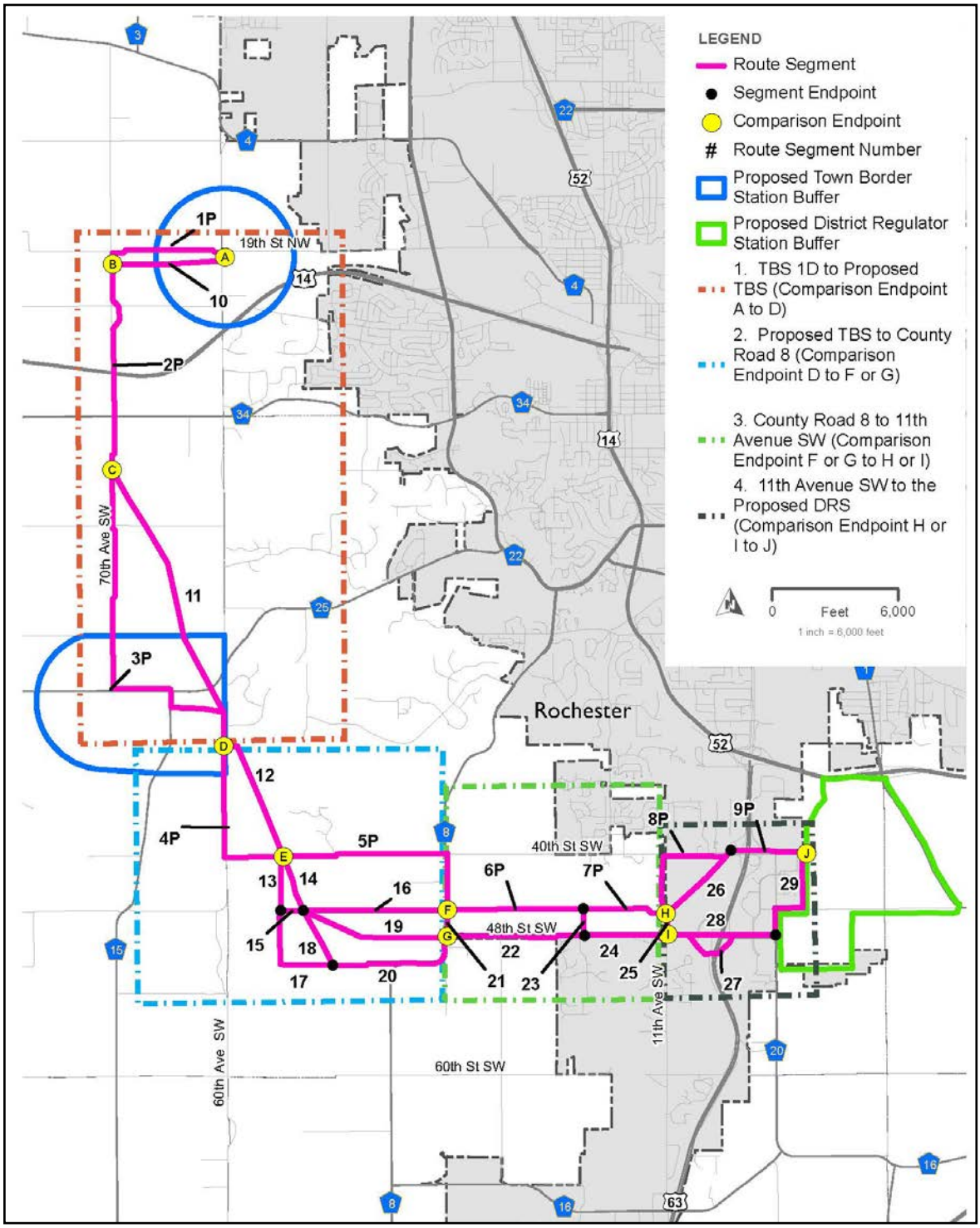

Rochester Natural Gas Pipeline Project
Docket No. G-011/GP-15-858

Comparative Environmental Analysis
September 16, 2016

Volume I of II

MINNESOTA DEPARTMENT OF COMMERCE

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Abstract

Under Minnesota Statute 21G.02 [Pipelines], a route permit from the Minnesota Public Utilities Commission (Commission) is required to construct a high pressure natural gas pipeline. Minnesota Energy Resources Corporation (MERC or Applicant) filed an application with the Commission for a route permit to construct and operate approximately 13 to 14 miles of new natural gas pipeline and associated facilities. Upon completion, the proposed project will tie together the northern and southern portions of MERC's existing natural gas distribution system in and around Rochester in Olmsted County, Minnesota.

The Applicant submitted its route permit application (Application) on November 3, 2015. The Application was filed pursuant to the full review process outlined in Minnesota Statute 216G.02 and Minnesota Rules 7852.0800–1900. On February 3, 2016, the Commission accepted the Application as complete.

Department of Commerce (Commerce), Energy Environmental Review and Analysis (EERA) staff is responsible for conducting environmental review for route permit applications submitted to the Commission. Accordingly, EERA held information/scoping meetings in Rochester on February 29, 2016, and prepared this comparative environmental analysis (CEA) for the proposed project. This CEA addresses the requirements of Minnesota Rules 7852.1500.

This CEA is being released in draft form. Following its release, a public meeting will be held in the project area to receive comments on the document. The deadline for comments on the CEA is October 7, 2016. EERA staff will respond to comments received on the draft CEA, but is not required to modify and re-issue the document. Rather, the Commission requested that EERA staff file response comments as pre-filed testimony no later than 14 days prior to the public hearing.

The hearing will be presided over by an administrative law judge (ALJ) from the Office of Administrative Hearings. Upon completion of the hearing process, the ALJ will compile a record of the public hearing, and public comments received, and present it to the Commission for its final permit decision. A decision on the route permit is anticipated in spring 2017.

Persons interested in this project can place their name on the project mailing list by contacting the Public Utilities Commission at docketing.puc@state.mn.us or 651-201-2204 to sign up. Please reference docket number G-011/GP-15-858 in your email or phone call.

Additional documents and information can be found on the EERA website at: http://mn.gov/commerce/energyfacilities/Docket.html?Id=34318 or the Minnesota eDockets webpage at: https://www.edockets.state.mn.us/EFiling/search.jsp by selecting "15" for year and "858" for number.

This document can be made available in alternative formats, that is, large print or audio, by calling 651-539-1530.

Acronyms, Abbreviations, and Definitions

2010 Olmsted County Report	*2010 Archaeological Reconnaissance Survey of Olmsted County, Minnesota*
2040 Plan	The Olmsted County 2040 Long Range Transportation Plan
AC	alternating current
AMP	Agriculture Mitigation Plan
ANSI	American National Standards Institute
API	American Petroleum Institute
Applicant	Minnesota Energy Resources Corporation
Application	Route Permit Application
BLM	Bureau of Land Management
BMP	Best Management Practice
Board	Rochester Township Board
BP	British Petroleum
Btu/hr	British Thermal Unit Per Hour
CEA	Comparative Environmental Analysis
CFR	Code of Federal Regulations
Commission	Public Utilities Commission
CP	Cathodic Protection
CSAH	County State Aid Highway
dBA	A-weighted Decibel Scale
DIMP	Distribution Integrity Management Program
DMC	Destination Medical Center
DNR	Minnesota Department of Natural Resources
DOC	Department of Commerce
DRS	District Regulator Station
EERA	Energy Environmental Review and Analysis
EI	Environmental Inspector
EPA	United States Environmental Protection Agency
EQB	Environmental Quality Board
ESA	Endangered Species Act
FERC	Federal Energy Regulatory Commission

GDP	General Development Plan
GIS	Geographic Information Systems
GLO	Government Land Office
HDD	Horizontal Directional Drilling
MBBA	Minnesota Breeding Bird Atlas
MBS	Minnesota Biological Survey
mcfd	Million Cubic Feet Per Day
mcfh	Million Cubic Feet Per Hour
MERC	Minnesota Energy Resources Corporation
MLCCS	Minnesota Land Cover Classification System
mm	Millimeters
MnDOT	Minnesota Department of Transportation
MnOPS	Minnesota Office of Pipeline Safety
MPCA	Minnesota Pollution Control Agency
MW	Megawatt
NAAQS	National Ambient Air Quality Standards
NAC	Noise Area Classification
NGEP	Natural Gas Extension Project
NHIS	Natural Heritage Information System
NNG	Northern Natural Gas
NO_x	Nitrogen Oxide
NPDES	National Pollutant Discharge System
NWI	National Wetlands Inventory
OPS	Office of Pipeline Safety
Phase Ia Report	Phase Ia Literature Search Report
PHMSA	Pipeline and Hazardous Materials Safety Administration
proposed Project	Rochester Natural Gas Pipeline Project
psig	Pounds Per Square Inch Gauge
PWI	Public Waters Inventory
Refuge	Rochester State Game Refuge
RGU	Responsible Governmental Unit
ROI	Region of Influence
ROCOG	Rochester-Olmsted Council of Governments

RPU	Rochester Public Utilities
SCADA	Supervisory Control and Data Acquisition
SDS	State Disposal System
SHPO	State Historic Preservation Office
SMYS	Specified Minimum Yield Strength
SO_2	Sulfur Dioxide
SWPPP	Stormwater Pollution Prevention Plan
TBS	Town Border Station
TCPA	Township Cooperative Planning Association
USDOT	United States Department of Transportation
USFWS	United States Fish and Wildlife Service

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Summary

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Minnesota Energy Resources Corporation (MERC or Applicant) proposes to construct approximately 13 to 14 miles of new high pressure natural gas pipeline and associated facilities that will cross portions of Cascade, Kalmar, Salem, Rochester, and Marion townships and the city of Rochester in Olmsted County.

In order to construct the proposed project, the Applicant must obtain approval from the Minnesota Public Utilities Commission (Commission) for a route permit. The Commission's docket number for the proposed Rochester Natural Gas Pipeline Project is G-011/GP-15-858. In addition to the route permit from the Commission, the project will require approvals (for example, permits, licenses) from other federal and state agencies and local units of government.

Minnesota Statute 216G.02 and Minnesota Rules, 7852.0800 through 7852.1900 outline the procedures that the Commission is required to follow when considering the issuance of pipeline routing permits. To aid the Commission in these considerations, it receives assistance from several state agencies, including the Department of Commerce (Department) and the Office of Administrative Hearings (OAH).

Department Energy Environmental Review and Analysis (EERA) staff is responsible for conducting environmental review for route permit applications submitted to the Commission. The intent of this review is to ensure that citizens, local governments, agencies, applicants and the Commission are aware of the potential human and environmental impacts of the project so that the Commission can consider these impacts when determining the location for the pipeline and associated facilities.

State Review Process

EERA staff has prepared this comparative environmental analysis (CEA) for the Commission and for other agencies and entities that have permitting authority related to the proposed project. This CEA also can assist citizens in providing guidance to the Commission and other decision-makers regarding the project. Volume I of this CEA evaluates the potential human and environmental impacts of the proposed project and possible mitigation measures, including route and route segment alternatives. Volume II provides Appendices, such as figures, tables, etc. The CEA does not advocate or state a preference for a specific route or route segment alternative. The CEA analyzes and compares potential impacts and mitigation measures, including routes and route segment alternatives, such that citizens, local governments, agencies, and the Commission can work from a common source of information.

EERA staff initiated work on this CEA by soliciting comments on (1) the issues and impacts that should be evaluated in the CEA, (2) the mitigation measures to study, and (3) the route and route segment alternatives that should be studied. This process of soliciting comments on the contents of the CEA is known as "scoping." EERA solicited comments through public meetings in February 2016 and a public comment period that ended May 30, 2016.

On June 27, 2016, EERA staff filed with the Commission a summary, analysis and recommendation on all route alternatives and issues identified during the public comment period. A Commission Order (July 26, 2016) accepted the comments and recommendations of EERA staff on route segments for consideration at the public hearing. All of the route segment alternatives are analyzed in this CEA with the same level of detail and analysis, and evaluated against the route selection criteria in Minnesota Rule 7852.1900.

After issuance of this CEA in draft form, a public meeting will be held to receive comments on the document. EERA staff will respond to comments received on the document, but is not required to modify and re-issue the document. Rather, the Commission requested that EERA staff file response comments as pre-filed testimony no later than 14 days prior to the public hearing.

An administrative law judge (ALJ) will hold a public hearing for the project. The hearing will be held for the purpose of collecting and verifying data, and establishing a complete record upon which the Commission will base its decision for designation of a route and issuance of a pipeline routing permit. The hearing will be held in the project area. Interested persons will have an opportunity at the hearing to ask questions, provide comments, submit evidence, and advocate for the routes or route segments they believe are most appropriate for the project. The ALJ will submit a report to the Commission. Based on the ALJ's report, the CEA and the entire record, the Commission will designate a route and issue a route permit for the project.

Project Need and Purpose

The Applicant has indicated that the proposed project is needed to: (1) expand the capacity of its natural gas distribution system to meet the projected increase in demand from its existing Rochester area customers, as well as from new customers and (2) provide the ability to shift the supply of natural gas to where it is needed on its high pressure distribution system within the Rochester service area.

Consideration of Impacts

Minnesota Statute 216G.02 Subd. 3(b)(9) requires "that a person who has constructed a pipeline, to the extent possible, restore the area affected by the pipeline to the natural conditions that existed immediately before construction of the pipeline, provided that the restoration is compatible with the safe operation, maintenance, and inspection of the pipeline."

To properly assess and determine the location of a pipeline, it is necessary to understand the impacts that a proposed pipeline and associated facilities will have on humans and the environment. Pipeline route designation procedures, proper pipeline right-of-way preparation, construction practices, restoration of the affected area and compliance with permit conditions will lessen or mitigate the impacts of the proposed pipeline project on humans and the environment.

The construction of a natural gas pipeline and associated facilities involves both short and long-term impacts. Some impacts may be avoidable; some may be unavoidable but can be mitigated; others may be unavoidable and unable to be mitigated. In general, impacts can be avoided and mitigated by prudent right-of-way alignment—that is by locating the pipeline and associated facilities in a manner that minimizes human and environmental impacts—and by design and construction measures.

Application of Routing Criteria to Proposed Project

The Commission is charged with locating pipelines in a manner that minimizes "adverse human and environmental impact[s]." Minnesota Rule 7852.1900 lists 10 criteria for the Commission to consider in its route permitting decisions.

Many of the impacts of the project, relative to the routing criteria of Minnesota Rule 7852.1900, are anticipated to be minimal and mitigated by (1) the general conditions in the Commission's generic route permit template, (2) prudent right-of-way location within the permitted route, and (3) the requirements of agency permits. The selection of certain routing options could also minimize and mitigate these impacts.

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1 Introduction

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Minnesota Energy Resources Corporation (MERC or Applicant) filed an application for a pipeline route permit with the Minnesota Public Utilities Commission (Commission) to construct the Rochester Natural Gas Pipeline project (proposed project) in and around Rochester, Minnesota. The Applicant intends to construct a new, approximately 13 to 14 mile long high pressure distribution natural gas pipeline and associated facilities.[1] The application was filed pursuant to Minnesota Statutes § 216G and Minnesota Rules 7852.0800 – 3100.

This document is a comparative environmental analysis (CEA).[2] It is intended to inform the public, decision-makers, local governments, state and federal agencies, and an applicant of the primary human and environmental effects and possible mitigation measures associated with the proposed project.[3] The Commission authorized Energy Environmental Review and Analysis (EERA) staff within the Minnesota Department of Commerce to prepare the CEA.[4] It is organized as follows:

Section 1 provides an overview of this document and the proposed project. It also explains the regulatory framework associated with the proposed project, including the pipeline route permitting process and other required permits and approvals.

Section 2 describes the project as proposed by the Applicant in detail and identifies land requirements for the proposed project.

Section 3 explains construction, operation, and maintenance procedures.

Section 4 discusses alternative routes and route segments accepted for consideration at the public hearing.

Section 5 details potential impacts to both human and natural resources; identifies measures to avoid, minimize, or mitigate adverse impacts; and summarizes the cumulative potential effects of the proposed project and other projects.

Section 6 applies the information and data available in the route permit application and the CEA to the routing criteria listed in Minnesota Rule 7852.1900.

1.1 Project Purpose

The purpose of the proposed project is two-fold. First, the proposed project would expand the Applicant's natural gas distribution system in and around Rochester to meet existing and projected demand. Second, the proposed project would build redundancy into the Applicant's system allowing the Applicant to shift load on its distribution system. On whole, the proposed project will enable the Applicant to meet the projected increase in demand from new and existing Rochester-area customers.

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[1] Minnesota Energy Resources Corporation (November 3, 2016) *Rochester Natural Gas Pipeline Project Application*, eDockets Document No. 201511-115408-01, 201511-115408-02, 201511-115408-03, 201511-115408-04, 201511-115408-05, 201511-115408-06, 201511-115408-07, 201511-115408-08 (hereinafter "Application").
[2] Minn. R. 7852.1500.
[3] *See generally* Minn. R. 7852.0200, subp. 3; Minn. R. 7852.0200, subp. 4(B).
[4] Minnesota Public Utilities Commission (February 3, 2016) *Order Finding Application Complete and Granting Variance; Notice of Hearing*, eDockets Document No. 20162-117991-01.

The Applicant is the sole provider of natural gas services to Rochester and surrounding communities. This area is experiencing continued population growth, including industrial and residential expansion, in large part due to the efforts to develop Rochester and the Mayo Clinic as a Destination Medical Center (DMC). As a result of this growth and limitations on the existing natural gas distribution system, the Applicant has a limited ability to provide firm and reliable natural gas service to new and existing customers as demand increases.

To provide firm and reliable natural gas service at increased levels in the Rochester area over the coming years, the Applicant has negotiated a 30-year pipeline capacity contract with Northern Natural Gas (NNG), an interstate natural gas provider. NNG will provide natural gas at volumes sufficient to meet the projected growth in customer demand over the contract's term. The combination of NNG's increased transmission capacity and construction of the proposed project will provide the Applicant with the ability to increase the supply of natural gas and shift that supply where it is needed on its high pressure distribution system within the Rochester service area.

1.2 Project Description

The Applicant proposes to construct approximately 13 to 14 miles of new natural gas distribution pipeline west and south of Rochester in Olmsted County, Minnesota (**Figure 1A** through **Figure 1C**). The proposed pipeline will include installation of approximately five miles of 16-inch outside diameter and about eight miles of 12-inch outside diameter steel pipeline. The 16-inch outside diameter pipe is anticipated to operate at 400 to 475 pounds per square inch gauge (psig) and the 12-inch outside diameter pipe is anticipated to operate at 250 to 275 psig; however, the maximum allowable operating pressure will be 500 psig for both pipelines.

The Applicant also proposes to construct two town border stations (TBS) and one district regulator station (DRS), which serve as natural gas transfer points along the high pressure transmission and distribution networks. These facilities are described in greater detail in **Section 2**.

The proposed project would connect the existing TBS 1D (to be expanded or rebuilt) northwest of Rochester in Cascade Township to a new, proposed TBS (Proposed TBS) located west of Rochester in Salem Township. It will then connect the Proposed TBS to a new, proposed DRS (Proposed DRS) located approximately three-quarter miles southwest of the Applicant's existing TBS 1B in southeast Rochester in Marion Township. TBS 1D will be the proposed project's northern endpoint, and the Proposed DRS will be the proposed project's southeastern endpoint (**Figure 1A** through **Figure 1C**).

TBS 1B will be decommissioned once construction of the Proposed DRS is complete. As a result, the Applicant would have two TBSs (TBS 1D and Proposed TBS) serving its distribution system in the Rochester area.

The proposed project will be constructed in three phases. Phase I will consist of the modification (expansion or rebuilding) of the existing TBS 1D (2017). Phase II will consist of the construction of the Proposed TBS and installation of a 16-inch distribution pipeline between TBS 1D and the Proposed TBS (2019). Phase III will consist of the installation of a

12-inch distribution pipeline from the Proposed TBS to the Proposed DRS and construction of the Proposed DRS (2023). (**Figure 3)**

1.3 Project Location

The proposed project would be located entirely within Olmsted County, Minnesota, in and around Rochester. Outside Rochester, the proposed project would cross through Cascade, Kalmar, Salem, Rochester, and Marion townships. The proposed pipeline would cross Cascade Creek and the Zumbro River on the southwest side of Rochester and Willow Creek on the south side of Rochester. The proposed project would cross US Highway 14 in Kalmar Township on the west side of Rochester and US Highway 63 on the south side of Rochester.

1.4 Regulatory Framework

In order to construct the proposed project, the Applicant must obtain a route permit from the Commission. Additional approvals from other state and federal agencies with permitting authority for actions related to the project will also be required.

1.4.1 Certificate of Need

An applicant cannot construct a large energy facility in Minnesota without first receiving a Certificate of Need (CN) issued by the Commission.[5] Pipelines designed to transport natural gas at a pressure greater than 200 pounds per square inch (psi) for a length of 50 miles or more in Minnesota are defined as a large energy facility.[6] The proposed project is designed to be approximately 13 to 14 miles in length; therefore, it does not meet the definition of large energy facility. As a result, a CN is not required.

1.4.2 Pipeline Route Permit

In Minnesota, no person may construct a pipeline designed to transport natural gas at a pressure of more than 275 psi without first obtaining a route permit from the Commission,[7] unless the pipeline is excluded or exempted from the Commission's routing authority.[8] The proposed project is designed to operate at different pressures based on pipe size. The 16-inch outside diameter pipe is designed to operate at 400 to 475 psig and the 12-inch outside diameter pipe is designed to operate at 250 to 275 psig.[9] The maximum allowable operating pressure will be 500 psig for both pipelines. As a result, the proposed project requires a route permit from the Commission.

[5] Minn. Stat. 216B.243, subd. 2.
[6] Minn. Stat. 216B.2421, subd. 2(5).
[7] Minn. Stat. 216G.02, subd. 1.
[8] Minn. Stat. 216G.02, subd. 3(b)(7)., Minn. R. 7852.0300.
[9] The maximum allowable operating pressure for both pipes will be 500 psig. *See* Application, page 11.

1.4.3 Environmental Review

Applications for pipeline route permits are subject to environmental review under Minnesota Rules Chapter 7852. The Minnesota Environmental Quality Board (EQB) approved these rules pursuant to Minnesota Rule 4410.3600 as an alternative form of environmental review because they "address substantially the same issues as the [environmental assessment worksheet] EAW and [environmental impact statement] EIS process and use procedures similar in effect to those of the EAW and EIS process."[10]

Application Acceptance

The Applicant filed its route permit application (Application) to the Commission on November 3, 2015.[11] The Applicant provided supplemental information on November 9, 2015,[12] and revised its Application on January 11, 2016.[13] The Commission considered the completeness of the Application at its January 14, 2016, agenda meeting.[14] On February 3, 2016, the Commission issued an order accepting the Application as complete.[15]

In its February 3 Order, the Commission supplemented the Minnesota Rules Chapter 7852 requirements by requesting "that the Department issue the comparative environmental analysis in draft form for public comment and reply to substantive comments received as pre-filed testimony at least 14 days prior to the public hearing."[16] The Order also authorized EERA staff to hold public information (scoping) meetings; collect and analyze all route alternative proposals; and provide a summary, analysis, and recommendation for the Commission's review and determination of routes to be considered at hearing.[17]

Public Information (Scoping) Meetings

Minnesota Rule 7852.1300 requires that public information/scoping meeting(s) be held in each county crossed by an applicant's preferred pipeline route, unless a variance is granted by the Commission. The purpose of these meetings is to explain the route designation process, to respond to questions raised by the public, and to solicit comments on route and route segment proposals and other issues that should to be examined in greater detail in the CEA prepared for the project.

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[10] Minn. R. 4410.3600, subp. 1.
[11] Application
[12] Minnesota Energy Resources Corporation (November 9, 2015) *Supplemental Tables Regarding Existing Environmental Conditions for Route Alternatives*, eDockets Document No. 201511-115590-01.
[13] Minnesota Energy Resources Corporation (January 13, 2016) *Revisions to Route Permit Application*, eDockets Document No. 20161-117213-01.
[14] Minnesota Public Utilities Commission (December 31, 2015) *Notice of Commission Meeting – January 14, 2016*, eDockets Document No. 201512-116910-04.
[15] Minnesota Public Utilities Commission (February 3, 2016) *Order Finding Application Complete and Granting Variance – Notice of Hearing*, eDockets Document No. 20162-117966-01.
[16] Order Finding Application Complete, February 3, 2016. See eDockets Document No. 20162-117966-01, p. 9.
[17] Minnesota Public Utilities Commission (February 3, 2016) *Order Finding Application Complete and Granting Variance – Notice of Hearing*, eDockets Document No. 20162-117966-01.

