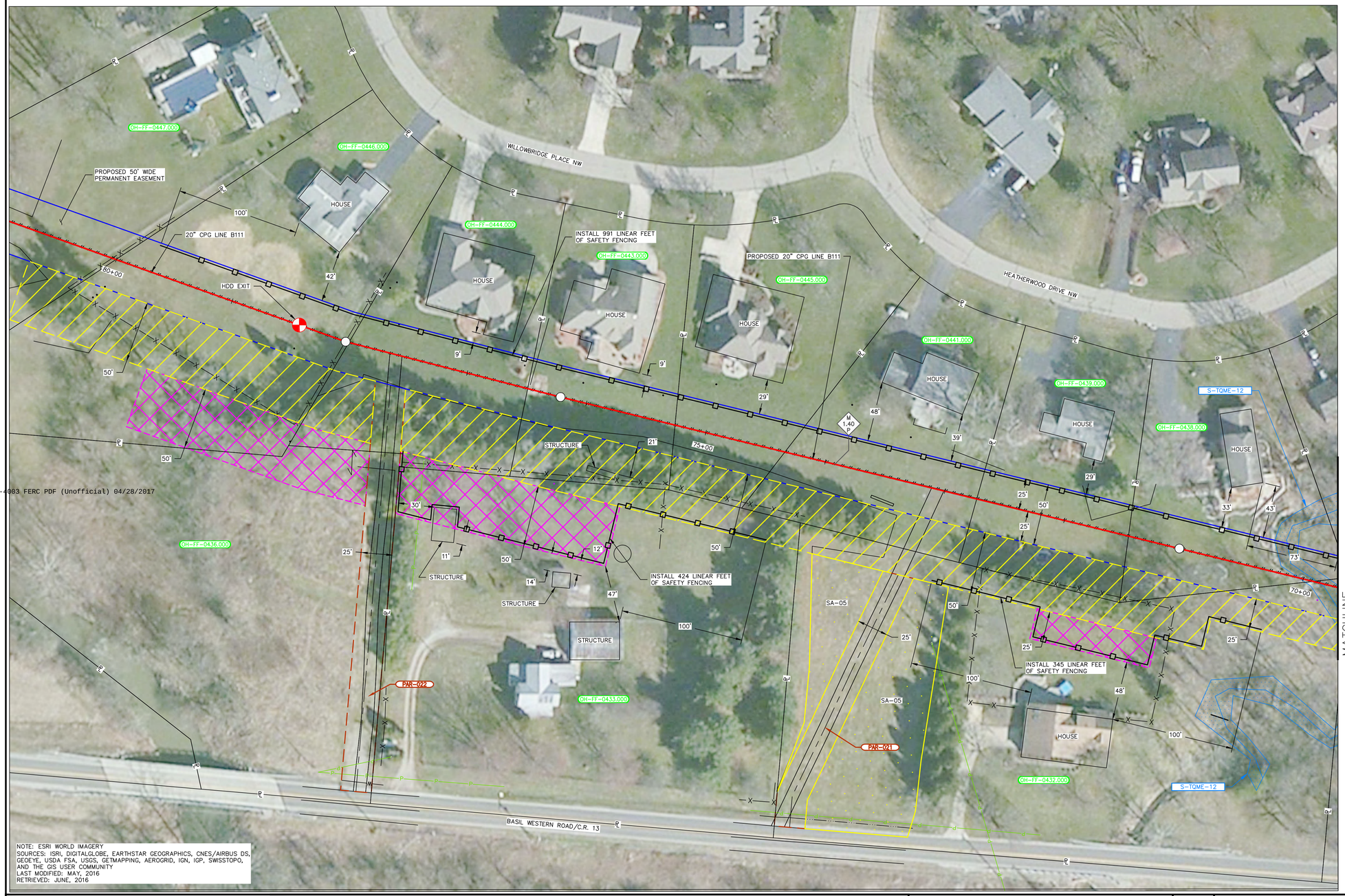
TRACTS OH-FF-0432.000, OH-FF-0433.000, OH-FF-0438.000, OH-FF-0439.000, OH-FF-0441.000, OH-FF-0443.000, OH-FF-0.444.000, OH-FF-0445.000 & OH-FF-0446
CRAIG DAVID & VIRGINIA HELEN BAUMAN, ROBERT L. & BARBARA A. SMALLWOOD, KEITH MICHAEL & MICHELLE T. GUEVARA-SMITH, LARRY E. & CHRISTINA C. WAIBEL, DENNIS L. & PAULA L. CLAYPOOL, GEORGE E. & SANDRA E. TOOTLE & GARY L. & DEBORAH A. NABER, BRENT D. & ALICIA R. HENRY, VIRGINIA L. GREEN & MARGARET C. MASON
FAIRFIELD COUNTY, OHIO



MATCHLINE
SEE DWG. NO. D7002-RSD-016

20170428-4003 FERC PDF (Unofficial) 04/28/2017

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12:31 PM
2016-08-20

DESCRIPTION

THIS DRAWING DOCUMENTS MITIGATION MEASURES THAT WILL BE IMPLEMENTED FOR ALL RESIDENCES WITHIN 50 FEET OF THE PROPOSED CONSTRUCTION WORK AREA. CONTRACTOR SHALL COMPLY WITH THE FOLLOWING CONSTRUCTION MITIGATION REQUIREMENTS IN ADDITION TO THOSE LISTED IN THE CONSTRUCTION SPECIFICATIONS.

CONSTRUCTION REQUIREMENTS

1. CONTRACTOR SHALL ERECT AND MAINTAIN A SAFETY FENCE BETWEEN THE CONSTRUCTION ZONE AND THE ADJACENT RESIDENCES EXTENDING 100 FEET ON EITHER SIDE OF THE RESIDENCE TO ENSURE THAT EQUIPMENT, MATERIALS AND SPOIL REMAIN WITHIN THE CONSTRUCTION WORK AREA.
2. A MINIMUM OF 25 FEET WILL BE MAINTAINED BETWEEN THE RESIDENCE AND CONSTRUCTION WORK AREA FOR A DISTANCE OF 100 FEET ON EITHER SIDE OF THE RESIDENCE. IF THE FACILITY MUST BE WITHIN 25 FEET OF A RESIDENCE, IT MUST BE INSTALLED SUCH THAT THE TRENCH DOES NOT REMAIN OPEN OVERNIGHT.
3. MATURE TREES AND LANDSCAPING WILL NOT BE REMOVED FROM WITHIN THE EDGE OF THE CONSTRUCTION WORK AREA UNLESS NECESSARY FOR SAFE OPERATION OF CONSTRUCTION EQUIPMENT OR AS SPECIFIED IN LANDOWNER AGREEMENTS.
4. OTHER EXISTING PHYSICAL FEATURES THAT NEED TO BE PROTECTED WILL BE ENCLOSED IN SAFETY FENCE TO AVOID DISTURBANCE DURING CONSTRUCTION.
5. TRENCH SHALL NOT BE EXCAVATED UNTIL PIPELINE IS READY FOR INSTALLATION AND SHALL BE BACKFILLED IN SAME DAY AS PIPE INSTALLATION IN THIS AREA. ALL OPEN DITCHES SHALL BE BARRICADED/FENCED OFF OR PLATED WHEN CONSTRUCTION ACTIVITIES ARE NOT IN PROGRESS.
6. IMMEDIATELY AFTER BACKFILLING THE TRENCH, ALL LAWN AND LANDSCAPING WILL BE RESTORED TO FINAL RESTORATION, OR TEMPORARY RESTORATION PENDING WEATHER AND SOIL CONDITIONS. IF SEASONAL OR WEATHER CONDITIONS PREVENT COMPLIANCE WITH THESE TIME FRAMES, TEMPORARY EROSION CONTROLS MUST BE MONITORED AND MAINTAINED UNTIL CONDITIONS ALLOW COMPLETION OF RESTORATION.
7. CONTRACTOR SHALL UTILIZE WATER TRUCKS AS NECESSARY TO MINIMIZE FUGITIVE DUST FROM CONSTRUCTION ACTIVITIES NEAR RESIDENCES/BUSINESSES.
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9. CONTRACTOR SHALL MAINTAIN AGREED UPON ACCESS TO THE IMPACTED AREA DURING CONSTRUCTION.
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11. LANDOWNER/OCCUPANT SHALL BE NOTIFIED OF PROPOSED CONSTRUCTION ACTIVITIES PRIOR TO CONSTRUCTION WORK.

ISSUED FOR 90% REVIEW
DATE: 08/30/2016

Ohio Utilities Protection Service Call 811 before you dig

Hatch Mott MacDonald

LEGEND

- MILEPOST
- ROUTE
- EXISTING COLUMBIA PIPELINE
- FOREIGN PIPELINE
- PERMANENT ROW
- FENCE
- TEMPORARY WORKSPACE
- ADDITIONAL TEMPORARY WORKSPACE
- ACCESS ROAD
- B111 ABANDONMENT TEMPORARY WORKSPACE
- CONTRACTOR / PIPE YARD
- ACCESS ROAD NUMBER
- PROPERTY TRACT NUMBER
- WETLAND ID
- WATERBODY ID
- UNDERGROUND CABLE
- OVERHEAD POWER LINE
- WATERLINE
- COUNTY BORDER
- WETLAND
- WATERBODY
- SAFETY FENCE

SCALE: 1" = 40'

No.	REVISIONS	APPROVED BY	DATE
P1	PRELIMINARY	MM	04/01/16
P2	ISSUED FOR 90% REVIEW	MM	08/30/16

No.	REVISIONS	APPROVED BY	DATE

No.	REVISIONS	APPROVED BY	DATE

DWG. NO.	REFERENCE
D7002-ALG-020	ALIGNMENT SHEET

PROJECT DELIVERY
PROJECT ENGINEERING
P.O. BOX 1273 CHARLESTON, WV 25325-1273
1700 MACCORKLE AVENUE SE, CHARLESTON, WV 25314

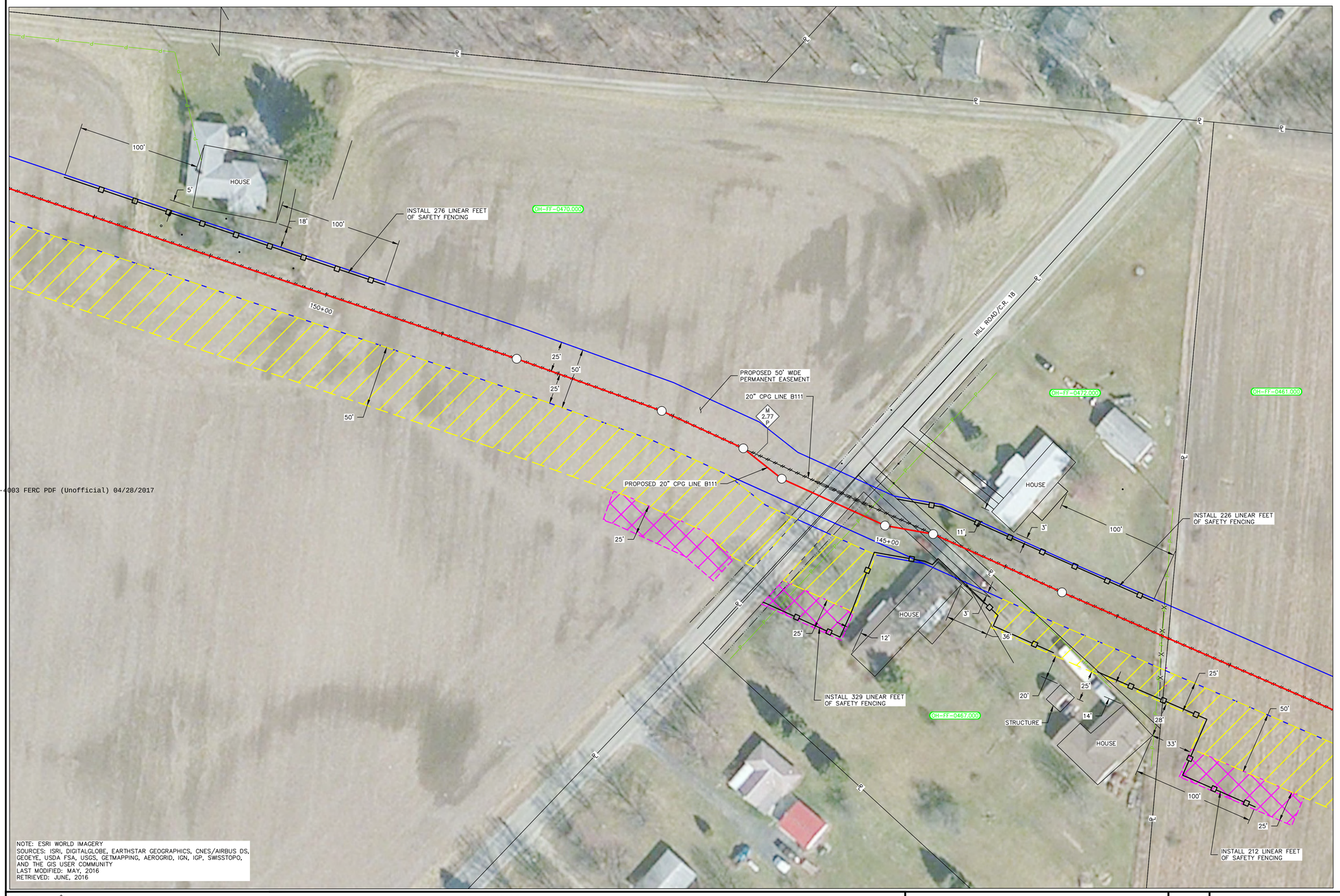
Columbia Gas Transmission

B-SYSTEM MODERNIZATION PROJECT

TITLE: MP 1.40 RESIDENTIAL – DETAIL
PROPOSED 20" LINE B111 REPLACEMENT
FAIRFIELD COUNTY, OHIO

DRAWN BY:	MM	DATE 03/28/2016	DRAWING NUMBER	SHEET	ISSUE
PROJECT NUMBER	21506		D7002-RSD-017	17 OF 45	P2
WORK ORDER NUMBER	46257				

TRACTS OH-FF-0467.000, OH-FF-0470.000 & OH-FF-0472.000
CARL L. & RUBY B. BALL, PAWPAW PATCH LLC. & GLEN B. & GLENNA JEAN THOMPSON
FAIRFIELD COUNTY, OHIO



20170428-4003 FERC PDF (Unofficial) 04/28/2017

DESCRIPTION

THIS DRAWING DOCUMENTS MITIGATION MEASURES THAT WILL BE IMPLEMENTED FOR ALL RESIDENCES WITHIN 50 FEET OF THE PROPOSED CONSTRUCTION WORK AREA. CONTRACTOR SHALL COMPLY WITH THE FOLLOWING CONSTRUCTION MITIGATION REQUIREMENTS IN ADDITION TO THOSE LISTED IN THE CONSTRUCTION SPECIFICATIONS.

CONSTRUCTION REQUIREMENTS

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ISSUED FOR 90% REVIEW
DATE: 08/30/2016

Ohio Utilities Protection Service Call 811 before you dig

Hatch Mott MacDonald

LEGEND

- MILEPOST (MP 1.00 D)
- ROUTE
- EXISTING COLUMBIA PIPELINE
- FOREIGN PIPELINE
- PERMANENT ROW
- X FENCE
- TEMPORARY WORKSPACE
- ADDITIONAL TEMPORARY WORKSPACE
- ACCESS ROAD
- B111 ABANDONMENT TEMPORARY WORKSPACE
- CONTRACTOR / PIPE YARD
- PAR-0001 ACCESS ROAD NUMBER
- ST-CO-001.000 PROPERTY TRACT NUMBER
- WPADJC002 WETLAND ID
- SPADJC002 WATERBODY ID
- U UNDERGROUND CABLE
- P OVERHEAD POWER LINE
- W WATERLINE
- COUNTY BORDER
- WETLAND
- WATERBODY
- SAFETY FENCE

SCALE: 1" = 40'
40 0 20 40

No.	REVISIONS	APPROVED BY	DATE
P1	PRELIMINARY	MM	04/01/16
P2	ISSUED FOR 90% REVIEW	MM	08/30/16

DWG. NO.	REFERENCE
D7002-ALG-021	ALIGNMENT SHEET

PROJECT DELIVERY
PROJECT ENGINEERING
P.O. BOX 1273 CHARLESTON, WV 25325-1273
1700 MACCORKLE AVENUE SE, CHARLESTON, WV 25314

Columbia Gas Transmission

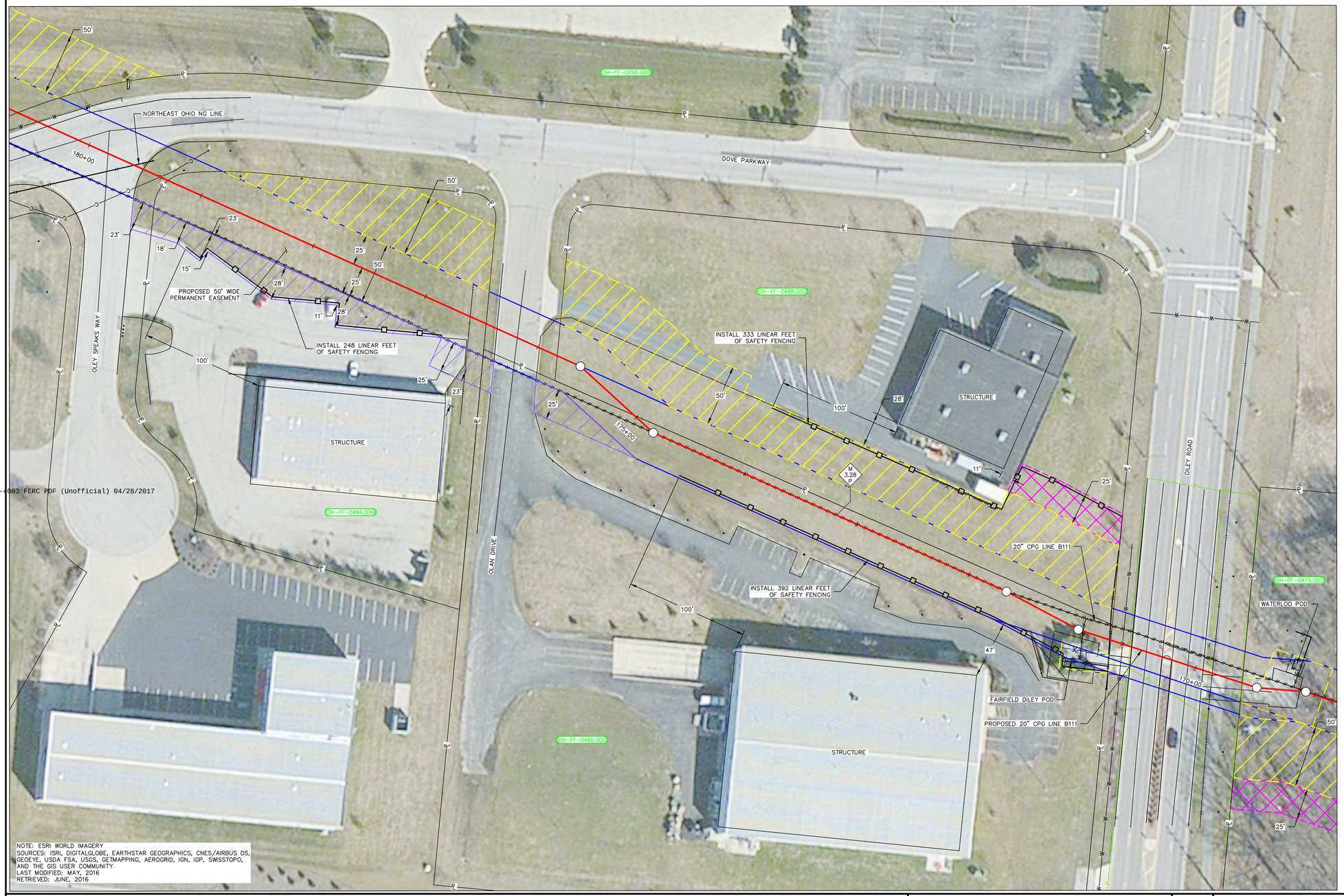
B-SYSTEM MODERNIZATION PROJECT

TITLE: MP 2.77 RESIDENTIAL – DETAIL
PROPOSED 20" LINE B111 REPLACEMENT
FAIRFIELD COUNTY, OHIO

DRAWN BY:	MM	DATE: 03/29/2016	DRAWING NUMBER	SHEET	ISSUE
PROJECT NUMBER	21506		D7002-RSD-018	18 OF 45	P2
WORK ORDER NUMBER	46257				

G:\Columbia\355773_CPG_Line_B105_and_B111\DataProd\Work\Drafting\Residential_Site_Specifics\D7002-RSD-018_B111
2016-08-20 12:29 PM

TRACTS OH-FF-0480.000, OH-FF-0484.000 & ON-FF-0488.000
OLAN INDUSTRIES, LLC., ENTERPRISE INVESTMENTS & DAUGHERTY, LTD.
FAIRFIELD COUNTY, OHIO



DESCRIPTION

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ISSUED FOR 90% REVIEW
DATE: 08/30/2016

Ohio Utilities Protection Service Call 811 before you dig

Hatch Mott MacDonald

LEGEND

- MILEPOST (M 1.00 P)
- ROUTE
- EXISTING COLUMBIA PIPELINE
- FOREIGN PIPELINE
- PERMANENT ROW
- X FENCE
- TEMPORARY WORKSPACE
- ADDITIONAL TEMPORARY WORKSPACE
- ACCESS ROAD
- B111 ABANDONMENT TEMPORARY WORKSPACE
- CONTRACTOR / PIPE YARD
- PAR-0001 ACCESS ROAD NUMBER
- ST=CO=001.000 PROPERTY TRACT NUMBER
- WPADJC002 WETLAND ID
- SPADJC002 WATERBODY ID
- U UNDERGROUND CABLE
- P OVERHEAD POWER LINE
- W WATERLINE
- COUNTY BORDER
- WETLAND
- WATERBODY
- SAFETY FENCE

SCALE: 1" = 40'
40 0 20 40

No.	REVISIONS	APPROVED BY	DATE
P	PRELIMINARY	MM	04/01/16
F2	ISSUED FOR 90% REVIEW	MM	08/30/16

DWG. NO.	REFERENCE
D7002-ALG-022	ALIGNMENT SHEET

PROJECT DELIVERY
PROJECT ENGINEERING
P.O. BOX 1273 CHARLESTON, WV 25325-1273
1700 MACCORKLE AVENUE SE, CHARLESTON, WV 25314