On February 4, 2016, the Commission sent notice of the place, date, and time of the first public information (scoping) meeting.[18] The notice was distributed in electronic and written form to:

- The Commission's service list and units of government (federal, state, and local).[19]
- All landowners along the preferred and alternate route identified by the Applicant in its Application through direct mail.[20]

Additionally, the notice appeared in the Rochester Post-Bulletin on February 11, 2016,[21] and the EQB Monitor on February 15, 2016.[22] It was also posted to eDockets[23] and the EERA website.[24]

On February 29, 2016, Commission and EERA staff held two public information/scoping meetings in Olmsted County as noticed (**Table 1-1**).

Table 1-1. Information/Scoping Meetings for the Rochester Natural Gas Pipeline Project

County	City	Date and Time	Attendance
Olmsted	Rochester	Monday, February 29, 2016 2:00 — 4:00 p.m.	Approximately 25 to 30 persons
Olmsted	Rochester	Monday, February 29, 2016 6:00 — 8:00 p.m.	Approximately 15 to 20 persons

The format of the meetings was the same, which started with an overview presentation provided by Commission staff, followed by a brief overview of the proposed project by the Applicant. EERA staff then provided an overview of the Commission's route permitting process.[25] These presentations were followed by public questions and comments. Commission, Applicant, and EERA staff responded as necessary.[26]

EERA staff handouts included a draft scoping document, a public comment form, and a guidance document titled: "How to Suggest an Alternative Pipeline Route". These documents are included in **Appendix D**.

In addition to the information/scoping meetings, the Rochester Township Board (Board) requested that MERC and EERA staff attend their monthly meeting on May 12, 2016, to provide information on the proposed project, an overview of the Commission's regulatory review process for pipelines, and to respond to questions from the Board and the public. On June 3, 2016, EERA staff spoke with the Rochester Township Board Chair, who indicated

[18] Minnesota Public Utilities Commission (February 4, 2016) *Notice of Application Acceptance – Public Information and Comparative Environmental Analysis Scoping Meeting*, eDockets Document No. 20162-117966-01.
[19] Commission Service list, See eDockets Document No. 20162-117966-02.
[20] See eDockets Document No. 20162-117991-02.
[21] Affidavit of Publication Post-Bulletin, See eDockets Document No. 20163-119141-01.
[22] EQB Monitor, Publication Date: February 15, 2016, Vol. 40, No.7., See eDockets Document No.ID 20164-119984-01.
[23] See eDockets Document No.: 20162-117966-02.
[24] http://www.mn.gov/commerce/energyfacilities/Docket.html?Id=34318
[25] Commission, MERC and DOC EERA Power Point Presentation, See eDockets ID # 20162-118358-01.
[26] Oral Record of Information/Scoping Meeting, See eDockets Document No. 20164-119800-01.

that while the Board did not send any written comments, they nonetheless wanted to be kept informed of project related activities.

Scoping Comments and Route Proposals

As with previous pipeline route permit proceedings under the full review process, the Commission authorized "the Department [of Commerce] to administer the route development process…."[27]

The initial comment period, as provided for in the published notice,[28] closed April 13, 2016; however, some landowners were inadvertently omitted and did not receive the notice. To correct this, a second notice was distributed on May 10, 2016, to provide previously omitted landowners with the opportunity to provide comment.[29] Following the close of these comment periods, EERA staff posted all comments received to eDockets.

Twenty-eight separate comments were received by the close of the comment periods through various methods, including oral comments provided at the public meetings and written comments submitted to EERA staff by mail and email. **Appendix D** summarizes all comments received, including route segment proposals.

On June 27, 2016, EERA staff filed comments and recommendations regarding route proposals received during scoping.[30] Staff recommended that 29 route segments and 8 alternative segment widths be studied in the CEA.[31] (**Section 4** discusses these alternatives in detail.) The Commission met on July 14, 2016, to consider the EERA Comments and Recommendations. On July 26, 2016, the Commission issued an Order that accepted EERA's Comments and Recommendations (**Appendix D**). On August 2, 2016, Commission staff filed a Generic Route Permit Template (**Appendix E**).

Alternative Route Analysis

The alternative route analysis (commonly referred to as a CEA) evaluates all of the alternative routes accepted by the Commission for consideration at the public hearing. It also evaluates other issues raised during the scoping process. Like an environmental assessment worksheet, an environmental assessment or an environmental impact statement, the CEA contains an overview of the resources, potential human and environmental impacts, and mitigation measures associated with the proposed project.

In this instance, the CEA will be issued in draft form to allow for public comment.[32] EERA staff will reply to all substantive comments received on the CEA and file its responses to the record prior to the public hearing; however, it will not revise and re-issue the CEA.[33]

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[27] See eDockets Document No. 20162-117966-01
[28] Minnesota Public Utilities Commission (February 3, 2016) *Order Finding Application Complete and Granting Variance – Notice of Hearing*, eDockets Document No. 20162-117966-01.
[29] Minnesota Energy Resources Corporation (June 27, 2016) *Affidavit of Notice of Supplemental Comment Period*, eDockets Document No. 20166-122015-01.
[30] Minnesota Department of Commerce (June 27, 2016) *Comments and Recommendations Regarding Route Proposals for the Rochester Natural Gas Pipeline Project*, eDockets Document No. 20166-122674-01.
[31] Minnesota Department of Commerce (June 27, 2016), at pages 29, 30.
[32] Minnesota Public Utilities Commission (February 3, 2016).
[33] Minnesota Public Utilities Commission (February 3, 2016).

Second Public Information Meeting

A second public information meeting must be held in each county crossed by a pipeline route alternative.[34] This second round of public meetings is held prior to the public hearing that will be held in each county through which a route is proposed. The purpose of this meeting is to explain the route designation process, present major issues, respond to questions raised by the public, and, in this instance, to solicit comments on the draft CEA.

Public Hearing

Under the full pipeline routing procedures, the proposed project must be referred to the Office of Administrative Hearings for a public hearing pursuant to Minnesota Rules Chapter 1405.[35] Before the hearing can take place, the CEA must be completed and made available for public review. The hearing(s) are administered by an administrative law judge (ALJ) and occur in counties along the proposed pipeline route alternatives. Upon completion of the hearing, the ALJ will provide a written recommendation to the Commission.

Permit Decision

Minnesota Rules 7852.1900, subpart 3 identifies 10 criteria the Commission must consider when deciding whether to issue a pipeline routing permit and, should a permit be issued, in selecting a designated route. At the time the Commission makes a final permit decision, it must make a specific written finding with respect to each of the identified criteria.[36] These criteria are:

> A. human settlement, existence and density of populated areas, existing and planned future land use, and management plans;
>
> B. the natural environment, public and designated lands, including but not limited to natural areas, wildlife habitat, water, and recreational lands;
>
> C. lands of historical, archaeological, and cultural significance;
>
> D. economies within the route, including agricultural, commercial or industrial, forestry, recreational, and mining operations;
>
> E. pipeline cost and accessibility;
>
> F. use of existing rights-of-way and right-of-way sharing or paralleling;
>
> G. natural resources and features;
>
> H. the extent to which human or environmental effects are subject to mitigation by regulatory control and by application of the permit conditions contained in part 7852.3400 for pipeline right-of-way preparation, construction, cleanup, and restoration practices;
>
> I. cumulative potential effects of related or anticipated future pipeline construction; and

[34] Minn. R. 7852.1300, subpart 1(B).
[35] Minn. R. 7852.1700.
[36] Minn. R. 7852.1900, subp. 1.

J. the relevant applicable policies, rules, and regulations of other state and federal agencies, and local government land use laws including ordinances adopted under Minnesota Statutes, section 299J.05, relating to the location, design, construction, or operation of the proposed pipeline and associated facilities.[37]

The CEA addresses each of these criteria by evaluating the potential impacts and possible mitigation measures associated with construction and operation of the proposed project.

1.5 Other Permits and Approvals

A route permit from the Commission is the only state permit required for routing the proposed project; however, should the Commission issue a route permit, other permits will be required. These subsequent permits are commonly referred to as "downstream" permits and must be obtained by an applicant prior to construction of the proposed project. Table 1-2 identifies federal, state, and local permits that may be required for the proposed project. Compliance with required permits will be a condition of the Commission route permit should a permit be issued by the Commission.

A route permit from the Commission supersedes local zoning, building, or land use rules, regulations, or ordinances.[38] Though zoning and land use rules are superseded, the Commission's route permit decision must be guided, in part, by impacts to local zoning and land use in accordance with the goal to minimize adverse impacts to the human and natural environment.[39]

Table 1-2. Required Permits and Approvals

Agency	Permit/Approval
Federal	
United States Army Corps of Engineers	Section 404 of the Clean Water Act Permit (to be determined)
State	
Minnesota Public Utilities Commission	Route Permit
Minnesota Department of Natural Resources	License to Cross Public Waters
Minnesota Department of Natural Resources	Dewater Permit (hydrostatic test water (if used) and trench dewatering)
Minnesota Office of Pipeline Safety	Construction Monitoring and Testing
Minnesota Department of Transportation	Utility Crossing Permit

[37] Minn. R. 7852.1900, subp. 3.
[38] Minn. R. 7852.0200, subp. 2.
[39] Minn. R. 7852.0200, subp. 4.

Agency	Permit/Approval
Minnesota Department of Agriculture	Review of the Agriculture Mitigation Plan
Minnesota Pollution Control Agency	National Pollutant Discharge System (NPDES) Construction Permit and Stormwater Pollution Prevention Plan (SWPPP)
Minnesota Pollution Control Agency	Section 401 Water Quality Certification (given with the Section 404 Permit) (to be determined)
Local	
Minnesota Board of Water and Soil Resources /Local Government Unit	Wetlands Conservation Act Permit (to be determined)[40]
Olmsted County	Oversize/Overweight Vehicle Permit
City of Rochester	Water Appropriation Permit (to be determined - if water needed from a municipal water source)
Olmsted County or City of Rochester or Township	Permit pertaining to an off-right-of-way yard use (jurisdiction depends on the location of the yard; permit may be responsibility of contractor)

1.6 Non-Jurisdictional Facilities

The proposed project has associated facilities that will be constructed in support of the project, but are outside of the Commission's jurisdiction. These non-jurisdictional facilities will be constructed before (upstream) or after (downstream) the jurisdictional facilities for the purpose of delivering, receiving, or using the natural gas. The following subsection identifies these facilities as well as the responsible governmental unit (RGU) with primary permitting authority.

1.6.1 Federal Energy Regulatory Commission

The Applicant is negotiating a 30-year pipeline capacity contract with NNG to assure firm and reliable natural gas service in the Rochester area for the life of the contract. NNG will increase the capacity of its existing interstate pipeline transmission infrastructure to provide natural gas at volumes sufficient to meet the projected demand in the Rochester area. NNG proposes to construct the following facilities:

Phase 1 is expected to be completed in 2018:

[40] Proposed projects are exempt from developing a replacement plan under the Wetland Conservation Act under Minnesota Rules, Chapter 8420.0420, Subp. 6, if the project will not modify or alter less than one-half acre of wetlands and the impacts were avoided to the extent possible. Should more than one-half acre of wetlands require modification or alteration because of the project, it may be exempt from a replacement plan if notices are provided to the local government units with jurisdiction over the project prior to or concurrent with the application to the Corps of Engineers per the Federal Exemption under Minnesota Statutes § 103G.2241, Subd. 3 and Minnesota Rules, Chapter 8420.0420, Subp. 4. 40 State Reg. 58 (July 20, 2015).

- A new 15,900-horsepower rated compressor station near Lake Mills, Iowa
- Modifications at existing NNG TBS 1D[41]

Phase 2 is expected to be completed in 2019:

- Installation of a new 12-mile pipeline lateral (a lateral branches off of the mainline natural gas pipeline) from the LaCrosse/Tomah pipeline to the Proposed TBS and pipeline near the intersection of 70th Avenue and Salem Road
- Piping modifications at the existing LaCrosse/Tomah pipeline connection
- Uprating the maximum allowable operating pressure of 8 miles of the existing LaCrosse/Tomah pipeline

These facilities are under Federal Energy Regulatory Commission (FERC) jurisdiction. While NNG has not finalized its regulatory approval plan, NNG expects to file any necessary Section 7(c) application and/or prior-notice filing under the Natural Gas Act with FERC after Commission approval of the Applicant's pipeline and cost recovery application.[42] The "Prior Notice" filing requirements may be done under a blanket certificate issued pursuant to Section 7(c) of the Natural Gas Act. This provision allows a natural gas company to undertake a restricted array of routine activities without the need to obtain a case-specific certificate for each project, provided each activity complies with constraints on costs and environmental impacts set forth in FERC's regulations.

NNG is an interstate pipeline operator; therefore, the company is not required to comply with the provisions of Minnesota Statutes §§ 216G.02 to 216G.05 as a condition of acquiring the easement, right-of-way, or route.[43]

1.6.2 City of Rochester

From the Proposed DRS, the Applicant intends to install 12-inch pipe within the DRS Buffer to interconnect with existing low pressure distribution infrastructure located south of Highway 52 (**Figure 2** [**page 4**]). This pipeline will be designed to operate at no more than 250 psig. The Applicant plans to operate the pipeline at 72 psig. Detailed routing for this low pressure pipeline is not complete. When this low pressure distribution pipeline is complete, the Applicant will decommission TBS 1B.

Pursuant to Minnesota Statutes § 216G, proposed natural gas pipelines designed to be operated at a pressure of more than 90 pounds psi, but less than 275 psig, require preparation of an "Information Book" that must be approved by the Commission, unless specifically exempted by Minnesota Statutes § 216G.01, subdivision 3. However, because the Applicant is a public utility, it is not subject to the "Information Book" requirements prescribed by Minnesota Statutes §§ 216G.04 through 21G.05. Therefore, location of the downstream proposed low-pressure distribution system is not subject to Commission

[41] NNG currently controls the following at TBS 1D: pressure regulator, line heater, flow meter, and the SCADA system, which is a remote monitoring and control system. The Applicant controls the gas odorization at TBS 1D. At the rebuilt TBS 1D, the Applicant will take responsibility for all activities, which requires the Applicant to install pressure regulation and flow control valves, a line heater, odorization, SCADA, and check metering.
[42] See eDockets Document No. 20164-120644-01.
[43] Minn. Stat. 216G.06.

jurisdiction. As a result, Rochester and adjacent townships are the appropriate RGUs for locating the Applicant's low pressure distribution system pursuant to Minnesota Statutes §§ 216B.02 Subd. 4 and 216B.361.

1.6.3 Minnesota Pollution Control Agency

Rochester Public Utilities (RPU), a division of the City of Rochester, proposes to construct and operate a new 48 megawatt (MW) natural gas fired generating station. This action is not a "connected action" as defined in Minnesota Rules 4410. The proposed facility will be next to RPU's existing Westside Substation in Cascade Township, in the same quarter section as NNG's existing TBS 1D (**Figure 2** [**page 1**]). Power generated by the proposed generating station will serve RPU's customers and serve as a backup to intermittent energy sources during peak demand periods.

The proposed RPU generating project meets the threshold for two Environmental Assessment Worksheet categories. The first is Minnesota Rules 4410.4300, subpart 3, for which the EQB is designated as the RGU. The second is Minnesota Rules 4410.4300, subpart 15(B), for which the Minnesota Pollution Control Agency (MPCA) is designated as the RGU. An agreement between the EQB and MPCA designated the MPCA as the RGU for the proposed project. On August 9, 2016, MPCA determined that the generating project does not have the potential for significant environmental effects.[44] RPU anticipates that construction will begin in the fall of 2016.

[44] Minnesota Pollution Control Agency (August 9, 2016) *Rochester Public Utilities – Westside Energy Station: Signature Document*, Retrieved August 19, 2016, from: https://www.pca.state.mn.us/quick-links/archived-eaws-electric-generating-facilities.

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2 Proposed Facilities

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Section 2 describes the project as proposed by the Applicant. Unless otherwise noted, the source of information for this section is the Application and its associated revisions.[45]

2.1 Pipeline Facilities

The Applicant proposes to construct a new natural gas pipeline west and south of Rochester in Olmsted County, Minnesota. The proposed pipeline will include installation of approximately 5.1 miles of 16-inch outside diameter and about 8.0 miles of 12-inch outside diameter steel pipeline. The Applicant requests a permanent right-of-way of 50 feet for the proposed project.

The proposed project will also include construction of two TBSs. A TBS receives high pressure natural gas from the natural gas transmission system (900-1,000 psig) and regulates it down for use on the local distribution system (200-500 psig). The proposed project will also include construction of a DRS. A DRS takes high pressure distribution natural gas (200-500 psig) and regulates it down further (60-100 psig) for delivery to the low pressure distribution system.

2.1.1 Pipeline Design Specifications

The proposed project will consist of approximately 5.1 miles of 16-inch pipe operated at 400 to 475 psig, and approximately 8.0 miles of 12-inch pipe operated at 200 to 275 psig. The approximately 13 to 14 mile long pipeline will have a maximum design capacity of 500 psig to accommodate customer demand beyond current forecasts. The proposed pipeline will be constructed and pressure tested for operation at this pressure. Table 2-1 provides design specifications.

The United States Department of Transportation (USDOT), Title 49 Code of Federal Regulations (CFR), Part 192, defines minimum federal safety standards for construction, operation and maintenance of natural gas pipelines.[46] The Applicant is required to comply with these standards. Enforcement of pipeline safety regulations is under the jurisdiction of the Minnesota Office of Pipeline Safety (MnOPS).

Table 2-1. Pipeline Design Specifications

Specification	TBS 1D to Proposed TBS Pipeline	Proposed TBS to Proposed DRS Pipeline
Pipe Size (outside diameter)	*16 inches*	*12.75 inches*
Pipe Type	Steel pipe manufactured to API 6L6 Pipeline System Limited 2 - Specifications for Line Pipe	
Nominal Wall Thickness	0.375 inch, X-60	0.375 inch, X-52

[45] Application; Minnesota Energy Resources Corporation (November 9, 2015) *Supplemental Tables Regarding Existing Environmental Conditions for Route Alternatives*, eDockets Document No. 201511-115590-01; Minnesota Energy Resources Corporation (January 13, 2016) *Revisions to Route Permit Application*, eDockets Document No. 20161-117213-01.
[46] 49 CFR Part 192 Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards

Specification	TBS 1D to Proposed TBS Pipeline	Proposed TBS to Proposed DRS Pipeline
Length	26,900 feet (5.1 miles)	42,250 feet (8.0 miles)
Pipe Design Factor	Meet or exceed 0.5 is the design factor included in 49 CFR 192.111	
Longitudinal or Seam Joint Factor	1.0, pipe would be seamless or electrical resistance welded	
Class Location and Requirements[a]	Pursuant to 49 CFR 192.5, the pipeline would be designed to a minimum of a Class 3 location.	
Specified Minimum Yield Strength	60,000 psig based on current pipeline design	52,000 psig based on current pipeline design
Tensile Strength	Minimum 75,000 psi for X-60 pipe	Minimum 75,000 psi for X-52 pipe

Notes:
TBS = Town Border Station; DRS = District Regulator Station; API = American Petroleum Institute; CFR = Code of Federal Regulations; psig = pounds per square inch gauge; psi = pounds per square inch;
a. Class locations are designated by the number of buildings intended for human occupancy within 660 feet of either side of the pipeline centerline. The following criteria apply to classifications under 49 CFR 192.5:
Class 1: 0-10 buildings
Class 2: 10-45 buildings
Class 3: 46 or more buildings or an area where the pipeline lies within 100 yards (300 feet) of either a building or a small, well-defined outside area (such as a playground, recreation area, outdoor theater, or other place of public assembly) that is occupied by 20 or more persons on at least 5 days a week for 10 weeks in any 12-month period.
Class 4: Any class location unit where buildings with four or more stories above ground are prevalent.

2.1.2 Product Capacity Information

The maximum design capacity of the proposed pipeline will be 151,000 million cubic feet per day (mcfd). The minimum design capacity will be 100,000 mcfd. The approximate hourly flow would be 4,600 million cubic feet per hour (mcfh) in the 16-inch portion of the pipeline and 1,700 mcfh in the 12-inch portion of the pipeline.

2.1.3 Product Description

The proposed pipeline will carry processed natural gas from the NNG natural gas transmission system. Natural gas is a non-hazardous, but highly flammable substance. Because natural gas is odorless, it will be odorized using ethyl mercaptan. Ethyl mercaptan makes natural gas smell like “rotten eggs,” which helps to detect leaks. Material Safety Data Sheets for natural gas and ethyl mercaptan are provided in **Appendix H**.

2.2 Associated Facilities

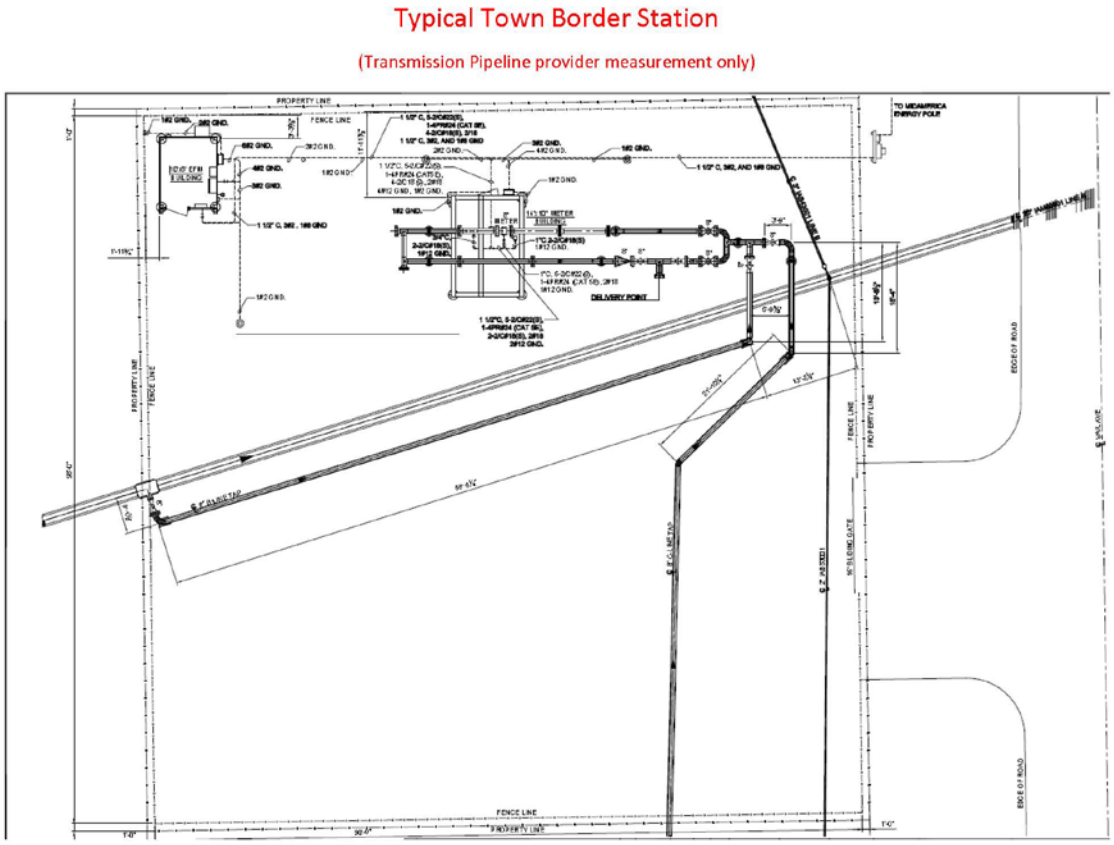
The Applicant requests the following associated facilities be permitted as part of the proposed project: modified TBS 1D, Proposed TBS, Proposed DRS, valves and flanges, cathodic protection (CP), alternating current (AC) mitigation, and other miscellaneous equipment, for example, pipeline markers.

2.2.1 *Town Border Stations*

Typically, a TBS serves as the custody transfer point for natural gas transmitted via transmission pipeline from a transmission operator to a distribution operator, neither of which is the ultimate consumer of the gas. The TBS is the point where the high pressure transmission pipeline gas is regulated down to the level of high pressure distribution pipeline gas.

The proposed project requires expanding or rebuilding TBS 1D and constructing Proposed TBS. The TBSs will contain all required valving, odorization, and other necessary equipment required for custody transfer of natural gas. **Drawing 1** and **Photograph 1** provide a representation of a typical TBS. The actual TBS design may differ, and will depend upon geography and pipeline entrance and exit locations. Each facility would be approximately 200 feet long by 200 feet wide.

Drawing 1 Typical Schematic of a Town Border Station



Photograph 1 Typical Town Border Station

In the past, NNG has regulated the delivery pressure to the TBSs and the Applicant would only provide odorization for the distribution system. TBS 1D and Proposed TBS will vary from this arrangement, as NNG will only monitor the system, while the Applicant will be responsible for the pressure decrease, odorization, and gas heating (to ensure freeze off during regulation does not occur), and supervisory control and data acquisition (SCADA).

TBS 1D

The Applicant will expand or rebuild TBS 1D at or near its current location (**Figure 2** [**page 1**]). This is anticipated to occur in 2017 during Phase I of construction. Once TBS 1D is rebuilt the Applicant will take responsibility for all activities; however, NNG will concurrently meter and monitor this site with SCADA on their facilities. The Applicant will install pressure regulation and flow control valves, a line heater, SCADA, and check metering. An above ground structure will house the SCADA equipment. A second above ground structure will house the regulator and odorizer. The line heater and some valves will be outside, above grade. TBS 1D will have controlled access and metal chain link fencing around the facility.

Proposed TBS

During Phase II, the Applicant will construct Proposed TBS near the intersection of 70th Avenue SW and Salem Road SW at the end of the 16-inch portion of the pipeline (**Figure 2** [**page 2**]). This is expected to occur in 2018 and 2019. At Proposed TBS, similar to modified TBS 1D, the Applicant will install pressure regulation and flow control valves, a line heater, odorization, SCADA, and metering. An above ground structure will house the SCADA equipment. A second above ground structure will house the regulator and odorizer. The line heater and some valves will be outside, above grade. NNG will be responsible for the transmission feed line entering the new TBS. It is anticipated NNG would concurrently monitor the site with independent SCADA and metering equipment on their facilities.

Odorization

Gas odorization systems will be installed at both TBS sites. Ethyl mercaptan will be used to odorize the natural gas. The injection rate will be adequate to achieve detection of natural gas at a concentration equal to 20 percent of the lower explosive limit, or approximately 0.50 to 0.75 pounds per million standard cubic feet. The stroke rate (infusion rate) would be optimized to maintain steady odorant concentration in the natural gas pipeline. Regular inspections will be required under the Applicant's operation and maintenance manual to assure the natural gas has the proper concentration of odorant.

2.2.2 District Regulator Station

The Proposed DRS will take high pressure distribution gas and regulate the pressure down to standard distribution pressure for delivery to the Applicant's low pressure distribution system that directly serves its customers.

The Proposed DRS will be constructed at the proposed project's southeastern endpoint at the end of the 12-inch portion of the pipeline. It will be constructed as part of Phase III and is anticipated to occur from 2020 to 2023. Proposed DRS will include an above grade structure with pressure regulating, pressure monitoring, line heating and filtering equipment, as well as all required valving. Drawing 2 and Photograph 2 provide a representation of a typical DRS. The actual DRS design may differ, and will depend upon geography and pipeline entrance and exit locations. The area around Proposed DRS will have controlled access and metal chain link fencing, and will be approximately 200 feet long by 200 feet wide.

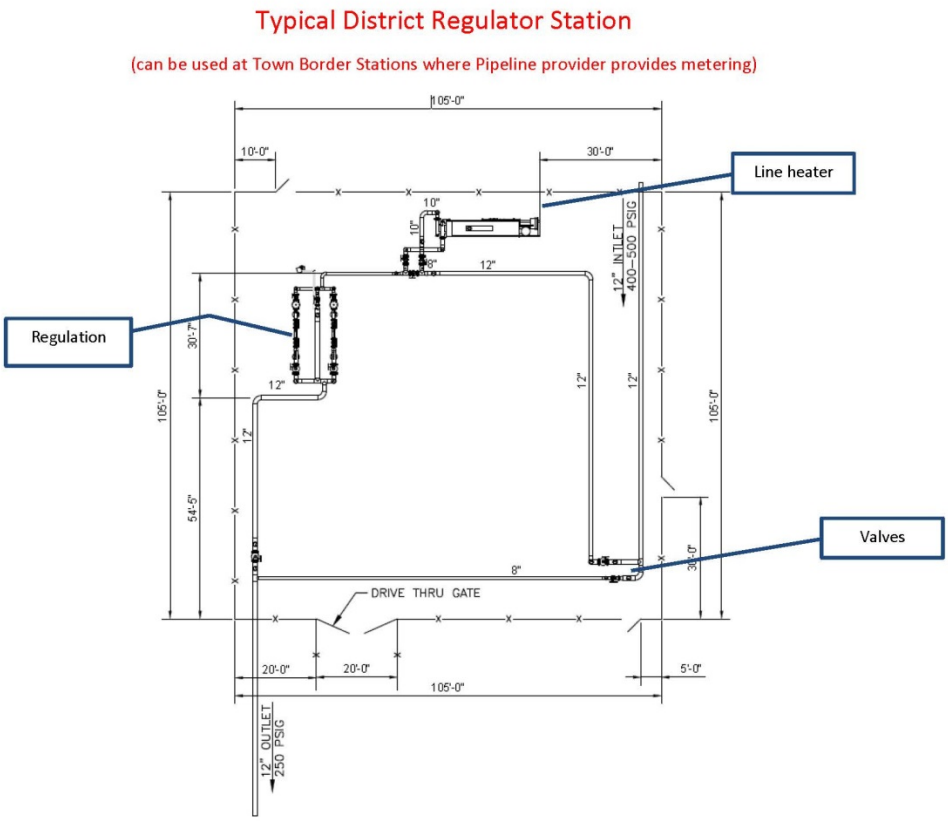
2.2.3 Valves and Flanges

Ball and plug valves (American National Standards Institute [ANSI] 600) and flanges will be installed at the metering facilities of TBS 1D, Proposed TBS, and Proposed DRS. The design, construction, testing, and marking of the valves would comply with federal regulations at 49 CFR Parts 192.145 and 194.147. Control valves will have the ability to vary the amount a valve is open or closed resulting in a pressure change. Other valves on the system will be on/off type valves.

2.2.4 Cathodic Protection

A CP system will be installed to prevent the pipeline from corroding. CP is a technique used to control the corrosion of a metal surface. This method of protection connects the metal to be protected to a more easily corroded "sacrificial metal," which corrodes instead of the pipeline. The CP system would consist of a distributed sacrificial anode system or an impressed current system. The only visible portion of the CP facilities after construction would be the CP test leads, which appear similar to pipeline markers (for example, posts in the ground) and are often attached to pipeline markers. The test leads would not be fenced.

Drawing 2 Typical Schematic of a District Regulator Station



Photograph 2 Existing District Regulator Station

2.2.5 Alternating Current Mitigation

The pipeline may cross beneath high voltage electric transmission lines, which could result in AC interference. Should this occur, the Applicant will evaluate ways to mitigate AC interference, minimize hazardous touch and step potentials and risks associated with AC corrosion. AC mitigation procedures will be implemented during construction and permanent mitigation measures will be installed, as required by federal regulations.[47] Following construction, the Applicant will test the mitigation measures to assure proper function, and implement a long-term monitoring program.

2.2.6 Miscellaneous Equipment

The Applicant will install pipeline markers at various locations (for example, road crossings) in accordance with applicable federal and state regulations.

2.3 Land Requirements

2.3.1 Pipeline Facilities

A "right-of-way" is the interest in real property used or proposed to be used to accommodate a pipeline and associated facilities.[48] Rights-of-way can be permanent or temporary.

Permanent Right-of-way

The Applicant proposes to maintain a permanent right-of-way that is 50 feet wide (approximately 25 feet to each side of the proposed pipeline centerline) to accommodate the proposed pipeline. The permanent right-of-way will provide sufficient space to perform pipeline maintenance and inspections, as well as provide a visual buffer where encroachments can be monitored and prevented.

As proposed by the Applicant, the pipeline would be approximately 13 to 14 miles in length. The final length depends upon which route is ultimately selected and approved by the Commission. An estimated 84.5 acres of permanent right-of-way would be needed for the pipeline portion of the proposed project.

Temporary Right-of-way

Construction will require 50 feet of temporary right-of-way (adjacent to the 50-foot permanent right-of-way) in addition to the permanent right-of-way. The temporary right-of-way is needed to ensure sufficient room for material layout and maneuvering equipment during pipeline construction. Temporary right-of-way will be needed for the entire length of the pipeline. An estimated 85.7 acres would be needed for temporary right-of-way.

[47] 49 CFR Part 192, Subpart G—General Construction Requirements for Transmission Lines and Mains; National Association of Corrosion Engineers Standard Practice 0177: Mitigation of Alternating Current and Lightning Effects on Metallic Structures and Corrosion Control Systems.
[48] Minn. R. 7852.0100, subp. 30.

Right-of-way Paralleling

The proposed pipeline may parallel existing rights-of-way; however, the pipeline will not share right-of-way with existing infrastructure. Instead, any pipeline section that parallels existing infrastructure will be located on new permanent right-of-way immediately adjacent to the existing right-of-way.

2.3.2 Associated Facilities

Permanent Right-of-way

Construction and operation of TBS 1D and the Proposed TBS would each require a permanent right-of-way approximately 200 feet long by 200 feet wide, or approximately 0.9 acres. Similarly, construction and operation of Proposed DRS would require a permanent right-of-way approximately 200 feet long by 200 feet wide. Alternatively, the Applicant could purchase land to accommodate the TBSs and DRS. No temporary right-of-way is required for construction of the associated facilities.

Pipeline markers and CP test lead stations would be located along the length of the pipeline. These markers and stations would generally be located at regular intervals and at road crossings within the pipeline permanent right-of-way.

Storage Yards

The proposed project will require at least one temporary storage yard for equipment and material storage and construction staging. The yard will be approximately 10 acres in size and would be located on a disturbed site, such as an agricultural field. The location of the yard has not been determined, but will be identified during the right-of-way acquisition process. The Applicant is responsible for securing any necessary permits needed for the storage yard, for example, a National Pollutant Discharge Elimination System (NPDES)/State Disposal System (SDS) Construction Stormwater General Permit from the MPCA. The yard will be restored to pre-construction conditions upon completion of the proposed project.

Access Roads

The Applicant anticipates that access to the proposed project will primarily be at intersections with public roads. Temporary access will be constructed at these locations to assist ingress and egress. If public roads do not provide sufficient access to the right-of-way, the Applicant must negotiate agreements with landowners to use existing private roads.

2.4 Cost and Accessibility

The total cost for the proposed project is expected to be approximately $44,000,000 (Table 2-2). This estimate is based on the Application Preferred Route. The final cost will vary depending on the segment alternatives selected by the Commission. Generally, costs will be greater as the overall route lengthens or if there is more boring or horizontal directional drilling (HDD) required.

Table 2-2. Rochester Gas Extension project Construction Activities and Costs

Phase	Year	Cost	Activities
I	2014	$127,000	Initial Environmental Review and Consultant Contract
I	2015	$237,000	Regulatory Review (Rider Petition and Route Permit)
I	2016	$636,000	Engineering & design for TBS 1D and the 16-inch pipeline to Proposed TBS, route surveys
I	2017	$6,019,400	Surveys, easement acquisition, construction of TBS 1D, engineering & design
II	2018	$11,252,500	Survey, engineering & design, construction of the 16-inch pipeline from TBS 1D to Proposed TBS
II	2019	$5,475,500	Survey, engineering & design, construction of Proposed TBS
III	2020	$6,950,400	Survey, engineering & design, construction of the 12-inch pipeline from Proposed TBS to Proposed DRS in the area of TBS 1B
III	2021	$6,423,600	Survey, engineering & design, construction of the 12-inch pipeline from Proposed TBS to Proposed DRS
III	2022	$6,833,600	Survey, engineering & design, construction of of the 12-inch pipeline from Proposed TBS to Proposed DRS
III	2023	$51,600	Project close-out
	Total	$44,006,600	

Notes:
TBS = Town Border Station; DRS = District Regulator Station

2.5 Construction Schedule

The proposed project will be constructed in three phases as indicated in **Table 2-3** and **Figure 3**.

Table 2-3. Construction Schedule

Phase	Activity	Completion Date
I	Rebuild TBS 1D	2017
II	Install 16-inch pipeline between TBS 1D and Proposed TBS Construct Proposed TBS	2019
III	Install 12-inch pipeline between Proposed TBS and Proposed DRS Construct Proposed DRS Remove TBS 1B	2023

Notes:
TBS = Town Border Station; DRS = District Regulator Station

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3 Construction, Operation and Maintenance Procedures

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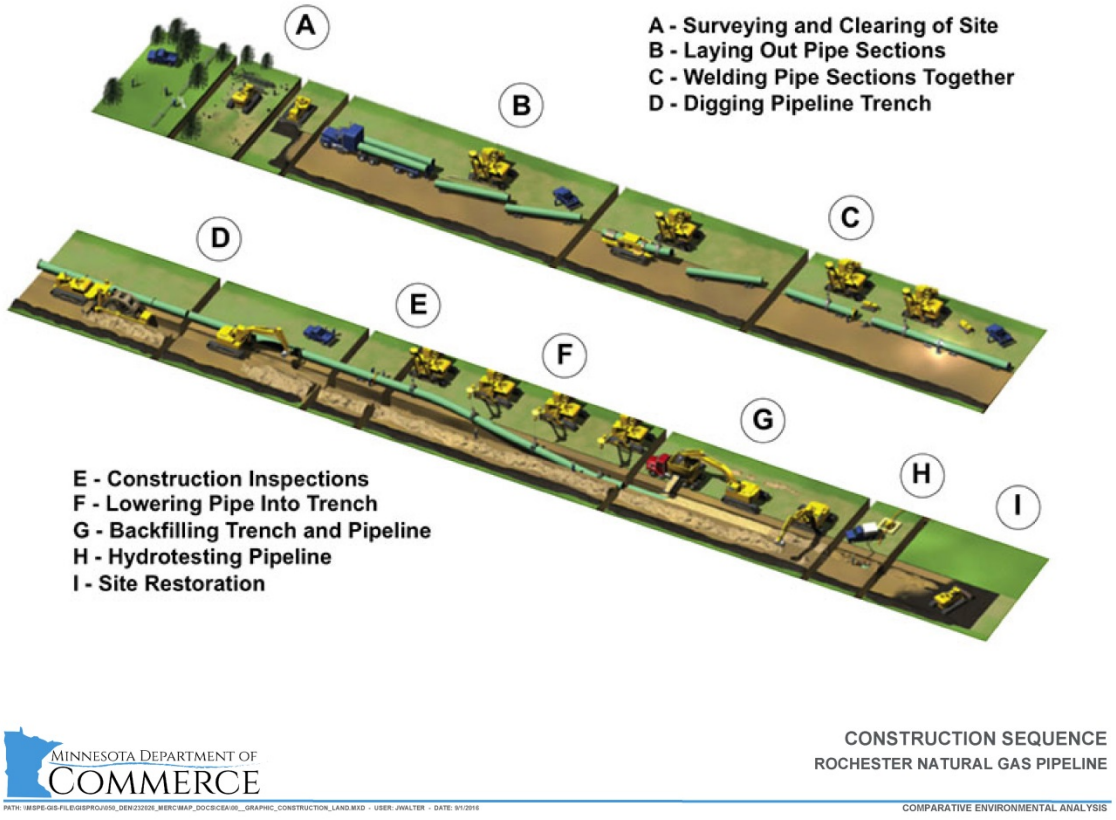
The proposed project will be constructed using the procedures described below and as shown in **Drawing 3**. MnOPS monitors compliance with federal pipeline regulations during construction.[49] The source of information for this section is the Application, unless otherwise noted.

Drawing 3 Pipeline Construction Sequence



3.1 Pipeline Construction Procedures

Heavy equipment used during pipeline construction typically includes: trackhoes, bulldozers, dump trucks, semi-trucks, front-end loaders, and roller/compactors. The Applicant indicates the following: construction will be completed by licensed contractors; trash and litter will be picked up daily; and the Applicant will replace or repair facilities damaged as a result of project construction, as necessary.

The construction area (permanent and temporary rights-of-way) is generally divided into the spoil side and the working side, split by the pipeline trench. The spoil side is for temporary stockpiling of segregated top soil and subsoil and the working side is for the safe movement

[49] 49 CFR Part 192—Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards

of material, equipment, and crew. This construction area would accommodate the horizontal directional drilling (HDD) or boring equipment needed to cross waterbodies, railroads, and roads. Staging areas for this equipment are anticipated to be located on either side of the crossings.

To minimize the potential for erosion from wind and water during construction, the Applicant will install temporary erosion control devices as specified in the Stormwater Pollution Prevention Plan (SWPPP) and as required by NPDES construction stormwater permit. Temporary erosion control measures include sediment barriers (for example, silt fence and straw bale structures) and slope breakers. Temporary erosion control measures will be installed downstream of planned work areas prior to initiating ground disturbing activities.

3.1.1 Marking the Alignment and Right-of-way

The pipeline alignment and workspace limits will be identified and marked prior to any ground disturbing activity. This includes marking the pipeline centerline at 100-foot intervals and at points where the alignment changes direction. The Applicant will also mark the edges of the construction area, temporary workspaces (for example, storage yards), sensitive environmental feature boundaries or setback limits, and underground facilities. Prior to construction, the Applicant will consult with landowners to determine if drain tile is located within the construction area and the approximate drain tile location. To the extent practicable, drain tile will be marked. Pipeline locators and other appropriate means, including the Gopher State One Call (GSOC), will be used to locate underground facilities. Permanent survey monuments and reference monuments identified within the construction area will be protected against disturbance.

3.1.2 Clearing and Grading

The 100-foot construction area (50-foot permanent right-of-way and 50-foot temporary right-of-way) will be cleared and graded to provide a relatively flat surface to accommodate construction equipment, while preserving natural drainage to the greatest extent possible. Clearing will be limited to only the area necessary for installation of the facilities. Vegetation buffers will be left between the edge of the construction area and waterbodies to minimize impacts (these buffers will be identified on alignment sheets and site-specific stream crossing drawings, as applicable).

Soil, brush, roots, and rocks removed from the construction area would be stored on the outer edge of the non-working side of the construction area. Some of these materials might be used for reclamation. Large (merchantable) timber would be salvaged or used for reclamation. Smaller trees and brush may be chipped for use as mulch. Burning of slash, brush, stumps, or other project debris is prohibited.

During grading, topsoil will be stripped and segregated from subsoil and placed and covered in a discrete location within the construction area.

3.1.3 Trenching and Horizontal Directional Drilling

The proposed pipeline would be installed by open cut trench and boring or HDD construction techniques. Open cut trench sections account for approximately 11.7 miles of the route as proposed by the Applicant. Trench sections would generally have a depth of 6.5 feet, a

bottom width of about 3.5 feet, and variable top width greater than 7 feet (based on soil and slope characteristics). Trackhoes and rippers would be used as necessary to excavate a trench. Trench spoil would typically be deposited on the non-working side of the construction area and will be segregated from topsoil.

Trenching will provide a minimum of 4.5 feet of cover over the pipeline. Where surface bedrock is encountered, the pipeline must be buried to a depth of 1.5 feet. The Applicant's internal standard operating and maintenance procedures require a minimum of 1-foot of clearance below foreign pipelines, drain tile, cables, underground wires (electrical, fiber optic or telephone), or other similar facilities.

HDD or boring may be used at road, paved driveway, wetland, and waterway crossings. These sections account for approximately 2.2 miles of the route as proposed by the Applicant. Excavation associated with HDD includes receiving and entrance pits dug on either side of the crossings. These pits allow the drilling fluid to be collected and reclaimed to reduce costs and prevent waste. The pits size will vary depending on site conditions, but could be up to 10 feet long by 10 feet wide by 5 feet deep.

Depth of cover above the pipeline would generally be 4.5 feet or more, unless rock is encountered (construction procedures used in areas of shallow bedrock, karst features, or rocky soils are discussed in **Section 3.2.4**). A minimum of five feet of cover is necessary over the pipeline where it crosses state highways. The Applicant indicates that it will install the pipe 10 feet beneath the beds of waterbodies (unless rock is encountered), and, at railroad crossings, in accordance with the requirements of the resource agencies and affected railroad company.

3.1.4 Pipe Laying

A typical pipe laying process begins by stringing pre-coated pipe segments along the working side of the construction area parallel to the trench. The pipe is then bent to conform to the trench contour, aligned, welded together, and lowered into the trench. This general process is implemented repeatedly as part of a single construction train or "spread" that moves in an assembly-line fashion over the pipeline alignment. In some locations "mini-spreads" might also be used so that specialized construction procedures can address specific on-the-ground issues, for example, shallow bedrock or stream crossings. These specialized construction procedures are described in **Section 3.2**.

Beginning at the factory, a one coat epoxy approximately 14 to 22 millimeters (mm) thick is applied to each individual pipe section (each approximately 40 feet in length) to prevent damage to the steel main. Once the pipe arrives on site, it is laid out parallel to the trench. The pipe is then bent to conform to the trench contour by track-mounted, hydraulic pipe bending machines. If multiple or complex bends are required, those bends are completed at a pipe fabrication facility and the pipe is shipped to the project area pre-bent to meet required specifications. Bends over 1.5 degrees are also completed at the fabrication facility.

After the pipe has been bent and laid out aboveground and parallel to the trench, the pipe sections are welded together. Welding is the process of joining the individual pipe sections together in one continuous string. Immediately prior to welding, the pipe joints are aligned. The pipe will be welded together in segments and placed on temporary supports at the edge

of the trench. Experienced welders, qualified according to applicable federal, state, and internal Applicant standards, as well as with ANSI and American Petroleum Institute (API), standards will weld on the project.

After the welds are completed, the pipe is placed on temporary supports where welds are visually and radiographically inspected. The Applicant will evaluate the quality of every weld. Radiography is the most commonly used non-destructive testing method for such inspection. The principle is that a source of radiation is directed toward the inspected object with a sheet of radiographic film behind the object to capture any variations in the penetrating radiation. Setup generally takes a few minutes, exposure one to 10 minutes, and film processing about 10 minutes.

Welds that pass inspection are covered with a new layer of 14 to 20 mm thick epoxy or an approved wrap, such as Wax-Tape. In areas where rock is present or HDD is being used, the pipe will be dual coated with a polymer/concrete coating. Any weld that does not pass testing, is cut and re-welded.

Prior to lowering-in the pipe, all sections of pipe will be inspected to locate and repair any faults, voids, or anomalies in the pipeline coating. The trench is also inspected to ensure it is free of rocks and other debris that could damage the pipe or its protective coating. If rocky conditions are encountered, the bottom of the trench will first be padded with a layer of rock-free soil such as sand. Padding will only be necessary when rock is encountered. Padding material will be generated on-site from previously excavated material or purchased from a local borrow pit or commercial source. Topsoil will not be used to pad the pipeline.

The pipe is lifted from the temporary supports and lowered into the trench using side-boom tractors. In locations where the direction in the pipeline changes, tie-in welds are completed in the trench within a larger bell hole. As necessary, trench breakers (stacked sand bags or foam) will be installed in the trench around the pipe in steeply sloped areas or bedrock areas to control movement of subsurface water along the pipeline.

3.1.5 Backfilling and Rough Grading

After the pipe is lowered, the trench will be backfilled using previously excavated materials. Backhoes will bring spoil material (not topsoil) from the non-working side of the construction area into the trench immediately around and above the pipe. Previously graded areas will be returned to pre-construction contours as near as practicable with a slight crowning at the top of the trench to allow for settling. Permanent erosion control measures will include trench and slope breakers.

3.1.6 Testing

After the trench is backfilled, the pipeline will be pressure-tested to ensure structural integrity in accordance with USDOT pressure testing requirements.[50] Hydrostatic, inert gas, or natural gas are approved testing methods.