Columbia Gas Transmission

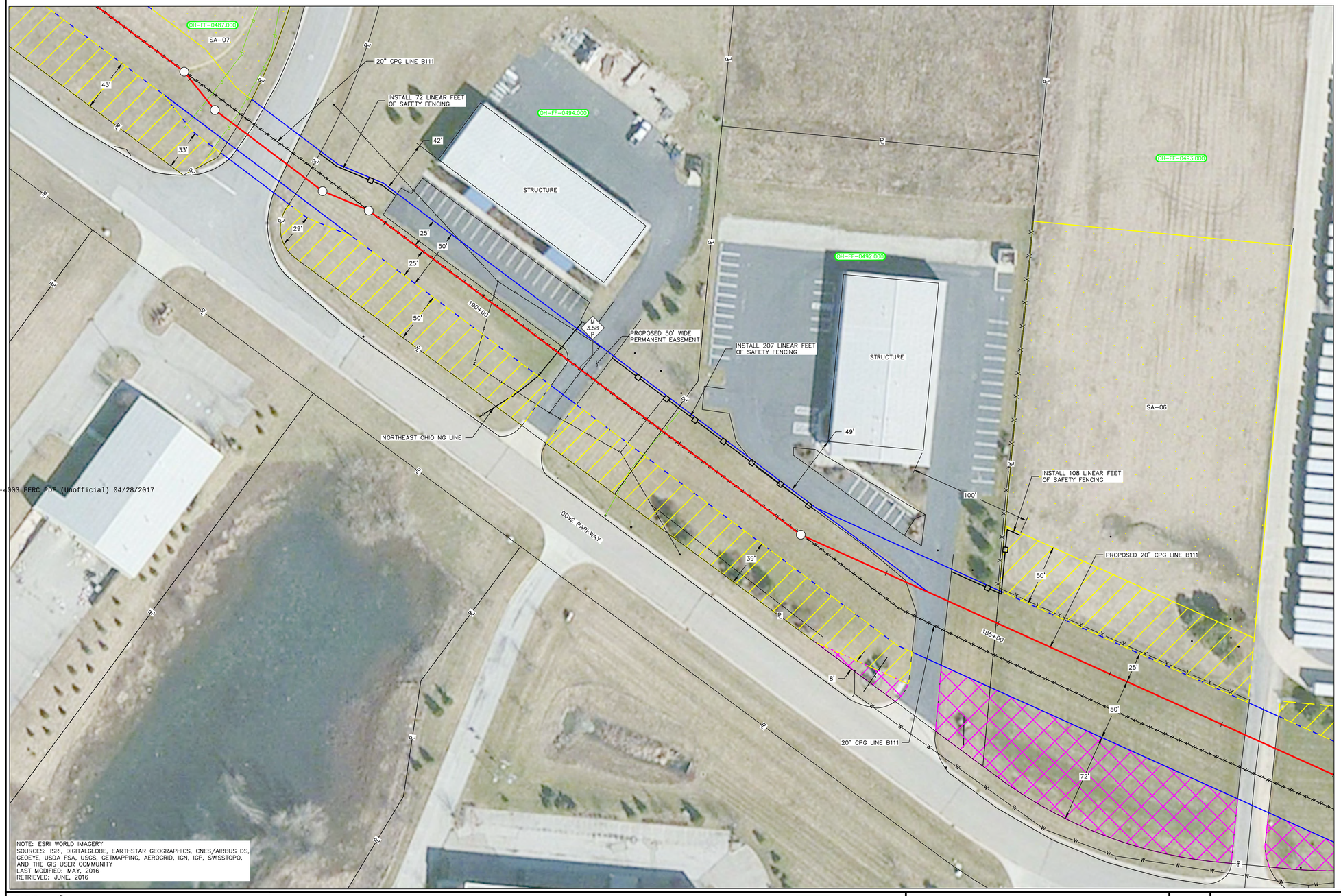
B-SYSTEM MODERNIZATION PROJECT

TITLE: MP 3.28 RESIDENTIAL – DETAIL
PROPOSED 20" LINE B111 REPLACEMENT
FAIRFIELD COUNTY, OHIO

DRAWN BY:	DATE:	DRAWING NUMBER	SHEET	ISSUE
MM	03/29/2016	D7002-RSD-019	19 OF 45	P2

PROJECT NUMBER: 21506
WORK ORDER NUMBER: 46257

TRACTS OH-FF-0492.000, & OH-FF-0494.000
JACK H. GRAHAM, LLC., GEORGE R. & CAREN L. WOLFENBARKER
FAIRFIELD COUNTY, OHIO



NOTE: ESRI WORLD IMAGERY
SOURCES: ISRI, DIGITALGLOBE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, GEOEYE, USDA FSA, USGS, GETMAPPING, AEROGRID, IGN, IGP, SWISSTOPO, AND THE GIS USER COMMUNITY
LAST MODIFIED: MAY, 2016
RETRIEVED: JUNE, 2016

DESCRIPTION

THIS DRAWING DOCUMENTS MITIGATION MEASURES THAT WILL BE IMPLEMENTED FOR ALL RESIDENCES WITHIN 50 FEET OF THE PROPOSED CONSTRUCTION WORK AREA. CONTRACTOR SHALL COMPLY WITH THE FOLLOWING CONSTRUCTION MITIGATION REQUIREMENTS IN ADDITION TO THOSE LISTED IN THE CONSTRUCTION SPECIFICATIONS.

CONSTRUCTION REQUIREMENTS

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ISSUED FOR 90% REVIEW
DATE: 08/30/2016

Ohio Utilities Protection Service Call 811 before you dig

Hatch Mott MacDonald

LEGEND

- MILEPOST (M 1.00 P)
- EXISTING COLUMBIA PIPELINE
- FOREIGN PIPELINE
- PERMANENT ROW
- ROUTE
- FENCE
- TEMPORARY WORKSPACE
- ADDITIONAL TEMPORARY WORKSPACE
- ACCESS ROAD
- B111 ABANDONMENT TEMPORARY WORKSPACE
- CONTRACTOR / PIPE YARD
- ACCESS ROAD NUMBER (PAR-0001)
- PROPERTY TRACT NUMBER (SF-CO-001.000)
- WETLAND ID (WPADJC002)
- WATERBODY ID (SPADJC002)
- UNDERGROUND CABLE
- OVERHEAD POWER LINE
- WATERLINE
- COUNTY BORDER
- WETLAND
- WATERBODY
- SAFETY FENCE

SCALE: 1" = 40'
40 0 20 40

No.	REVISIONS	APPROVED BY	DATE
P1	PRELIMINARY	MM	04/01/16
P2	ISSUED FOR 90% REVIEW	MM	08/30/16

DWG. NO.	REFERENCE
D7002-ALG-022	ALIGNMENT SHEET

PROJECT DELIVERY
PROJECT ENGINEERING
P.O. BOX 1273 CHARLESTON, WV 25325-1273
1700 MACCORKLE AVENUE SE, CHARLESTON, WV 25314

Columbia Gas Transmission

B-SYSTEM MODERNIZATION PROJECT

TITLE: MP 3.58 RESIDENTIAL – DETAIL
PROPOSED 20" LINE B111 REPLACEMENT
FAIRFIELD COUNTY, OHIO

DRAWN BY:	DATE	DRAWING NUMBER	SHEET	ISSUE
MM	03/29/2016	D7002-RSD-020	20 OF 45	P2

PROJECT NUMBER: 21506
WORK ORDER NUMBER: 46257

TRACT OH-FF-0501.000
BRENT A. & PAMELA D. SMITH JENKINS
FAIRFIELD COUNTY, OHIO

DESCRIPTION

THIS DRAWING DOCUMENTS MITIGATION MEASURES THAT WILL BE IMPLEMENTED FOR ALL RESIDENCES WITHIN 50 FEET OF THE PROPOSED CONSTRUCTION WORK AREA. CONTRACTOR SHALL COMPLY WITH THE FOLLOWING CONSTRUCTION MITIGATION REQUIREMENTS IN ADDITION TO THOSE LISTED IN THE CONSTRUCTION SPECIFICATIONS.

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ISSUED FOR 90% REVIEW
DATE: 08/30/2016

Ohio Utilities Protection Service Call 811 before you dig

Hatch Mott MacDonald

LEGEND

- MILEPOST (M 1.00 P)
- ROUTE
- EXISTING COLUMBIA PIPELINE
- FOREIGN PIPELINE
- PERMANENT ROW
- FENCE
- TEMPORARY WORKSPACE
- ADDITIONAL TEMPORARY WORKSPACE
- ACCESS ROAD
- B111 ABANDONMENT TEMPORARY WORKSPACE
- CONTRACTOR / PIPE YARD
- PAR-0001 ACCESS ROAD NUMBER
- ST-CO-001.000 PROPERTY TRACT NUMBER
- WPADJC002 WETLAND ID
- SPADJC002 WATERBODY ID
- UNDERGROUND CABLE
- OVERHEAD POWER LINE
- WATERLINE
- COUNTY BORDER
- WETLAND
- WATERBODY
- SAFETY FENCE

SCALE: 1" = 40'
40 0 20 40

No.	REVISIONS	APPROVED BY	DATE
P1	PRELIMINARY	MM	04/01/16
P2	ISSUED FOR 90% REVIEW	MM	08/30/16

DWG. NO.	REFERENCE
D7002-ALG-023	ALIGNMENT SHEET

PROJECT DELIVERY
PROJECT ENGINEERING
P.O. BOX 1273 CHARLESTON, WV 25325-1273
1700 MACCORKLE AVENUE SE, CHARLESTON, WV 25314

Columbia Gas Transmission

B-SYSTEM MODERNIZATION PROJECT

TITLE: MP 4.17 RESIDENTIAL – DETAIL
PROPOSED 20" LINE B111 REPLACEMENT
FAIRFIELD COUNTY, OHIO

DRAWN BY:	DATE	DRAWING NUMBER	SHEET	ISSUE
MM	03/29/2016	D7002-RSD-021	21 OF 45	P2

PROJECT NUMBER: 21506
WORK ORDER NUMBER: 46257

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TRACTS OH-FN-0001.000, OH-FN-0002.000, OH-FN-0004.000, OH-FN-0005.000, OH-FN-0006.000, OH-FN-0007.000, OH-FN-0008.000 & OH-FN-0009.000
LEONARD R. & LUCY A. BOGGS, TROY & ANGELA M. HALSTEAD, THE W. & P. HELMIC FAMILY LIMITED PARTNERSHIP, JOHN H. HOSKINS JR., JAMES R. & JULIA M. SOUTHALL, DENNIS W. & MELINDA N. THOMPSON, MICHAEL W. & KATHERINE M. STOVER, PRESTON B. FRENCH, JR., TRUSTEE
FAIRFIELD & FRANKLIN COUNTIES, OHIO

DESCRIPTION

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5. TRENCH SHALL NOT BE EXCAVATED UNTIL PIPELINE IS READY FOR INSTALLATION AND SHALL BE BACKFILLED IN SAME DAY AS PIPE INSTALLATION IN THIS AREA. ALL OPEN DITCHES SHALL BE BARRICADED/FENCED OFF OR PLATED WHEN CONSTRUCTION ACTIVITIES ARE NOT IN PROGRESS.
6. IMMEDIATELY AFTER BACKFILLING THE TRENCH, ALL LAWN AND LANDSCAPING WILL BE RESTORED TO FINAL RESTORATION, OR TEMPORARY RESTORATION PENDING WEATHER AND SOIL CONDITIONS. IF SEASONAL OR WEATHER CONDITIONS PREVENT COMPLIANCE WITH THESE TIME FRAMES, TEMPORARY EROSION CONTROLS MUST BE MONITORED AND MAINTAINED UNTIL CONDITIONS ALLOW COMPLETION OF RESTORATION.
7. CONTRACTOR SHALL UTILIZE WATER TRUCKS AS NECESSARY TO MINIMIZE FUGITIVE DUST FROM CONSTRUCTION ACTIVITIES NEAR RESIDENCES/BUSINESSES.
8. ACCESS TO RESIDENCES BY CAR WILL BE MAINTAINED AT ALL TIMES, OR OTHER ACCOMMODATIONS WILL BE MADE WITH EACH RESPECTIVE LANDOWNER.
9. CONTRACTOR SHALL MAINTAIN AGREED UPON ACCESS TO THE IMPACTED AREA DURING CONSTRUCTION.
10. CONTRACTOR SHALL LIMIT WORK IN THIS AREA TO DAYLIGHT HOURS, UNLESS OTHERWISE AGREED UPON WITH LANDOWNER/OCCUPANT.
11. LANDOWNER/OCCUPANT SHALL BE NOTIFIED OF PROPOSED CONSTRUCTION ACTIVITIES PRIOR TO CONSTRUCTION WORK.

ISSUED FOR 90% REVIEW
DATE: 08/30/2016

Ohio Utilities Protection Service Call 811 before you dig

Hatch Mott MacDonald

LEGEND

- MILEPOST (M 1.00 P)
- ROUTE
- EXISTING COLUMBIA PIPELINE
- FOREIGN PIPELINE
- PERMANENT ROW
- FENCE
- TEMPORARY WORKSPACE
- ADDITIONAL TEMPORARY WORKSPACE
- ACCESS ROAD
- B111 ABANDONMENT TEMPORARY WORKSPACE
- CONTRACTOR / PIPE YARD
- PAR-0001 ACCESS ROAD NUMBER
- ST-CO-001.000 PROPERTY TRACT NUMBER
- WPADJC002 WETLAND ID
- SPADJC002 WATERBODY ID
- UNDERGROUND CABLE
- OVERHEAD POWER LINE
- WATERLINE
- COUNTY BORDER
- WETLAND
- WATERBODY
- SAFETY FENCE

SCALE: 1" = 40'

DWG. NO.	REFERENCE
D7002-ALG-023	ALIGNMENT SHEET
D7002-ALG-034	ALIGNMENT SHEET

No.	REVISIONS	APPROVED BY	DATE
P1	PRELIMINARY	MM	04/01/16
P2	ISSUED FOR 90% REVIEW	MM	08/30/16

PROJECT DELIVERY
PROJECT ENGINEERING
P.O. BOX 1273 CHARLESTON, WV 25325-1273
1700 MACCORKLE AVENUE SE, CHARLESTON, WV 25314

Columbia Gas Transmission

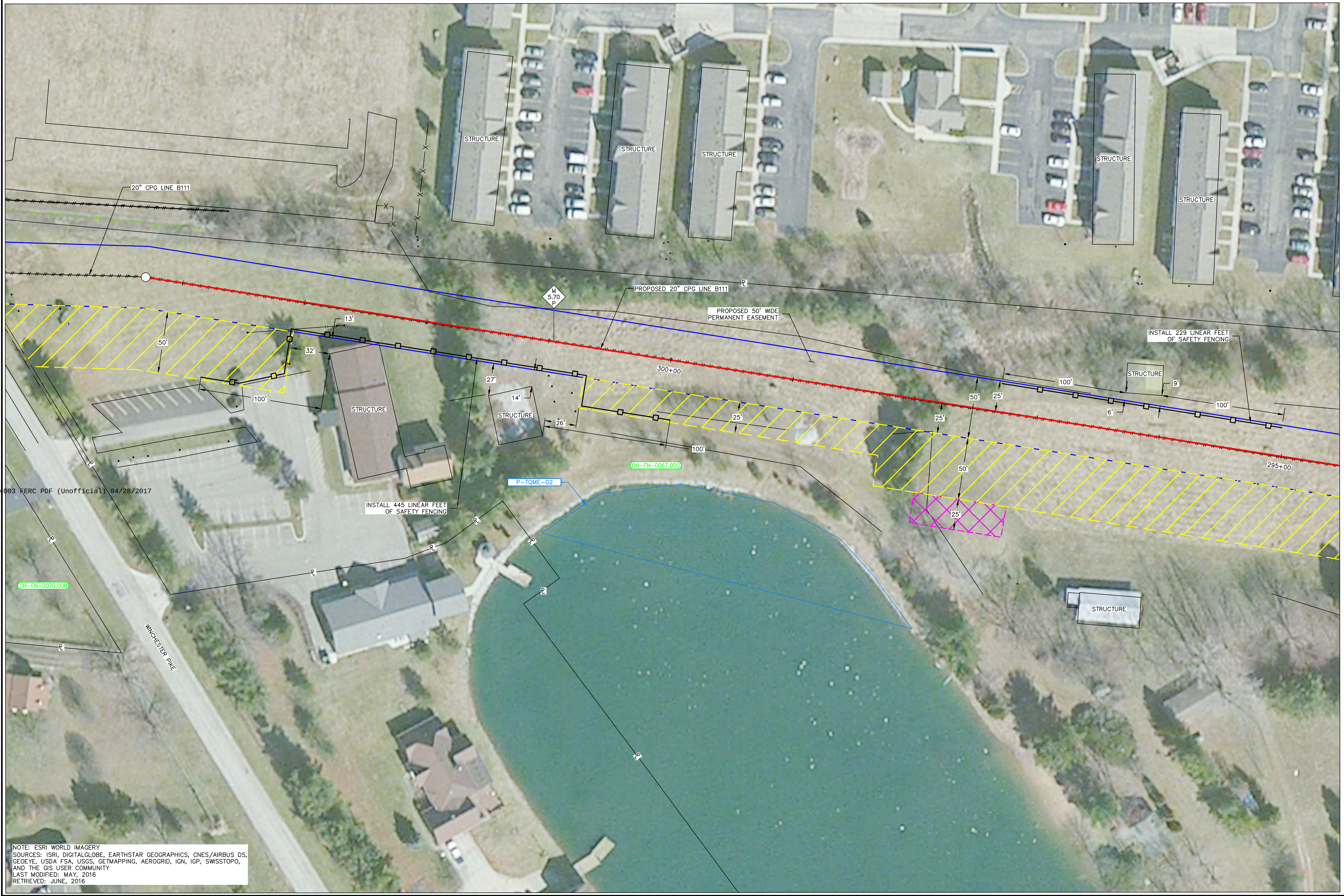
B-SYSTEM MODERNIZATION PROJECT

TITLE: MP 4.40 RESIDENTIAL – DETAIL
PROPOSED 20" LINE B111 REPLACEMENT
FAIRFIELD & FRANKLIN COUNTIES, OHIO

DRAWN BY:	DATE:	DRAWING NUMBER	SHEET	ISSUE
MM	03/29/2016	D7002-RSD-022	22 OF 45	P2

PROJECT NUMBER: 21506
WORK ORDER NUMBER: 46257

TRACT OH-FN-0067.000
HENRIETA L. PFEIFER
FRANKLIN COUNTY, OHIO



DESCRIPTION

THIS DRAWING DOCUMENTS MITIGATION MEASURES THAT WILL BE IMPLEMENTED FOR ALL RESIDENCES WITHIN 50 FEET OF THE PROPOSED CONSTRUCTION WORK AREA. CONTRACTOR SHALL COMPLY WITH THE FOLLOWING CONSTRUCTION MITIGATION REQUIREMENTS IN ADDITION TO THOSE LISTED IN THE CONSTRUCTION SPECIFICATIONS.

CONSTRUCTION REQUIREMENTS

1. CONTRACTOR SHALL ERECT AND MAINTAIN A SAFETY FENCE BETWEEN THE CONSTRUCTION ZONE AND THE ADJACENT RESIDENCES EXTENDING 100 FEET ON EITHER SIDE OF THE RESIDENCE TO ENSURE THAT EQUIPMENT, MATERIALS AND SPOIL REMAIN WITHIN THE CONSTRUCTION WORK AREA.
2. A MINIMUM OF 25 FEET WILL BE MAINTAINED BETWEEN THE RESIDENCE AND CONSTRUCTION WORK AREA FOR A DISTANCE OF 100 FEET ON EITHER SIDE OF THE RESIDENCE. IF THE FACILITY MUST BE WITHIN 25 FEET OF A RESIDENCE, IT MUST BE INSTALLED SUCH THAT THE TRENCH DOES NOT REMAIN OPEN OVERNIGHT.
3. MATURE TREES AND LANDSCAPING WILL NOT BE REMOVED FROM WITHIN THE EDGE OF THE CONSTRUCTION WORK AREA UNLESS NECESSARY FOR SAFE OPERATION OF CONSTRUCTION EQUIPMENT OR AS SPECIFIED IN LANDOWNER AGREEMENTS.
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5. TRENCH SHALL NOT BE EXCAVATED UNTIL PIPELINE IS READY FOR INSTALLATION AND SHALL BE BACKFILLED IN SAME DAY AS PIPE INSTALLATION IN THIS AREA. ALL OPEN DITCHES SHALL BE BARRICADED/FENCED OFF OR PLATED WHEN CONSTRUCTION ACTIVITIES ARE NOT IN PROGRESS.
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11. LANDOWNER/OCCUPANT SHALL BE NOTIFIED OF PROPOSED CONSTRUCTION ACTIVITIES PRIOR TO CONSTRUCTION WORK.

ISSUED FOR 90% REVIEW
DATE: 08/30/2016

Ohio Utilities Protection Service — Call 811 before you dig

Hatch Mott MacDonald
2343 Alexandria Drive, Suite 320, Lexington, KY 40504 | T: (859) 629-3520 F: (859) 224-0146

LEGEND

MILEPOST; EXISTING COLUMBIA PIPELINE; FOREIGN PIPELINE; PERMANENT ROW; ROUTE; FENCE; TEMPORARY WORKSPACE; ADDITIONAL TEMPORARY WORKSPACE; ACCESS ROAD; B111 ABANDONMENT TEMPORARY WORKSPACE; CONTRACTOR / PIPE YARD; PAR-0001 ACCESS ROAD NUMBER; PROPERTY TRACT NUMBER; WETLAND ID; WATERBODY ID; UNDERGROUND CABLE; OVERHEAD POWER LINE; WATERLINE; COUNTY BORDER; WETLAND; WATERBODY; SAFETY FENCE

SCALE: 1" = 40'
40 0 20 40

No.	REVISIONS	APPROVED BY	DATE
P1	PRELIMINARY	MM	04/01/16
P2	ISSUED FOR 90% REVIEW	MM	08/30/16

DWG. NO.	REFERENCE
D7002-ALG-024	ALIGNMENT SHEET

PROJECT DELIVERY
PROJECT ENGINEERING
P.O. BOX 1273 CHARLESTON, WV 25325-1273
1700 MACCORKLE AVENUE SE, CHARLESTON, WV 25314

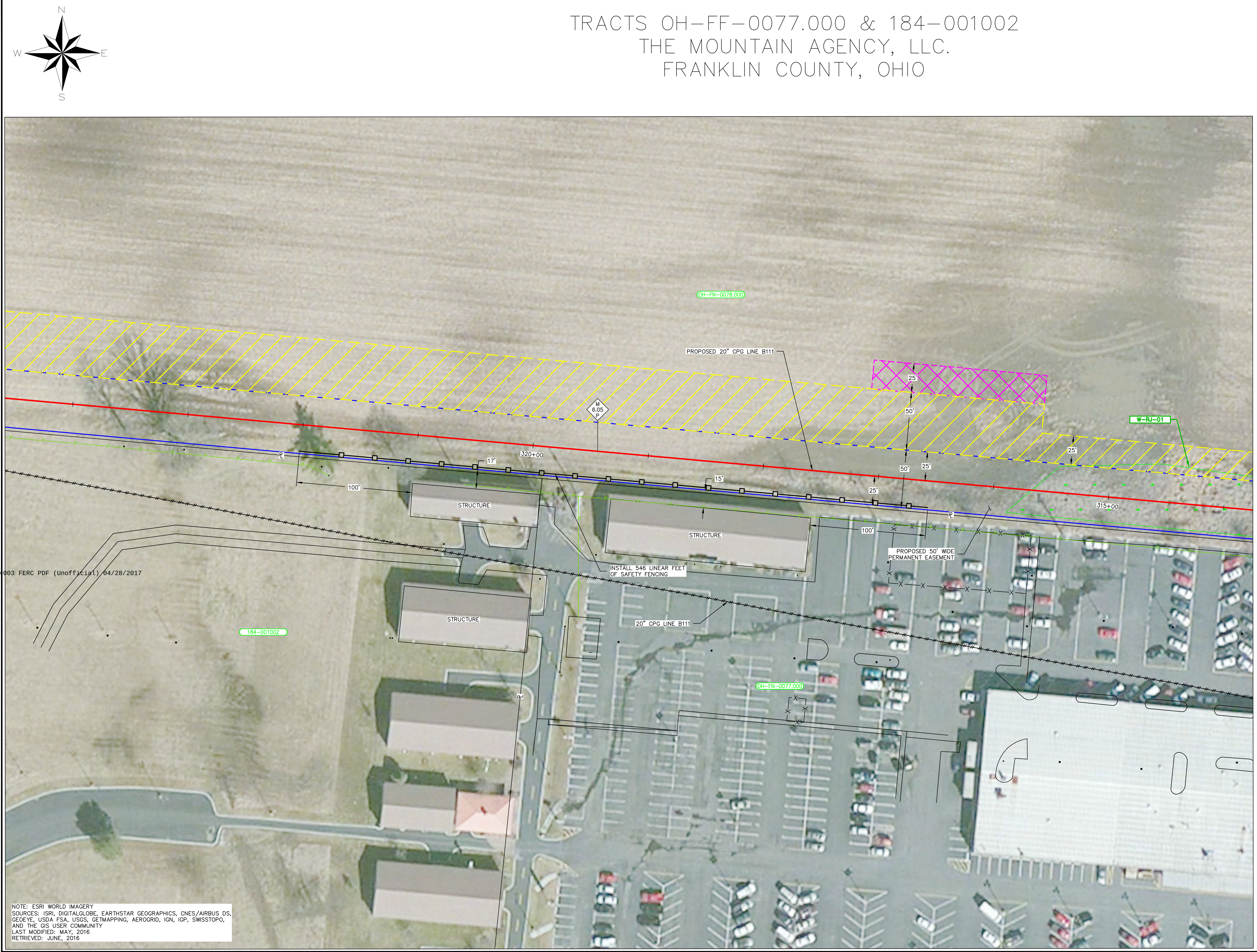
Columbia Gas Transmission

B-SYSTEM MODERNIZATION PROJECT

TITLE: MP 5.70 RESIDENTIAL – DETAIL
PROPOSED 20" LINE B111 REPLACEMENT
FRANKLIN COUNTY, OHIO

DRAWN BY:	MM	DATE: 03/21/2016	DRAWING NUMBER	SHEET	ISSUE
PROJECT NUMBER	21506		D7002-RSD-023	23 OF 45	P2
WORK ORDER NUMBER	46257				

TRACTS OH-FF-0077.000 & 184-001002
THE MOUNTAIN AGENCY, LLC.
FRANKLIN COUNTY, OHIO



DESCRIPTION

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CONSTRUCTION REQUIREMENTS

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11. LANDOWNER/OCCUPANT SHALL BE NOTIFIED OF PROPOSED CONSTRUCTION ACTIVITIES PRIOR TO CONSTRUCTION WORK.