If water is used for hydrostatic testing, municipal water from Rochester will be used, subject to required permit approvals from the City. The Applicant will also be required to acquire

[50] 49 CFR Part 192, Subpart J—Test Requirements.

appropriate approvals from the MPCA and Minnesota Department of Natural Resources (DNR) for any discharge of hydrostatic test water. Test water from hydrostatic testing is discharged into a straw bale and silt fence dewatering structure to minimize erosion. The discharge rate of test water will be regulated using valves and an energy dissipation device containing internal baffles or weirs to slow water as it exits into the dewatering structure. No chemicals are used during hydrostatic testing or dewatering of the pipeline.

After the pipeline has been pressure tested, it is cleaned by running a cleaning "pig" through the pipe. Once the pipe is ready to be placed into service, the line will be purged—typically using an inert gas, which is followed by natural gas. At the end of the pipeline the gas percent is monitored until it reaches 100 percent. The valves are then closed until all equipment is ready to be placed into service.

The pipeline will be properly pre-odorized upon startup. New gas pipelines absorb odorant until the microscopic voids on the inside wall of the pipe are saturated. Pre-odorizing the pipe assists in detecting leaks.

3.1.7 Cleanup and Restoration

After each phase of project construction has been completed and successfully tested, the construction area, additional workspaces, and other disturbed areas will be restored as near as practicable to their pre-construction condition. Construction debris and any remaining trash would be taken to an approved disposal area. Topsoil will be replaced, permanent erosion control measures would be installed, and disturbed areas seeded with an approved seed mix, fertilized, and mulched as appropriate to facilitate revegetation. Landscape improvements will be installed as appropriate for the surrounding land use, location, and landowner agreements.

3.1.8 Aboveground Pipeline Facility Procedures

Pipeline markers and CP test lead stations will be located along the length of the pipeline. These markers and stations will generally be located at regular intervals and at road crossings within the permanent right-of-way.[51] Additionally, pipeline markers will be located in field corners and on fence lines as required by Olmsted County ordinances.[52]

Construction of aboveground pipeline facilities, including CP facilities and AC mitigation measures, will generally occur at the same time as construction of the pipeline. Aboveground facilities would be fenced or otherwise protected while maintaining permanent access for operation and maintenance. The only visible portion of the CP facilities after construction will be the CP test leads, which appear similar to pipeline markers and are often attached to pipeline markers. The test leads and markers will not need to be fenced.

[51] 49 CFR Part 192, Subpart M—Maintenance.
[52] Olmsted County Zoning Ordinance Article X, Section 10.40.

3.2 Special Pipeline Construction Procedures

3.2.1 Boring and Horizontal Directional Drill

Boring and HDD will be used when the open trench method described above is not practicable, for example, when crossing a highway or stream. While similar, boring and HDD differ. Boring involves a straight line hole, whereas HDD involves a shallow arc.

Boring requires excavation of a bore pit (approximately 225 square feet) on each side of the feature to be crossed. Workspace will be determined on a site-specific basis, but will be located adjacent to the road or railroad crossing and sized to contain spoil from the boring operation. Following pipe placement, the workspace will be backfilled and the road or railroad ditch graded to pre-construction condition.

Boring equipment is placed in the pit. A straight line hole is then bored under the feature. The hole is at least as large as the diameter of the pipe. Once the hole is bored, a prefabricated pipe section is pushed through the borehole. For long crossings, sections may be welded (using the process described above) onto the pipe string just before being pushed through the borehole.

HDD also requires two workspaces per crossing; one on either side of the crossing. These work spaces are expected to be approximately 225 square feet, and will fit within the construction area. Workspace will be determined on a site-specific basis, but will be located adjacent to the crossing and sized to contain spoil from the HDD operation. Following pipe placement, the workspace will be backfilled and graded to pre-construction condition.

During HDD, a prefabricated pipe section is placed in one workspace and a drill rig is located in the workspace on the opposite side of the crossing. The drill rig creates a pilot hole underneath the barrier towards the prefabricated pipe section. Next, larger barrel reams are used to increase the diameter of the pilot hole to eventually reach the pipeline diameter. The prefabricated pipe section is then pulled through the hole by the drill rig and welded to the pipe sections on either side of the crossing. Drilling mud, to be supplied by the HDD contractor, is used to maintain the integrity of the hole, and is contained in a tank or earthen berm within the workspace so that it does not migrate offsite. No surface water will be used for the drilling mud.

3.2.2 Road and Railroad Crossings

Roads will be crossed using the HDD or bore method in accordance with MnDOT, Olmsted County, or Commission permit specific requirements. At road crossings, barricades, lights, and warning signs, as appropriate, will be placed to allow for at least one vehicle passing lane at all times. Roads will not be crossed by open cut trenches. Railroad crossing will also utilize the HDD or bore method in accordance with the requirements of the affected company or agency with authority for the crossing. The final depth for each crossing will vary depending on the depth of bedrock, terrain, length of crossing, and other factors, but will meet state and county requirements.

3.2.3 Waterbody, Wetland, and Floodway Crossings

Streams, wetlands, and floodways may be crossed using the HDD, bore, or trench method. Typically the HDD would occur 10 feet below the stream bed unless rock is encountered. In rocky areas, the pipe would likely be installed several feet below the stream bed. Final depth would be determined in consultation with resource agencies, such as the DNR or Army Corps of Engineers. Typically, HDD workspaces are located 25 feet away from the wetland or waterbody.

In some cases, the use of boring or HDD to cross a wetland may not be practical or reasonable because of site conditions or engineering constraints. If the Applicant proposes to cross a wetland using the trench method, they will be required to coordinate with DNR and the Army Corps of Engineers, as appropriate, and secure all necessary permits.

3.2.4 Shallow Bedrock or Rocky Soils

Special construction procedures might be necessary in rocky soils, areas with shallow bedrock (less than 5 feet below the soil surface), or karst features. The Applicant will employ ground penetrating radar analysis within areas of known karst features and areas with a high probability of karst features to determine depth to bedrock and potential sinkhole locations prior to trenching (greater detail is provided in Section 5.6.1).

If shallow bedrock or rocky soils are encountered during trenching, the rock will be "ripped" or shattered using mechanical means, such as a backhoe or rock saw. A rock saw trencher is a piece of construction equipment used to cut trenches, with a rotating toothed metal wheel that can also side cast the spoil.

Blasting may be required to excavate the pipeline trench where bedrock interferes with conventional excavation or rock-trenching methods. The Applicant indicates that blasting would be conducted according to a Blasting Plan to be developed specifically for the proposed project, which will include mitigation measures designed to prevent damage to nearby structures, for example, the use of blasting mats to prevent the scattering of loose rock. Blasting activity would be performed by licensed professionals using controlled energy release. Required permits will be identified in the Blasting Plan and obtained by the contractor prior to any blasting activity. Blasting would occur during daytime hours after notifying nearby residents and building inhabitants. Blasting vibration would be controlled using charge size limits and charge delays that stagger each charge in a series of explosions. The contractor would perform pre-blast inspections, monitor ground vibrations at the nearest structure or well during blasting, and perform post-blast inspections as warranted.

If shallow bedrock is encountered during HDD or boring, the bedrock will be bored and the pipe inserted through the rock. There is not a way to pad the bore hole when boring through rock. Rather, the pipe would be protected by using a heavier pipe coating. If the rock types are smaller and can protrude into the pipe causing a dent, the contractor would install an outside plastic or steel conduit or casing to protect the pipe.

3.2.5 Residential Areas

Where residential structures are within 50 feet of the construction area, the Applicant indicates that the workspace will be reduced to the extent practicable to minimize

inconvenience to property owners. At some locations, HDD could be used to minimize surface disturbance. The Applicant will fence the construction area for 100 feet on either side of a residence. Landowners and tenants will be notified prior to removal of private property, such as gates or fences. Backfilling will occur immediately in residential areas. During restoration, residential lawns and landscaping will be restored in accordance with landowner agreements.

3.2.6 Commercial/Industrial Areas

The Applicant states that it will maintain close coordination with business owners in order to maintain access during construction and restoration activities. The Applicant will fence the construction area for 100 feet on either side of a commercial area. Property owners and tenants will be notified prior to removal of private property, such as signs or landscaping. Backfilling will occur immediately in commercial areas. Restoration will occur in accordance with landowner agreements.

3.2.7 Active Cropland

The Applicant indicates that it will strip and segregate topsoil from subsoil and place it in a discrete location within the construction area. The Applicant will segregate a maximum of 12 inches of topsoil in these areas. Topsoil and subsoil will be temporarily stockpiled in separate windrows within the construction area and will not be allowed to mix. Topsoil will be covered. If topsoil is less than 12 inches deep, the actual depth of the topsoil will be removed and segregated.

The Applicant indicates that it will consult with landowners to determine if drain tile is located on their property within the construction area. These locations will be marked and, if possible, avoided. If tile is encountered during construction it will be marked and repaired. Other drainage features, such as grass swales, will be restored to pre-construction conditions. Following construction but prior to final restoration, the Applicant will be required to alleviate soil compaction through deep-ripping and excess surface rocks removed with a rock picker. Gates and fences will be repaired during restoration unless otherwise negotiated with the landowner.

3.3 Aboveground Facility Construction Procedures

All material delivery and equipment storage will be confined to construction areas. Debris and waste will be properly disposed. All disturbed surface areas will be graded, graveled, fenced, and permanently converted to industrial use.

3.3.1 Town Border Stations and District Regulation Station Facilities

Construction activities associated with the installation of TBS and DRS facilities are summarized below. Special construction methods are not anticipated.

Foundations

Excavation would be performed as necessary to accommodate the reinforced concrete foundations for the new metering, SCADA, and odorization equipment and buildings. Forms

would be set, rebar installed, and concrete poured and cured in accordance with applicable industry standards. Concrete pours will be randomly sampled to verify compliance with minimum strength requirements. Once the forms are removed, backfill will be compacted in place, and excess soil used elsewhere or distributed around the site to improve grade.

Equipment

SCADA, metering, and odorization equipment will be shipped to the sites by truck. The equipment will be offloaded using cranes and front-end loaders, and then positioned on the foundations, leveled, grouted where necessary, and secured with anchor bolts.

Piping

All welders will be qualified and welding procedures completed in accordance with ANSI and API standards. All welds will be examined using radiography, ultrasound, or another approved, non-destructive evaluation method to ensure compliance with code requirements.

Testing

All high-pressure natural gas service components will be hydrostatically tested. Controls and safety equipment and systems, including emergency shutdown, relief valves, and gas and fire detection equipment, will be checked and tested prior to being placed in service.

3.3.2 Temporary Storage Yard

The Applicant will locate a fenced, temporary storage yard in a previously disturbed area, such as agricultural land. If necessary, the yard will be graded to ensure a level work area. A gravel access driveway will be constructed. The Applicant will utilize stormwater best management practices and obtain necessary permits. Construction activities and material and equipment storage will be confined within the site boundary. Debris and wastes generated from construction would be disposed of appropriately. The temporary storage yard will be restored to preconstruction conditions after construction is completed.

3.4 Environmental Compliance Inspection and Monitoring

3.4.1 Training and Documentation

The Applicant indicates that the construction contractor will be provided with copies of pertinent environmental planning documents and detailed environmental procedures, and informed of specific permit requirements. The Applicant states that construction and mitigation requirements from the Route Permit and other regulatory authorizations will be incorporated into the contract bid documents, as appropriate.

3.4.2 Environmental Inspection

The Applicant indicates it will use an Environmental Inspector (EI) to ensure compliance with environmental requirements. The EI's responsibilities will include: (1) monitoring the contractor's compliance with environmental measures required by the Commission, other environmental permits or approvals, and all construction, restoration, and mitigation plans; (2) taking corrective actions, including issuing stop-activity orders to the contractor who is

conducting a non-compliant activity; (3) documenting compliance with environmental requirements; and (4) preparing status reports. The EI will also conduct required MPCA SWPPP inspections once every seven days during active construction and within 24 hours after a rainfall event greater than 0.5 inches in 24 hours.[53]

Additional duties of the EI will include:

- Provide training for new construction personnel as they rotate into the project;
- Maintain an environmental training roster;
- Verify that soils are properly stabilized;
- Document and report spills and verify cleanup;
- Verify proper placement of de-watering structures and slope breakers;
- Verify that trench de-watering activities are conducted in a manner that ensures proper deposition of sand, silt, and sediment to avoid environmental damage, including wetlands and waterbodies;
- Test soils to determine where compaction needs to be alleviated;
- Verify proper segregation of topsoil;
- Oversee proper restoration of contours and topsoil;
- Verify that the permanent and temporary erosion controls are installed and maintained properly;
- Verify that repairs to temporary erosion control measures are completed promptly;
- Verify that markings for wetlands and other environmentally sensitive areas are in place;
- Contact or coordinate with DNR and USFWS, as appropriate, to mitigate impacts to wildlife within the construction area;
- Monitor site restoration following completion of construction activities;
- Conduct a final walkover of the project area and develop two lists: (1) areas that need additional work, and (2) areas that should be monitored closely following construction; and
- Complete regular reports on environmental compliance.

3.5 Operations and Maintenance

The Applicant indicates that the pipeline's operating pressure will be monitored and controlled via a remote terminal unit that is connected to the Applicant's SCADA network. Day-to-day monitoring and control will be done by the Applicant's Gas Control Group stationed in Joliet, Illinois. The physical pipeline itself will not be monitored on a day-to-day basis. The pipeline will be entered into the GSOC system. When a GSOC ticket is received by the Applicant, it will respond based on the type of ticket that has been called.

The Applicant indicates that the pipeline, upon being put into service, will enter a leak patrol survey rotation. The frequency is determined by class location and will potentially change as Rochester continues to experience population growth. The Applicant anticipates the pipeline will be surveyed for leaks at five year intervals. According to the Applicant, this interval would

[53] MPCA. 2008. Stormwater Construction Inspection Guide. https://www.pca.state.mn.us/sites/default/files/wq-strm2-10.pdf

only potentially decrease, not increase, per internal operating and maintenance procedures. The permanent right-of-way will be cleared as needed using a mower, weed trimmer or brush hog. Herbicides will not be used.

Routine maintenance will occur if abnormal operating conditions on the pipeline are identified, such as an unusual CP reading or a dead patch of vegetation within the permanent right-of-way is discovered. Local operations staff could potentially excavate the area to identify and address the issue. TBS and DRS are inspected annually. If issues are found, they will be addressed prior to the next inspection. The Applicant indicates that should employees on-site notice any abnormal operating conditions, they will inform local operations staff who will investigate and address the issue.

3.6 Safety Procedures

Operations and maintenance for natural gas pipelines is regulated by the USDOT CFR 49 Part 192 – Transportation of Natural Gas and Other Gas By Pipeline: Minimum Federal Safety Standards (Subparts L-Operations and M-Maintenance) and are administered by MnOPS. MnOPS is also responsible for ensuring pipeline operator compliance with Title 49 CFR, Part 192 – *Transportation of Natural and Other Gas By Pipeline: Minimum Safety Regulations* and Part 199 – *Drug and Alcohol Testing*. Minnesota State Statute § 299F adopts these regulations for intrastate pipeline companies and provides MnOPS with statutory authority for inspection, investigation, and enforcement. Pipeline regulations are minimum safety standards. Pipeline companies may implement additional safety practices.

The Applicant maintains all natural gas distribution facilities according to the requirements in Part 192. MnOPS requires all pipeline companies to comply with regulations pertaining to design, construction, testing, operations and maintenance, personnel qualifications, corrosion control and integrity management. The Applicant indicates that the proposed project would be designed, constructed and operated according to these safety standards.

Design

The Applicant indicates that the proposed pipeline was evaluated based on size and wall thickness to keep the pipe and associated fittings within distribution status (<20% Specified Minimum Yield Strength [SMYS]). Typically, 16-inch and 12-inch steel mains are designed for 0.375-inch wall thickness. The calculation of SMYS is calculated using the wall thickness, design pressure, yield strength, and outer diameter of the pipe. The 16-inch main will be installed with minimum yield strength of 62,000 psi. The 12-inch main will have a 52,000 psi minimum yield strength.

The pipe is coated to protect its integrity. The pipe coating typically consists of one coat of epoxy approximately 14-22 mm thick. For areas where rock is present, two coats are typically specified: 14-22 mm of epoxy and 20-22 mils of a polymer/concrete coating. For weld joints, the pipe is welded, and then a layer of epoxy is painted on 20-22 mm thick. For boring or HDD and pulling/dragging the pipe through the hole, the pipe is dual coated with a polymer/concrete coating.

Construction

To prevent third-party entities from coming into contact with the pipeline, it will be trenched a minimum of 4.5 feet deep, except in locations where rock is encountered. State highway crossings will have a minimum depth of 5 feet. Pipeline sections are welded above grade along the trench line. All welds will be visually and radiographically inspected, and then wrapped or coated to protect against corrosion.

Testing Requirements

After the trench is backfilled, the pipeline will be pressure-tested to ensure structural integrity in accordance with USDOT pressure testing requirements under Part 192 Subpart J.

Operations and Maintenance

The safety standards in 49 CFR Part 192, Minimum Federal Safety Standards requires the Applicant to conduct the following activities to ensure the pipeline is operated in a safe manner:

- develop an emergency plan, working with local fire departments and other agencies to identify personnel to be contacted, equipment to be mobilized, and procedures to be followed to respond to a hazardous condition caused by the pipeline or associated facilities;
- establish and maintain a liaison with the appropriate fire, police, and public officials in order to coordinate mutual assistance when responding to emergencies;
- establish a continuing education program to enable customers, the public, government officials, and those engaged in excavation activities to recognize a natural gas pipeline emergency and report it to appropriate public officials;
- ensure that personnel working on these facilities are part of a random drug and alcohol testing program.

In accordance with 49 CFR Part 192, the Applicant indicates that the pipeline will be monitored periodically and appropriate action taken concerning changes in class locations, gas leakage, erosion, CP requirements, and other conditions affecting safe pipeline operation. Patrolling and leak survey is dependent on class location and type of pipeline (transmission vs. distribution). The proposed pipeline will be surveyed every 5 years, and will be incorporated into the overall inspection schedule for the Rochester distribution system.

Natural gas pipeline markers will be installed and maintained over the buried pipeline at road crossings and other locations necessary to identify the location of the pipeline facilities and reduce the risk of inadvertent third-party damage or interference. The markers will identify the owner of the pipeline and convey emergency information in accordance with applicable governmental regulations, including USDOT safety requirements.

Personnel Qualifications

The Applicant has developed and implemented an Operator Qualification program in accordance with 49 CFR Part 192, Subpart N. The program provides training, testing and record keeping for individuals performing operating or maintenance tasks on pipelines or tasks that affect the operation or integrity of the proposed pipeline. The Applicant uses qualified personnel to operate and maintain pipelines in accordance with the approved Operator Qualification Plan which has been approved by MnOPS.

Corrosion Control

A CP system will be installed to prevent corrosion of the pipeline. The CP system will be designed in accordance with 49 CFR Part 192, Subpart I.

Distribution Integrity Management Program

The Applicant implemented a Distribution Integrity Management Program (DIMP) in 2011 as required by 49 CFR Part 192, Subpart P. All gas distribution facilities including mains, service lines, service regulators, high pressure distribution systems, and low pressure distribution systems are subject to this program. The purpose of the DIMP is to enhance safety by identifying, analyzing, ranking, tracing, and performing actions to reduce gas distribution system risks. The proposed pipeline would be incorporated into the current DIMP administered by the Applicant.

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4 Alternative Routes and Route Segments

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Section 4 discusses the routing alternatives associated with the proposed project. The following introduction explains how the different routes and route segments were analyzed and evaluated.

The terms "Route" and "Route Segment" are used extensively throughout this section and the remainder of the document. These terms are defined by Minnesota Rule:

> **Route** means the proposed location of a pipeline between two endpoints. A route may have a variable width from the minimum required for the pipeline right-of-way up to 1.25 miles.[54]
>
> **Route Segment** means a portion of a route.[55]

Three complete route alternatives were proposed (**Figures 1A**, **1B**, **1C** and **Figure 2**). These routes have been reduced into route segments to facilitate a more consistent comparison. Additionally, new route segments or modifications to existing route segments were identified. In all, 29 different route segments are analyzed in this CEA (**Figure 2** and **Figure 4**).

The analysis combines route segments into different combinations called **segment alternatives**. Thirty-six different segment alternatives are analyzed in this CEA, which encompass the three proposed routes as well as other logical combinations of route segments. Not all possible combinations of route segments are studied in the CEA.

Segment alternatives are grouped by location using **comparison endpoints**, which indicate the beginning and end of a segment alternative (**Figure 4**). The use of comparison endpoints allows for evaluation and comparison of segment alternatives along shorter sections of the overall project length. See **Section 4.2** for further discussion regarding segment alternatives and comparison endpoints.

The Commission could ultimately select any grouping of route segments to arrive at the final pipeline route regardless of whether or not the combination of route segments is reflected as part of the 36 segment alternatives.

4.1 Route Permit Application Routes

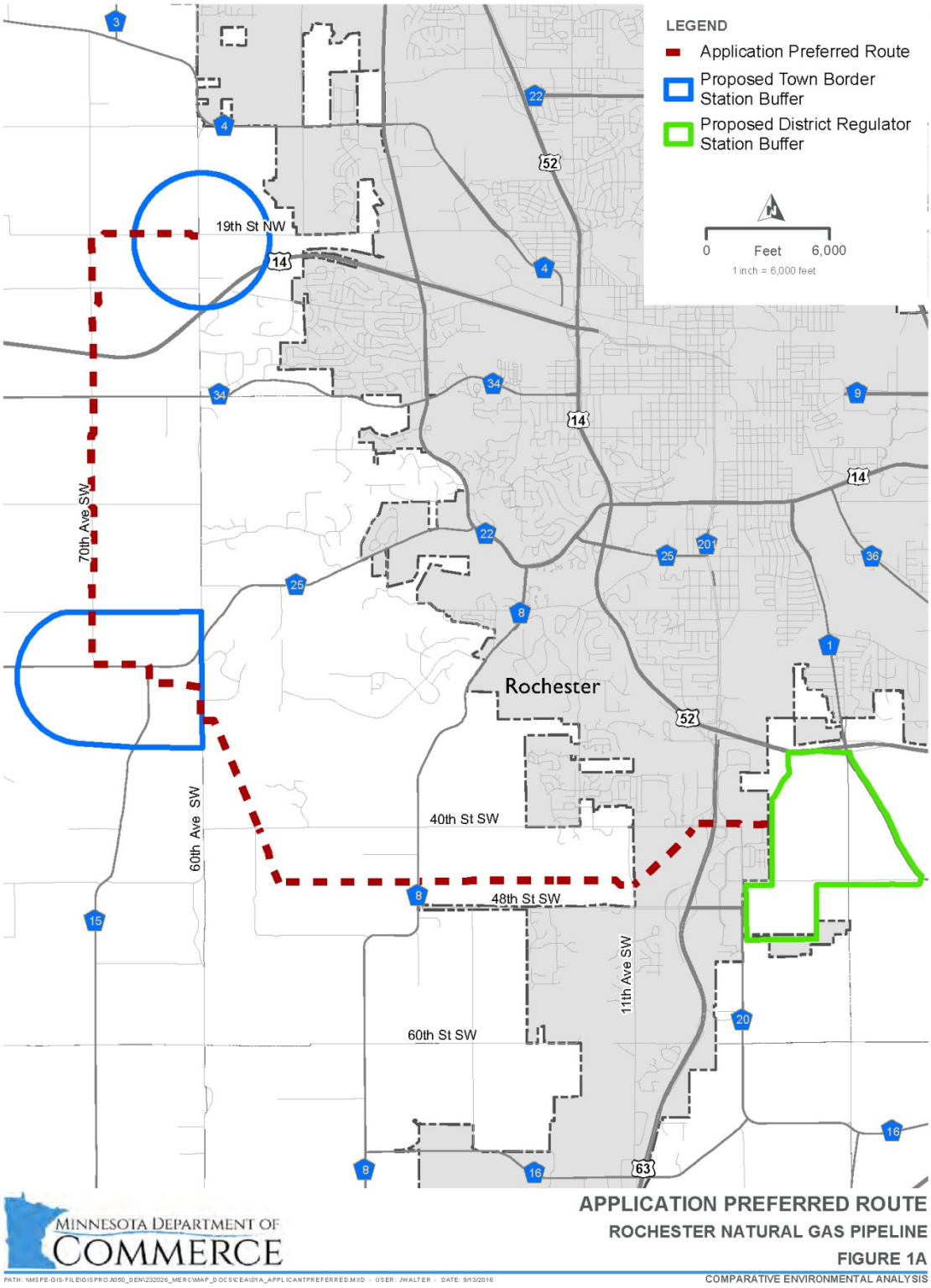
The Applicant submitted the Application Preferred Route and Application Alternative Route as part of its Route Permit Application.[56] These routes connect TBS 1D and Proposed DRS.

4.1.1 Application Preferred Route

The Application Preferred Route is approximately 13.1 miles in length. See **Figure 1A** for the general project location and **Figure 2** for detailed maps. **Table 4-1** lists the route segments included in the Application Preferred Route.

[54] Minn. R. 7852.0100, subp. 31.
[55] Minn. R. 7852.0100, subp. 32.
[56] Submitted November 3, 2015, supplemented on November 9, 2015, and revised January 11, 2016

Figure 1A: Application Preferred Route



The route interconnects with TBS 1D on the southeast corner of 19th Street NW and 60th Avenue NW. The route follows 19th Street NW west for 1.2 miles and then 70th Avenue NW south for 4.0 miles to reach County State Aid Highway (CSAH) 25 near the Proposed TBS. The route turns east and continues along CSAH 25 for 0.5 mile, turns south along CSAH 15 for 0.2 mile, proceeds southeast cross country for 0.5 mile to 60th Avenue SW, and then continues south for 0.3 mile along 60th Avenue SW. The route continues east for about 0.1 mile to the existing British Petroleum (BP) refined oil products pipeline and follows the BP pipeline southeast for about 1.6 miles to about 0.5 mile south of 40th Street SW.

The route then heads east cross country along the half section to 11th Avenue SW for approximately 3.3 miles. The route continues cross country northeast for about 0.75 mile to 40th Street SW. The route follows 40th Street SW for approximately 0.8 mile, crossing US Highway 63 in the 40th Street SW interchange, before terminating at the Proposed DRS on existing agricultural land in Section 24 or 25, Township 106N, Range 14W.

Table 4-1. Route Permit Application Routes

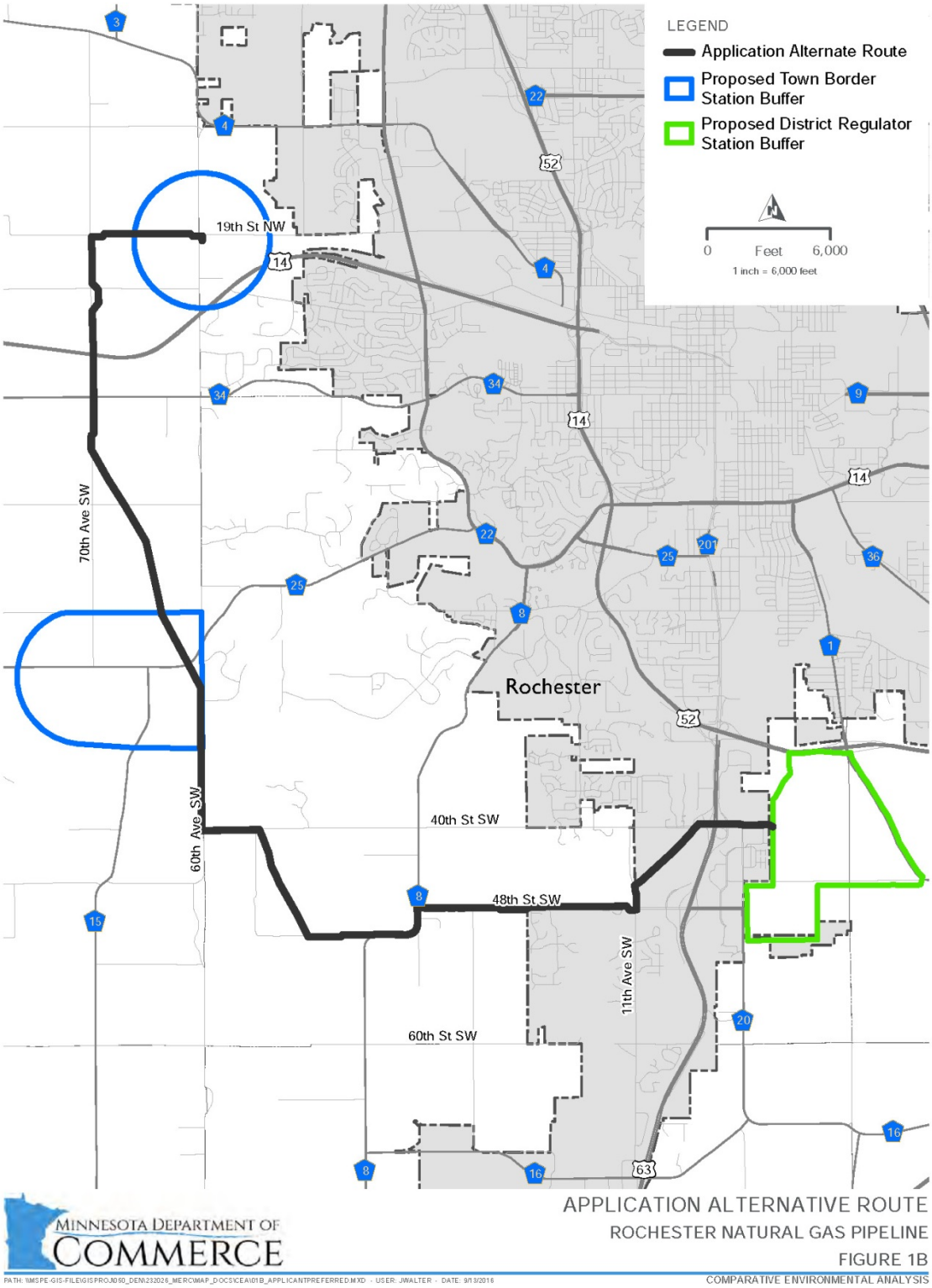
Route(s)	Route Segments	Approximate Length (miles)
Application Preferred	1P, 2P, 3P, 12, 14, 16, 6P, 7P, 26, 9P	13.1
Application Alternative	1P, 2P, 11, 4P, 14, 18, 20, 22, 24, 25, 26, 9P	13.5

4.1.2 Application Alternative Route

The Applicant indicates it proposed the Application Alternative Route to provide greater opportunities to parallel existing infrastructure, consistent with Minnesota Rule 7852.1900. It is approximately 13.5 miles long. See **Figure 1B** for the general project location and **Figure 2** for detailed maps. **Table 4-1** lists route segments included in the Application Alternative Route.

The Application Alternative Route interconnects with TBS 1D. The route shares the first two route segments with the Application Preferred Route, following 19th Street NW west for about 1.2 miles and 70th Avenue NW south for approximately 1.9 miles to the intersection of the existing BP refined oil products pipeline and 70th Avenue NW. The route then follows the existing BP pipeline southeast for about 2.4 miles to 60th Avenue SW near the Proposed TBS, it then continues south along 60th Avenue SW for approximately 0.3 mile. The Application Alternative Route continues south along 60th Avenue SW for an additional 1.0 mile to 40th Street SW, and then continues east along 40th Street SW for about 0.5 mile to the existing BP pipeline. The route follows the existing BP pipeline southeast for roughly 1.1 miles to 50th Street SW. The route then heads east along 50th Street SW and then north along County Road 8 to 48th Street SW. The route follows 48th Street SW east for about 2.1 miles to 11th Avenue SW and 11th Avenue SW north for approximately 0.2 mile, before continuing northeast for about 0.8 mile to 40th Street SW. The route crosses US Highway 63 in the 40th Street SW interchange before terminating at Proposed DRS in the same manner described for the Application Preferred Route.

Figure 1B: Application Alternative Route



4.2 Route Segments Modified or Proposed During Scoping

Multiple public and agency comments were received during scoping. Many commenters suggested alternative route segments, which included new route segments as well as modifications to existing route segments included in the Application.

This document analyzes 29 individual route segments. These segments are combined into 36 segment alternatives. Segment alternatives reflect possible route segment combinations.[57]

The segment alternatives are grouped by location using comparison endpoints, which are labeled A through J. The comparison endpoints indicate the beginning and end of the segment alternative. Segment alternatives are named to reflect the two comparison endpoints, with a numerical suffix added to identify the specific alternative. For example, Segment Alternative EF-1 represents one combination of route segments that link Comparison Endpoint E to Comparison Endpoint F. Segment Alternative EF-2 is a second combination of route segments that connects Comparison Endpoint E to Comparison Endpoint F.

There are four comparison areas: TBS 1D to Proposed TBS (Comparison Endpoint A to D); Proposed TBS to County Road 8 (Comparison Endpoint D to F or G); County Road 8 to 11th Avenue SW (Comparison Endpoint F or G to H or I); and 11th Avenue SW to the Proposed DRS (Comparison Endpoint H or I to J) (**Figure 4**).

4.2.1 TBS 1D to Proposed TBS Comparison Area

Five segment alternatives were identified between TBS 1D and Proposed TBS. See **Table 4-2** and **Figure 4**.

Table 4-2. TBS 1D to Proposed TBS Segment Alternatives

Segment Alternative	Route Segment(s)	Length (mi appx.)	Description
AB-1	1P	1.1	Originates at TBS 1D on the southeast corner of 19th St NW and 60th Ave NW. Follows 19th St NW west for 1.0 miles and then 70th Ave NW south for 0.1 miles.
AB-2	10	1.0	Originates at TBS 1D and follows the existing Northern Natural Gas Pipeline right-of-way for 1.0 miles to 70th Ave NW, approximately 0.1 mile south of 19th St NW. Route Segment 10 was added.
BC-1	2P	1.9	Originates on 70th Ave NW approximately 0.1 mile south of 19th St NW and follows 70th Ave NW south to the junction of BP pipeline.

[57] Not all possible route segment combinations are evaluated in this CEA. Rather, the segment alternatives that resulted from the most logical combination of route segments are evaluated.

Segment Alternative	Route Segment(s)	Length (mi appx.)	Description
CD-1	3P	3.4	Originates at junction of BP pipeline and 70th Ave SW and follows 70th Ave SW south for 2.0 miles to CSAH 25, then follows CSAH 25 east for 0.5 miles to CR 15, then south for 0.2 miles, then east for 0.6 miles to 60th Ave SW, then follows 60th Ave SW south for 0.3 miles to Comparison Endpoint D.
CD-2	11	2.7	Originates at junction of BP pipeline and 70th Ave SW and follows BP pipeline to 60th Ave SW.

4.2.2 Proposed TBS to County Road 8 Comparison Area

Thirteen segment alternatives were identified between the Proposed TBS and County Road 8. See **Table 4-3** and **Figure 4**.

Table 4-3. Proposed TBS to County Road 8 Segment Alternatives

Segment Alternatives	Route Segment(s)	Length (mi appx.)	Description
DE-1	4P	1.5	Follows 60th Ave SW south to 40th St SW and east along 40th St SW. Route Segment 4P was widened along 60th Ave SW.
DE-2	12	1.2	From 60th Ave SW, heads east to the existing BP pipeline. Follows the BP pipeline southeast to 40th St SW. Route Segment 12 was widened along the BP pipeline.
EF-1	5P	2.0	Follows 40th St SW east for 1.5 miles to CR 8, then south along CR 8 for 0.5 miles. Route Segment 5P was added.
EF-2	14, 16	1.8	Follows the BP pipeline southeast to about 0.5 mile south of 40th St SW. Heads east cross country along the half section to CR 8.
EF-3	13, 15, 16	2.0	From the intersection of 55th Ave SW and 40th St SW, follows 55th Ave SW south to about 0.5 miles south of 40th St SW. Heads east cross country along the half section to CR 8. Route Segments 13 and 15 were added.
EG-1	5P, 21	2.2	From the intersection of 55th Ave SW and 40th St SW, follows 40th St SW. Turns south and follows CR 8 to 48th St SW. Route Segments 5P and 21 were added.

Segment Alternatives	Route Segment(s)	Length (mi appx.)	Description
EG-2	14, 16, 21	2.1	Follows the BP pipeline southeast to about 0.5 mile south of 40th St SW. Heads east cross country along the half section to CR 8. Follows CR 8 south to intersection with 48th St SW. Route Segment 21 was added.
EG-3	14, 19	1.9	Follows the BP pipeline southeast to about 0.5 mile south of 40th St SW. Heads southeast cross country (following property boundaries where available) to intersection of CR 8 and 48th St SW. Route Segment 19 was added.
EG-4	14, 18, 20	2.3	Follows the BP pipeline southeast to 50th St SW. Follows 50th St SW to CR 8 and then follows CR 8 north to the intersection with 48th St SW. The Route Segments 18 and 20 were widened along the BP pipeline, 50th St SW, and CR 8.
EG-5	13, 15, 16, 21	2.2	From the intersection of 55th Ave SW and 40th St SW, follows 55th Ave SW south to about 0.5 miles south of 40th St SW. Heads east cross country along the half section to CR 8. Follows CR 8 south to intersection with 48th St SW. Route Segments 13, 15, and 21 were added.
EG-6	13, 15, 19	2.1	From the intersection of 55th Ave SW and 40th St SW, follows 55th Ave SW south to about 0.5 miles south of 40th St SW. Heads east cross county to the BP pipeline. Heads southeast cross county (following property boundaries where available) to intersection of CR 8 and 48th St SW. Route Segments 13, 15, and 19 were added.
EG-7	13, 15, 18, 20	2.5	From the intersection of 55th Ave SW and 40th St SW, follows 55th Ave SW south to about 0.5 miles south of 40th St SW. Heads east cross county to the BP pipeline. Follows the BP pipeline southeast to 50th St SW. Follows 50th St SW to CR 8 and then CR 8 north to the intersection with 48th St SW. Route Segments 18 and 20 were widened along the BP pipeline, 50th St SW, and CR 8. Route Segments 13 and 15 were added.

Segment Alternatives	Route Segment(s)	Length (mi appx.)	Description
EG-8	13, 17, 20	2.7	From the intersection of 55th Ave SW and 40th St SW, follows 55th Ave SW south to 50th St SW. Follows 50th St SW to CR 8 and then CR 8 north to intersection with 48th St SW. Route Segment 20 was widened along 50th St SW and CR 8. Route Segments 13 and 17 were added.

4.2.3 County Road 8 to 11th Avenue SW Comparison Area

Eleven segment alternatives were identified between County Road 8 and 11th Avenue SW. See **Table 4-4** and **Figure 4**.

Table 4-4. County Road 8 to 11th Avenue SW Segment Alternatives

Segment Alternatives	Route Segments	Length (mi appx.)	Description
FH-1	6P, 7P	2.0	From CR 8, heads east cross county along the half section to 11th Ave SW.
FH-2	6P, 23, 24, 25	2.5	From CR 8, heads east cross county along the half section to the western boundary of the Westridge Hills Development. Follows property boundaries south to 48th St SW. Heads east on 48th St SW to 11th Ave SW. Heads north on 11th Ave SW for 0.2 mile. Route Segment 24 was widened along 48th St SW. Route Segment 23 was added.
FH-3	21, 22, 24, 25	2.5	Follows CR 8 south to intersection with 48th St SW. Follows 48th St SW east to 11th Ave SW. Follows 11th Ave SW north for 0.2 mile. Route Segments 22 and 24 were widened along 48th St SW. Route Segment 21 was added.
FI-1	6P, 23, 24	2.3	From CR 8, heads east cross county along the half section to the western boundary of the Westridge Hills Development. Follows property boundaries south to 48th St SW. Heads east on 48th St SW to 11th Ave SW. Route Segment 24 was widened along 48th St SW. Route Segment 23 was added.
FI-2	6P, 7P, 25	2.2	From CR 8, heads east cross county along the half section to 11th Ave SW. Follows 11th Ave SW south for 0.2 mile.
FI-3	21, 22, 24	2.3	Follows CR 8 south to intersection with 48th St SW. Follows 48th St SW east to 11th Ave SW. Route Segments 22 and 24 was widened along 48th St SW. Route Segment 21 was added.

Segment Alternatives	Route Segments	Length (mi appx.)	Description
GH-1	22, 24, 25	2.3	From the intersection of CR 8 and 48th St SW, follows 48th St SW east to 11th Ave SW. Follows 11th Ave SW north for 0.2 mile. Route Segments 22 and 24 were widened along 48th St SW.
GH-2	21, 6P, 7P	2.2	From the intersection of CR 8 and 48th St SW, follows CR 8 north for 0.2 mile. From CR 8, heads east cross county along the half section to 11th Ave SW. Route Segment 21 was added.
GI-1	22, 24	2.1	From the intersection of CR 8 and 48th St SW, follows 48th St SW east to 11th Ave SW. Route Segments 22 and 24 were widened along 48th St SW.
GI-2	21, 6P, 7P, 25	2.4	From the intersection of CR 8 and 48th St SW, follows CR 8 north for 0.2 mile. From CR 8, heads east cross county along the half section to 11th Ave SW. Follows 11th Ave SW south for 0.2 mile. Route Segment 21 was added.
GI-3	21, 6P, 23, 24	2.5	From the intersection of CR 8 and 48th St SW, follows CR 8 north for 0.2 mile. From CR 8, heads east cross county along the half section to the western boundary of the Westridge Hills Development. Follows property boundaries south to 48th St SW. Heads east on 48th St SW to 11th Ave SW. Route Segment 24 was widened along 48th St SW. Route Segments 21 and 23 were added.

4.2.4 11th Avenue SW to Proposed DRS Comparison Area

Eight segment alternatives were identified between 11th Avenue SW and the Proposed DRS. See **Table 4-5** and **Figure 4**.

Table 4-5. 11th Avenue SW to Proposed District Regulator Station Segment Alternatives

Segment Alternatives	Route Segments	Length (mi appx.)	Description
HJ-1	8P, 9P	1.8	From 11th Ave SW, continues north along 11th Ave SW and then east along 40th St SW, crossing US Highway 63 in the 40th St SW interchange, to the Proposed DRS. Route Segment 8P was added.
HJ-2	26, 9P	1.5	From 11th Ave SW, heads cross county northeast to 40th St SW. Follows 40th St SW, crossing US Highway 63 in the 40th St SW interchange, to the Proposed DRS.

Segment Alternatives	Route Segments	Length (mi appx.)	Description
HJ-3	25, 27, 29	2.4	Follows 11th Ave SW south for 0.2 mile. Follows 48th St SE east, crossing US Highway 63 south of the 48th St SE interchange, to CR 20. Continues north along CR 20 to 45th St SE, east along 45th St SE for 0.25 mile, and north along property boundaries, to the Proposed DRS. Route Segments 27 and 29 were added.
HJ-4	25, 28, 29	2.2	Follows 11th Ave SW south for 0.2 mile. Follows 48th St SE east, crossing US Highway 63 within the 48th St SE interchange, to CR 20. Continues north along CR 20 to 45th St SE, east along 45th St SE for 0.25 mile, and north along property boundaries, to the Proposed DRS. Route Segments 28 and 29 were added.
IJ-1	25, 8P, 9P	2.0	Follows 11th Ave SW north for 0.7 mile. Continues east along 40th St SW, crossing US Highway 63 in the 40th St SW interchange, to the Proposed DRS. Route Segment 8P was added.
IJ-2	25, 26, 9P	1.7	Follows 11th Ave SW north for 0.2 mile. Continues cross country northeast to 40th St SW. Follows 40th St SW, crossing US Highway 63 in the 40th St SW interchange, to the Proposed DRS.
IJ-3	27, 29	2.2	Follows 48th St SE east, crossing US Highway 63 south of the 48th St SE interchange, to CR 20. Continues north along CR 20 to 45th St SE, east along 45th St SE for 0.25 mile, and north along property boundaries to the Proposed DRS. Route Segments 27 and 29 were added.
IJ-4	28, 29	2.0	Follows 48th St SE east, crossing US Highway 63 within the 48th St SE interchange, to CR 20. Continues north along CR 20 to 45th St SE, east along 45th St SE for 0.25 mile, and north along property boundaries to the Proposed DRS. Route Segments 28 and 29 were added.

4.3 Modified Preferred Route

The Applicant modified several route segments of its Application Preferred Route and proposed additional route segments to create the Modified Preferred Route. The Applicant indicates this was because of public comments received and continued route evaluation. This Modified Preferred Route is currently preferred by the Applicant over the Application Preferred Route.

The route segments that make up the Modified Preferred Route are listed in **Table 4-6**. The route is about 13.9 miles long. See **Figure 1C** for the general project location and **Figure 2** for detailed maps.

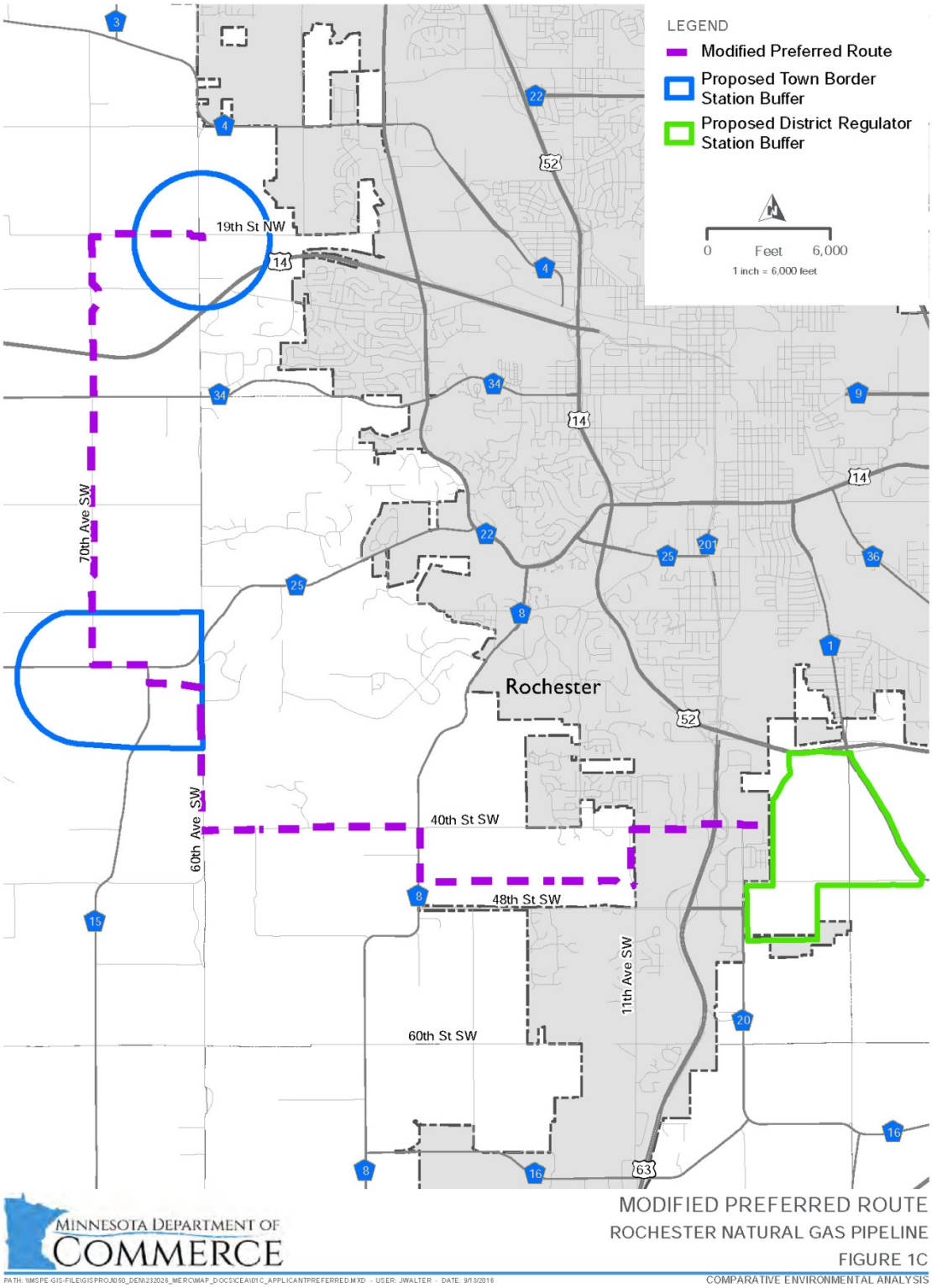
Table 4-6. Modified Preferred Route

Route	Route Segments	Approximate Length (miles)
Modified Preferred	1P, 2P, 3P, 4P, 5P, 6P, 7P, 8P, 9P	13.9

The Modified Preferred Route interconnects with TBS 1D. The route shares the first three route segments with the Application Preferred Route, following 19th Street NW west for about 1.2 miles and 70th Avenue NW south for approximately 4.0 miles to CSAH 25 near the Proposed TBS. The route turns east and continues along CSAH 25 for about 0.5 mile, south along CSAH 15 for nearly 0.2 mile, proceeds southeast cross country for about 0.5 mile to 60th Avenue SW, and then continues south for roughly 0.3 mile along 60th Avenue SW.