ISSUED FOR 90% REVIEW
DATE: 08/30/2016

Ohio Utilities Protection Service — Call 811 before you dig

Hatch Mott MacDonald
2343 Alexandria Drive, Suite 320, Lexington, KY 40504 | T: (859) 629-3520 F: (859) 224-0146

LEGEND: MILEPOST; EXISTING COLUMBIA PIPELINE; FOREIGN PIPELINE; PERMANENT ROW; ROUTE; FENCE; TEMPORARY WORKSPACE; ADDITIONAL TEMPORARY WORKSPACE; ACCESS ROAD; B111 ABANDONMENT TEMPORARY WORKSPACE; CONTRACTOR / PIPE YARD; ACCESS ROAD NUMBER (PAR-0001); PROPERTY TRACT NUMBER; WETLAND ID (WPADJC0002); WATERBODY ID; UNDERGROUND CABLE; OVERHEAD POWER LINE; WATERLINE; COUNTY BORDER; WETLAND; WATERBODY; SAFETY FENCE

SCALE: 1" = 40'

No.	REVISIONS	APPROVED BY	DATE
P1	PRELIMINARY	MM	04/01/16
P2	ISSUED FOR 90% REVIEW	MM	08/30/16

DWG. NO.	REFERENCE
D7002-ALG-024	ALIGNMENT SHEET
D7002-ALG-025	ALIGNMENT SHEET

PROJECT DELIVERY
PROJECT ENGINEERING
P.O. BOX 1273 CHARLESTON, WV 25325-1273
1700 MACCORKLE AVENUE SE, CHARLESTON, WV 25314

Columbia Gas Transmission

B-SYSTEM MODERNIZATION PROJECT

TITLE: MP 6.05 RESIDENTIAL – DETAIL
PROPOSED 20" LINE B111 REPLACEMENT
FRANKLIN COUNTY, OHIO

DRAWN BY	DATE	PROJECT NUMBER	WORK ORDER NUMBER	DRAWING NUMBER	SHEET	ISSUE
MM	03/21/2016	21506	46257	D7002-RSD-024	24 OF 45	P2

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12:21 PM 2016-08-20

TRACTS OH-FN-0101.000, OH-FN-0103.000, OH-FN-0106.000, OH-FN-0108.000 & OH-FN-0110.000
CHARLES A. LOGUE, TRUSTEE, LLOYD W. & BECKY S. CASSIDY, ARON P. HOLLOWDAY, COLUMBIA GAS OF OHIO, INC., JOHN E. & DOTTIE L. LYNN
FRANKLIN COUNTY, OHIO

NOTE: ESRI WORLD IMAGERY
SOURCES: ISRI, DIGITALGLOBE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, GEOEYE, USDA FSA, USGS, GETMAPPING, AEROGRID, IGN, IGP, SWISSTOPO, AND THE GIS USER COMMUNITY
LAST MODIFIED: MAY, 2016
RETRIEVED: JUNE, 2016

DESCRIPTION

THIS DRAWING DOCUMENTS MITIGATION MEASURES THAT WILL BE IMPLEMENTED FOR ALL RESIDENCES WITHIN 50 FEET OF THE PROPOSED CONSTRUCTION WORK AREA. CONTRACTOR SHALL COMPLY WITH THE FOLLOWING CONSTRUCTION MITIGATION REQUIREMENTS IN ADDITION TO THOSE LISTED IN THE CONSTRUCTION SPECIFICATIONS.

CONSTRUCTION REQUIREMENTS

1. CONTRACTOR SHALL ERECT AND MAINTAIN A SAFETY FENCE BETWEEN THE CONSTRUCTION ZONE AND THE ADJACENT RESIDENCES EXTENDING 100 FEET ON EITHER SIDE OF THE RESIDENCE TO ENSURE THAT EQUIPMENT, MATERIALS AND SPOIL REMAIN WITHIN THE CONSTRUCTION WORK AREA.
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11. LANDOWNER/OCCUPANT SHALL BE NOTIFIED OF PROPOSED CONSTRUCTION ACTIVITIES PRIOR TO CONSTRUCTION WORK.

ISSUED FOR 90% REVIEW
DATE: 08/30/2016

Ohio Utilities Protection Service Call 811 before you dig

Hatch Mott MacDonald

LEGEND

- MILEPOST
- ROUTE
- EXISTING COLUMBIA PIPELINE
- FOREIGN PIPELINE
- PERMANENT ROW
- FENCE
- TEMPORARY WORKSPACE
- ADDITIONAL TEMPORARY WORKSPACE
- ACCESS ROAD
- B111 ABANDONMENT TEMPORARY WORKSPACE
- CONTRACTOR / PIPE YARD
- ACCESS ROAD NUMBER
- PROPERTY TRACT NUMBER
- WETLAND ID
- WATERBODY ID
- UNDERGROUND CABLE
- OVERHEAD POWER LINE
- WATERLINE
- COUNTY BORDER
- WETLAND
- WATERBODY
- SAFETY FENCE

SCALE: 1" = 40'

No.	REVISIONS	APPROVED BY	DATE
P1	PRELIMINARY	MM	04/01/16
P2	ISSUED FOR 90% REVIEW	MM	08/30/16

DWG. NO.	REFERENCE
D7002-ALG-027	ALIGNMENT SHEET

PROJECT DELIVERY
PROJECT ENGINEERING
P.O. BOX 1273 CHARLESTON, WV 25325-1273
1700 MACCORKLE AVENUE SE, CHARLESTON, WV 25314

Columbia Gas Transmission

B-SYSTEM MODERNIZATION PROJECT

TITLE: MP 8.10 RESIDENTIAL – DETAIL
PROPOSED 20" LINE B111 REPLACEMENT
FRANKLIN COUNTY, OHIO

DRAWN BY:	MM	DATE: 03/21/2016	DRAWING NUMBER	SHEET	ISSUE
PROJECT NUMBER	21506		D7002-RSD-025	25 OF 45	P2
WORK ORDER NUMBER	46257				

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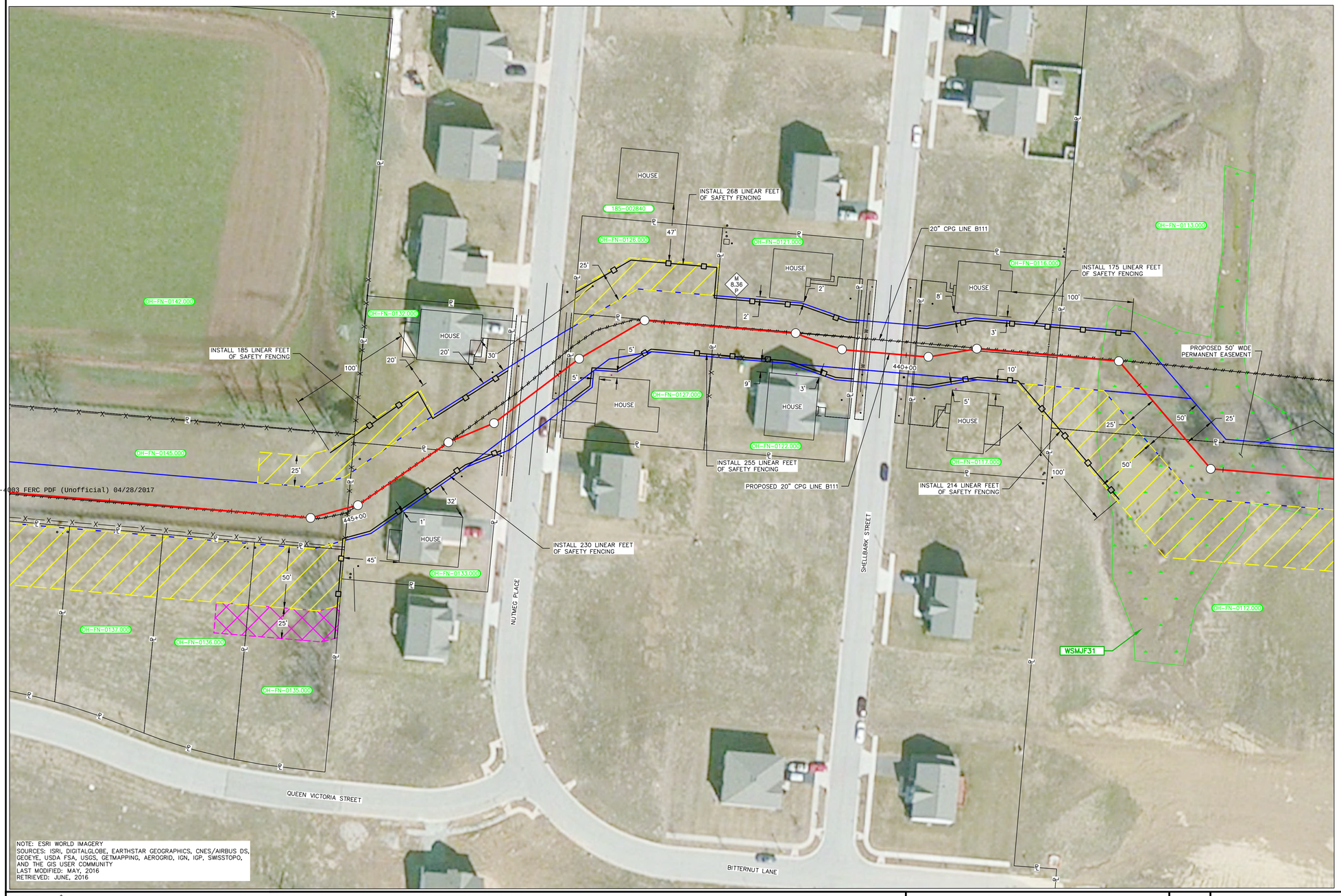
TRACTS OH-FN-0116.000, OH-FN-0117.000, OH-FN-0121.000, OH-FN-0122.000, OH-FN-0127.000, OH-FN-0132.000, OH-FN-0133.000 & 185-002840
LARRY DARNEL & AMANDA R. MCKISSACK, BENJAMIN P. & KENDRA HINKLE, MICHELLE MARIE & KEITH B. GIBSON, MICHAEL P. & ANDREA M. GEE, HERIBERTO CHACON, JR. & SONIA E. RODRIGUEZ, DARREL A., JR. & KAREN S. MADSEN, TINA M. STICKNEY. CHRISTOPHER STICKNEY & FREDDIE M. REEDY, ERROL DWAYNE DICKSON
FRANKLIN COUNTY, OHIO



NOTE: ESRI WORLD IMAGERY
SOURCES: ISRI, DIGITALGLOBE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, GEOEYE, USDA FSA, USGS, GETMAPPING, AEROGRID, IGN, IGP, SWISSTOPO, AND THE GIS USER COMMUNITY
LAST MODIFIED: MAY, 2016
RETRIEVED: JUNE, 2016

DESCRIPTION

THIS DRAWING DOCUMENTS MITIGATION MEASURES THAT WILL BE IMPLEMENTED FOR ALL RESIDENCES WITHIN 50 FEET OF THE PROPOSED CONSTRUCTION WORK AREA. CONTRACTOR SHALL COMPLY WITH THE FOLLOWING CONSTRUCTION MITIGATION REQUIREMENTS IN ADDITION TO THOSE LISTED IN THE CONSTRUCTION SPECIFICATIONS.

CONSTRUCTION REQUIREMENTS

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ISSUED FOR 90% REVIEW
DATE: 08/30/2016

Ohio Utilities Protection Service Call 811 before you dig

Hatch Mott MacDonald

LEGEND

MILEPOST (M 1.00 P)
ROUTE
EXISTING COLUMBIA PIPELINE
FOREIGN PIPELINE
PERMANENT ROW
X FENCE
TEMPORARY WORKSPACE
ADDITIONAL TEMPORARY WORKSPACE
ACCESS ROAD
B111 ABANDONMENT TEMPORARY WORKSPACE
CONTRACTOR / PIPE YARD
PAR-0001 ACCESS ROAD NUMBER
ST-CO-001.000 PROPERTY TRACT NUMBER
WPADJC002 WETLAND ID
SPADJC002 WATERBODY ID
U UNDERGROUND CABLE
P OVERHEAD POWER LINE
W WATERLINE
COUNTY BORDER
WETLAND
WATERBODY
SAFETY FENCE

SCALE: 1" = 40'
40 0 20 40

No.	REVISIONS	APPROVED BY	DATE
P1	PRELIMINARY	MM	04/01/16
P2	ISSUED FOR 90% REVIEW	MM	08/30/16

DWG. NO.	REFERENCE
D7002-ALG-027	ALIGNMENT SHEET

PROJECT DELIVERY
PROJECT ENGINEERING
P.O. BOX 1273 CHARLESTON, WV 25325-1273
1700 MACCORKLE AVENUE SE, CHARLESTON, WV 25314

Columbia Gas Transmission

B-SYSTEM MODERNIZATION PROJECT

TITLE: MP 8.36 RESIDENTIAL – DETAIL
PROPOSED 20" LINE B111 REPLACEMENT
FRANKLIN COUNTY, OHIO

DRAWN BY:	MM	DATE: 03/21/2016	DRAWING NUMBER	SHEET	ISSUE
PROJECT NUMBER	21506		D7002-RSD-026	26 OF 45	P2
WORK ORDER NUMBER	46257				

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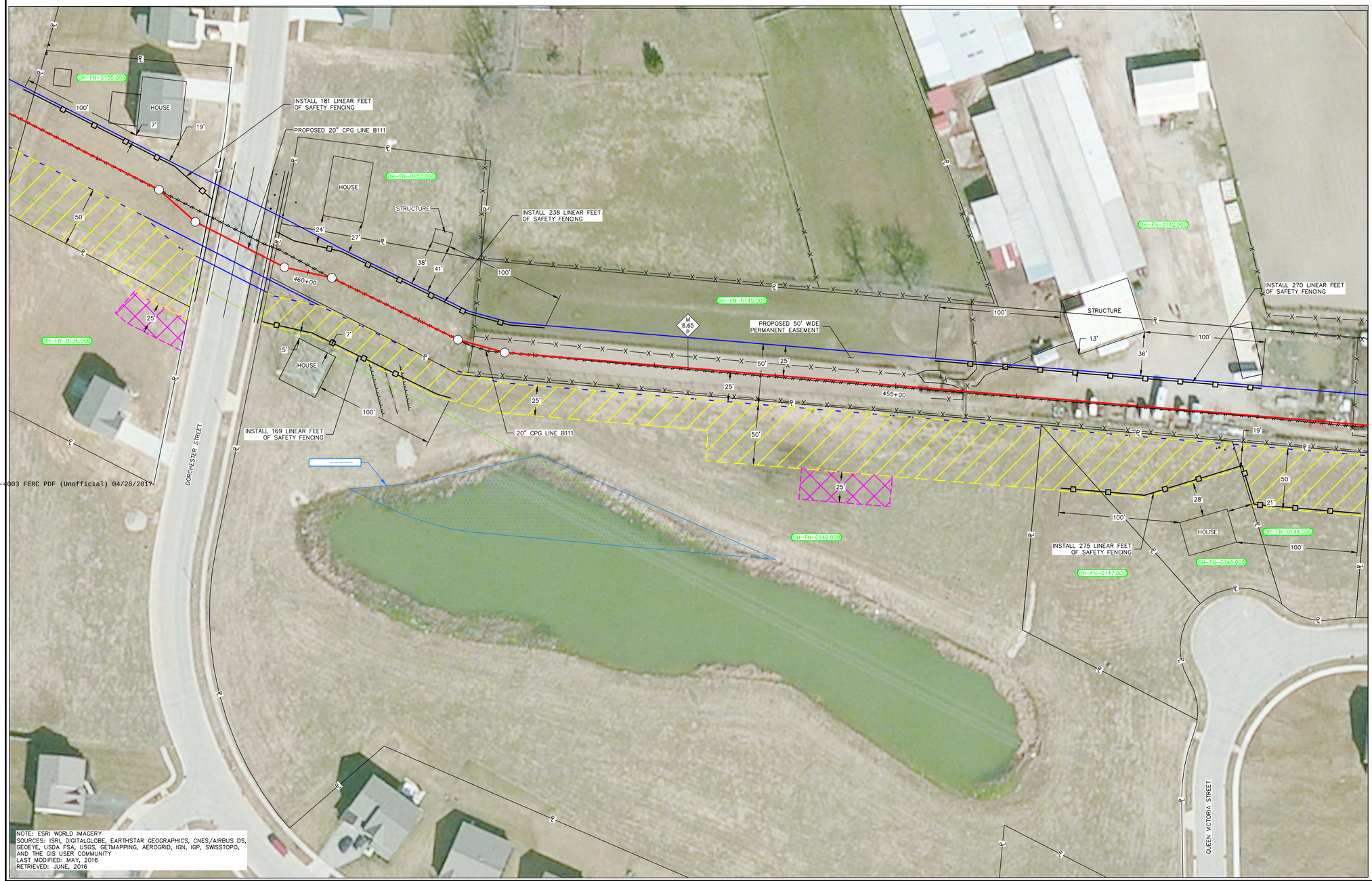
TRACTS OH-FN-0142.000, OH-FN-0146.000, OH-FN-0149.000, OH-FN-0152.000 & OH-FN-0155.000
PATRICK M. & SHARON DANISON, JESSICA M. MILLER, VILLAGE OF GROVEPORT, KATHLEEN & JOHN PARKER, MARVIN A. STEVENS
FRANKLIN COUNTY, OHIO



NOTE: ESRI WORLD IMAGERY
SOURCES: ISRI, DIGITALGLOBE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, GEOEYE, USDA FSA, USGS, GETMAPPING, AEROGRID, IGN, IGP, SWISSTOPO, AND THE GIS USER COMMUNITY
LAST MODIFIED: MAY, 2016
RETRIEVED: JUNE, 2016

DESCRIPTION

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4. OTHER EXISTING PHYSICAL FEATURES THAT NEED TO BE PROTECTED WILL BE ENCLOSED IN SAFETY FENCE TO AVOID DISTURBANCE DURING CONSTRUCTION.
5. TRENCH SHALL NOT BE EXCAVATED UNTIL PIPELINE IS READY FOR INSTALLATION AND SHALL BE BACKFILLED IN SAME DAY AS PIPE INSTALLATION IN THIS AREA. ALL OPEN DITCHES SHALL BE BARRICADED/FENCED OFF OR PLATED WHEN CONSTRUCTION ACTIVITIES ARE NOT IN PROGRESS.
6. IMMEDIATELY AFTER BACKFILLING THE TRENCH, ALL LAWN AND LANDSCAPING WILL BE RESTORED TO FINAL RESTORATION, OR TEMPORARY RESTORATION PENDING WEATHER AND SOIL CONDITIONS. IF SEASONAL OR WEATHER CONDITIONS PREVENT COMPLIANCE WITH THESE TIME FRAMES, TEMPORARY EROSION CONTROLS MUST BE MONITORED AND MAINTAINED UNTIL CONDITIONS ALLOW COMPLETION OF RESTORATION.
7. CONTRACTOR SHALL UTILIZE WATER TRUCKS AS NECESSARY TO MINIMIZE FUGITIVE DUST FROM CONSTRUCTION ACTIVITIES NEAR RESIDENCES/BUSINESSES.
8. ACCESS TO RESIDENCES BY CAR WILL BE MAINTAINED AT ALL TIMES, OR OTHER ACCOMMODATIONS WILL BE MADE WITH EACH RESPECTIVE LANDOWNER.
9. CONTRACTOR SHALL MAINTAIN AGREED UPON ACCESS TO THE IMPACTED AREA DURING CONSTRUCTION.
10. CONTRACTOR SHALL LIMIT WORK IN THIS AREA TO DAYLIGHT HOURS, UNLESS OTHERWISE AGREED UPON WITH LANDOWNER/OCCUPANT.
11. LANDOWNER/OCCUPANT SHALL BE NOTIFIED OF PROPOSED CONSTRUCTION ACTIVITIES PRIOR TO CONSTRUCTION WORK.

ISSUED FOR 90% REVIEW
DATE: 08/30/2016

Ohio Utilities Protection Service Call 811 before you dig

Hatch Mott MacDonald

LEGEND

- MILEPOST
- ROUTE
- EXISTING COLUMBIA PIPELINE
- FOREIGN PIPELINE
- PERMANENT ROW
- FENCE
- TEMPORARY WORKSPACE
- ADDITIONAL TEMPORARY WORKSPACE
- ACCESS ROAD
- B111 ABANDONMENT TEMPORARY WORKSPACE
- CONTRACTOR / PIPE YARD
- ACCESS ROAD NUMBER
- PROPERTY TRACT NUMBER
- WETLAND ID
- WATERBODY ID
- UNDERGROUND CABLE
- OVERHEAD POWER LINE
- WATERLINE
- COUNTY BORDER
- WETLAND
- WATERBODY
- SAFETY FENCE

SCALE: 1" = 40'

No.	REVISIONS	APPROVED BY	DATE
P1	PRELIMINARY	MM	04/01/16
P2	ISSUED FOR 90% REVIEW	MM	08/30/16

D7002-ALG-027	ALIGNMENT SHEET

PROJECT DELIVERY
PROJECT ENGINEERING
P.O. BOX 1273 CHARLESTON, WV 25325-1273
1700 MACCORKLE AVENUE SE, CHARLESTON, WV 25314

Columbia Gas Transmission

B-SYSTEM MODERNIZATION PROJECT

TITLE: MP 8.65 RESIDENTIAL – DETAIL
PROPOSED 20" LINE B111 REPLACEMENT
FRANKLIN COUNTY, OHIO

DRAWN BY:	MM	DATE: 03/21/2016	DRAWING NUMBER	SHEET	ISSUE
PROJECT NUMBER	21506		D7002-RSD-027	27 OF 45	P2
WORK ORDER NUMBER	46257				

DWG. NO. REFERENCE

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TRACTS OH-FN-0172.000 & OH-FN-0173.000
STATE OF OHIO DIR. OF ADM. SERVICES, BOARD OF FRANKLIN COUNTY COMMISSIONERS
FRANKLIN COUNTY, OHIO

20170428-4003 FERC PDF (Unofficial) 04/28/2017

DESCRIPTION

THIS DRAWING DOCUMENTS MITIGATION MEASURES THAT WILL BE IMPLEMENTED FOR ALL RESIDENCES WITHIN 50 FEET OF THE PROPOSED CONSTRUCTION WORK AREA. CONTRACTOR SHALL COMPLY WITH THE FOLLOWING CONSTRUCTION MITIGATION REQUIREMENTS IN ADDITION TO THOSE LISTED IN THE CONSTRUCTION SPECIFICATIONS.