The Modified Preferred Route continues south along 60th Avenue SW for an additional 1.0 mile to 40th Street SW, and then follows 40th Street SW east for about 2.0 miles to County Road 8 and south along County Road 8 for approximately 0.5 mile. The route then heads east cross country for about 2.0 mile on the half section line along field breaks and property lines to 11th Avenue SW. The route continues north along 11th Avenue SW for approximately 0.5 mile and then east along 40th Street SW for nearly 1.3 miles, crossing US Highway 63 in the 40th Street SW interchange before terminating at Proposed DRS as described in the Application Preferred Route.

Figure 1C: Modified Preferred Route



5 Potential Impacts and Mitigation Measures

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5.1 Introduction and Background

Section 5 provides an overview of the environmental setting, affected resources, and potential impacts and mitigation measures associated with construction—including associated restoration—and operation of the proposed project. Some tables in Chapter 5 are included as Appendix B to enable the reader to have both the text and table available simultaneously for review.

5.1.1 Analysis Background

Minnesota Rule 7852.1900 outlines the criteria the Commission must consider when selecting a pipeline route. Potential impacts to these criteria are identified and evaluated for the segment alternatives identified in Section 4.2. These segment alternatives encompass all route segments approved by the Commission for inclusion in this CEA and the public hearing.

A potential impact is the anticipated change to an existing condition caused either directly or indirectly by the construction and operation of a proposed project. Potential impacts can be positive or negative, short- or long-term, and, in certain circumstances, can accumulate incrementally. Impacts vary in duration and size, by resource, and across locations.

Direct impacts are caused by the proposed action and occur at the same time and place as the proposed action. An indirect impact is caused by the proposed action, but is further removed in distance or time. Both direct and indirect impacts must be reasonably foreseeable, which means a reasonable person would anticipate or predict the impact. Cumulative potential effects are the result of the incremental effects of the proposed action in addition to other projects in the environmentally relevant area.

Potential Impacts and Mitigation

Section 5 explains the potential direct and indirect impacts to various resources caused by the proposed project. The following terms and concepts are used to describe and analyze potential impacts, that is, to put impacts into a consistent context:

- Duration Impacts vary over time. Short-term impacts are generally associated with project construction. Long-term impacts are associated with the operational life of the project and usually end with project decommissioning and reclamation. Permanent impacts extend beyond the decommissioning stage of the project.
- Size Impacts vary by magnitude. To the extent possible, potential impacts are described quantitatively, for example, the number of impacted acres or the percentage of affected individuals in a population.
- Location Impacts are location dependent. For example, noise impacts decrease as distance from the source increases, or common resources in one location might be uncommon in another.
- Uniqueness Resources are different. Common resources occur frequently, while uncommon resources are not ordinarily encountered.

The context of an impact—in combination with its anticipated on-the-ground effect—is used to determine an impact intensity level, which can range from highly beneficial to highly

harmful. Impact intensity levels are described using a qualitative scale, which is explained below. These terms are not intended to be value judgments, but rather a means to ensure a common understanding among readers and to compare impacts between alternatives.

- **Negligible** impacts do not alter an existing resource function, and are generally not noticeable to an average observer. These impacts are generally short-term and affect common resources.
- **Minimal** impacts do not considerably alter an existing resource condition or function. Minimal impacts might, for some resources and at some locations, be noticeable to an average observer. These impacts are generally short-term and affect common resources.
- **Moderate** impacts alter an existing resource condition or function, and are generally noticeable or predictable to the average observer. Effects might be spread out over a large area making them difficult to observe. These impacts are generally short- to long-term and affect uncommon resources, but these impacts may also be long-term or permanent and affect common resources.
- **Significant** impacts alter an existing resource condition or function to the extent that the resource is impaired or cannot function. Significant impacts are likely noticeable or predictable to the average observer. Effects might be spread out over a large area making them difficult to observe. Significant impacts can be of any duration, and affect common or uncommon resources.

In instances where the potential effects of other projects coincide with the potential effects of the proposed project in the environmentally relevant area, these effects are cumulative. Cumulative potential effects may or may not change the impact intensity level. **Section 5.8** discusses cumulative potential effects in detail.

Section 5 also discusses opportunities to avoid, minimize, or mitigate an impact. These actions are collectively referred to as *mitigation*.

- To **avoid** an impact means it is eliminated altogether, for example, by not undertaking parts or all of a project, or relocating the project.
- To **minimize** an impact means to limit its intensity, for example, by reducing a project's size or moving a portion of the project.
- To **mitigate** an impact means fixing it by repairing, rehabilitating or restoring the affected resource, or compensating for it by replacing it or providing a substitute resource elsewhere. Mitigating an impact is often used when it cannot be avoided or further minimized.

Some impacts can be avoided or minimized; some might be unavoidable but can be minimized; others might be unavoidable and unable to be minimized, but can be mitigated. Example mitigation measures that may be used for the project are provided in **Appendix G**.

5.1.2 Regions of Influence

Potential impacts to each resource are analyzed within specific spatial bounds or "regions of influence" (ROI). The ROI for each resource is the geographic area within which direct and indirect impacts to a resource may occur. As necessary, the CEA will discuss resources, potential impacts and mitigation measures beyond the identified ROI to provide appropriate context. The ROI for each resource is listed in **Table 5-1**.

Table 5-1. Regions of Influence for Human and Environmental Resources

Type of Resource	Resource	Region of Influence
Human Settlement	Population and Employment	Olmsted County
	Displacement	Route Width
	Land Use and Zoning	Project Area
	Planned Future Land Use	Project Area
	Existing Rights-of-Way	Project Area
	Cultural Values	Olmsted County
	Transportation	Olmsted County
	Public Services	Olmsted County
	Noise and Vibration	Project Area
	Aesthetics	Project Area
Human Heath and Safety	Public Safety	Project Area
	Air Quality	Olmsted County
	Hazardous Waste and Regulated Materials	500-foot buffer around the Project Area
Cultural Resources	Archaeological, Cultural and Historic Resources	1-mile buffer around the Project Area
Natural Environment	Geology	Project Area
	Soils	Project Area
	Water Resources (Groundwater, Surface Water, Wetlands)	Project Area
	Vegetation	Project Area
	Wildlife and Wildlife Habitat	Project Area
	Threatened, Endangered, and Other Special Status Species	1-mile buffer around the Project Area
Land-Based Economics	Agriculture	Olmsted County
	Commercial/Industrial	1-mile buffer around the Project Area
	Forestry	Olmsted County
	Recreation	1-mile buffer around the Project Area

Type of Resource	Resource	Region of Influence
	Mining	1-mile buffer around the Project Area

The Project Area includes the route segment widths of 500 to 2,000 feet around the pipeline centerlines and the facility buffers (up to 1.24 miles wide) around the associated facilities (**Figure 2**). The Project Area contains both the permanent and temporary rights-of-way.

Where possible, the area of direct impact was calculated through the use of Geographic Information Systems (GIS) by overlaying the permanent and temporary rights-of-way onto resource mapping layers and calculating the area of overlap. Where spatial analysis was not possible, impacts are described qualitatively.

5.1.3 Land Requirements

As discussed in **Section 3**, the proposed project requires a 50-foot wide permanent right-of-way and a 50-foot wide temporary right-of-way[58] (the temporary right-of-way will be adjacent to the permanent right-of-way and may all be located to one side of the right-of-way or split between the two sides depending on construction needs). In addition, the proposed project requires the following:

- A permanent easement measuring 200 feet by 200 feet (0.92 acre) for expanding or rebuilding of TBS 1D;[59]
- A permanent easement measuring 200 feet by 200 feet (0.92 acre) for constructing the Proposed TBS;
- A permanent easement measuring 200 feet by 200 feet (0.92 acre) for constructing the Proposed DRS;
- A temporary easement measuring 10.0 acres for storing equipment and materials and construction staging;

Land requirements for segment alternatives are listed in **Table B-2**. **Table B-3** lists the land requirements of the evaluated routes. Land requirements for all route segments are provided in **Appendix C**.

The precise locations of TBS 1D, Proposed TBS, Proposed DRS, and temporary storage area have not yet been determined. These facilities will likely be placed on disturbed sites such as in agricultural land, to the extent practicable. The acreage required for each of these facilities is listed in **Table B-3**, but has not been included in the GIS-based impact calculations in **Sections 5-3** through **5-7**.

[58] If the Applicant has a need for a temporary right-of-way wider than 50 feet, it may obtain a wider temporary right-of-way, so long as the landowner is agreeable.
[59] For the TBSs and DRSs for the Project, the Applicant intends to obtain an easement for these portions of the Project. If, however, the landowner requests that the Applicant obtain the property in fee, the Applicant will purchase the required property from the landowner.

5.2 Description of Environmental Setting

The proposed project is located in the western portion of the Rochester Plateau Subsection of the Paleozoic Plateau Ecological Section of southeastern Minnesota.[60] This region was not affected by the most recent glaciation, so landforms are highly influenced by erosion.[61] Erosion processes created the region's distinctive landscape of bluffs and dissected stream valleys. Watersheds generally begin in the western portion of this section, where the elevation is higher with level to gently rolling landscapes, descending east to the Mississippi River, where the landscape transitions to steep blufflands and river valleys.

The proposed project falls within the Paleozoic Plateau Section and Rochester Plateau Subsection of the Eastern Broadleaf Forest Province.[62] The Paleozoic Plateau Section is an area of rugged bluffs and valleys created by erosion and dissected by streams and rivers. Within the Paleozoic Plateau Section, the Project Area crosses three Land Type Associations mapped by the DNR: the Chester Ridge, Stewartville Plain, and Lewiston Plain. Land Type Associations. The Chester Ridge Land Type Association generally occupies higher elevations marked by moderately sloped blufflands and river valleys; the Lewiston and Stewartville Plains Land Type Associations occupy generally flat areas to the north and south of Chester Ridge, respectively.

5.3 Human Settlement

The Project Area is located entirely within Olmsted County within Cascade, Kalmar, Salem, Rochester, and Marion townships and the city of Rochester (**Figure 2**). TBS 1D will be located in Cascade or Kalmar Township. Proposed TBS and Proposed DRS will be located in Salem Township and Marion Township, respectively.

The lengths of each route within each jurisdiction are shown in **Table B-14**. The length of each segment alternative within each jurisdiction from (1) TBS 1D to the Proposed TBS, (2) Proposed TBS to County Road 8, (3) County Road 8 to 11th Avenue SW, and (4) 11th Avenue SW to Proposed DRS are listed in **Table B-15**, **Table B-16**, **Table B-17**, and **Table B-18**, respectively.

5.3.1 Population and Employment

The ROI for population and employment is Olmsted County. Population in Olmsted County grew from 144,260 in 2010 to 150,287 in 2014,[63] a growth rate of 4.2 percent. The statewide growth rate was 2.9 percent for the same time period. The population density of Olmsted County increased from 221 residents per square mile in 2010 to 230 residents per square mile in 2014. Rochester is the main population center in Olmsted County, with

[60] MERC. November 3, 2015. *Route Permit Application for the Rochester Natural Gas Pipeline Project*. Docket No. G-011/GP-15-858 (Application).
[61] Ibid.
[62] DNR. Ecological Classification System Descriptions. http://www.dnr.state.mn.us/ecs/222L/index.html. Accessed August 8, 2016.
[63] 2014 population levels are estimates from the United States Census Bureau, Population Estimates Program. Estimates are based on the 2010 Census. See https://www.census.gov/quickfacts/table/PST045214/27,27109,2754880

approximately 74 percent of the countywide population residing there. Population within Rochester city limits grew from 106,769 residents in 2010 to 111,402 residents in 2014, a growth rate of 4.4 percent. The population density of Rochester increased from 1,956 residents per square mile in 2010 to 2,041 residents per square mile in 2014.[64]

The population of Olmsted County is projected to reach 215,800 residents by 2040, driven by the expectation of continued strong employment growth and increasing trends toward urbanization.[65] The majority of this growth is expected to occur in Rochester. The cities of Byron, Stewartville, and Pine Island are also expected to see significant population increases relative to their existing size.

Olmsted County's economy is centered on healthcare, technology, and agriculture. Major employers in the region include the Mayo Clinic, IBM, Rochester Public Schools, and food producers including Seneca Foods and Kemps. Healthcare is the largest employment industry, representing 37.2 percent of jobs in Olmsted County in 2010.[66] The State of Minnesota and Rochester recently provided additional public funding in support of Mayo Clinic's plan to become a DMC, which it is estimated will create 26,800 to 32,200 direct jobs, and 10,000 to 15,000 indirect jobs.[67] After healthcare, retail (10.3 percent) and manufacturing (9.3 percent) are the second and third largest employment sectors in the county.[68] Approximately 23 percent of the labor force of Olmsted County commutes from outside the county.[69]

Income is slightly higher in Olmsted County than the State of Minnesota. In 2014, median household income in Olmsted County was $67,089 ($60,828 statewide) and per capita income was $34,891 ($31,642 statewide). Poverty levels are lower in Olmsted County than the State of Minnesota. In 2014, 5.0 percent of families in Olmsted County were living below the poverty level (7.5 percent statewide), and 8.7 percent of individuals were living below the poverty level (11.5 percent statewide).[70]

Olmsted County's ethnic composition is 85.9 percent white, 5.6 percent Asian, 5.1 percent black or African American, 0.1 percent American Indian and Alaska Native, and 3.3 percent other ethnicities, including two or more ethnicities. Just over 4 percent identify as Hispanic

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[64] United States Census Bureau (2014) QuickFacts Minnesota. 2014 Population Estimates for Minnesota, Olmsted County, and the City of Rochester. Available from: https://www.census.gov/quickfacts/table/PST045214/27,27109,2754880

[65] Rochester-Olmsted Planning Department (2015) *City of Rochester Zoning Ordinance and Land Development Manual*. Ordinance No. 2785. Effective January 1, 1992. Updated November 4, 2015.

[66] Rochester-Olmsted Council of Governments (2014) *Employment & Population Projections*. Planning & Analysis Division. May 2014.

[67] Destination Medical Center Corporation (2014) *Destination Medical Center Development Plan*.

[68] United States Census Bureau (2014) Industry By Occupation for the Civilian Employed Population 16 Years and Over. Olmsted County. 2010-2014 American Community Survey 5-Year Estimates. Available from: http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_14_5YR_C24050&prodType=table

[69] Rochester-Olmsted Council of Governments (2014) *Employment & Population Projections*. Planning & Analysis Division. May 2014.

[70] United States Census Bureau (2014) Selected Economic Statistics. Olmsted County and Minnesota. 2010-2014 American Community Survey 5-Year Estimates. Available from: http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_14_5YR_DP03&prodType=table

or Latino. These numbers are approximately equivalent to the statewide ethnic composition, which is 85.2 percent white, 4.3 percent Asian, 5.4 percent black or African American, 1.0 percent American Indian and Alaska Native, and 3.1 percent other ethnicities, with 4.9 percent identifying as Hispanic or Latino.[71]

Impacts and Mitigation

Direct impacts to population and employment in Olmsted County and Rochester are anticipated to be minimal. Impacts would be long-term and most would be positive. Impacts would be similar across most segment alternatives. Segment alternatives that include Route Segment 29 may impact existing residences and would require close coordination with landowners to minimize impacts.

Impacts to population and employment are anticipated to be positive because the proposed project would support the expected increase in energy demand due the population growth associated with the development of the Mayo Clinic as a DMC. The additional capacity would allow the Applicant to meet the needs of approximately 9,400 additional customers in the next 10 years.

Short-term, local economic benefits would result from an influx of labor workforce during project construction. Expenditures would include workforce lodging and fuel, grocery, and restaurant sales. Miscellaneous construction-related materials may be purchased locally. Demand for housing and public services from the non-local workers is anticipated to be minimal. Additional positive impacts include easement payments, permit fees, and property tax revenues. Construction would create temporary jobs for both local and non-local workers. Operation of the pipeline would not be expected to employ any additional permanent staff.

5.3.2 Displacement

The ROI for displacement is the route width. Displacement is the forced removal of a residence or building to facilitate the safe operation of the pipeline. The Commissioner of Public Safety, as required by Minnesota Statute 299J.05 [Pipeline Setback Ordinance], established a model ordinance requiring a setback from pipelines in areas where residential or other development is allowed. This model ordinance, Minnesota Rule, Chapter7835.0500 Subp. 3. [Setback], states “Buildings and places of public assembly subject to this ordinance shall not be constructed closer to the pipeline than the boundary of the pipeline easement.”

The purpose of this model ordinance is to increase public safety by requiring that new development be setback from pipelines. The requirements of Minnesota Statute 299J.05 and Minnesota Rules 7835.0300 directs statutory or home rule charter cities, towns, and counties that have planning and zoning authority under Minnesota Statutes, sections 366.10 to 366.19, 394.21 to 394.37, or 462.351 to 462.365, and in which a pipeline is located to adopt a setback ordinance.

[71] United States Census Bureau (2014) Selected Characteristics of the Total and Native Populations in the United States. 2010-2014 American Community Survey 5-Year Estimates. Available from: http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_14_5YR_S0601&prodType=table

Each jurisdiction is required to submit a copy of its proposed ordinance to the commissioner of public safety for comparison to parts 7535.0100 and 7535.0500 to ensure that the proposed setback meets or exceeds the minimum standards set out in the model. The commissioner's written decision on the proposed ordinance will be sent to the jurisdiction within 90 days of receipt specifying approval of the ordinance or areas of deficiency and recommended modification.

Residences, agricultural and commercial buildings, and other buildings within the anticipated permanent right-of way and construction area and within 50, 100, and 200 feet from the edge of the anticipated permanent right-of-way and construction area of the different routes are shown in **Table B-25**. Buildings within the buffers for the associated facilities are shown in **Table B-26** and on **Figure 10**.

Residences, agricultural and commercial buildings, and other buildings within the anticipated permanent right-of-way and construction area and within 50, 100, and 200 feet of the edge of the anticipated permanent right-of-way and construction area of each segment alternatives for TBS 1D to the Proposed TBS, the Proposed TBS to County Road 8, County Road 8 to 11th Avenue SW, and 11th Avenue SW to the Proposed DRS are listed in **Table B-27**, **Table B-28**, **Table B-29**, and **Table B-30**, respectively.

Impacts and Mitigation

There are numerous residences, commercial and agricultural buildings, and other buildings within the anticipated permanent right-of-way and construction area) of Route Segments 4P, 7P, and 29 (Segment Alternatives DE-1, FH-1, FI-2, GH-2, GI-2, HJ-3, HJ-4, IJ-3, and IJ-4). There are agricultural buildings within the anticipated construction area of Route Segment 5P (Segment Alternatives EF-1 and EG-1). The Applicant indicates that final design will realign the pipeline within the approved route, such that the permanent right-of-way would avoid direct impacts to residences or other buildings. Impacts are anticipated to minimal.

5.3.3 Land Use and Zoning

The ROI for land use and zoning is the Project Area. The Project Area includes land that has undergone significant development, including agricultural farming, as well as rights-of-way for roads, railroads, pipelines, and an electrical transmission line. Land use within the first comparison area, TBS 1D to Proposed TBS, is primarily rural agricultural. Land use within the second and third comparison areas, Proposed TBS to County Road 8 and County Road 8 to 11th Avenue SW, is agricultural with increasing dispersed residential developments closer to Rochester. Land use within the fourth comparison area, 11th Avenue SW to Proposed DRS, is mixed commercial and low and medium density residential developments.

Olmsted County and the City of Rochester each maintain land use plans.[72,73] The Olmsted County Land Use Plan is maintained by the Rochester-Olmsted Planning Department, a joint planning agency for the city and county. The County Land Use Plan is a 25-year plan and was last updated in 2014. The City Land Use Plan is maintained by the Rochester-Olmsted

[72] Rochester-Olmsted Planning Department (2014) *Olmsted County General Land Use Plan*. Amended March 25, 2014. Recorded Document Number A-1258681.
[73] Rochester-Olmsted Council of Governments (2013) *Land Use Plan for the Rochester Urban Service Area*. Amended through January 28, 2013.

Council of Governments (ROCOG) Planning Department. The City Land Use Plan was last updated in 2013 and is currently being revised. Both plans provide the framework for identifying future growth and development within Olmsted County and its communities.

Olmsted County, the City of Rochester, and a number of the townships maintain zoning ordinances, that help implement the Land Use Plans. The County of Olmsted Zoning Ordinance and the City of Rochester Zoning Ordinance are both maintained by the Rochester-Olmsted Planning Department.[74,75] Zoning districts, which are defined in the ordinances, are listed in **Table B-19** and shown in **Figure 6** (Olmsted County) and **Figure 7A** and **Figure 7B** (City of Rochester).

A pipeline route permit issued by the Commission under Minnesota Statutes Section 216G.02 is the only site approval required to be obtained by the Applicant before constructing the proposed project and supersedes and preempts all zoning, building or land use rules, regulations, or ordinances promulgated by regional, county, local, and special purpose agreements.[76]

Impacts and Mitigation

Direct impacts to land use and zoning are anticipated to be minimal. Impacts would be both short- and long-term, would be of a relatively small size, and would not affect any unique resources. Impacts to land use and zoning would be similar among all segment alternatives. Short-term impacts would occur during construction as the land within the construction area would not be available for other uses. Long-term impacts would include permanent conversion of approximately 3 acres of land from agricultural to industrial use for the aboveground facilities. Indirect impacts would include the encumbrance of land within the permanent right-of-way affecting future project development due to the presence of a buried pipeline. Impacts can be mitigated through avoidance, but some are unavoidable.

The majority of direct, short-term impacts would occur on land zoned as agricultural.[77] Impacts to agriculture economies are discussed in **Section 5.7.1**. After construction and right-of-way restoration the land within the permanent right-of-way would be available for agricultural uses.

Segment Alternatives DE-2, EF-1 and EG-1 would cross land zoned as a special district near 40th Street SW and the BP Pipeline that the County Zoning database indicates has been platted and developed as the Heritage Hills 2 Subdivision.[78] All segment alternatives in the 11th Avenue SW to Proposed DRS comparison area would cross a portion of Rochester that is zoned for commercial development.

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[74] Rochester-Olmsted Planning Department (2014) *County of Olmsted Zoning Ordinance*. Recorded Document #855420. Effective April 16, 1983. Updated June 1, 2014.
[75] Rochester-Olmsted Planning Department (2015) *City of Rochester Zoning Ordinance and Land Development Manual*. Ordinance No. 2785. Effective January 1, 1992. Updated November 4, 2015.
[76] Minn. Stat. § 216G.02, subd. 4.
[77] Application Preferred Route: 88 percent of the permanent right-of-way and 88 percent of the construction area; Application Alternative Route: 81 percent of the permanent right-of-way and 79 percent of the construction area; Modified Preferred Route: 88 percent of the permanent right-of-way and 88 percent of the construction area.
[78] Rochester-Olmsted Planning Department (2013) Olmsted County Zoning GIS Mapping. GIS Department. Updated 2013.

Long-term indirect impacts may result within the permanent right-of-way, as construction of a buried pipeline could preclude some types of future developments in this area. To mitigate these potential impacts to future land use, the Applicant will work with the landowner to identify the best location for the alignment as it crosses these parcels.

Expansion or rebuild of TBS 1D and construction of Proposed TBS and Proposed DRS will require permanent conversion of about 3 acres of land, about 1 acre for each of the aboveground stations. The exact location of these facilities has not yet been determined, but they would likely be sited on agricultural land. No existing buildings or infrastructure would be impacted by construction of the aboveground facilities.

The acreages of Olmsted County and Rochester zoning districts that would be impacted by the routes are listed in **Table B-20**. Impacts to land use and zoning associated with segment alternatives for TBS 1D to the Proposed TBS, Proposed TBS to County Road 8, County Road 8 to 11th Avenue SW, and 11th Avenue SW to Proposed DRS are listed in **Table B-21**, **Table B-22**, **Table B-23**, and **Table B-24.**

5.3.4 Planned Future Land Use

The ROI for planned future land use is the Project Area. During development of the CEA, the Rochester-Olmsted Planning Department and local township planning department (Township Cooperative Planning Association [TCPA]) were contacted and asked to provide information on future or current planned developments along any route segment under consideration. There are 14 planned future developments in various stages of review orapproval in the Project Area.[79] These proposed developments are illustrated on **Figure 8** and described below.

[79] Jenna Campbell, Rochester-Olmsted Planning Department, (April 7, 2016) Personal communication to Lydia Nelson, HDR.
Jenna Campbell, Rochester-Olmsted Planning Department, (April 7, 2016) Personal communication to Lydia Nelson, HDR.
Brent Svenby, City of Rochester, (April 8, 2016) Personal communication to Brian Hunker, HDR.
Jeff Ellerbusch, Rochester-Olmsted Planning Department, (April 20, 2016) 1 Personal communication to Brian Hunker, HDR.
Jenna Campbell, Rochester-Olmsted Planning Department, (April 20, 2016) 2 Personal communication to Brian Hunker, HDR.
Jeff Ellerbusch, Rochester-Olmsted Planning Department, (April 20, 2016) 3 Personal communication to Brian Hunker, HDR.
Jeff Ellerbusch, Rochester-Olmsted Planning Department, (April 20, 2016) 4 Personal communication to Brian Hunker, HDR.
Jeff Ellerbusch, Rochester-Olmsted Planning Department, (April 21, 2016) 1 Personal communication to Brian Hunker, HDR.
Jeff Ellerbusch, Rochester-Olmsted Planning Department, (April 21, 2016) 2 Personal communication to Brian Hunker, HDR.
Jeff Ellerbusch, Rochester-Olmsted Planning Department, (April 21, 2016) 3 Personal communication to Brian Hunker, HDR.
Jeff Ellerbusch, Rochester-Olmsted Planning Department, (April 21, 2016) 4 Personal communication to Brian Hunker, HDR.
Jeff Ellerbusch, Rochester-Olmsted Planning Department, (April 21, 2016) 5 Personal communication to Brian Hunker, HDR.
Roger Irhke, Township Cooperative Planning Association, (April 22, 2016) Personal communication to Brian Hunker, HDR.

40th Street Townhomes

40th Street Townhomes was a planned mixed use commercial and residential development in the City of Rochester along 40th Street SW. According to the Rochester-Olmsted Planning Department, the land that was included in the 40th Street Townhomes General Development Plan (GDP) is now part of the Willow Creek Commons GDP.[80]

The Boulders

The Boulders apartment and townhomes development has been approved and construction is nearly complete.

Forest Knoll

Forest Knoll is an inactive GDP. No other information was available from the Rochester-Olmsted Planning Department.[81]

The Gardens

The Gardens includes two areas (1) a vacant lot on the south side of Maine Ave SE just to the west of a daycare facility zoned R-3-Medium Density Residential[82] and (2) apartment buildings are being constructed at the northern terminus of Maine Ave SE.

Hart Farm South

Hart Farm South GDP was amended and submitted to the Rochester-Olmsted Planning Department on February 26, 2014. The first phase of Hart Farm South has been platted. Roads, infrastructure and houses have been built but some vacant lots exist. Phases 2, 3, and 4 will eventually be platted as Hart Farm South Seventh, Eighth and Ninth Subdivisions, respectively, but no plans have been submitted to the Rochester-Olmsted Planning Department for these subdivisions.

David Meir, Township Cooperative Planning Association, (April 22, 2016) Personal communication to Brian Hunker, HDR.
Jeff Ellerbusch, Rochester-Olmsted Planning Department, (April 22, 2016) Personal communication to Brian Hunker, HDR.
Jeff Ellerbusch, Rochester-Olmsted Planning Department, (June 20, 2016) Personal communication to Brian Hunker, HDR.
Jeff Ellerbusch, Rochester-Olmsted Planning Department, (June 24, 2016) Personal communication to Brian Hunker, HDR.
Jeff Ellerbusch, Rochester-Olmsted Planning Department, (July 5, 2016) Personal communication to Brian Hunker, HDR.
Roger Irhke, Township Cooperative Planning Association, (July 14, 2016) Personal communication to Lydia Nelson, HDR.

[80] GDPs are only required for projects within the municipal city limits, Urban Service Area, and Urban Growth Area for Rochester. Projects outside municipal city limits in Olmsted County do not require GDPs.

[81] Ibid.

[82] R-3 District is intended to maintain areas developed predominantly with multi-unit residential buildings outside of the Central Development Core, or areas of existing low density development where the need to encourage redevelopment has been identified on the Land Use Plan. Certain supportive non-residential uses, and compatible residential infill development are provided for.

Maine Heights

Maine Heights is a planned development (car dealership and apartment complex) in Rochester at the southwest corner of 48th Street SW and Maine Ave SE. The GDP and site plans were approved.

Montgomery Meadows

Montgomery Meadows is a planned mixed use development in Kalmar Township along Trunk Highway 14. The project would develop 166 acres into a residential-equestrian community, with large lots for houses and shared equestrian facilities, including stables and horse trails. Kalmar Township approved the GDP and zoning change and is waiting for a preliminary plat.

Rochester Public Utilities

Rochester Public Utilities (RPU), a division of the City of Rochester, is the largest municipal utility in Minnesota. RPU serves 50,000 electric customers in Rochester. RPU plans to construct a new natural gas-fired plant at the site of its existing Westside Substation at 19th Street NW and 60th Avenue NW, near the existing TBS 1D and the northernmost end of the proposed project.[83] Expansion or rebuild of TBS 1D would not interfere with construction or operation of this facility.

Scenic Oaks West

Scenic Oaks is a planned residential development in Rochester Township, near the Willow Creek Reservoir. The project would develop 176 acres into 217 residential lots. Plans were submitted to the Rochester-Olmsted Planning Department in April 2016 and are presently tabled in front of the Rochester-Olmsted Planning and Zoning Commission.

Scenic Oaks 9th Subdivision

Scenic Oaks is a platted expansion of a current residential development.

Unnamed

Rochester Township is considering rezoning a 2-square mile area bounded by 40th Street SW, County Road 8, 50th Street SW, and 60th Avenue SW to Suburban Subdivision. First discussion was held on July 14, 2016. An application has not yet been received. If an application is submitted and approved by the township board, the township would provide a letter of support to the Rochester-Olmsted Planning Department regarding the rezoning request. The rezoning process would likely take 6 to 12 months, or longer.[84]

Westridge Hills

Westridge Hills GDP is a planned community development in Rochester Township near the Willow Creek Golf Course. The project would develop 79 acres for 86 single-family homes and a church.

[83] David, Kim (2016) "A New Generating Station for Rochester." KROC AM News, February 23, 2016. Available from: http://krocam.com/a-new-generating-station-for-rochester/
[84] Roger Irhke, TCPA, (July 15, 2016) Personal communication to Brian Hunker, HDR

Willow Creek Commons and Willow Creek Commons West

Willow Creek Commons and Willow Creek Commons West are proposed mixed use developments in Rochester. Willow Creek Commons (GDP 214) is a 22-acre property along US Highway 63 that would be subdivided into four lots for commercial development. On May 21, 2012, the Rochester City Council approved GDP 214. The south half has a preliminary plat that was approved in 2012. A final plat of the north half of the GDP 214 was submitted and approved on June 16, 2014. It was recorded with Olmsted County in November 2014.

Willow Creek Commons West (GDP 243) is a proposed residential development that would develop about 61 acres adjacent to Willow Creek into approximately 175 multi-family units. This property is located south and east of Willow Creek, north of 48th St NW and east of US Highway 63. GDP 243 was tabled on February 4, 2008, and although it was further discussed at the May 21, 2012, meeting of the Rochester City Council, it remains tabled.

Willow Heights 5th

Willow Heights 5th was a planned residential development in the City of Rochester along 40th Street SW. It would have developed 25 additional single-family homes in the existing Willow Heights subdivision. According to the Rochester-Olmsted Planning Department, this plan is no longer valid.

Impacts and Mitigation

Direct impacts to planned future land use are anticipated to be minimal along most of the segment alternatives. Long-term impacts to several planned future developments would be moderate to significant. Impacts cannot be avoided in all cases. As a result, the Applicant has indicated it will work with the landowner to identify the best location for the alignment as it crosses affected parcels.

Segment alternatives that bisect a planned or proposed development would require that the development be designed to accommodate the pipeline resulting in significant impacts. Segment alternatives that follow the edge of a planned or proposed development would be easier to accommodate but would still require plan modifications resulting in moderate impacts. Impacts are not solely based on the on-the-ground effects of pipeline construction and operation, but also include the extra time and process related to designing a real estate development in a manner that meets the various added constraints resulting from the occurrence of a pipeline.

Significant impacts would occur to the planned Westridge Hills development within route segment 7P (Segment Alternative FH-1, FI-2, GH-2 and GI-2) and to the planned Willow Creek Commons and Willow Creek Commons West developments within route segment 26 (Segment Alternatives HG-2 and IJ-2). Moderate impacts would occur to the planned Westridge Hills development within route segments 23 and 24 (Segment Alternatives FH-2, FH-3, FI-1, FI-3, GH-1, GI-1 and GI-3) and to the planned Willow Creek Commons and Willow Creek Commons West developments within route segment 8P (Segment Alternatives HJ-1 and IJ-1).

5.3.5 Existing Rights-of-Way

The ROI for existing rights-of-way is the Project Area. Existing rights-of-way in the Project Area includes roads, railroads, electric distribution and transmission lines, and pipelines.

Paralleling of existing rights-of-way places new infrastructure with existing infrastructure, thus making efficient use of the state's limited land resource and minimizing land use conflicts. Table B-31 and Table B-32 present the length of pipeline located parallel to existing rights-of-way (road, pipeline, or electrical distribution line) versus not located parallel to an existing right-of-way (that is, greenfield) for each route and segment alternative, respectively (Figure 9). Existing infrastructure that would be crossed or adjacent to each route or segment alternative is included in Table B-33 and Table B-34.

Impacts and Mitigation

Paralleling of existing rights-or-way with the different comparison areas is as follows:

TBS 1D to the Proposed TBS

All segment alternatives parallel existing electrical, pipeline or road right-of-way for the majority of their length.

Proposed TBS to County Road 8

Segment Alternatives EF-2, EF-3, EG-2, EG-3 and EG-6 have significant portions of their length that do not parallel existing electrical, pipeline or road right-of-way.

County Road 8 to 11th Avenue SW

Segment Alternatives FH-3, FI-3, GH-1, and GI-1 parallel existing electrical, pipeline or road right-of-way for a significant portion of their length. All other segment alternatives do not.

11th Avenue SW to Proposed DRS

Segment Alternatives HJ-1 and IJ-1 parallel existing electrical, pipeline or road right-of-way for a significant portion of their length.

5.3.6 Cultural Values

The ROI for cultural values is Olmsted County. Cultural values are learned community beliefs and attitudes. These values provide a framework for individual and community thought and action. Cultural values are informed, in part, by ethnic heritage.

Olmsted County was historically occupied by Native American tribes from the Upper Mississippi, Northern Woodlands, and Western Prairies cultures.[85] Tribes that were living in the area around the time of European contact included the Dakota Sioux, Ojibway, and Winnebago. French fur traders arrived in the area in 1660, followed by the British in the 1760s. Migration of settlers to southeastern Minnesota reached its peak in 1885, drawn by the booming agricultural industry. Current residents of Olmsted County self-report as having primarily German, Norwegian, Irish, English, and American ancestry.[86] Additional information about the prehistory and history of Olmsted County is included in the Phase Ia Literature

[85] Olmsted County (2016) "History of Olmsted County." Available from: https://www.co.olmsted.mn.us/yourgovernment/Pages/HistoryofOlmstedCounty.aspx.
[86] United States Census Bureau (n.d.) 2010-2014 American Community Survey 5-year Estimates: Selected Social Characteristics in the United States, Available from: http://factfinder.census.gov/bkmk/table/1.0/en/ACS/14_5YR/DP02/0500000US27109.

Search Report (Phase Ia Report), included as **Appendix I** and discussed in further detail in **Section 5.5**.

Health care and technology are significant drivers of the regional economy. Saint Mary's Hospital, which would later become the Mayo Clinic, opened in 1889. Today, the Mayo Clinic is widely regarded as one of the best hospitals in the world. Its Rochester headquarters is a major employer in the region. The technology industry arrived in Rochester in 1956, when IBM opened a manufacturing, engineering, and educational center. This center became IBM's largest facility by the late 1970s, and bolstered Rochester's reputation as a center for innovation.[87]Rochester is the regional center for industry and commerce in southeastern Minnesota and northeastern Iowa. The University of Minnesota established a new campus in Rochester in 2007.

The population is highly educated, with over 50 percent of the population attaining an Associate's degree or higher, as compared to approximately 37 percent of the United States population as a whole.[88] Rochester is regularly listed on rankings of the most livable cities, and was ranked #1 in 2016 as the Most Livable City in the United States by Livability.[89,90]

Rochester is the third largest city in Minnesota and offers many community amenities from parks and recreation, shopping, concerts, theater, and nightlife.[91] Common cultural value themes mentioned on the websites of cities and business communities stress high quality of life, partnerships and citizen participation, safety, hard work, optimism, and appreciation of the natural world.

Impacts and Mitigation

The proposed project is not anticipated to have direct or indirect adverse impacts on the cultural values of Olmsted County, Rochester, or the surrounding communities.

5.3.7 Transportation

The ROI for transportation is Olmsted County. The Olmsted County 2040 Long Range Transportation Plan (2040 Plan) was originally adopted in 2010. It was updated in 2015 to account for increased population and growth projections for the Rochester area associated with Mayo Clinic's DMC Initiative. The 2040 Plan reported there are approximately 1,800 miles of road in Olmsted County. Of this mileage, approximately 10 percent are state highways, and 30 percent each are county roads, township roads, and municipal roads. State highways carry approximately 56 percent of the vehicle miles of travel in the county,

[87] City of Rochester (n.d.) "History of Rochester". Available from: http://www.rochestermn.gov/about-the-city/history-of-rochester
[88] United States Census Bureau (n.d.) 2010-2014 American Community Survey 5-year Estimates: Selected Social Characteristics in the United States, Available from: http://factfinder.census.gov/bkmk/table/1.0/en/ACS/14_5YR/DP02/0500000US27109.
[89] See a list of rankings Rochester has received here: https://www.mayo.edu/mayo-edu-docs/mayo-school-of-graduate-medical-education-documents/rochester-facts-endocrinology-fellowship.pdf
[90] Livability (2015) "Top 100 Best Places to Live." Accessed on June 20, 2016 at http://www.livability.com/best-places/top-100-best-places-to-live/2016.
[91] Rochester, MN Convention and Visitors Bureau (2016) Rochester MN Visitors Information. Available from: http://www.rochestercvb.org/

county roads carry about 23 percent, Rochester city roads carry about 20 percent, and township roads carry 1 percent.[92]

Roadways in Rochester and Olmsted County will be upgraded to accommodate projected growth and development in the area. Planned upgrades in the Project Area include an improved interchange at 60th Avenue NW and Trunk Highway 14. The 60th Avenue NW road alignment will change to allow for a new interchange approach and grade separation. The proposed interchange will shift 60th Avenue NW to the west, beginning at County State Aid Highway (CSAH) 34. The west shift of the 60th Avenue NW centerline will be approximately 450 feet. After crossing Trunk Highway 14 the proposed roadway will transition back to the existing 60th Avenue NW alignment just south of 19th Street NW.

Public transit in Olmsted County includes fixed route and paratransit services in the Rochester urbanized area, private for-profit regional commuter bus service, and local bus service in Stewartville. Besides public transit, there are a variety of for-profit and non-profit transit services within the county (for example, taxis, employee shuttles) as well as private buses and vans connected with senior housing, disabled housing, and churches. The Rochester fixed route system serves the largest number of passengers, and ridership has grown steadily since the late 1990s.

Rochester International Airport is located approximately 7.5 miles southwest of the Rochester central business district and 4 miles southwest of the proposed project's southern endpoint, within the city limits. Eight carriers serve the airport, and just over 3,000 flights departed the airport between March 2015 and March 2016.[93] The Rochester International Airport's 2009 Master Plan identifies airport improvements anticipated over the next 20 years. Significant updates include construction of a new commercial passenger terminal and continued expansion of the airport's business park, air cargo, and general aviation facilities.[94]

High speed passenger rail service between Rochester and the Minneapolis-St. Paul metropolitan area is being studied. The Rochester-Twin Cities Passenger Rail Corridor Project, or Zip Rail, would be an approximately 100-mile rail corridor that would provide express service between Rochester and Minneapolis-St. Paul. The Zip Rail Project would be consistent with a potential future high speed rail connection to Chicago. The corridors that have been recommended for further consideration run parallel to Trunk Highway 14 into downtown Rochester.[95] Minnesota Department of Transportation (MnDOT) suspended work on the project in January 2016, pending action by the Olmsted County Regional Railroad Authority.[96]

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[92] ROCG (2015) *Reaffirmation of the Year 2040 Long Range Transportation Plan*.
[93] USDOT (2016) Rochester, MN: Rochester International (RST). Office of the Assistant Secretary for Research and Technology, Bureau of Transportation Statistics. Accessed on June 17, 2016 at: http://www.transtats.bts.gov/airports.asp?pn=1&Airport=RST&Airport_Name=Rochester,%20MN:%20Rochester%20International&carrier=FACTS
[94] Rochester-Olmsted Planning Department (2015) *Reaffirmation of the Year 2040 Long Range Transportation Plan*.
[95] MnDOT (2015) *Final Scoping Decision Document for Rochester-Twin Cities Passenger Rail Corridor Investment Plan and Tier 1 EIS (Zip Rail)*. Saint Paul, Minnesota.
[96] MnDOT (2016) "MnDOT suspends its work on Zip Rail Project." News Release. January 27, 2016. Available from: http://www.dot.state.mn.us/newsrels/16/01/27ziprail.html

Impacts and Mitigation

Impacts to transportation are anticipated to be minimal. Impacts would be short-term and no unique resources would be affected. Short-term impacts would result from construction causing increased traffic and delays where construction intersects roadways and railroads. Impacts can be mitigated through use of Best Management Practices (BMPs) and coordination with MnDOT and Olmsted County. Other potential short-term impacts, such as noise and dust during the construction period, can be mitigated with BMPs. Long-term impacts are not anticipated, as roadways are proposed to be crossed via HDD or boring. Section 5.5.4 of the Generic Route Permit requires that the Applicant work with existing easement holders to ensure minimal disturbance to existing infrastructure.

Construction of the proposed project may temporarily affect transportation systems. The Applicant will construct the pipeline under paved roadways using boring or HDD methods to avoid disruptions to vehicular traffic and physical impacts on road beds. Unpaved roadways would be crossed by boring or HDD. Where the proposed project crosses Trunk Highway 14 (all segment alternatives in the TBS 1D to New TBS comparison area) and the US Highway 63 interchange (all segment alternatives in the 11th Avenue SW to DRS comparison area), the Applicant will acquire the necessary approval from MnDOT (Utility Crossing Permit) This approval will address construction methods for boring or HDD under highways and roads, impact on other utilities, traffic control in construction areas, authorized access points for construction activities, impact on highway drainage, impact on highway vegetation, and other concerns. The US Highway 63 interchange crossing, in particular, will require extensive coordination with MnDOT.

Section 5.5.17 of the Generic Route Permit requires that the Applicant contact state, county, and township governing bodies having jurisdiction over any roads to be impacted by construction of the proposed project will be contacted and roads will be repaired as necessary if impacted by the extra wear and tear of the transportation of construction-related materials. Additionally, proper signage and traffic management, as agreed upon by the county and city road authorities in consultation with the Applicant, will be employed during construction. Table B-33 and Table B-34 list the roads that would be crossed or paralleled by the routes and segment alternatives.

Movement of workers, equipment, and materials to the construction area is anticipated to have short-term impacts on transportation systems. Locations for storage yards have not been identified; the Applicant would work with local road authorities to identify sites that minimize impacts to local traffic patterns. The Applicant anticipates that road congestion associated with construction would increase during peak hours, but congestion is expected to be minimal. If oversize and/or overweight loads of pipeline and equipment would be transported on US Highway 52, Trunk Highway 14, or US Highway 63, the Applicant will coordinate with the appropriate road authorities to ensure roads and highways are not impacted by heavy loads.

The temporary increase in traffic, dust and soil on the roads, and noise levels from construction equipment and employees would result in increased risk to the traveling public. This risk is anticipated to be minimal. BMPs would be implemented to minimize noise, and dust and soil on roadways.

No impacts are anticipated to the planned, new grade-separated interchange at Trunk Highway 14 and 60th Avenue NW. The Applicant would coordinate with Olmsted County regarding the tie-in location where the proposed alignment shifts back to existing 60th Avenue NW around 19th Street NW near TBS 1D. Future road construction will likely occur within Route Segment 1P along 60th Avenue NW going west along 19th Street NW.

There are three City of Rochester bus stops near the Project Area: the Target Park & Ride on Maine Avenue is between Route Segments 27 and 29 (Segment Alternatives HJ-3, HJ-4, IJ-3 and IJ-4); 40th Street SW & Willow Heights Drive is along Route Segment 8P and approximately 800 feet from Route Segment 26 (Segment Alternatives HJ-1, HJ-2, IJ-1 and IJ-2) ; and Galaxy 14 on St. Bridget's Road SE is between Route Segments 9P and 29 (all segment alternatives in the 11th Avenue SW to DRS comparison area). Bus routes that serve these stops may be affected by construction, as increased traffic could cause temporary, short-term delays in service and increased wait times.

The proposed project is not anticipated to impact the planned development or expansion at the Rochester International Airport. The Zip Rail corridors recommended for further consideration cross Route Segment 2P (Segment Alternative BC-1) at Trunk Highway 14.[97] Development of the Zip Rail project will require coordination between federal, state and local agencies, organizations, and shareholders, including the Applicant.

5.3.8 Public Services

The ROI for public services is Olmsted County. Olmsted County provides many public services to its communities, including public safety and emergency management services, highway construction and maintenance, public health care programs, land management, and park maintenance. The City of Rochester provides public services within City limits, including public transportation, public safety and emergency management services, stormwater and wastewater management, and the Rochester Public Library.

The Von Wald Group Home, located on County Road 8 SW between 42nd Street SW and 48th Street SW, is a youth group home located on registered school land. The Home is part of the Olmsted County Sheriff's Youth Program of Minnesota and is licensed by the Minnesota Department of Corrections.

Impacts and Mitigation

Impacts to public services are anticipated to be minimal. Short-term, temporary impacts may include delays to emergency services response times and delays to public transportation. All segment alternatives would have similar impacts. Section 5.5.4 of the Generic Route Permit requires the permittee to minimize disruption to public services during construction of the proposed project. The Applicant indicates it will coordinate with the appropriate County and City departments. The proposed project will not result in long-term impacts on public services in Olmsted County or the City of Rochester.

Route Segment 5P (Segment Alternatives EF-1 and EG-1) runs adjacent to the Von Wald Group Home. Short-term, temporary impacts from construction experienced at the group

[97] MnDOT (2015) *Final Scoping Decision Document for Rochester-Twin Cities Passenger Rail Corridor Investment Plan and Tier 1 EIS (Zip Rail)*. Saint Paul, Minnesota.

home would be similar to those experienced at residential homes, including potential noise and traffic delays during construction. As with any project, the construction crew would immediately respond to allow public safety and emergency personnel access to the Group Home. The Group Home would not experience any long-term or permanent impacts.

5.3.9 Noise and Vibration

The ROI for noise is the Project Area. Noise is generally defined as unwanted sound. Noise is measured in units of decibel on a logarithmic scale. Human hearing is not equally sensitive to all frequencies of sound, so certain frequencies are given more weight. The A-weighted decibel scale (dBA) is used to emphasize the range of sound frequencies most audible to the human hear, those between 1,000 and 8,000 cycles per second.

MPCA has established standards for the regulation of daytime and nighttime noise levels for noise sensitive areas using noise area classifications (NACs) that are based on the land use at the location of the person that hears the noise: residential, commercial, and industrial. [98] They are also based on the sound level in decibels (dBA) over ten percent (L_{10}), or six minutes, and fifty percent (L_{50}), or thirty minutes, of an hour (**Table 5-2**).