CONSTRUCTION REQUIREMENTS

1. CONTRACTOR SHALL ERECT AND MAINTAIN A SAFETY FENCE BETWEEN THE CONSTRUCTION ZONE AND THE ADJACENT RESIDENCES EXTENDING 100 FEET ON EITHER SIDE OF THE RESIDENCE TO ENSURE THAT EQUIPMENT, MATERIALS AND SPOIL REMAIN WITHIN THE CONSTRUCTION WORK AREA.
2. A MINIMUM OF 25 FEET WILL BE MAINTAINED BETWEEN THE RESIDENCE AND CONSTRUCTION WORK AREA FOR A DISTANCE OF 100 FEET ON EITHER SIDE OF THE RESIDENCE. IF THE FACILITY MUST BE WITHIN 25 FEET OF A RESIDENCE, IT MUST BE INSTALLED SUCH THAT THE TRENCH DOES NOT REMAIN OPEN OVERNIGHT.
3. MATURE TREES AND LANDSCAPING WILL NOT BE REMOVED FROM WITHIN THE EDGE OF THE CONSTRUCTION WORK AREA UNLESS NECESSARY FOR SAFE OPERATION OF CONSTRUCTION EQUIPMENT OR AS SPECIFIED IN LANDOWNER AGREEMENTS.
4. OTHER EXISTING PHYSICAL FEATURES THAT NEED TO BE PROTECTED WILL BE ENCLOSED IN SAFETY FENCE TO AVOID DISTURBANCE DURING CONSTRUCTION.
5. TRENCH SHALL NOT BE EXCAVATED UNTIL PIPELINE IS READY FOR INSTALLATION AND SHALL BE BACKFILLED IN SAME DAY AS PIPE INSTALLATION IN THIS AREA. ALL OPEN DITCHES SHALL BE BARRICADED/FENCED OFF OR PLATED WHEN CONSTRUCTION ACTIVITIES ARE NOT IN PROGRESS.
6. IMMEDIATELY AFTER BACKFILLING THE TRENCH, ALL LAWN AND LANDSCAPING WILL BE RESTORED TO FINAL RESTORATION, OR TEMPORARY RESTORATION PENDING WEATHER AND SOIL CONDITIONS. IF SEASONAL OR WEATHER CONDITIONS PREVENT COMPLIANCE WITH THESE TIME FRAMES, TEMPORARY EROSION CONTROLS MUST BE MONITORED AND MAINTAINED UNTIL CONDITIONS ALLOW COMPLETION OF RESTORATION.
7. CONTRACTOR SHALL UTILIZE WATER TRUCKS AS NECESSARY TO MINIMIZE FUGITIVE DUST FROM CONSTRUCTION ACTIVITIES NEAR RESIDENCES/BUSINESSES.
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11. LANDOWNER/OCCUPANT SHALL BE NOTIFIED OF PROPOSED CONSTRUCTION ACTIVITIES PRIOR TO CONSTRUCTION WORK.

ISSUED FOR 90% REVIEW
DATE: 08/30/2016

Ohio Utilities Protection Service Call 811 before you dig

Hatch Mott MacDonald

LEGEND

- MILEPOST (M 1.00 P)
- ROUTE
- EXISTING COLUMBIA PIPELINE
- FOREIGN PIPELINE
- PERMANENT ROW
- X FENCE
- TEMPORARY WORKSPACE
- ADDITIONAL TEMPORARY WORKSPACE
- ACCESS ROAD
- B111 ABANDONMENT TEMPORARY WORKSPACE
- CONTRACTOR / PIPE YARD
- PAR-0001 ACCESS ROAD NUMBER
- ST-CO-001.000 PROPERTY TRACT NUMBER
- WPADJC002 WETLAND ID
- SPADJC002 WATERBODY ID
- UNDERGROUND CABLE
- P OVERHEAD POWER LINE
- W WATERLINE
- COUNTY BORDER
- WETLAND
- WATERBODY
- SAFETY FENCE

SCALE: 1" = 40'
40 0 20 40

No.	REVISIONS	APPROVED BY	DATE
P1	PRELIMINARY	MM	04/01/16
P2	ISSUED FOR 90% REVIEW	MM	08/30/16

No.	REVISIONS	APPROVED BY	DATE

No.	REVISIONS	APPROVED BY	DATE

DWG. NO.	REFERENCE
D7002-ALG-028	ALIGNMENT SHEET

PROJECT DELIVERY
PROJECT ENGINEERING
P.O. BOX 1273 CHARLESTON, WV 25325-1273
1700 MACCORKLE AVENUE SE, CHARLESTON, WV 25314

Columbia Gas Transmission

B-SYSTEM MODERNIZATION PROJECT

TITLE: MP 9.75 RESIDENTIAL – DETAIL
PROPOSED 20" LINE B111 REPLACEMENT
FRANKLIN COUNTY, OHIO

DRAWN BY:	MM	DATE 03/21/2016	DRAWING NUMBER	SHEET	ISSUE
PROJECT NUMBER	21506		D7002-RSD-028	28 OF 45	P2
WORK ORDER NUMBER	46257				

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2016-08-20
12:15 PM

TRACTS OH-FN-0183.000, 530-176496, & 530-183834, OH-FN-0184.000, OH-FN-0189.000, MIMG XXXIII THREE RIVERS, LLC., SHARON K. TOD HORN, LISA M. HUNTER FRANKLIN COUNTY, OHIO

20170428-4003 FERC PDF (Unofficial) 04/28/2017

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2016-08-20
12:13 PM

DESCRIPTION

THIS DRAWING DOCUMENTS MITIGATION MEASURES THAT WILL BE IMPLEMENTED FOR ALL RESIDENCES WITHIN 50 FEET OF THE PROPOSED CONSTRUCTION WORK AREA. CONTRACTOR SHALL COMPLY WITH THE FOLLOWING CONSTRUCTION MITIGATION REQUIREMENTS IN ADDITION TO THOSE LISTED IN THE CONSTRUCTION SPECIFICATIONS.

CONSTRUCTION REQUIREMENTS

1. CONTRACTOR SHALL ERECT AND MAINTAIN A SAFETY FENCE BETWEEN THE CONSTRUCTION ZONE AND THE ADJACENT RESIDENCES EXTENDING 100 FEET ON EITHER SIDE OF THE RESIDENCE TO ENSURE THAT EQUIPMENT, MATERIALS AND SPOIL REMAIN WITHIN THE CONSTRUCTION WORK AREA.
2. A MINIMUM OF 25 FEET WILL BE MAINTAINED BETWEEN THE RESIDENCE AND CONSTRUCTION WORK AREA FOR A DISTANCE OF 100 FEET ON EITHER SIDE OF THE RESIDENCE. IF THE FACILITY MUST BE WITHIN 25 FEET OF A RESIDENCE, IT MUST BE INSTALLED SUCH THAT THE TRENCH DOES NOT REMAIN OPEN OVERNIGHT.
3. MATURE TREES AND LANDSCAPING WILL NOT BE REMOVED FROM WITHIN THE EDGE OF THE CONSTRUCTION WORK AREA UNLESS NECESSARY FOR SAFE OPERATION OF CONSTRUCTION EQUIPMENT OR AS SPECIFIED IN LANDOWNER AGREEMENTS.
4. OTHER EXISTING PHYSICAL FEATURES THAT NEED TO BE PROTECTED WILL BE ENCLOSED IN SAFETY FENCE TO AVOID DISTURBANCE DURING CONSTRUCTION.
5. TRENCH SHALL NOT BE EXCAVATED UNTIL PIPELINE IS READY FOR INSTALLATION AND SHALL BE BACKFILLED IN SAME DAY AS PIPE INSTALLATION IN THIS AREA. ALL OPEN DITCHES SHALL BE BARRICADED/FENCED OFF OR PLATED WHEN CONSTRUCTION ACTIVITIES ARE NOT IN PROGRESS.
6. IMMEDIATELY AFTER BACKFILLING THE TRENCH, ALL LAWN AND LANDSCAPING WILL BE RESTORED TO FINAL RESTORATION, OR TEMPORARY RESTORATION PENDING WEATHER AND SOIL CONDITIONS. IF SEASONAL OR WEATHER CONDITIONS PREVENT COMPLIANCE WITH THESE TIME FRAMES, TEMPORARY EROSION CONTROLS MUST BE MONITORED AND MAINTAINED UNTIL CONDITIONS ALLOW COMPLETION OF RESTORATION.
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11. LANDOWNER/OCCUPANT SHALL BE NOTIFIED OF PROPOSED CONSTRUCTION ACTIVITIES PRIOR TO CONSTRUCTION WORK.

ISSUED FOR 90% REVIEW
DATE: 08/30/2016

Ohio Utilities Protection Service Call 811 before you dig

Hatch Mott MacDonald

LEGEND

- MILEPOST (M 1.00 P)
- EXISTING COLUMBIA PIPELINE
- FOREIGN PIPELINE
- PERMANENT ROW
- ROUTE
- FENCE
- TEMPORARY WORKSPACE
- ADDITIONAL TEMPORARY WORKSPACE
- ACCESS ROAD
- B111 ABANDONMENT TEMPORARY WORKSPACE
- CONTRACTOR / PIPE YARD
- PAR-0001 ACCESS ROAD NUMBER
- ST-CO-001.000 PROPERTY TRACT NUMBER
- WPADJC002 WETLAND ID
- SPADJC002 WATERBODY ID
- UNDERGROUND CABLE
- P OVERHEAD POWER LINE
- W WATERLINE
- COUNTY BORDER
- WETLAND
- WATERBODY
- SAFETY FENCE

SCALE: 1" = 40'
40 0 20 40

No.	REVISIONS	APPROVED BY	DATE
P	PRELIMINARY	MM	04/01/16
P2	ISSUED FOR 90% REVIEW	MM	08/30/16

No.	REVISIONS	APPROVED BY	DATE

No.	REVISIONS	APPROVED BY	DATE

DWG. NO.	REFERENCE
D7002-ALG-030	ALIGNMENT SHEET

PROJECT DELIVERY
PROJECT ENGINEERING
P.O. BOX 1273 CHARLESTON, WV 25325-1273
1700 MACCORKLE AVENUE SE, CHARLESTON, WV 25314

Columbia Gas Transmission

B-SYSTEM MODERNIZATION PROJECT

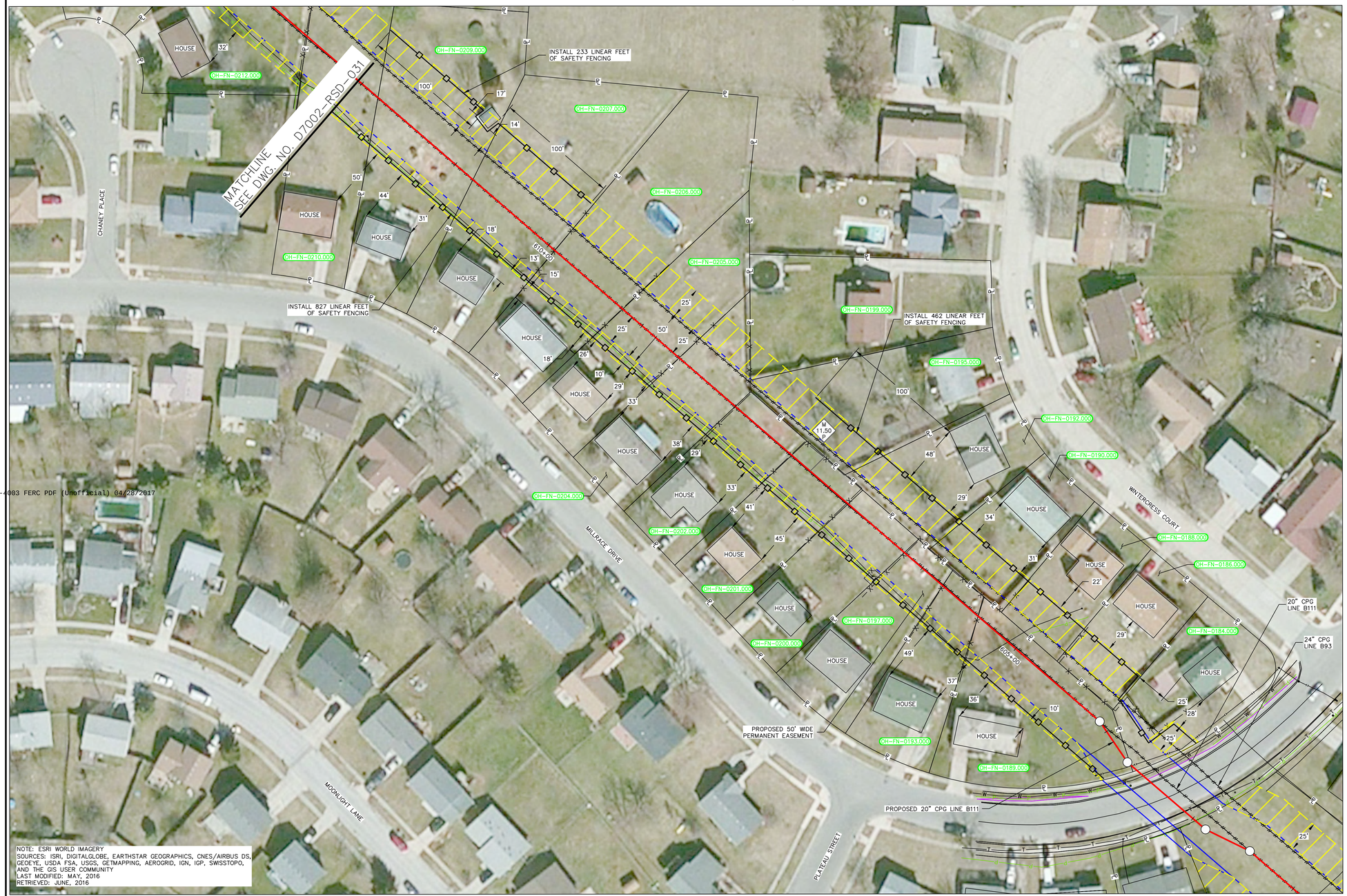
TITLE: MP 11.35 RESIDENTIAL – DETAIL
PROPOSED 20" LINE B111 REPLACEMENT
FRANKLIN COUNTY, OHIO

DRAWN BY:	MM	DATE: 03/21/2016	DRAWING NUMBER	SHEET	ISSUE
PROJECT NUMBER	21506		D7002-RSD-029	29 OF 45	P2
WORK ORDER NUMBER	46257				

TRACTS OH-FN-0184.000, OH-FN-0186.000, OH-FN-0188.000, OH-FN-0189.000, OH-FN-0190.000, OH-FN-0192.000, OH-FN-0193.000, OH-FN-0197.000, OH-FN-0201.000, ON-FN-0202.000, OH-FN-0204.000, OH-FN-0205.000, OH-FN-0206.000, OH-FN-0207.000, OH-FN-0209.000, OH-FN-0210.000 & OH-FN-0212.000

ERIC W. ELLIS, ELONA J. COYER, SBY 2014-1 BORROWER, LLC., ROGER M. & SHARON R. DENZER, GARY G. & BRENDA K. WHITT, PATRICK J. DOORLEY, CLAYON L. & DIANE ALLTON, KIRK IVEY, SHAWN BOSSCAWEN, MAURICE A. & BETH A. HARRIS, MICHAEL A. & THERESA A. HARTLEY, EVELYN M. JOHNSON, PAUL E. & MARTHA A. BRUSH, JENETTE M. WILKS, GUY M. BOVEINGTON, PAUL E. & MARTHA A. BRUSH

FRANKLIN COUNTY, OHIO



NOTE: ESRI WORLD IMAGERY
SOURCES: ISRI, DIGITALGLOBE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, GEOEYE, USDA FSA, USGS, GETMAPPING, AEROGRID, IGN, IGP, SWISSTOPO, AND THE GIS USER COMMUNITY
LAST MODIFIED: MAY, 2016
RETRIEVED: JUNE, 2016

DESCRIPTION

THIS DRAWING DOCUMENTS MITIGATION MEASURES THAT WILL BE IMPLEMENTED FOR ALL RESIDENCES WITHIN 50 FEET OF THE PROPOSED CONSTRUCTION WORK AREA. CONTRACTOR SHALL COMPLY WITH THE FOLLOWING CONSTRUCTION MITIGATION REQUIREMENTS IN ADDITION TO THOSE LISTED IN THE CONSTRUCTION SPECIFICATIONS.

CONSTRUCTION REQUIREMENTS

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ISSUED FOR 90% REVIEW
DATE: 08/30/2016

Ohio Utilities Protection Service Call 811 before you dig

Hatch Mott MacDonald

LEGEND

- MILEPOST (M 1.00 P)
- ROUTE
- EXISTING COLUMBIA PIPELINE
- FOREIGN PIPELINE
- PERMANENT ROW
- X FENCE
- TEMPORARY WORKSPACE
- ADDITIONAL TEMPORARY WORKSPACE
- ACCESS ROAD
- B111 ABANDONMENT TEMPORARY WORKSPACE
- CONTRACTOR / PIPE YARD
- PAR-0001 ACCESS ROAD NUMBER
- ST-CO-001.000 PROPERTY TRACT NUMBER
- WP-WD-0002 WETLAND ID
- SP-WD-0002 WATERBODY ID
- UNDERGROUND CABLE
- P OVERHEAD POWER LINE
- W WATERLINE
- COUNTY BORDER
- WETLAND
- WATERBODY
- SAFETY FENCE

SCALE: 1" = 40'

40 0 20 40

No.	REVISIONS	APPROVED BY	DATE
P1	PRELIMINARY	MM	04/01/16
P2	ISSUED FOR 90% REVIEW	MM	08/30/16

DWG. NO.	REFERENCE
D7002-ALG-030	ALIGNMENT SHEET

PROJECT DELIVERY
PROJECT ENGINEERING
P.O. BOX 1273 CHARLESTON, WV 25325-1273
1700 MACCORKLE AVENUE SE, CHARLESTON, WV 25314

Columbia Gas Transmission

B-SYSTEM MODERNIZATION PROJECT

TITLE: MP 11.50 RESIDENTIAL – DETAIL
PROPOSED 20" LINE B111 REPLACEMENT
FRANKLIN COUNTY, OHIO

DRAWN BY:	MM	DATE: 03/21/2016	DRAWING NUMBER	SHEET	ISSUE
PROJECT NUMBER	21506		D7002-RSD-030	30 OF 45	P2
WORK ORDER NUMBER	46257				

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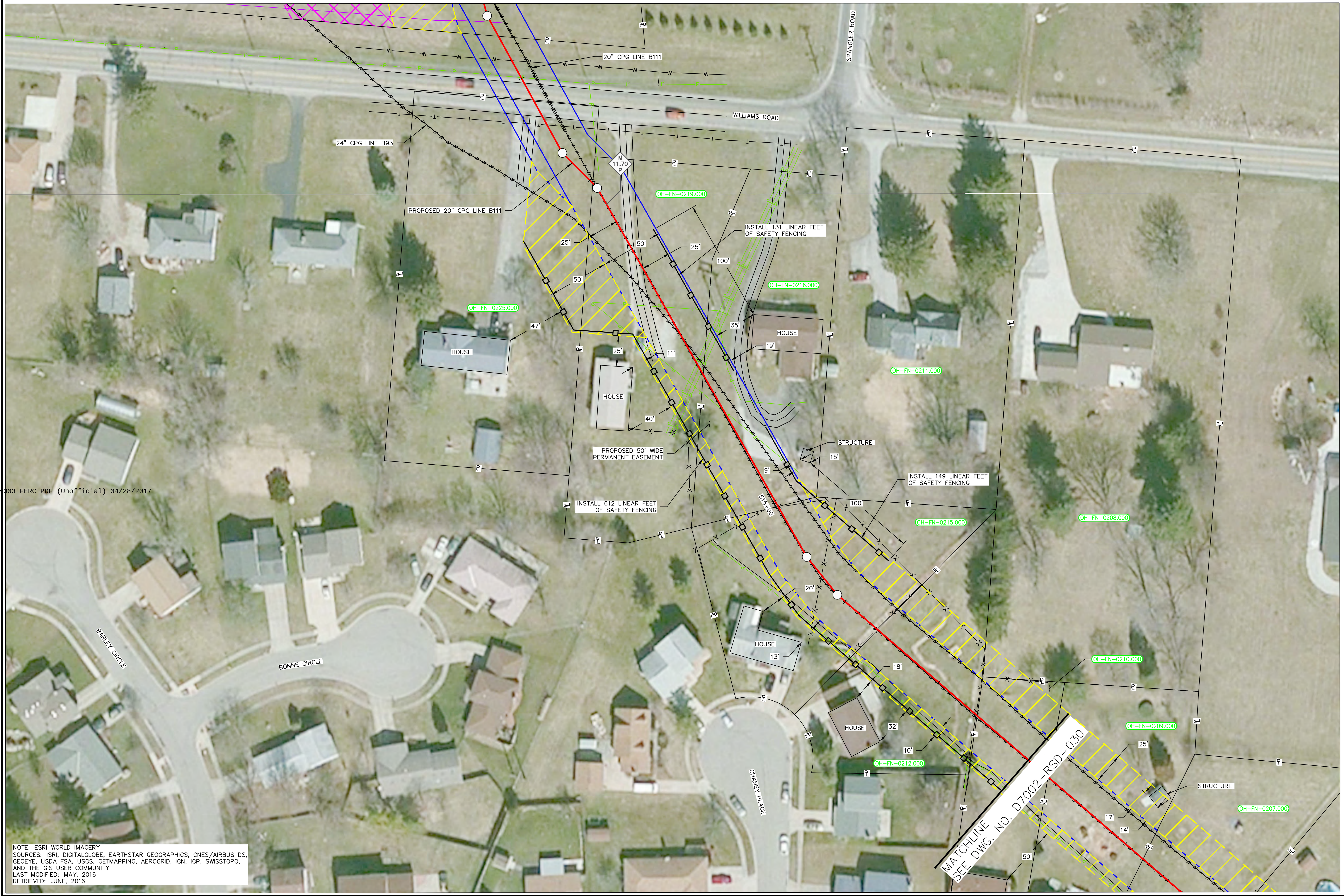
2016-08-20
12:12 PM

TRACTS OH-FN-0209.000, OH-FN-0210.000, OH-FN-0212.000, OH-FN-0215.000, OH-FN-0216.000, OH-FN-0219.000 & OH-FN-0225.000
JEANETTE M. WILKS, GUY M. BOVEINGTON, PAUL E. & MARTHA A. BRUSH, WILLARD M. & LINDA L. RICE, DAVIDA P. SIBERT & VIRGINIA KATHLEEN BONNER
FRANKLIN COUNTY, OHIO



DESCRIPTION

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11. LANDOWNER/OCCUPANT SHALL BE NOTIFIED OF PROPOSED CONSTRUCTION ACTIVITIES PRIOR TO CONSTRUCTION WORK.

ISSUED FOR 90% REVIEW
DATE: 08/30/2016

Ohio Utilities Protection Service — Call 811 before you dig

Hatch Mott MacDonald
2343 Alexandria Drive, Suite 320, Lexington, KY 40504 | T: (859) 629-3520 | F: (859) 224-0146

LEGEND

MILEPOST	EXISTING COLUMBIA PIPELINE	TEMPORARY WORKSPACE	B111 ABANDONMENT TEMPORARY WORKSPACE
ROUTE	FOREIGN PIPELINE	ADDITIONAL TEMPORARY WORKSPACE	CONTRACTOR / PIPE YARD
	PERMANENT ROW	ACCESS ROAD	ACCESS ROAD NUMBER (PAR-0001)
	FENCE		
PROPERTY TRACT NUMBER (ST-CO-001.000)	UNDERGROUND CABLE	WETLAND	
WETLAND ID (WPADJC002)	OVERHEAD POWER LINE	WATERBODY	
WATERBODY ID (SPADJC002)	WATERLINE	SAFETY FENCE	
	COUNTY BORDER		

SCALE: 1" = 40'
40 0 20 40

No.	REVISIONS	APPROVED BY	DATE	No.	REVISIONS	APPROVED BY	DATE	No.	REVISIONS	APPROVED BY	DATE
P	PRELIMINARY	MM	04/01/16								
P2	ISSUED FOR 90% REVIEW	MM	08/30/16								

DWG. NO.	REFERENCE
D7002-ALG-030	ALIGNMENT SHEET

PROJECT DELIVERY
PROJECT ENGINEERING
P.O. BOX 1273 CHARLESTON, WV 25325-1273
1700 MACCORKLE AVENUE SE, CHARLESTON, WV 25314

Columbia Gas Transmission

B-SYSTEM MODERNIZATION PROJECT

TITLE: MP 11.70 RESIDENTIAL – DETAIL
PROPOSED 20" LINE B111 REPLACEMENT
FRANKLIN COUNTY, OHIO

DRAWN BY:	MM	DATE: 03/21/2016	DRAWING NUMBER	SHEET	ISSUE
PROJECT NUMBER	21506		D7002-RSD-031	31 OF 45	P2
WORK ORDER NUMBER	46257				

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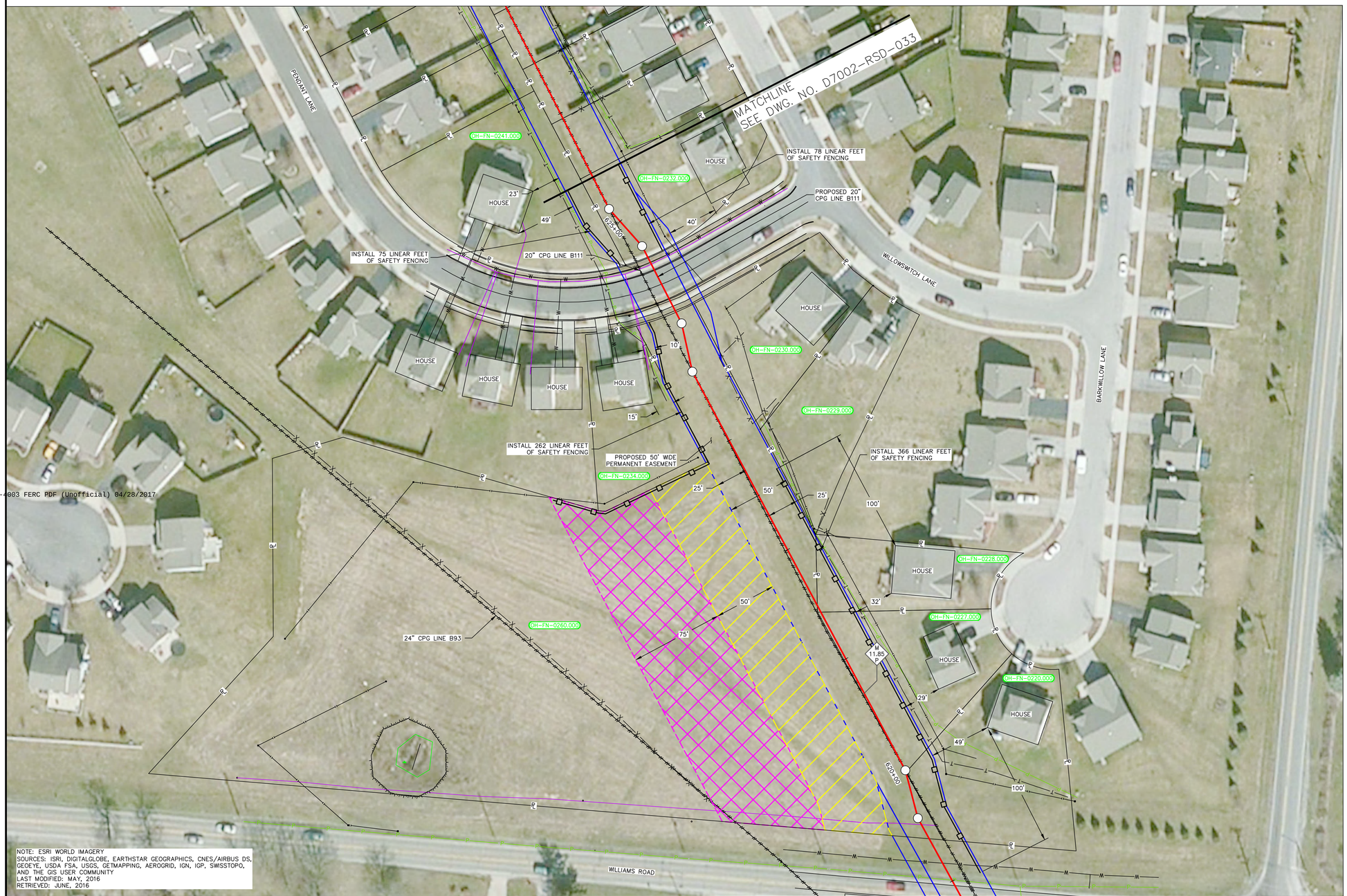
12:10 PM 2016-08-20

TRACTS OH-FN-0220.000, OH-FN-0227.000, OH-FN-0228.000, OH-FN-0232.000, OH-FN-0234.000 & OH-FN-0241.000
MALICK & SARAN DIANE, WADE L. JOHE & DEHAVLYN N. WAINWRIGHT, ANTHONY Q. & BENITA D. DULANEY, BRADY L. WILLIAMS, NICHLAS J. BRYAN, CHERYL S. & GEORGE KARAGIORGE, CALVIN E., SR. & THERESA D. LEE
FRANKLIN COUNTY, OHIO



NOTE: ESRI WORLD IMAGERY
SOURCES: ISRI, DIGITALGLOBE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, GEOEYE, USDA FSA, USGS, GETMAPPING, AEROGRID, IGN, IGP, SWISSTOPO, AND THE GIS USER COMMUNITY
LAST MODIFIED: MAY, 2016
RETRIEVED: JUNE, 2016

DESCRIPTION

THIS DRAWING DOCUMENTS MITIGATION MEASURES THAT WILL BE IMPLEMENTED FOR ALL RESIDENCES WITHIN 50 FEET OF THE PROPOSED CONSTRUCTION WORK AREA. CONTRACTOR SHALL COMPLY WITH THE FOLLOWING CONSTRUCTION MITIGATION REQUIREMENTS IN ADDITION TO THOSE LISTED IN THE CONSTRUCTION SPECIFICATIONS.

CONSTRUCTION REQUIREMENTS

1. CONTRACTOR SHALL ERECT AND MAINTAIN A SAFETY FENCE BETWEEN THE CONSTRUCTION ZONE AND THE ADJACENT RESIDENCES EXTENDING 100 FEET ON EITHER SIDE OF THE RESIDENCE TO ENSURE THAT EQUIPMENT, MATERIALS AND SPOIL REMAIN WITHIN THE CONSTRUCTION WORK AREA.
2. A MINIMUM OF 25 FEET WILL BE MAINTAINED BETWEEN THE RESIDENCE AND CONSTRUCTION WORK AREA FOR A DISTANCE OF 100 FEET ON EITHER SIDE OF THE RESIDENCE. IF THE FACILITY MUST BE WITHIN 25 FEET OF A RESIDENCE, IT MUST BE INSTALLED SUCH THAT THE TRENCH DOES NOT REMAIN OPEN OVERNIGHT.
3. MATURE TREES AND LANDSCAPING WILL NOT BE REMOVED FROM WITHIN THE EDGE OF THE CONSTRUCTION WORK AREA UNLESS NECESSARY FOR SAFE OPERATION OF CONSTRUCTION EQUIPMENT OR AS SPECIFIED IN LANDOWNER AGREEMENTS.
4. OTHER EXISTING PHYSICAL FEATURES THAT NEED TO BE PROTECTED WILL BE ENCLOSED IN SAFETY FENCE TO AVOID DISTURBANCE DURING CONSTRUCTION.
5. TRENCH SHALL NOT BE EXCAVATED UNTIL PIPELINE IS READY FOR INSTALLATION AND SHALL BE BACKFILLED IN SAME DAY AS PIPE INSTALLATION IN THIS AREA. ALL OPEN DITCHES SHALL BE BARRICADED/FENCED OFF OR PLATED WHEN CONSTRUCTION ACTIVITIES ARE NOT IN PROGRESS.
6. IMMEDIATELY AFTER BACKFILLING THE TRENCH, ALL LAWN AND LANDSCAPING WILL BE RESTORED TO FINAL RESTORATION, OR TEMPORARY RESTORATION PENDING WEATHER AND SOIL CONDITIONS. IF SEASONAL OR WEATHER CONDITIONS PREVENT COMPLIANCE WITH THESE TIME FRAMES, TEMPORARY EROSION CONTROLS MUST BE MONITORED AND MAINTAINED UNTIL CONDITIONS ALLOW COMPLETION OF RESTORATION.
7. CONTRACTOR SHALL UTILIZE WATER TRUCKS AS NECESSARY TO MINIMIZE FUGITIVE DUST FROM CONSTRUCTION ACTIVITIES NEAR RESIDENCES/BUSINESSES.
8. ACCESS TO RESIDENCES BY CAR WILL BE MAINTAINED AT ALL TIMES, OR OTHER ACCOMMODATIONS WILL BE MADE WITH EACH RESPECTIVE LANDOWNER.
9. CONTRACTOR SHALL MAINTAIN AGREED UPON ACCESS TO THE IMPACTED AREA DURING CONSTRUCTION.
10. CONTRACTOR SHALL LIMIT WORK IN THIS AREA TO DAYLIGHT HOURS, UNLESS OTHERWISE AGREED UPON WITH LANDOWNER/OCCUPANT.
11. LANDOWNER/OCCUPANT SHALL BE NOTIFIED OF PROPOSED CONSTRUCTION ACTIVITIES PRIOR TO CONSTRUCTION WORK.

ISSUED FOR 90% REVIEW
DATE: 08/30/2016

Ohio Utilities Protection Service Call 811 before you dig

Hatch Mott MacDonald

LEGEND

M 1.00 P MILEPOST
ROUTE
EXISTING COLUMBIA PIPELINE
FOREIGN PIPELINE
PERMANENT ROW
X FENCE
TEMPORARY WORKSPACE
ADDITIONAL TEMPORARY WORKSPACE
ACCESS ROAD
B111 ABANDONMENT TEMPORARY WORKSPACE
CONTRACTOR / PIPE YARD
PAR-0001 ACCESS ROAD NUMBER
ST-CO-001.000 PROPERTY TRACT NUMBER
WP-ADJC002 WETLAND ID
SP-ADJC002 WATERBODY ID
UNDERGROUND CABLE
P OVERHEAD POWER LINE
W WATERLINE
COUNTY BORDER
WETLAND
WATERBODY
SAFETY FENCE

SCALE: 1" = 40'
40 0 20 40

No.	REVISIONS	APPROVED BY	DATE
P	PRELIMINARY	MM	04/01/16
P2	ISSUED FOR 90% REVIEW	MM	08/30/16

DWG. NO.	REFERENCE
D7002-ALG-030	ALIGNMENT SHEET
D7002-ALG-031	ALIGNMENT SHEET

PROJECT DELIVERY
PROJECT ENGINEERING
P.O. BOX 1273 CHARLESTON, WV 25325-1273
1700 MACCORKLE AVENUE SE, CHARLESTON, WV 25314

Columbia Gas Transmission

B-SYSTEM MODERNIZATION PROJECT

TITLE: MP 11.85 RESIDENTIAL – DETAIL
PROPOSED 20" LINE B111 REPLACEMENT
FRANKLIN COUNTY, OHIO

DRAWN BY:	MM	DATE: 03/21/2016	DRAWING NUMBER	SHEET	ISSUE
PROJECT NUMBER	21506		D7002-RSD-032	32 OF 45	P2
WORK ORDER NUMBER	46257				

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TRACTS OH-FN-0232.000, OH-FN-0233.000, OH-FN-0235.000, OH-FN-0236.000, OH-FN-0238.000, OH-FN-0240.000, OH-FN-0241.000
OH-FN-0242.000, OH-FN-0245.000, OH-FN-0247.000, OH-FN-0250.000, OH-FN-0252.000, OH-FN-0254.000 & OH-FN-0256.000
BRADY L. WILLIAMS, LINSAY NICOLE TOOHEY, EDWARD & HAZEL SIMMONS, BRADLEY K. & VICTORIA E. MICHEL, STEVEN H. SCHULTZ, SR., MICHAEL CVENGROS & TERRA CECCONI, CALVIN E. SR. & THERESA D. LEE,
MARY A. WILLIAMS, OZZIE A. HAIRSTON, CLINTON, JR. & MAGALY M. WALLACE, PRISCILLA A. & ESAU ROBINSON JR., CECIL M. II & LYNETTE J. LINVILLE, SHERRI FORD, ANGEL T. YOUNG
FRANKLIN COUNTY, OHIO

NOTE: ESRI WORLD IMAGERY
SOURCES: ISRI, DIGITALGLOBE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, GEOEYE, USDA FSA, USGS, GETMAPPING, AEROGRID, IGN, IGP, SWISSTOPO, AND THE GIS USER COMMUNITY
LAST MODIFIED: MAY, 2016
RETRIEVED: JUNE, 2016

DESCRIPTION

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Ohio Utilities Protection Service Call 811 before you dig

ISSUED FOR 90% REVIEW
DATE: 08/30/2016

Hatch Mott MacDonald

LEGEND
- M 1.00 — MILEPOST
- ROUTE
- EXISTING COLUMBIA PIPELINE
- FOREIGN PIPELINE
- PERMANENT ROW
- X — FENCE
- TEMPORARY WORKSPACE
- ADDITIONAL TEMPORARY WORKSPACE
- ACCESS ROAD
- B111 ABANDONMENT TEMPORARY WORKSPACE
- CONTRACTOR / PIPE YARD
- PAR-0001 — ACCESS ROAD NUMBER
- CT-CO-001.000 — PROPERTY TRACT NUMBER
- WPADJC002 — WETLAND ID
- SPADJC002 — WATERBODY ID
- UNDERGROUND CABLE
- P — OVERHEAD POWER LINE
- W — WATERLINE
- COUNTY BORDER
- WETLAND
- WATERBODY
- SAFETY FENCE

SCALE: 1" = 40'
40 0 20 40

No.	REVISIONS	APPROVED BY	DATE
P1	PRELIMINARY	MM	04/01/16
P2	ISSUED FOR 90% REVIEW	MM	08/30/16

DWG. NO.	REFERENCE
D7002-ALG-030	ALIGNMENT SHEET
D7002-ALG-031	ALIGNMENT SHEET

PROJECT DELIVERY
PROJECT ENGINEERING
P.O. BOX 1273 CHARLESTON, WV 25325-1273
1700 MACCORKLE AVENUE SE, CHARLESTON, WV 25314

Columbia Gas Transmission

B-SYSTEM MODERNIZATION PROJECT

TITLE: MP 11.90 RESIDENTIAL – DETAIL
PROPOSED 20" LINE B111 REPLACEMENT
FRANKLIN COUNTY, OHIO

DRAWN BY:	MM	DATE: 03/21/2016	DRAWING NUMBER	SHEET	ISSUE
PROJECT NUMBER	21506		D7002-RSD-033	33 OF 45	P2
WORK ORDER NUMBER	46257				

20170428-4003 FERC PDF (Unofficial) 04/28/2017

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2016-08-20 12:08 PM

TRACTS OH-FN-0268.000 & OH-FN-0270.000
THE VILLAGE AT WILLIAMS CREEK CONDOMINIUM ASSOCIATION
FRANKLIN COUNTY, OHIO

NOTE: ESRI WORLD IMAGERY
SOURCES: ISRI, DIGITALGLOBE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, GEOEYE, USDA FSA, USGS, GETMAPPING, AEROGRID, IGN, IGP, SWISSTOPO, AND THE GIS USER COMMUNITY
LAST MODIFIED: MAY, 2016
RETRIEVED: JUNE, 2016

20170428-4003 FERC PDF (Unofficial) 04/28/2017

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2016-08-20
12:06 PM

DESCRIPTION

THIS DRAWING DOCUMENTS MITIGATION MEASURES THAT WILL BE IMPLEMENTED FOR ALL RESIDENCES WITHIN 50 FEET OF THE PROPOSED CONSTRUCTION WORK AREA. CONTRACTOR SHALL COMPLY WITH THE FOLLOWING CONSTRUCTION MITIGATION REQUIREMENTS IN ADDITION TO THOSE LISTED IN THE CONSTRUCTION SPECIFICATIONS.

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ISSUED FOR 90% REVIEW
DATE: 08/30/2016

Ohio Utilities Protection Service Call 811 before you dig

Hatch Mott MacDonald

LEGEND

- MILEPOST (M 1.00 P)
- ROUTE
- EXISTING COLUMBIA PIPELINE
- FOREIGN PIPELINE
- PERMANENT ROW
- X FENCE
- TEMPORARY WORKSPACE
- ADDITIONAL TEMPORARY WORKSPACE
- ACCESS ROAD
- B111 ABANDONMENT TEMPORARY WORKSPACE
- CONTRACTOR / PIPE YARD
- PAR-0001 ACCESS ROAD NUMBER
- SF-CO-001.000 PROPERTY TRACT NUMBER
- WPADJC002 WETLAND ID
- SPADJC002 WATERBODY ID
- U UNDERGROUND CABLE
- P OVERHEAD POWER LINE
- W WATERLINE
- COUNTY BORDER
- WETLAND
- WATERBODY
- SAFETY FENCE

SCALE: 1" = 40'
40 0 20 40

No.	REVISIONS	APPROVED BY	DATE
P1	PRELIMINARY	MM	04/01/16
P2	ISSUED FOR 90% REVIEW	MM	08/30/16

DWG. NO.	REFERENCE
D7002-ALG-030	ALIGNMENT SHEET
D7002-ALG-031	ALIGNMENT SHEET

PROJECT DELIVERY
PROJECT ENGINEERING
P.O. BOX 1273 CHARLESTON, WV 25325-1273
1700 MACCORKLE AVENUE SE, CHARLESTON, WV 25314

Columbia Gas Transmission

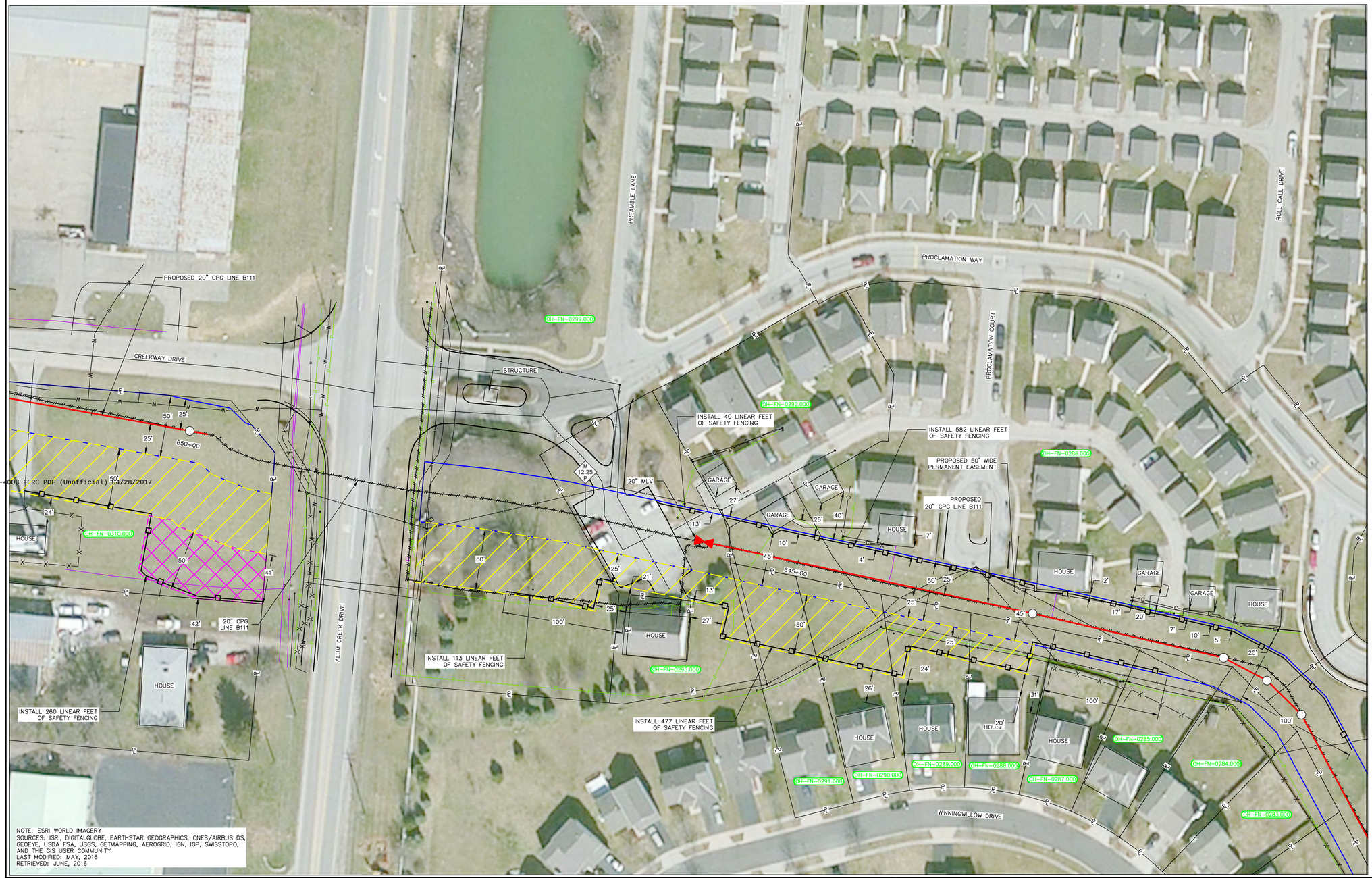
B-SYSTEM MODERNIZATION PROJECT

TITLE: MP 12.10 RESIDENTIAL – DETAIL
PROPOSED 20" LINE B111 REPLACEMENT
FRANKLIN COUNTY, OHIO

DRAWN BY:	DATE	DRAWING NUMBER	SHEET	ISSUE
MM	03/21/2016	D7002-RSD-034	34 OF 45	P2

PROJECT NUMBER: 21506
WORK ORDER NUMBER: 46257

TRACTS OH-FN-0286.000, OH-FN-0287.000, OH-FN-0288.000, OH-FN-0289.000, OH-FN-0290.000, OH-FN-0292.000 OH-FN-0295.000, & OH-FN-0299.000
THE VILLAGE AT WILLIAMS CREEK CONDOMINIUM ASSOCIATION
FRANKLIN COUNTY, OHIO



NOTE: ESRI WORLD IMAGERY
SOURCES: ISRI, DIGITALGLOBE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, GEOEYE, USDA FSA, USGS, GETMAPPING, AEROGRID, IGN, IGP, SWISSTOPO, AND THE GIS USER COMMUNITY
LAST MODIFIED: MAY, 2016
RETRIEVED: JUNE, 2016

DESCRIPTION

THIS DRAWING DOCUMENTS MITIGATION MEASURES THAT WILL BE IMPLEMENTED FOR ALL RESIDENCES WITHIN 50 FEET OF THE PROPOSED CONSTRUCTION WORK AREA. CONTRACTOR SHALL COMPLY WITH THE FOLLOWING CONSTRUCTION MITIGATION REQUIREMENTS IN ADDITION TO THOSE LISTED IN THE CONSTRUCTION SPECIFICATIONS.

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ISSUED FOR 90% REVIEW
DATE: 08/30/2016

Ohio Utilities Protection Service Call 811 before you dig

Hatch Mott MacDonald

LEGEND

- MILEPOST (M 1.00)
- EXISTING COLUMBIA PIPELINE
- FOREIGN PIPELINE
- PERMANENT ROW
- ROUTE
- FENCE
- TEMPORARY WORKSPACE
- ADDITIONAL TEMPORARY WORKSPACE
- ACCESS ROAD
- B111 ABANDONMENT TEMPORARY WORKSPACE
- CONTRACTOR / PIPE YARD
- ACCESS ROAD NUMBER (PAR-0001)
- PROPERTY TRACT NUMBER (ST-CO-001.000)
- WETLAND ID (WPADJC002)
- WATERBODY ID (SPADJC002)
- UNDERGROUND CABLE
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- WATERLINE
- COUNTY BORDER
- WETLAND
- WATERBODY
- SAFETY FENCE

SCALE: 1" = 40'
40 0 20 40

No.	REVISIONS	APPROVED BY	DATE
P1	PRELIMINARY	MM	04/01/16
P2	ISSUED FOR 90% REVIEW	MM	08/30/16

D7002-ALG-031	ALIGNMENT SHEET

PROJECT DELIVERY
PROJECT ENGINEERING
P.O. BOX 1273 CHARLESTON, WV 25325-1273
1700 MACCORKLE AVENUE SE, CHARLESTON, WV 25314

Columbia Gas Transmission

B-SYSTEM MODERNIZATION PROJECT

TITLE: MP 12.25 RESIDENTIAL – DETAIL
PROPOSED 20" LINE B111 REPLACEMENT
FRANKLIN COUNTY, OHIO

DRAWN BY:	DATE	DRAWING NUMBER	SHEET	ISSUE
MM	03/21/2016	D7002-RSD-035	35 OF 45	P2

PROJECT NUMBER: 21506
WORK ORDER NUMBER: 46257

DWG. NO. REFERENCE

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2016-08-20 12:04 PM

TRACTS OH-FN-0310.000, OH-FN-0314.000, OH-FN-0316.000, OH-FN-0318.000, & OH-FN-0321.000
NEW PAR, (DBA AIRTOUCH CELLULAR), A & L PROPERTY ASSOCIATES, LLC. & FOR ENTERPRISES, LLC.
FRANKLIN COUNTY, OHIO

DESCRIPTION

THIS DRAWING DOCUMENTS MITIGATION MEASURES THAT WILL BE IMPLEMENTED FOR ALL RESIDENCES WITHIN 50 FEET OF THE PROPOSED CONSTRUCTION WORK AREA. CONTRACTOR SHALL COMPLY WITH THE FOLLOWING CONSTRUCTION MITIGATION REQUIREMENTS IN ADDITION TO THOSE LISTED IN THE CONSTRUCTION SPECIFICATIONS.

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ISSUED FOR 90% REVIEW
DATE: 08/30/2016

Ohio Utilities Protection Service Call 811 before you dig

Hatch Mott MacDonald

LEGEND

M 1.00 P — MILEPOST
ROUTE
EXISTING COLUMBIA PIPELINE
FOREIGN PIPELINE
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OVERHEAD POWER LINE
WATERLINE
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WATERBODY
SAFETY FENCE

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No.	REVISIONS	APPROVED BY	DATE
P1	PRELIMINARY	MM	04/01/16
P2	ISSUED FOR 90% REVIEW	MM	08/30/16

No.	REVISIONS	APPROVED BY	DATE

No.	REVISIONS	APPROVED BY	DATE

DWG. NO.	REFERENCE
D7002-ALG-031	ALIGNMENT SHEET

PROJECT DELIVERY
PROJECT ENGINEERING
P.O. BOX 1273 CHARLESTON, WV 25325-1273
1700 MACCORKLE AVENUE SE, CHARLESTON, WV 25314

Columbia Gas Transmission

B-SYSTEM MODERNIZATION PROJECT

TITLE: MP 12.45 RESIDENTIAL – DETAIL
PROPOSED 20" LINE B111 REPLACEMENT
FRANKLIN COUNTY, OHIO

DRAWN BY:	DATE	DRAWING NUMBER	SHEET	ISSUE
MM	03/21/2016	D7002-RSD-036	36 OF 45	P2

PROJECT NUMBER: 21506
WORK ORDER NUMBER: 46257

G:\Columbia\355773_CPG_Line_B105_and_B111\DataProd Work\Drafting\Residential_Site_Specifics\D7002-RSD-036_B111 2016-08-20 12:02 PM

TRACT OH-FN-0326.000
CHARLES P. REYNOLDS
FRANKLIN COUNTY, OHIO

DESCRIPTION

THIS DRAWING DOCUMENTS MITIGATION MEASURES THAT WILL BE IMPLEMENTED FOR ALL RESIDENCES WITHIN 50 FEET OF THE PROPOSED CONSTRUCTION WORK AREA. CONTRACTOR SHALL COMPLY WITH THE FOLLOWING CONSTRUCTION MITIGATION REQUIREMENTS IN ADDITION TO THOSE LISTED IN THE CONSTRUCTION SPECIFICATIONS.

CONSTRUCTION REQUIREMENTS

1. CONTRACTOR SHALL ERECT AND MAINTAIN A SAFETY FENCE BETWEEN THE CONSTRUCTION ZONE AND THE ADJACENT RESIDENCES EXTENDING 100 FEET ON EITHER SIDE OF THE RESIDENCE TO ENSURE THAT EQUIPMENT, MATERIALS AND SPOIL REMAIN WITHIN THE CONSTRUCTION WORK AREA.
2. A MINIMUM OF 25 FEET WILL BE MAINTAINED BETWEEN THE RESIDENCE AND CONSTRUCTION WORK AREA FOR A DISTANCE OF 100 FEET ON EITHER SIDE OF THE RESIDENCE. IF THE FACILITY MUST BE WITHIN 25 FEET OF A RESIDENCE, IT MUST BE INSTALLED SUCH THAT THE TRENCH DOES NOT REMAIN OPEN OVERNIGHT.
3. MATURE TREES AND LANDSCAPING WILL NOT BE REMOVED FROM WITHIN THE EDGE OF THE CONSTRUCTION WORK AREA UNLESS NECESSARY FOR SAFE OPERATION OF CONSTRUCTION EQUIPMENT OR AS SPECIFIED IN LANDOWNER AGREEMENTS.
4. OTHER EXISTING PHYSICAL FEATURES THAT NEED TO BE PROTECTED WILL BE ENCLOSED IN SAFETY FENCE TO AVOID DISTURBANCE DURING CONSTRUCTION.
5. TRENCH SHALL NOT BE EXCAVATED UNTIL PIPELINE IS READY FOR INSTALLATION AND SHALL BE BACKFILLED IN SAME DAY AS PIPE INSTALLATION IN THIS AREA. ALL OPEN DITCHES SHALL BE BARRICADED/FENCED OFF OR PLATED WHEN CONSTRUCTION ACTIVITIES ARE NOT IN PROGRESS.
6. IMMEDIATELY AFTER BACKFILLING THE TRENCH, ALL LAWN AND LANDSCAPING WILL BE RESTORED TO FINAL RESTORATION, OR TEMPORARY RESTORATION PENDING WEATHER AND SOIL CONDITIONS. IF SEASONAL OR WEATHER CONDITIONS PREVENT COMPLIANCE WITH THESE TIME FRAMES, TEMPORARY EROSION CONTROLS MUST BE MONITORED AND MAINTAINED UNTIL CONDITIONS ALLOW COMPLETION OF RESTORATION.
7. CONTRACTOR SHALL UTILIZE WATER TRUCKS AS NECESSARY TO MINIMIZE FUGITIVE DUST FROM CONSTRUCTION ACTIVITIES NEAR RESIDENCES/BUSINESSES.
8. ACCESS TO RESIDENCES BY CAR WILL BE MAINTAINED AT ALL TIMES, OR OTHER ACCOMMODATIONS WILL BE MADE WITH EACH RESPECTIVE LANDOWNER.
9. CONTRACTOR SHALL MAINTAIN AGREED UPON ACCESS TO THE IMPACTED AREA DURING CONSTRUCTION.
10. CONTRACTOR SHALL LIMIT WORK IN THIS AREA TO DAYLIGHT HOURS, UNLESS OTHERWISE AGREED UPON WITH LANDOWNER/OCCUPANT.
11. LANDOWNER/OCCUPANT SHALL BE NOTIFIED OF PROPOSED CONSTRUCTION ACTIVITIES PRIOR TO CONSTRUCTION WORK.

ISSUED FOR 90% REVIEW
DATE: 08/30/2016

Ohio Utilities Protection Service Call 811 before you dig

Hatch Mott MacDonald

LEGEND

MILEPOST (M 1.00 P) | ROUTE | EXISTING COLUMBIA PIPELINE | FOREIGN PIPELINE | PERMANENT ROW | FENCE | TEMPORARY WORKSPACE | ADDITIONAL TEMPORARY WORKSPACE | ACCESS ROAD | B111 ABANDONMENT TEMPORARY WORKSPACE | CONTRACTOR / PIPE YARD | PAR-0001 ACCESS ROAD NUMBER | ST-CO-001.000 PROPERTY TRACT NUMBER | WPADJC002 WETLAND ID | SPADJC002 WATERBODY ID | UNDERGROUND CABLE | P OVERHEAD POWER LINE | W WATERLINE | COUNTY BORDER | WETLAND | WATERBODY | SAFETY FENCE

SCALE: 1" = 40'
40 0 20 40

DWG. NO.	REFERENCE
D7002-ALG-031	ALIGNMENT SHEET
D7002-ALG-032	ALIGNMENT SHEET

PROJECT DELIVERY
PROJECT ENGINEERING
P.O. BOX 1273 CHARLESTON, WV 25325-1273
1700 MACCORKLE AVENUE SE, CHARLESTON, WV 25314

Columbia Gas Transmission

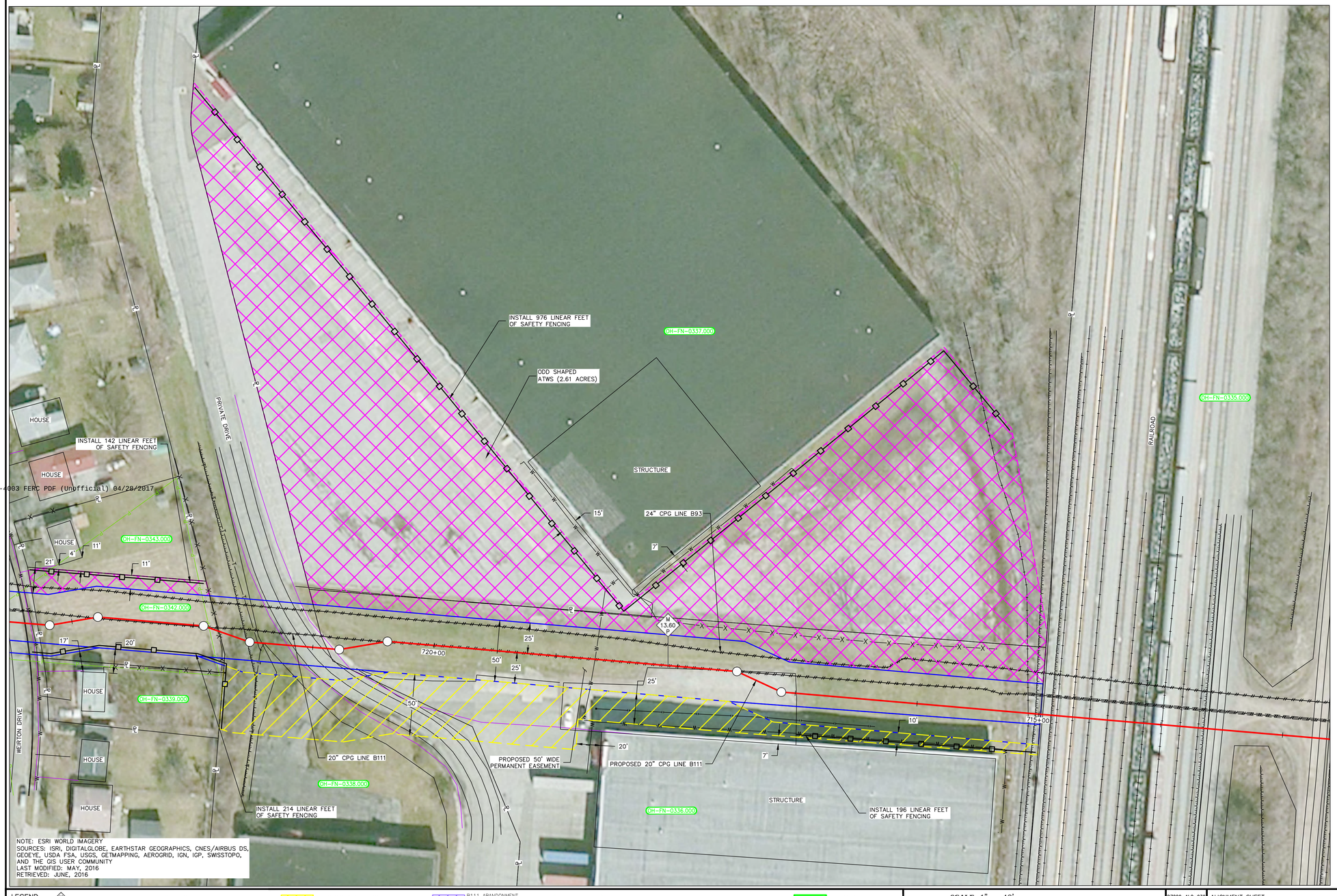
B-SYSTEM MODERNIZATION PROJECT

TITLE: MP 12.85 RESIDENTIAL – DETAIL
PROPOSED 20" LINE B111 REPLACEMENT
FRANKLIN COUNTY, OHIO

No.	REVISIONS	APPROVED BY	DATE
P1	PRELIMINARY	MM	04/01/16
P2	ISSUED FOR 90% REVIEW	MM	08/30/16

DRAWN BY:	MM	DATE: 03/21/2016	DRAWING NUMBER	SHEET	ISSUE
PROJECT NUMBER	21506		D7002-RSD-037	37 OF 45	P2
WORK ORDER NUMBER	46257				

TRACTS OH-FN-0336.000, OH-FN-0337.000, OH-FN-0339.000 & OH-FN-0343.000
GARRISON SOUTHFIELD PARK, LLC., GEORGIA M. SIMS, LARRY & CLAUDIA ANDERSON
FRANKLIN COUNTY, OHIO



NOTE: ESRI WORLD IMAGERY
SOURCES: ISRI, DIGITALGLOBE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, GEOEYE, USDA FSA, USGS, GETMAPPING, AEROGRID, IGN, IGP, SWISSTOPO, AND THE GIS USER COMMUNITY
LAST MODIFIED: MAY, 2016
RETRIEVED: JUNE, 2016

DESCRIPTION

THIS DRAWING DOCUMENTS MITIGATION MEASURES THAT WILL BE IMPLEMENTED FOR ALL RESIDENCES WITHIN 50 FEET OF THE PROPOSED CONSTRUCTION WORK AREA. CONTRACTOR SHALL COMPLY WITH THE FOLLOWING CONSTRUCTION MITIGATION REQUIREMENTS IN ADDITION TO THOSE LISTED IN THE CONSTRUCTION SPECIFICATIONS.

CONSTRUCTION REQUIREMENTS

1. CONTRACTOR SHALL ERECT AND MAINTAIN A SAFETY FENCE BETWEEN THE CONSTRUCTION ZONE AND THE ADJACENT RESIDENCES EXTENDING 100 FEET ON EITHER SIDE OF THE RESIDENCE TO ENSURE THAT EQUIPMENT, MATERIALS AND SPOIL REMAIN WITHIN THE CONSTRUCTION WORK AREA.
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ISSUED FOR 90% REVIEW
DATE: 08/30/2016

Ohio Utilities Protection Service Call 811 before you dig

Hatch Mott MacDonald

LEGEND

M 1.00 P MILEPOST
ROUTE
EXISTING COLUMBIA PIPELINE
FOREIGN PIPELINE
PERMANENT ROW
X FENCE
TEMPORARY WORKSPACE
ADDITIONAL TEMPORARY WORKSPACE
ACCESS ROAD
B111 ABANDONMENT TEMPORARY WORKSPACE
CONTRACTOR / PIPE YARD
PAR-0001 ACCESS ROAD NUMBER
ST-CO-001.000 PROPERTY TRACT NUMBER
WPADJC002 WETLAND ID
SPADJC002 WATERBODY ID
U UNDERGROUND CABLE
P OVERHEAD POWER LINE
W WATERLINE
COUNTY BORDER
WETLAND
WATERBODY
SAFETY FENCE

SCALE: 1" = 40'
40 0 20 40

No.	REVISIONS	APPROVED BY	DATE
P1	PRELIMINARY	MM	04/01/16
P2	ISSUED FOR 90% REVIEW	MM	08/30/16

D7002-ALG-032 ALIGNMENT SHEET

DWG. NO. REFERENCE

PROJECT DELIVERY
PROJECT ENGINEERING
P.O. BOX 1273 CHARLESTON, WV 25325-1273
1700 MACCORKLE AVENUE SE, CHARLESTON, WV 25314

Columbia Gas Transmission

B-SYSTEM MODERNIZATION PROJECT

TITLE MP 13.60 RESIDENTIAL – DETAIL
PROPOSED 20" LINE B111 REPLACEMENT
FRANKLIN COUNTY, OHIO

DRAWN BY:	DATE:	DRAWING NUMBER	SHEET	ISSUE
MM	03/21/2016	D7002-RSD-038	38 OF 45	P2

PROJECT NUMBER 21506
WORK ORDER NUMBER 46257

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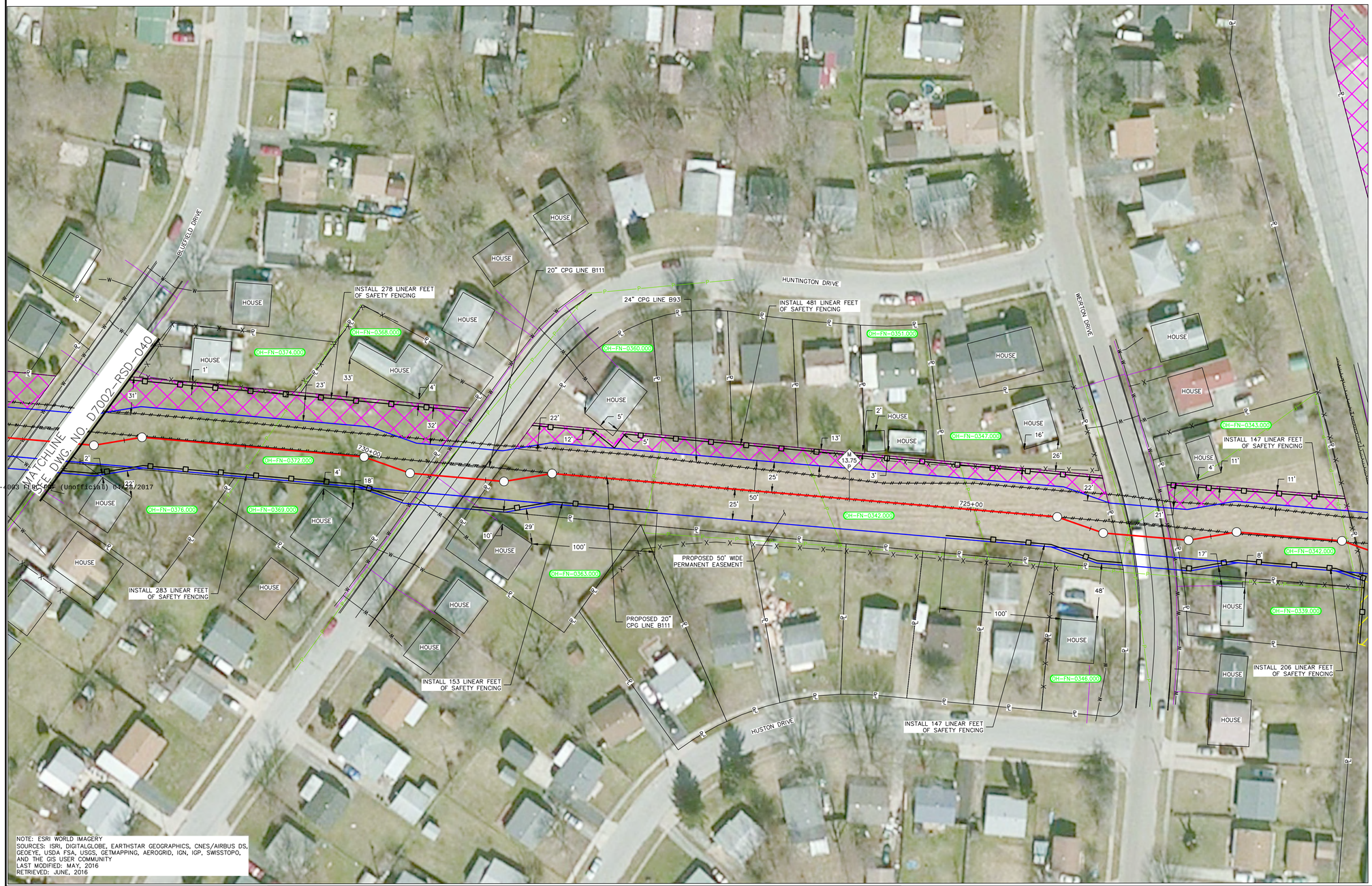
2016-08-20
12:00 PM

TRACTS OH-FN-0339.000, OH-FN-0343.000, OH-FN-0346.000, OH-FN-0347.000, OH-FN-0351.000, OH-FN-0360.000, OH-FN-0363.000, OH-FN-0368.000, OH-FN-0369.000, OH-FN-0374.000 & OH-FN-0376-000

GEORGIA M. SIMS, LARRY & CLAUDIA ANDERSON, DOEUN & LEANA KENG, BOOKER T. & LAVENA MASON, THOMAS M. ANDERSON, DORCAS PORTER, HELEN A. & HELEN WARNER, ELLRED PARK 2426, LLC., JOHN R. UPTON, BETTY A. WATKINS & THOMAS R. LAROERE, JR. & DEBRA J. ANGEL

FRANKLIN COUNTY, OHIO



NOTE: ESRI WORLD IMAGERY
SOURCES: ISRI, DIGITALGLOBE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, GEOEYE, USDA FSA, USGS, GETMAPPING, AEROGRID, IGN, IGP, SWISSTOPO, AND THE GIS USER COMMUNITY
LAST MODIFIED: MAY, 2016
RETRIEVED: JUNE, 2016

DESCRIPTION

THIS DRAWING DOCUMENTS MITIGATION MEASURES THAT WILL BE IMPLEMENTED FOR ALL RESIDENCES WITHIN 50 FEET OF THE PROPOSED CONSTRUCTION WORK AREA. CONTRACTOR SHALL COMPLY WITH THE FOLLOWING CONSTRUCTION MITIGATION REQUIREMENTS IN ADDITION TO THOSE LISTED IN THE CONSTRUCTION SPECIFICATIONS.

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11. LANDOWNER/OCCUPANT SHALL BE NOTIFIED OF PROPOSED CONSTRUCTION ACTIVITIES PRIOR TO CONSTRUCTION WORK.

ISSUED FOR 90% REVIEW
DATE: 08/30/2016

Ohio Utilities Protection Service Call 811 before you dig

Hatch Mott MacDonald

LEGEND

- MILEPOST (M 1.00)
- ROUTE
- EXISTING COLUMBIA PIPELINE
- FOREIGN PIPELINE
- PERMANENT ROW
- FENCE
- TEMPORARY WORKSPACE
- ADDITIONAL TEMPORARY WORKSPACE
- ACCESS ROAD
- B111 ABANDONMENT TEMPORARY WORKSPACE
- CONTRACTOR / PIPE YARD
- ACCESS ROAD NUMBER (PAR-0001)
- PROPERTY TRACT NUMBER (CT-CO-001.000)
- WETLAND ID (WPADJC002)
- WATERBODY ID (SPADJC002)
- UNDERGROUND CABLE
- OVERHEAD POWER LINE
- WATERLINE
- COUNTY BORDER
- WETLAND
- WATERBODY
- SAFETY FENCE

SCALE: 1" = 40'
40 0 20 40

No.	REVISIONS	APPROVED BY	DATE
P1	PRELIMINARY	MM	04/01/16
P2	ISSUED FOR 90% REVIEW	MM	08/30/16

DWG. NO.	REFERENCE
D7002-ALG-032	ALIGNMENT SHEET

PROJECT DELIVERY
PROJECT ENGINEERING
P.O. BOX 1273 CHARLESTON, WV 25325-1273
1700 MACCORKLE AVENUE SE, CHARLESTON, WV 25314

Columbia Gas Transmission

B-SYSTEM MODERNIZATION PROJECT

TITLE: MP 13.75 RESIDENTIAL – DETAIL
PROPOSED 20" LINE B111 REPLACEMENT
FRANKLIN COUNTY, OHIO

DRAWN BY:	MM	DATE: 03/21/2016	DRAWING NUMBER	SHEET	ISSUE
PROJECT NUMBER	21506		D7002-RSD-039	39 OF 45	P2
WORK ORDER NUMBER	46257				

20170428-4003 FERC PDF (Unofficial) 04/28/2017

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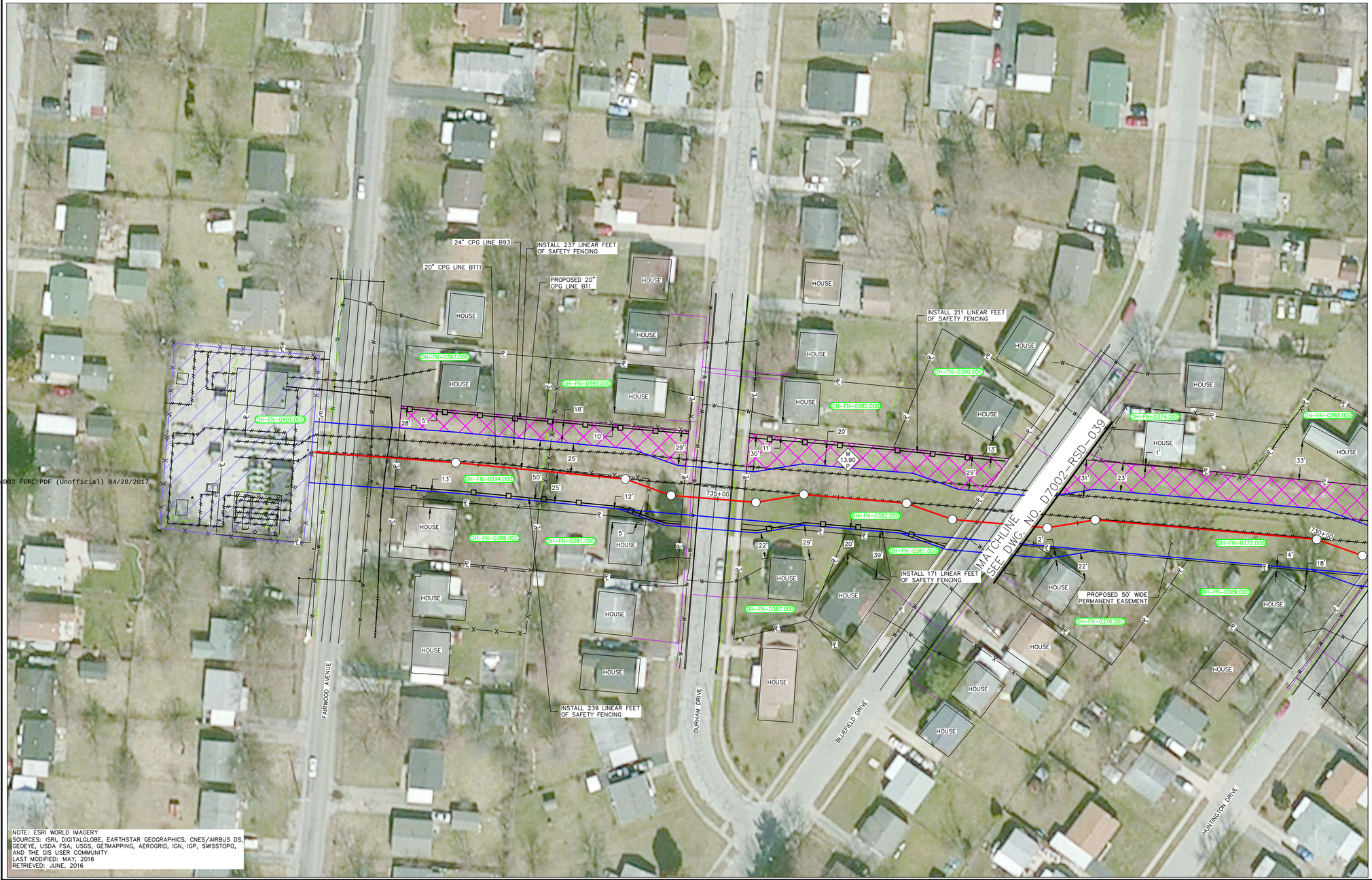
TRACTS OH-FN-0380.000, OH-FN-0381.000, OH-FN-0385.000, OH-FN-0387.000, TRACTS OH-FN-0390.000, OH-FN-0391.000, OH-FN-0397.000, OH-FN-0398.000, & OH-FN-0401.000 DEBRA MOORE, ANTHONY HILL, JAMES HASSEL, CLAUDE L. MILLS, ET AL, HERSCHEL D. TAYLOR, JEANNETTE M. CHRISTIAN, DANIEL J. SATTERWHITE, CHARLES W. & DELORES A. WARFIELD, COLUMBUS GAS TRANSMISSION CORP. FRANKLIN COUNTY, OHIO



NOTE: ESRI WORLD IMAGERY
SOURCES: ISRI, DIGITALGLOBE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, GEOEYE, USDA FSA, USGS, GETMAPPING, AEROGRID, IGN, IGP, SWISSTOPO, AND THE GIS USER COMMUNITY
LAST MODIFIED: MAY, 2016
RETRIEVED: JUNE, 2016

DESCRIPTION

THIS DRAWING DOCUMENTS MITIGATION MEASURES THAT WILL BE IMPLEMENTED FOR ALL RESIDENCES WITHIN 50 FEET OF THE PROPOSED CONSTRUCTION WORK AREA. CONTRACTOR SHALL COMPLY WITH THE FOLLOWING CONSTRUCTION MITIGATION REQUIREMENTS IN ADDITION TO THOSE LISTED IN THE CONSTRUCTION SPECIFICATIONS.

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ISSUED FOR 90% REVIEW
DATE: 08/30/2016

Ohio Utilities Protection Service Call 811 before you dig

Hatch Mott MacDonald

LEGEND

- MILEPOST (N 1.00 P)
- EXISTING COLUMBIA PIPELINE
- FOREIGN PIPELINE
- PERMANENT ROW
- ROUTE
- FENCE
- TEMPORARY WORKSPACE
- ADDITIONAL TEMPORARY WORKSPACE
- ACCESS ROAD
- B111 ABANDONMENT TEMPORARY WORKSPACE
- CONTRACTOR / PIPE YARD
- PAR-0001 ACCESS ROAD NUMBER
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- SPADJC002 WATERBODY ID
- UNDERGROUND CABLE
- P OVERHEAD POWER LINE
- W WATERLINE
- COUNTY BORDER
- WETLAND
- WATERBODY
- SAFETY FENCE

SCALE: 1" = 40'
40 0 20 40

No.	REVISIONS	APPROVED BY	DATE
P1	PRELIMINARY	MM	04/01/16
P2	ISSUED FOR 90% REVIEW	MM	08/30/16

No.	REVISIONS	APPROVED BY	DATE

No.	REVISIONS	APPROVED BY	DATE

DWG. NO.	REFERENCE
D7002-ALG-032	ALIGNMENT SHEET

PROJECT DELIVERY
PROJECT ENGINEERING
P.O. BOX 1273 CHARLESTON, WV 25325-1273
1700 MACCORKLE AVENUE SE, CHARLESTON, WV 25314

Columbia Gas Transmission

B-SYSTEM MODERNIZATION PROJECT

TITLE: MP 13.90 RESIDENTIAL – DETAIL
PROPOSED 20" LINE B111 REPLACEMENT
FRANKLIN COUNTY, OHIO

DRAWN BY:	MM	DATE: 03/21/2016	DRAWING NUMBER	SHEET	ISSUE
PROJECT NUMBER	21506		D7002-RSD-040	40 OF 45	P2
WORK ORDER NUMBER	46257				

TRACT OH-FN-0009.000, OH-FN-0011.000, & OH-FN-0012.000
PRESTON B. FRENCH, JR., TRUSTEE
FRANKLIN COUNTY, OHIO

ABANDON IN PLACE
CUT AND REMOVE PIPELINE, CAP THE ENDS OF THE ABANDONED PIPELINE
CUT THE PIPELINE, WATER FILL THE STREAM/WETLAND CROSSING AND CAP BOTH ENDS OF PIPELINE
CUT AND REMOVE PIPELINE AND GROUT CASING PIPE, CAP THE ENDS OF THE ABANDONED PIPELINE
CUT, GROUT AND CAP BOTH ENDS OF THE PIPELINE
PIPELINE TO BE REMOVED

NOTE: ESRI WORLD IMAGERY
SOURCES: ISRI, DIGITALGLOBE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, GEOEYE, USDA FSA, USGS, GETMAPPING, AEROGRID, IGN, IGP, SWISSTOPO, AND THE GIS USER COMMUNITY
LAST MODIFIED: MAY, 2016
RETRIEVED: JUNE, 2016

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ISSUED FOR 90% REVIEW
DATE: 08/30/2016

Ohio Utilities Protection Service Call 811 before you dig

Hatch Mott MacDonald

LEGEND
- MILEPOST (M 1.00 P)
- ROUTE
- EXISTING COLUMBIA PIPELINE
- FOREIGN PIPELINE
- PERMANENT ROW
- FENCE (X)
- TEMPORARY WORKSPACE
- ADDITIONAL TEMPORARY WORKSPACE
- ACCESS ROAD
- B130 TEMPORARY WORKSPACE
- CONTRACTOR / PIPE YARD
- PAR-0001 ACCESS ROAD NUMBER
- ST-CO-001.002 PROPERTY TRACT NUMBER
- WPADJC002 WETLAND ID
- SPADJC002 WATERBODY ID
- UNDERGROUND CABLE
- OVERHEAD POWER LINE (P)
- WATERLINE (W)
- COUNTY BORDER
- WETLAND
- WATERBODY
- CONSTRUCTION TAPE

SCALE: 1" = 40'
40 0 20 40

No.	REVISIONS	APPROVED BY	DATE
1	PRELIMINARY	MM	04/01/16
2	ISSUED FOR 90% REVIEW	MM	08/30/16

DWG. NO.	REFERENCE
D7002-ALG-023	ALIGNMENT SHEET
D7002-ALG-034	ALIGNMENT SHEET

PROJECT DELIVERY
PROJECT ENGINEERING
P.O. BOX 1273 CHARLESTON, WV 25325-1273
1700 MACCORKLE AVENUE SE, CHARLESTON, WV 25314

Columbia Gas Transmission

B-SYSTEM MODERNIZATION PROJECT

TITLE: MP 0.10 RESIDENTIAL – DETAIL
PROPOSED 4" LINE B130 REPLACEMENT
FRANKLIN COUNTY, OHIO

DRAWN BY:	DATE	DRAWING NUMBER	SHEET	ISSUE
MM	03/21/2016	D7002-RSD-041	41 OF 45	P2

PROJECT NUMBER: 21506
WORK ORDER NUMBER: 46294

G:\Columbia\355773_CPG_Line_B105_and_B111\DataProd\Work\Drafting\Residential_Site_Specifics\D7002-RSD-041_B111 2016-08-20 11:55 AM

TRACTS OH-FN-0014.000, OH-FN-0015.000, OH-FN-0016.000
PATRICIA E. MARTIN AND RAYMOND G. MARTIN, WIFE AND HUSBAND, WILLIAM D. BUNCH
FRANKLIN COUNTY, OHIO

DESCRIPTION

THIS DRAWING DOCUMENTS MITIGATION MEASURES THAT WILL BE IMPLEMENTED FOR ALL RESIDENCES WITHIN 50 FEET OF THE PROPOSED CONSTRUCTION WORK AREA. CONTRACTOR SHALL COMPLY WITH THE FOLLOWING CONSTRUCTION MITIGATION REQUIREMENTS IN ADDITION TO THOSE LISTED IN THE CONSTRUCTION SPECIFICATIONS.

CONSTRUCTION REQUIREMENTS

1. CONTRACTOR SHALL ERECT AND MAINTAIN A SAFETY FENCE BETWEEN THE CONSTRUCTION ZONE AND THE ADJACENT RESIDENCES EXTENDING 100 FEET ON EITHER SIDE OF THE RESIDENCE TO ENSURE THAT EQUIPMENT, MATERIALS AND SPOIL REMAIN WITHIN THE CONSTRUCTION WORK AREA.
2. A MINIMUM OF 25 FEET WILL BE MAINTAINED BETWEEN THE RESIDENCE AND CONSTRUCTION WORK AREA FOR A DISTANCE OF 100 FEET ON EITHER SIDE OF THE RESIDENCE. IF THE FACILITY MUST BE WITHIN 25 FEET OF A RESIDENCE, IT MUST BE INSTALLED SUCH THAT THE TRENCH DOES NOT REMAIN OPEN OVERNIGHT.
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11. LANDOWNER/OCCUPANT SHALL BE NOTIFIED OF PROPOSED CONSTRUCTION ACTIVITIES PRIOR TO CONSTRUCTION WORK.

ISSUED FOR 90% REVIEW
DATE: 08/30/2016

Ohio Utilities Protection Service Call 811 before you dig

Hatch Mott MacDonald

LEGEND

- M 1.00 P — MILEPOST
- ROUTE
- EXISTING COLUMBIA PIPELINE
- FOREIGN PIPELINE
- PERMANENT ROW
- X — FENCE
- TEMPORARY WORKSPACE
- ADDITIONAL TEMPORARY WORKSPACE
- ACCESS ROAD
- B130 TEMPORARY WORKSPACE
- CONTRACTOR / PIPE YARD
- ACCESS ROAD NUMBER
- ST-CO-001.000 — PROPERTY TRACT NUMBER
- WPADJ0002 — WETLAND ID
- SPADJ0002 — WATERBODY ID
- UNDERGROUND CABLE
- P — OVERHEAD POWER LINE
- W — WATERLINE
- COUNTY BORDER
- WETLAND
- WATERBODY
- CONSTRUCTION TAPE

SCALE: 1" = 40'
40 0 20 40

No.	REVISIONS	APPROVED BY	DATE
P1	PRELIMINARY	MM	04/01/16
P2	ISSUED FOR 90% REVIEW	MM	08/30/16

No.	REVISIONS	APPROVED BY	DATE

No.	REVISIONS	APPROVED BY	DATE

DWG. NO.	REFERENCE
D7002-ALG-023	ALIGNMENT SHEET
D7002-ALG-034	ALIGNMENT SHEET

PROJECT DELIVERY
PROJECT ENGINEERING
P.O. BOX 1273 CHARLESTON, WV 25325-1273
1700 MACCORKLE AVENUE SE, CHARLESTON, WV 25314

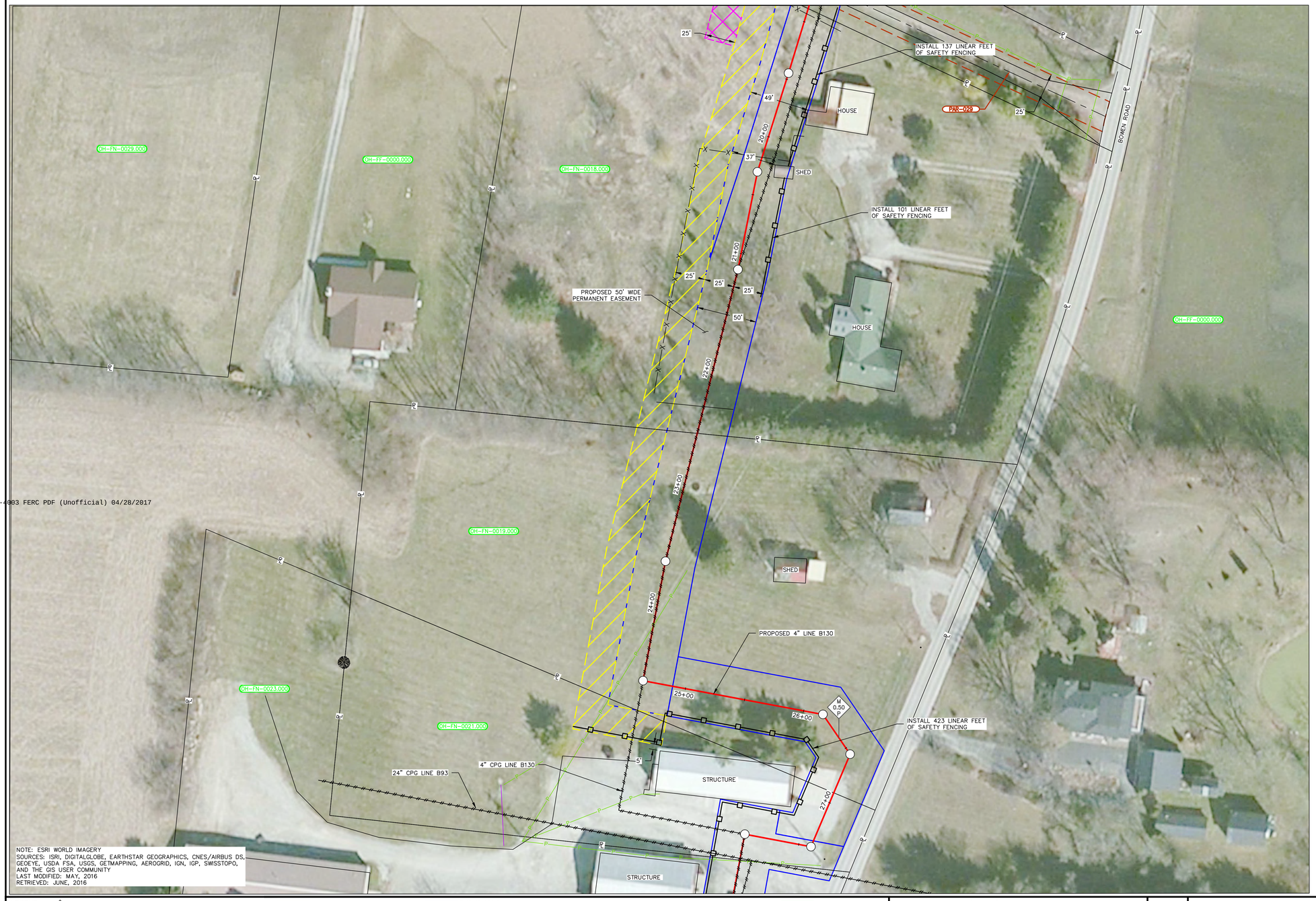
Columbia Gas Transmission

B-SYSTEM MODERNIZATION PROJECT

TITLE: MP 0.20 RESIDENTIAL – DETAIL
PROPOSED 4" LINE B130 REPLACEMENT
FRANKLIN COUNTY, OHIO

DRAWN BY:	MM	DATE: 03/21/2016	DRAWING NUMBER	SHEET	ISSUE
PROJECT NUMBER	21506		D7002-RSD-042	42 OF 45	P2
WORK ORDER NUMBER	46294				

TRACTS OH-FN-0018.000 & OH-FN-0021.000
KAREN RINEHART & HERCH PACKING & RUBBER COMPANY, INC.
FRANKLIN COUNTY, OHIO



NOTE: ESRI WORLD IMAGERY
SOURCES: ISRI, DIGITALGLOBE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, GEOEYE, USDA FSA, USGS, GETMAPPING, AEROGRID, IGN, IGP, SWISSTOPO, AND THE GIS USER COMMUNITY
LAST MODIFIED: MAY, 2016
RETRIEVED: JUNE, 2016

LEGEND

- MILEPOST (M 1.00 P)
- ROUTE
- EXISTING COLUMBIA PIPELINE
- FOREIGN PIPELINE
- PERMANENT ROW
- X FENCE
- TEMPORARY WORKSPACE
- ADDITIONAL TEMPORARY WORKSPACE
- ACCESS ROAD
- B130 TEMPORARY WORKSPACE
- CONTRACTOR / PIPE YARD
- PAR-0001 ACCESS ROAD NUMBER
- ST-CO-001.000 PROPERTY TRACT NUMBER
- WPADJC002 WETLAND ID
- SPADJC002 WATERBODY ID
- U UNDERGROUND CABLE
- P OVERHEAD POWER LINE
- W WATERLINE
- COUNTY BORDER
- WETLAND
- WATERBODY
- CONSTRUCTION TAPE

SCALE: 1" = 40'
40 0 20 40

No.	REVISIONS	APPROVED BY	DATE
P1	PRELIMINARY	MM	04/01/16
P2	ISSUED FOR 90% REVIEW	MM	08/30/16

DWG. NO.	REFERENCE
D7002-ALG-034	ALIGNMENT SHEET

DESCRIPTION

THIS DRAWING DOCUMENTS MITIGATION MEASURES THAT WILL BE IMPLEMENTED FOR ALL RESIDENCES WITHIN 50 FEET OF THE PROPOSED CONSTRUCTION WORK AREA. CONTRACTOR SHALL COMPLY WITH THE FOLLOWING CONSTRUCTION MITIGATION REQUIREMENTS IN ADDITION TO THOSE LISTED IN THE CONSTRUCTION SPECIFICATIONS.

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ISSUED FOR 90% REVIEW
DATE: 08/30/2016

Ohio Utilities Protection Service Call 811 before you dig

Hatch Mott MacDonald

PROJECT DELIVERY
PROJECT ENGINEERING
P.O. BOX 1273 CHARLESTON, WV 25325-1273
1700 MACCORKLE AVENUE SE, CHARLESTON, WV 25314

Columbia Gas Transmission

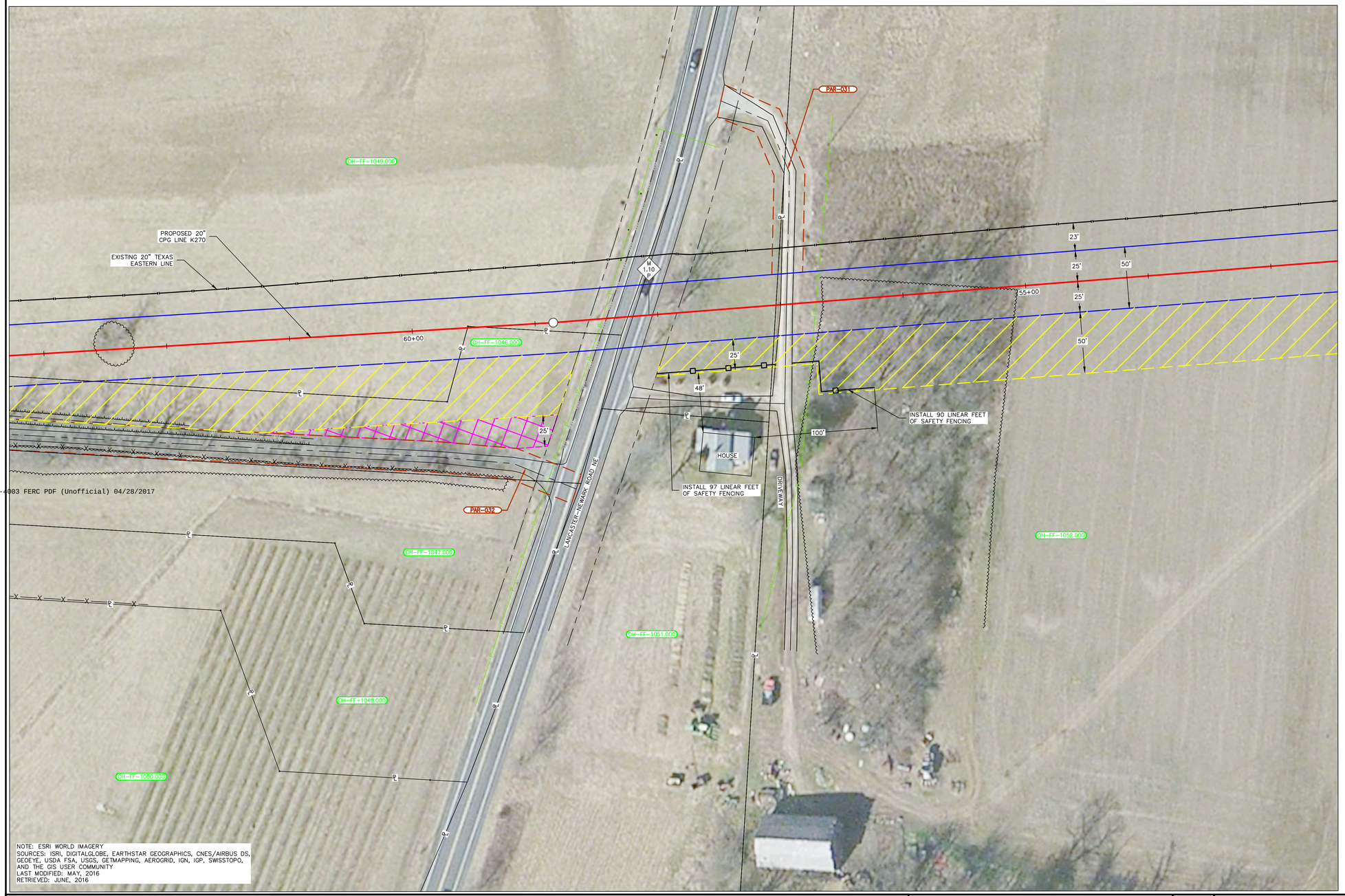
B-SYSTEM MODERNIZATION PROJECT

TITLE: MP 0.50 RESIDENTIAL – DETAIL
PROPOSED 4" LINE B130 REPLACEMENT
FRANKLIN COUNTY, OHIO

DRAWN BY:	DATE	DRAWING NUMBER	SHEET	ISSUE
MM	03/21/2016	D7002-RSD-043	43 OF 45	P2

PROJECT NUMBER: 21506
WORK ORDER NUMBER: 46294

TRACT OH-FF-1051.000
WOHRER IAN MICHAEL & JUDITH LEE SURV, VAJEN THOMAS R & MARY JANE SURV, RUTTER RONALD D & LYNNELLE M SURV, WOHRER MICHAEL & JENNIFER SURV, & MCCOY RAYMOND L
FAIRFIELD COUNTY, OHIO



NOTE: ESRI WORLD IMAGERY
SOURCES: ISRI, DIGITALGLOBE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, GEOEYE, USDA FSA, USGS, GETMAPPING, AEROGRID, IGN, IGP, SWISSTOPO, AND THE GIS USER COMMUNITY
LAST MODIFIED: MAY, 2016
RETRIEVED: JUNE, 2016

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ISSUED FOR 90% REVIEW
DATE: 08/30/2016

Ohio Utilities Protection Service Call 811 before you dig

Hatch Mott MacDonald

LEGEND

- MILEPOST (M 1.00 P)
- ROUTE
- EXISTING COLUMBIA PIPELINE
- FOREIGN PIPELINE
- PERMANENT ROW
- FENCE
- TEMPORARY WORKSPACE
- ADDITIONAL TEMPORARY WORKSPACE
- ACCESS ROAD
- K270 TEMPORARY WORKSPACE
- CONTRACTOR / PIPE YARD
- ACCESS ROAD NUMBER (PAR-0001)
- PROPERTY TRACT NUMBER (ST-CO-001.000)
- WETLAND ID (WPADJC002)
- WATERBODY ID (SPADJC002)
- UNDERGROUND CABLE
- OVERHEAD POWER LINE
- WATERLINE
- COUNTY BORDER
- WETLAND
- WATERBODY
- SAFETY FENCE

SCALE: 1" = 40'
40 0 20 40

D7002-ALG-035	ALIGNMENT SHEET
D7002-ALG-036	ALIGNMENT SHEET

PROJECT DELIVERY
PROJECT ENGINEERING
P.O. BOX 1273 CHARLESTON, WV 25325-1273
1700 MACCORKLE AVENUE SE, CHARLESTON, WV 25314

Columbia Gas Transmission

B-SYSTEM MODERNIZATION PROJECT

TITLE: MP 1.10 RESIDENTIAL – DETAIL
PROPOSED 20" LINE K270 INSTALLATION
FAIRFIELD COUNTY, OHIO

DRAWN BY:	MM	DATE: 03/21/2016	DRAWING NUMBER	SHEET	ISSUE
PROJECT NUMBER	21506		D7002-RSD-044	44 OF 45	P2
WORK ORDER NUMBER	46255				

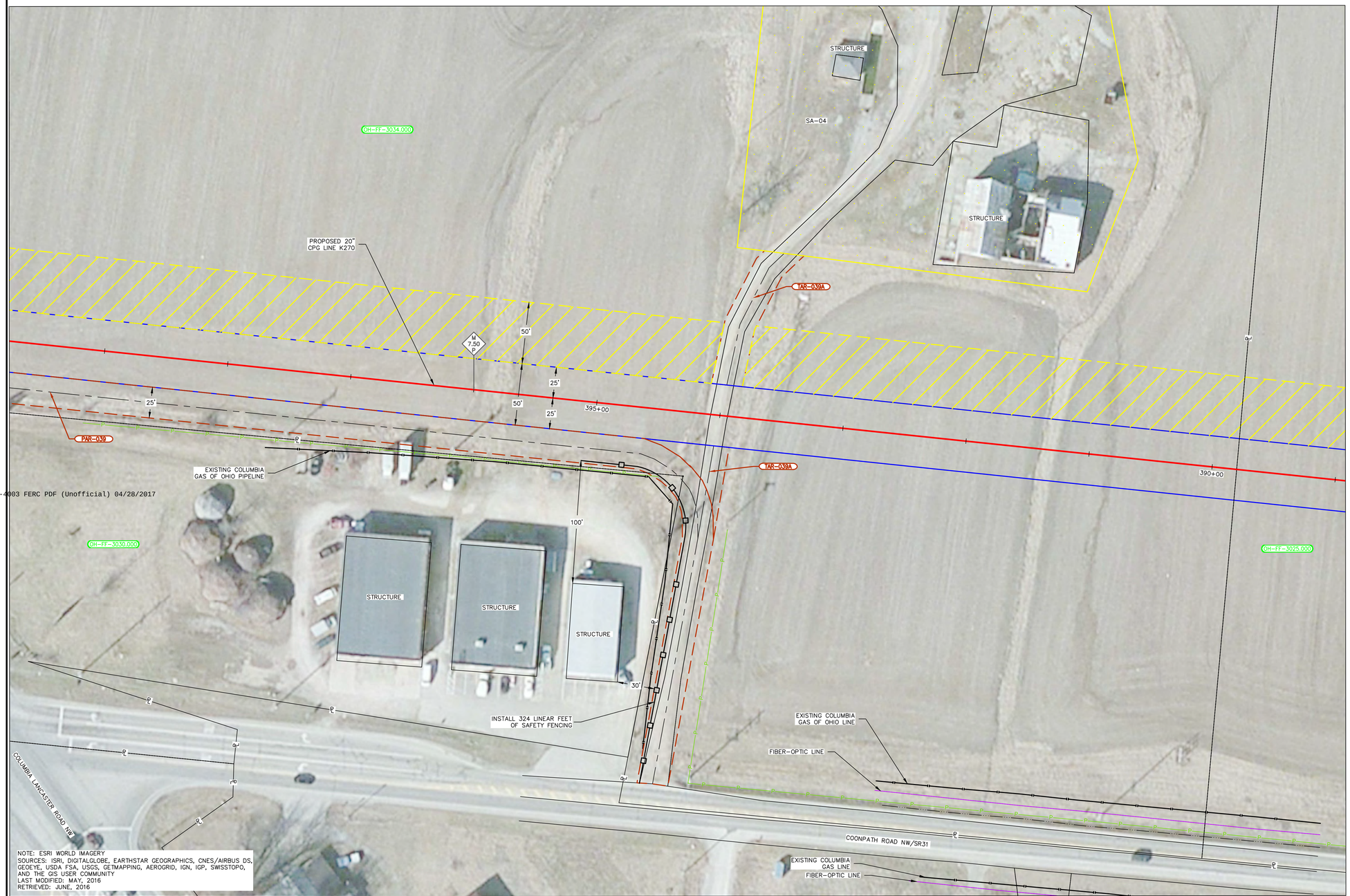
No.	REVISIONS	APPROVED BY	DATE
P1	PRELIMINARY	MM	04/01/16
P2	ISSUED FOR 90% REVIEW	MM	08/30/16

No.	REVISIONS	APPROVED BY	DATE
No.	REVISIONS	APPROVED BY	DATE

DWG. NO. REFERENCE

G:\Columbia\355773_CPG_Line_B105_and_B111\DataProd Work\Drafting\Residential_Site_Specifics\D7002-RSD-044_K270 2016-08-20 11:51 AM

TRACTS OH-FF-3030.000
FAIRFIELD COMMERCIAL PROPERTIES, LLC
FAIRFIELD COUNTY, OHIO



DESCRIPTION

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ISSUED FOR 90% REVIEW
DATE: 08/30/2016

Ohio Utilities Protection Service Call 811 before you dig

Hatch Mott MacDonald

LEGEND
- MILEPOST (N 1.00 D)
- EXISTING COLUMBIA PIPELINE
- FOREIGN PIPELINE
- PERMANENT ROW
- ROUTE
- FENCE
- TEMPORARY WORKSPACE
- ADDITIONAL TEMPORARY WORKSPACE
- ACCESS ROAD
- K270 TEMPORARY WORKSPACE
- CONTRACTOR / PIPE YARD
- PAR-0001 ACCESS ROAD NUMBER
- ST-CO-001.000 PROPERTY TRACT NUMBER
- WPADJC002 WETLAND ID
- SPADJC002 WATERBODY ID
- UNDERGROUND CABLE
- P OVERHEAD POWER LINE
- W WATERLINE
- COUNTY BORDER
- WETLAND
- WATERBODY
- SAFETY FENCE

SCALE: 1" = 40'
40 0 20 40

D7002-ALG-013	ALIGNMENT SHEET
D7002-ALG-014	ALIGNMENT SHEET
D7002-ALG-044	ALIGNMENT SHEET

PROJECT DELIVERY
PROJECT ENGINEERING
P.O. BOX 1273 CHARLESTON, WV 25325-1273
1700 MACCORKLE AVENUE SE, CHARLESTON, WV 25314

Columbia Gas Transmission

B-SYSTEM MODERNIZATION PROJECT

TITLE: MP 7.50 RESIDENTIAL - DETAIL
PROPOSED 20" LINE K270 INSTALLATION
FAIRFIELD COUNTY, OHIO

P1	PRELIMINARY	MM	04/01/16												
P2	ISSUED FOR 90% REVIEW	MM	08/30/16												
No.	REVISIONS	APPROVED BY	DATE	No.	REVISIONS	APPROVED BY	DATE	No.	REVISIONS	APPROVED BY	DATE	DWG. NO.	REFERENCE		

DRAWN BY:	MM	DATE: 03/21/2016	DRAWING NUMBER	SHEET	ISSUE
PROJECT NUMBER	21506		D7002-RSD-045	45 OF 45	P2
WORK ORDER NUMBER	46255				

APPENDIX J

Projects Considered for Cumulative Impacts

Past, Present, and Reasonably Foreseeable Future Actions with Potential for Cumulative Impacts when Combined with the B-System Project a/						
Project Name (Proponent)	**Location (City / County)**	**Approximate Distance and Direction from B-System Project**	**Project Description**	**Permits/ Authorizations Required**	**Current Status and Schedule**	**Resources with Potential Cumulative Effects**
Industrial Developments						
Columbia Line G Project (Columbia Gas Transmission, LLC) b/	Sugar Grove / Fairfield County	Closest portion of project is 0.10 mile from MP 0.1 on Line B-105	This project involved three components: • The abandonment of 13.57 miles of Line G pipeline. • The replacement of 5,000 feet of Line G pipeline. • The in-place abandonment of 1.31 miles of the Line G-137 pipeline.	CWA Section 401/401 Permits Section 106 Clearance State and Federal T&E Species Consultations County Floodplain Permit	Construction occurred between May and December 2016	Water use and quality Fish, wildlife, and vegetation Soils Land use
R601 Integrity Project (Columbia Gas Transmission, LLC) b/	Sugar Grove / Fairfield County	Closest portion of project is 0.10 mile from MP 0.1 on Line B-105	This project consisted of modifications to nine valve setting sites. The closest component to the Project is at the Crawford Compressor Station, which is an existing, maintained natural gas compressor station.	CWA Section 401/401 Permits Section 106 Clearance State and Federal T&E Species Consultations County Floodplain Permit	In service as of October 2015	Water use and quality Fish, wildlife, and vegetation Soils Land use
R701 Project (Columbia Gas Transmission, LLC) b/	Sugar Grove / Fairfield County	Closest portion of project is 0.10 mile from MP 0.1 on Line B-105	This project included the installation of launchers, receivers, and/or valve settings along the R701 pipeline. The closest component to the Project is at the Crawford Compressor Station, which is an existing, maintained natural gas compressor station.	Section 106 Clearance State and Federal T&E Species Consultations County Floodplain Permit	In service as of October 2015	Water use and quality Fish, wildlife, and vegetation Soils Land use
Leach Xpress (Columbia Gas Transmission, LLC) c/	Sugar Grove / Fairfield County	Small portion of Leach Xpress located adjacent to MP 0.0 on Line B-105	This project involves the construction of approximately 160 miles of natural gas pipeline and compression facilities.	Not Available	Construction to occur between Fall 2016 – Fall 2017	Water use and quality Fish, wildlife, and vegetation Soils Land use Air Quality and Noise

Past, Present, and Reasonably Foreseeable Future Actions with Potential for Cumulative Impacts when Combined with the B-System Project a/						
Project Name (Proponent)	**Location (City / County)**	**Approximate Distance and Direction from B-System Project**	**Project Description**	**Permits/ Authorizations Required**	**Current Status and Schedule**	**Resources with Potential Cumulative Effects**
Bluegrass Pipeline (Boardwalk Pipeline Partners, LP and Williams Companies, Inc.) d/	Fairfield County	Proposed route is in Fairfield County. No additional location information is available.	This proposed project includes construction of a pipeline to transport natural gas liquids from the Marcellus and Utica shale formations in Ohio, West Virginia, and Pennsylvania to the Gulf Coast.	Not available	On hold since 2014	Not determined
Appalachia-to-Texas Express "ATEX" (Enterprise Products Partners L.P.) e/	Lancaster / Fairfield County	Crosses K-270 and B-105 north of Lancaster, OH	This project included construction of a 1,230-mile-long pipeline to transport natural gas liquids (ethane) from the Marcellus-Utica Shale region of Pennsylvania, West Virginia, and Ohio to the Texas Gulf Coast near Houston.	Specific permits not available but the following permits are approvals are assumed to be required: CWA Section 401/401 Permits Section 106 Clearance State and Federal T&E Species Consultations County Floodplain Permit	In service as of 2013	Water use and quality Fish, wildlife, and vegetation Soils Land use
Transportation Improvement Projects						
US 33 Carroll Interchange Project (Ohio Department of Transportation) g/	Carroll / Fairfield County	0.5 mile west of MP 14.7 on Line B-105	This project replaces an intersection at Winchester Road and US 33 with a new interchange with ramps and connector roads, and includes three new signaled intersections, four new bridge structures, new lighting, and retaining walls.	Not available	Construction started spring 2015; scheduled to be completed June 2017	Water use and quality Fish, wildlife, and vegetation Soils Land use

Past, Present, and Reasonably Foreseeable Future Actions with Potential for Cumulative Impacts when Combined with the B-System Project a/						
Project Name (Proponent)	**Location (City / County)**	**Approximate Distance and Direction from B-System Project**	**Project Description**	**Permits/ Authorizations Required**	**Current Status and Schedule**	**Resources with Potential Cumulative Effects**
Proposed US 33 Project on Southeast Side (Ohio Department of Transportation) h/	Canal Winchester / Franklin County	B-System Project crosses US 33 within the proposed Ohio DOT project area at MP 6.6 on Line B-111	This project repaved 5.11 miles of US 33 in southeastern Franklin County using a "mill and fill" technique, added left turn lanes on US 33 in both directions, and placed deck overlays on the bridges over Blacklick Creek.	Not available	Construction is anticipated to occur in spring/summer 2016.	Water use and quality Fish, wildlife, and vegetation
Various Road and Bridge Improvement Projects (Ohio Department of Transportation) i/	Columbus / Franklin County	5 miles NW of MP 13.9 on Line B-111	These various road and bridge improvement projects are within the City of Columbus.	Not available	Construction underway on a number of projects; anticipated completion date is end of 2017	Water use and quality Fish, wildlife, and vegetation
US 33 Intersection Reconfigurations (Ohio Department of Transportation) j/	Fairfield County	0.34 mile west of MP 16.1 on Line B-105	This project reconfigured the US 33/Winchester Road/High Street, US 33/Lockville Road/Pleasantville Road, and US 33/Carroll-Southern Road intersections.	Not available	Notice posted January 2014; project complete.	Water use and quality Fish, wildlife, and vegetation Land use
Various Road and Bridge Improvement Projects (Franklin County Engineer) k/	Franklin County	Various	This project involves various road and bridge improvements within Franklin County.	Not available	Ongoing from 2014-2017	Water use and quality Fish, wildlife, and vegetation Air Quality and Noise (construction)
Winchester Pike and Bixby Road/Brice Road (Franklin County Engineer) k/	Franklin County	0.53 mile north of MP 6.4 on Line B-111	This project involved the installation of new drainage pipes and temporary pavement along Winchester Pike and construction of a new road alignment to connect Bixby Road to Brice Road.	Not available	Construction occurred between March and October 2016	Water use and quality Fish, wildlife and vegetation Land use

Past, Present, and Reasonably Foreseeable Future Actions with Potential for Cumulative Impacts when Combined with the B-System Project a/						
Project Name (Proponent)	**Location (City / County)**	**Approximate Distance and Direction from B-System Project**	**Project Description**	**Permits/ Authorizations Required**	**Current Status and Schedule**	**Resources with Potential Cumulative Effects**
Winchester Pike at Shannon-Ebright (Franklin County Engineer) k/	Blacklick Estates / Franklin County	1.58 miles north of MP 8.1 on Line B-111	This project involves one or more roadway intersection improvements.	Not available	Construction planned for 2017	Water use and quality Fish, wildlife, and vegetation
Ety Road Extension (City of Lancaster) l/	Lancaster / Fairfield County	0.03 mile east of MP 8.1 on Line B-105	This project would extend Ety Road from its current southern terminus at West Fair Avenue to State Route 188.	Not available	Planning stage. No information on timeline, but not likely to occur for many years.	Water use and quality Fish, wildlife, and vegetation Soils Land use
Subdivision Developments						
River Valley Highlands Subdivision (Proponent Unknown) m/	Lancaster / Fairfield County	0.55 mile south of MP 3.9 of Line K-270	This project includes new development sections including construction of an elementary school and green space.	Not available	Currently under construction; Estimated completion fall 2017	Water use and quality Fish, wildlife, and vegetation Soils Land use
Preston Trails – Residential Developments (Westport Homes) f/	Pickerington / Fairfield County	1.0 mile north of MP 2.8 on Line B-111	Not Available	Not available	Not Available	Not determined
Heron Crossing Subdivision (M/I Schottenstein Homes) n/	Fairfield County	5 miles north of MP 17.4 on Line B-105 within HUC-12 watershed boundary	This project would construct an approximately 180-lot subdivision.	Not available	Preliminary plan approved September 2015; in process of construction drawing review.	Water use and quality Fish, wildlife, and vegetation

Past, Present, and Reasonably Foreseeable Future Actions with Potential for Cumulative Impacts when Combined with the B-System Project a/						
Project Name (Proponent)	**Location (City / County)**	**Approximate Distance and Direction from B-System Project**	**Project Description**	**Permits/ Authorizations Required**	**Current Status and Schedule**	**Resources with Potential Cumulative Effects**
Violet Meadows Subdivision (Proponent Unknown) n/	Fairfield County	5 miles north of MP 0.5 on Line B-111 within HUC-12 watershed boundary	This project would revise an existing subdivision section.	Not available	Yet to be constructed; no information on timeline.	Water use and quality Fish, wildlife, and vegetation
Misty Meadows Subdivision (Proponent Unknown) l/	Lancaster / Fairfield County	At MP 8.9 on Line B-105	This project involves the construction of single family residence houses on Section 3 (which has been platted), and may also include construction on the adjacent Section 4.	Not available	Houses currently being constructed; no information on timeline.	Water use and quality Fish, wildlife, and vegetation Soils Land use
Other						
Main Street Lowhead Dam Removal (Columbus Downtown Development Corporation) o/	Columbus / Franklin County	4.5 miles northwest of MP 13.98 on Line B-111	This project would create a 33-acre greenway through Downtown Columbus, with the objectives of improving the existing ecological systems and river habitat and providing new recreational options.	CWA 401/401 Permits	Not Available	Water use and quality Fish, wildlife, and vegetation

Past, Present, and Reasonably Foreseeable Future Actions with Potential for Cumulative Impacts when Combined with the B-System Project a/						
Project Name (Proponent)	**Location (City / County)**	**Approximate Distance and Direction from B-System Project**	**Project Description**	**Permits/ Authorizations Required**	**Current Status and Schedule**	**Resources with Potential Cumulative Effects**
New Junior High School (Lancaster City School) l/	Lancaster / Fairfield County	Potential locations near the Project include: • MP 9.48 on Line B-105 • 0.2 mile southwest of MP 9.3 on Line B-105 • 0.2 mile west of MP 8 on Line B-105 • 0.16 mile west of MP 6.8 on Line B-105 • 0.16 mile northeast of MP 5.6 on Line B-105	This project would construct a new junior high school	Not available	Scheduled to be constructed within the next several years; no firm date available.	Water use and quality Fish, wildlife, and vegetation Soils Land use

Past, Present, and Reasonably Foreseeable Future Actions with Potential for Cumulative Impacts when Combined with the B-System Project a/						
Project Name (Proponent)	**Location (City / County)**	**Approximate Distance and Direction from B-System Project**	**Project Description**	**Permits/ Authorizations Required**	**Current Status and Schedule**	**Resources with Potential Cumulative Effects**

a/ All projects are within the HUC-12 watershed boundary, which includes the B-System Project.
b/ CH2M HILL (2015)
c/ Columbia Pipeline Group (2016)
d/ Marcellus Drilling News (2016)
e/ U.S. Environmental Protection Agency (2016c)
f/ U.S. Army Corps of Engineers (2016a)
g/ Ohio Department of Transportation (2016b)
h/ Ohio Department of Transportation (2016c)
i/ Ohio Department of Transportation (2016d)
j/ U.S. Army Corps of Engineers (2016b)
k/ Franklin Country Engineer's Office (2016)
l/ Steven Wellstead (2016)
m/ Pete Vail (2016)
n/ Loudan Klein (2016)
o/ Downtown Columbus (2016)

CWA = Clean Water Act
MP = milepost
T&E = threatened and endangered

APPENDIX K

List of Preparers

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Document Content(s)