Table 5-2. Minnesota State Noise Standards[99]

Code	Daytime (7 a.m. – 10 p.m.) dBA		Nighttime (10 p.m. – 7 a.m.) dBA	
NAC 1	L_{10} of 65	L_{50} of 60	L_{10} of 55	L_{50} of 50
NAC 2	L_{10} of 70	L_{50} of 65	L_{10} of 70	L_{50} of 65
NAC 3	L_{10} of 80	L_{50} of 75	L_{10} of 80	L_{50} of 75

Residential locations (NAC 1) have the most restrictive noise limits; L_{10} = 65 dBA and L_{50} = 60 dBA during the daytime and L_{10} = 55 dBA and L_{50} = 50 dBA during the nighttime. This means that during the one-hour monitoring period daytime noise levels cannot exceed 65 dBA for more than 10 percent of the time (six minutes) and cannot exceed 60 dBA more than 50 percent of the time (30 minutes). Intermittent noises such as horns, sirens, or back-up beeps, while disruptive, rarely violate state noise standard because they are too short in duration to affect monitoring results for L_{10} and L_{50} standards. Other receptor types, such as retail, business and government services, recreational activities, and transit passenger terminals (NAC 2) and manufacturing, and agricultural activities (NAC 3) are also located in the Project Area. However, the noise limits for these receptors are less restrictive.

Chapter 85 of the Rochester City Ordinances (city ordinances) addresses noise, but does not include specific time or decibel restrictions. City ordinances provide that “no person shall make, continue, or cause to be made or continued any loud, unnecessary or unusual noise which unreasonably annoys, disturbs, injures or endangers the comfort, convenience, safety, health, welfare or repose of persons in the vicinity thereof, unless the making, continuing, or causing to be made or continue of such noise cannot be prevented and is necessary for the

[98] A Guide to Noise Control in Minnesota, Minnesota Pollution Control Agency, November 2015
[99] Minnesota Pollution Control Agency. 2015. A Guide to Noise Control in Minnesota. November. https://www.pca.state.mn.us/sites/default/files/p-gen6-01.pdf.

protection or preservation of property or of the health, safety, life or limb of some person".[100]

Table 5-3 provides a summary of typical noise levels for various activities as a comparison for noise levels expected for the proposed Project.

Table 5-3. Typical Noise Levels[101]

Common Outdoor Activities	Noise Level dB(A)	Common Indoor Activities
	-110-	Rock Band
Jet Fly-over at 1000 feet		
	-100-	
Gas Lawn Mower at 3 feet		
	-90-	
Diesel Truck at 50 feet, at 50 mph		Food Blender at 3 feet
	-80-	Garbage Disposal at 3 feet
Noisy Urban Area (Daytime)		
Gas Lawn Mower at 100 feet	-70-	Vacuum Cleaner at 10 feet
Commercial Area		Normal Speech at 3 feet
Heavy Traffic at 300 feet	-60-	
		Large Business Office
Quiet Urban Daytime	-50-	Dishwasher Next Room
Quiet Urban Nighttime	-40-	Theater, Large Conference Room (Background)
Quiet Suburban Nighttime		
	-30-	
Quiet Rural Nighttime		Library
	-20-	Bedroom at Night, Concert Hall (Background)
	-10-	Broadcast/Recording Studio
Lowest Threshold of Human Hearing	-0-	Lowest Threshold of Human Hearing

In contrast to airborne noise, ground-borne vibration is not a phenomenon that most people experience every day. Generally, the background vibration level in residential areas is usually 50 vibration decibels (VdB) or lower. This is well below the threshold of perception for humans, which is around 65 VdB.

Most perceptible indoor vibration is caused by sources within buildings such as operation of mechanical equipment, movement of people or slamming of doors. Typical outdoor sources of perceptible ground-borne vibration are construction equipment, steel-wheeled trains, and

[100] Chapter 85.10 of the City of Rochester, Minnesota City Ordinances.
[101] California Dept. of Transportation Technical Noise Supplement, Oct. 1998, Page 18.

traffic on rough roads. If the roadway is smooth, the vibration from traffic is rarely perceptible.

Although the perceptibility threshold is about 65 VdB, human response to vibration is not usually significant unless the vibration exceeds 70 VdB. One of the major problems in developing suitable criteria for ground-borne vibration is that there has been relatively little research into human response to vibration, in particular, human annoyance with building vibration. Because of this, no specific vibration standards exist.

Impacts and Mitigation

Impacts to noise are anticipated to be minimal. Impacts will be short-term and temporary, would be of a relatively small size, and would not affect any unique resources. Noise and vibration impacts would be similar for all routes and segment alternatives. The primary noise impacts associated with the proposed project would result from project construction. These impacts would be short-term and temporary. No long-term noise impacts are anticipated. Vehicle noise generated during routine inspections and maintenance activities would be negligible. Section 5.5.6 of the Generic Route Permit requires the permittee to comply with the MPCA's noise standards and limit construction activities to daytime hours, as defined in Minnesota Rule 7030.0010 to 7030.0080, to the extent practicable.

Construction noise is highly variable because the equipment operating at any location changes with each construction phase. Moreover, construction equipment generally operates intermittently. Therefore, sound level impacts on noise-sensitive areas, such as residences, churches, and schools, along the pipeline right-of-way due to construction activities would depend on the type of equipment used, the duration of use for each piece of equipment, the number of construction vehicles and equipment used simultaneously, and the distance between the noise source and receptor. Construction equipment would be operated on an as-needed basis during daylight hours. The most prevalent sound source during construction is anticipated to be the internal combustion engines of construction equipment (75 to 100 dBA at 50 feet). Site grading would be expected to result in the highest construction noise due to multiple pieces of equipment operating simultaneously.

Pipeline construction noise will result in short-term impacts as construction activities move along the right-of-way. During construction, worst-case conditions for noise will occur when multiple pieces of equipment are used simultaneously. Noise impacts would be intermittent and limited to short periods at any one location. Due to the temporary nature of construction activities, no long-term noise effects are anticipated from construction.

Blasting may be required to excavate the pipeline trench where bedrock could be encountered at depths that interfere with conventional excavation or rock-trenching methods. Blasting would occur during daytime hours after notifying nearby residents and building inhabitants. Vibration would be controlled using charge size limits and charge delays that stagger each charge in a series of explosions. The contractor would perform pre-blast inspections, monitor ground vibrations at the nearest structure or well during blasting, and perform post-blast inspections as warranted. Based on these vibration control measures, construction vibration impacts on noise sensitive areas would be minor and temporary.

Certain project testing and start-up activities may require 24 hours of activity for limited time periods (presumably one to three days). Unmitigated water pump operation would generate

noise levels from 70 to 80 dBA at 50 feet; therefore, any noise sensitive areas within 400 feet could experience noise levels greater than an L_{dn} of 55 dBA[102]. Noise sensitive areas further than 400 feet would experience lower noise levels, but operation of the pumps may still be perceived. Noise sensitive areas may experience locally elevated noise levels during these activities. These impacts are unavoidable and may violate state noise standards; however, the effects would be temporary.

While the actual location of the Proposed TBS and Proposed DRS are still to be determined, the Applicant has indicated that the Proposed TBS and Proposed DRS will be designed and constructed consistent with industry standards to meet the applicable MPCA noise regulations described above.

Construction of the proposed project would add and relocate miscellaneous piping, valves, fittings, and meters, which could affect general flow noise. The Applicant would perform occasional maintenance or repair activities along the right-of-way and at TBS and DRS stations after construction. Maintenance and repair activities would be infrequent and would involve a limited number of vehicles and equipment. Given the temporary nature of construction and the infrequent nature of maintenance and repair activities, operational noise and vibration impacts on noise sensitive areas would be minimal.

The following are categories of mitigation measures for construction noise. Due to the interrelatedness of construction noise and vibration, some of these measures also apply for vibration resulting from construction activities. The Applicant indicates that at the time of construction, the project manager will determine the most appropriate mitigation measures to reduce impacts.

Design Considerations

Design considerations means including measures in plans and specifications to minimize or eliminate adverse impacts. The Applicant indicates that the proposed project's proximity to noise sensitive receivers were factors during design considerations.

Community Awareness

It is important for the public to be made aware of the possible inconvenience associated with noise impacts and to know the approximate duration so that the public has clear expectations of the impact, and so that they can plan their activities accordingly. The Applicant will submit information concerning the proposed project to all local news media.

Source Control

Source control involves reducing noise impacts from construction by controlling noise emissions at their source. This can be accomplished by specifying proper muffler systems, for example, as a requirement in plans and specifications or through established local noise ordinance requiring mufflers. Contractors generally maintain proper muffler systems on their equipment to ensure efficient operation and to minimize noise for the benefit of their own personnel as well as the adjacent receivers.

[102] Ldn - Day Night Average Sound Level. The Ldn is the average equivalent sound level over a 24 hour period, with a penalty added fornoise during the nighttime hours of 10:00pm to 07:00am. During the nighttime period 10 dB is added to reflect the impact of the noise.

Site Control

Site control involves the specification of certain areas where extra precautions are taken to minimize construction noise. One way to reduce construction noise impacts at sensitive receivers is to operate stationary equipment, such as air compressors or generators, as far away from the sensitive receivers as possible. Another method might be placing a temporary noise barrier in front of the equipment. As a general rule, good coordination between the project engineer, the contractor, and the affected receivers will help to make site control less confusing and is a more personal approach to minimize construction noise impacts in more noise-sensitive areas. The Applicant indicates that while site control is an option, no specific site-control specifications are anticipated at this time.

Time and Activity Constraints

Limiting working hours can reduce construction noise impacts. The Generic Route Permit filed by the Commission requires that most construction and maintenance activities will be limited to daytime working hours to the extent practicable to ensure nighttime noise level standards will not be exceeded. Exceptions could occur due to weather, schedule, and a time-related phase of construction work. Section 5.5.6 of the Generic Route Permit also requires, to the extent practicable, that construction activities be limited to the hours of 7:00 a.m. to 10:00 p.m.

5.3.10Aesthetics

The ROI for aesthetics is the Project Area. Aesthetics refers to the visual quality of an area as perceived by the viewer, and forms the overall impression an observer has of an area, that is, the individual's concern with, or appreciation of, beauty. Aesthetics are subjective, meaning their relative value depends upon the perception and philosophical or psychological responses unique to individual viewers. Impacts to aesthetics are equally subjective, and depend upon the sensitivity and exposure of an individual. The relative value of aesthetics, as well as perceived impacts to visual resources, can vary greatly between individuals.

The aesthetic character of the Project Area is primarily rural and semi-rural outside of Rochester—city outskirts and suburban—and increasingly urban towards the center of Rochester. Views experienced by residents and visitors include those from roadways, homes and businesses (including planned developments), Willow Creek Golf Course, and recreation areas. In rural areas, such as along county roads, agricultural fields and homesteads are the most common view. Semi-rural and suburban areas have views of residential developments and agriculture on the suburban edge. Recreation and conservation areas provide views of natural vegetation, including oak, willow, and cottonwood forested areas, and landscaped greenspace (for example, golf courses and open play fields). Views from roads, businesses, and residential apartments within the center of Rochester are of the urban landscape and views of the Zumbro River along the waterfront.

Impacts and Mitigation

Impacts to aesthetics are anticipated to be minimal. Visual impacts will be similar for all routes and segment alternatives. Temporary impacts to the visual environment will occur during construction when residents and travelers view large construction equipment, tree and vegetation clearing, and exposed soil areas. Unique resources will not be affected. Long-

term impacts will occur due to changes from forested to non-forested conditions. These impacts are of a small size and do not affect a unique resource; therefore, the impact intensity level is anticipated to be minimal. Restoration of vegetation to pre-construction conditions will occur after each phase of construction is complete. Grasses and forbs will be replanted consistent with landowner agreements. Short-term impacts include the removal of vegetation within the 100-foot construction area. Permanent impacts include maintenance of the 50-foot permanent right-of-way (continued removal of trees and shrubs).

5.4 Human Health and Safety

Construction and operation of natural gas pipelines has the potential to impact human health and safety.

5.4.1 Public Safety

The ROI for public safety is the Project Area. The USDOT Pipeline and Hazardous Materials Safety Administration (PHMSA) administers a national regulatory program to ensure the safe transportation of natural gas and other hazardous materials by pipeline. PHMSA 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 certain standards. 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.

The federal Office of Pipeline Safety (OPS), within PHMSA, has regulatory responsibility for hazardous liquid and gas pipelines under its jurisdiction in the United States. The OPS enforces the pipeline safety regulations for gas and hazardous liquid pipeline operators in Minnesota based on inspections performed by the State of Minnesota.

The State inspects and enforces pipeline safety regulations for intrastate gas and hazardous liquid pipeline operators in Minnesota. Also, by signed agreement with OPS, the State inspects interstate gas and hazardous liquid pipeline operators in Minnesota. This work is performed by MnOPS, a division of the Minnesota Department of Public Safety. MnOPS also enforces the state one-call laws under M.S. 216D and provides education on damage prevention.

Each operator in Minnesota has an operator ID that is used to track their reported data. Operators are responsible for maintenance and reporting on their pipelines and are subject to inspections and audits, as well as penalties if requirements are not met. Operators report to PHMSA at the federal level and to MnOPS at the state level. Each operator is required to report annually on the mileage of their pipelines, materials, leaks, incidents, and other topics. Additionally, MnOPS conducts yearly audits of operators.

The pipeline and aboveground facilities associated with the proposed project must be designed, constructed, operated, and maintained in accordance with the USDOT 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

USDOT specifies material selection and qualification; minimum design requirements; and protection from internal, external, and atmospheric corrosion.

The USDOT 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 five 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 on land in 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 require a minimum cover of 36 inches in normal soil and 24 inches in consolidated rock.

The USDOT prescribes 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.

Pipeline Accident Data

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

- cause a death or personal injury requiring hospitalization; or

- involve property damage of more than $50,000 (1984 dollars).[103]

During the 20-year period from 1996 through 2015, a total of 35 significant incidents were reported on the more than 30,000 total miles of natural gas distribution main lines in Minnesota.[104]

Table 5-4 provides a distribution of the causal factors as well as the number of each incident by cause.

Table 5-4. Natural Gas Distribution Pipeline Significant Incidents by Cause in Minnesota (1996-2015)[a]

Cause	Number of Incidents	Percentage
Corrosion	0	00.0
Excavation[b]	4	11.4
Pipeline material, weld or equipment failure	2	05.7
Natural force damage	13	37.1
Outside force[c]	7	20.0
Incorrect operation	3	08.6
All Other Causes [d]	6	17.1
Total	**35**	**100**

Notes:
[a] All data gathered from Pipeline and Hazardous Materials Safety Administration (PHMSA) Significant incident files, June 27, 2016
[b] Includes third-party damage
[c] Fire, explosion, vehicle damage, previous damage, intentional damage
[d] Miscellaneous causes or unknown causes

The primary cause of pipeline incidents are natural force damage. Natural force damage includes those types of incidents caused by acts of nature such as flooding, earthquakes, lightning, earth movement, landslides, and subsidence. Pipeline design and construction regulations require that operators identify, assess, and design for known geotechnical conditions and anticipated meteorological events. In addition, integrity management regulations require pipeline operators to conduct risk assessments on an ongoing basis to identify potential threats, including those associated with natural force damage, and once identified to implement preventive and mitigative measures to counteract these potential threats.

Outside force damage is the cause in 20.0 percent of significant pipeline incidents. These result from fire, explosion, vehicle damage, previous damage, and intentional damage.

Older pipelines have a higher frequency of outside force incidents partly because their location may be less well known and less well marked than newer lines. Table 5-5 shows the various causes of outside force incidents.

[103] $50,000 in 1984 dollars is about $115,609 as of June 2016 (United States Department of Labor - Bureau of Labor Statistics CPI Inflation Calculator, 2016).
[104] PHMSA Significant incident files, June 27, 2016.

Table 5-5. Outside Forces Natural Gas Distribution Pipeline Incidents by Cause in Minnesota (1996-2015)[a]

Cause	Number of Incidents	Percent of all Incidents
Other outside force damage[b]	1	14
Vehicle (not engaged with excavation)	3	43
Previous mechanical damage	2	29
Unspecified outside force damage	1	14
TOTAL	**7**	—

Note:
[a] All data gathered from Pipeline and Hazardous Materials Safety Administration (PHMSA) Significant incident files, June 27, 2016.
[b] Other outside force damage includes: vehicle or equipment contact not related to excavation, damage caused by accidents or fires from other businesses or industries that are nearby, vandalism, sabotage or terrorism.

Since 1987, operators have been required to participate in "One Call" programs to minimize damage from excavation activities in the vicinity of underground facilities, such as pipelines. The "One Call" program is a service used by public utilities and some private sector companies (for example, oil pipelines and cable television) to provide pre-construction information to contractors or other maintenance workers regarding the underground location of pipes, cables, and culverts.

Pipeline incidents data are summarized in **Table 5-5**. **Table 5-6** presents the average annual injuries and fatalities that occurred on natural gas distribution lines in Minnesota for the 5-year period between 2011 and 2015.

Table 5-6. Injuries and Fatalities – Natural Gas Distribution Pipelines in Minnesota[a]

Year	Injuries	Fatalities
2011	1	0
2012	0	0
2013	0	0
2014	0	0
2015	0	0

Note:
[a] All data gathered from Pipeline and Hazardous Materials Safety Administration (PHMSA) Significant incident files, June 27, 2016

Impacts and Mitigation

Direct impacts to human health and safety as a result of normal pipeline operations are anticipated to be minimal with the application of federal safety standards. Safety measures were discussed in **Section 3.6**; additional safety measures are discussed below. Potential impacts can be minimized.

The transportation of natural gas by pipeline does involve risk due to the potential for accidental release of natural gas. The greatest hazard is a fire or explosion following a pipeline rupture. Federal safety regulations have been developed to minimize risks associated with natural gas pipelines.

Methane, the primary component of natural gas, is colorless, odorless, and tasteless. It is buoyant at atmospheric temperatures and disperses upward rapidly in air. Methane is not toxic, but is classified as a simple asphyxiant.[105] 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 and 15 percent in air. An unconfined mixture of methane and air is not explosive; however, it may ignite if there is an ignition source. A flammable concentration within an enclosed space in the presence of an ignition source can explode.

The Applicant indicates it will incorporate the proposed project into its existing gas monitoring and control systems and maintain a monitoring system that includes a gas control center. A gas control center monitors system pressures, flows, and customer deliveries on its entire system. The center is continually staffed. The Applicant's gas control group and field operations group would remotely monitor and control the proposed facilities.

As required by federal regulations, the Applicant will be required to have a CP system installed and in operation and pipe-to-soil surveys performed. CP needs are determined based on soil resistivity, size of pipeline, length of main, and soil type. Based upon the requirements and pipe-to-soil readings, the Applicant will install anodes or a rectifier to protect the pipeline from corrosion. The Applicant indicates that it will require its corrosion technicians to measure pipe-to-soil readings at least once each calendar year (not to exceed 15 months between inspections) at established test points. The test points would be installed along the pipeline during construction. Technicians may increase inspection frequency when conditions warrant.

The USDOT requires that each operator establish and maintain a 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.

The Applicant indicates it will provide the appropriate training to local emergency service personnel before the pipeline is placed into service. No additional specialized local fire protection equipment would be required to handle a pipeline emergency.

5.4.2 Air Quality

The ROI for air quality is Olmsted County. The Project Area is entirely within Olmsted County, which is designated as in attainment with all National Ambient Air Quality Standards (NAAQS). Rochester is a maintenance area for sulfur dioxide (SO_2), meaning that it was previously (within the past 20 years) a nonattainment area for SO_2 (original 1971 SO_2 NAAQS). Rochester has been designated as attainment/maintenance for SO_2 since 2001.[106] The United States Environmental Protection Agency (EPA) uses 3 years of complete

[105] Simple asphyxiants are inert gases or vapors that displace oxygen in the ambient atmosphere. Simple asphyxiants pose a slight inhalation hazard due to oxygen deprivation.
[106] EPA 2016. SO_2 attainment/nonattainment status history, EPA, online attainment status data at https://www3.epa.gov/airquality/greenbook/anayo_mn.html

monitoring data to make NAAQS attainment/nonattainment designations. A continuous 3-year SO_2 monitoring dataset has not been available for Rochester for over two decades.[107] Two years of recent data[108] show 1-hour maximum concentrations of 3 parts per billion (ppb) in each of the last two calendar years, which is below the NAAQS of 75 ppb.[109]

Impacts and Mitigation

Impacts to air quality are anticipated to be minimal. Impacts would vary in duration, be of a relatively small size, and would not affect any unique resources. All segment alternatives would have similar impacts.

Short-term impacts would occur during construction. Air emissions during construction would primarily consist of emissions from both road and non-road construction equipment. These emissions will include carbon dioxide, mono-nitrogen oxides (NO_x), and particulate matter (for example, dust generated from earth-disturbing activities). Localized construction emissions would be dependent on weather conditions, the amount of equipment at any location at a given time, and the length of time equipment is in operation for a given construction phase. Emissions would occur in localized areas for short periods. During excavation, trenching, and other earthmoving operations, there would be a potential for windblown fugitive dust emissions. The impact from fugitive dust emissions can be mitigated by a variety of means, including watering, covering, or seeding exposed soils, or watering unpaved driving surfaces as-needed.

Pipeline operations are anticipated to result in minimal, long-term impacts to air quality. Minor vehicle emissions would occur during routine inspections and maintenance activities. Minor stationary source emissions will also occur at TBS and DRS sites due to routine use of natural gas-fired line heaters at the aboveground stations.

The purpose of the line heaters is to keep the natural gas temperature above 30°F, which prevents equipment freeze-up. The size of each line heater is not yet known, but the Applicant anticipates that the line heaters will be sized at less than 5 million British thermal units per hour (Btu/hour). Thus, each line heater will be below levels that trigger emission standards under New Source Performance Standards,[110] and will have emissions below federal and state air emissions permit thresholds. No other source point emissions are anticipated during operation of the proposed project; therefore, an air quality permit will not be required.

5.4.3 Hazardous Waste and Regulated Materials

The ROI for hazardous waste and regulated materials is a 500-foot buffer around the Project Area. Properties where hazardous waste or other regulated materials are stored, or have been previously stored, present a risk for spills or leaks. Contaminated or potentially

[107] The last one was in 1992-1994, per EPA's AirData database; EPA 2016. AirData online database, accessed July 13, 2016. https://www3.epa.gov/airdata/
[108] 2014 and 2015
[109] Ibid.
[110] The lower bound for NSPS applicability to indirect-fired heaters and boilers is 10 million Btu/hr, per 40 CFR 60, Subpart Dc

contaminated properties[111] are of concern for most construction projects because of the liability created for the company associated with acquiring such property, potential cleanup costs, and safety concerns during construction related to exposure to contaminated soil, surface water, or groundwater.

The use, storage, and cleanup of hazardous wastes and petroleum products are regulated by the EPA and MPCA. The MPCA's "What's In My Neighborhood?" (WIMN) database identifies information about air quality, hazardous waste, remediation, solid waste, tanks and leak sites, and water quality for regulated facilities and sites in Minnesota.[112] **Table B-35** summarizes, and **Figure 10** illustrates, the listings that were identified within 500 feet of the Project Area using the WIMN database.

The search identified 27 sites (excluding feedlots, wastewater discharge permits, and construction stormwater permits) within 500 feet of the Project Area. No onsite evaluation of the sites was conducted, nor was their locations field verified. The following rankings were then used to evaluate the potential for contamination based on the information available in the WIMN database and as defined below:

- **Low Potential for Contamination Sites** includes properties that are hazardous waste generators.
- **Medium Potential for Contamination Sites** includes properties with closed leaking underground or aboveground storage tanks (LUASTs), all parcels with underground or aboveground storage tanks (USTs or ASTs), all parcels with historic or current vehicle and/or auto body repair activities and petroleum use or storage, and unintentional hazardous materials release sites.
- **High Potential for Contamination Sites** includes all active and inactive Voluntary Investigation and Cleanup Program (VIC) sites, all active Petroleum Brownfields Program (PBP) sites, Minnesota Environmental Response and Liability Act (MERLA) sites, all heavy industry sites, all active and inactive dumpsites or landfills, all Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) sites, and all active LUAST sites.

Based on the above rankings, 11 low potential, 6 medium potential, and 1 high potential site was indicated within 500 feet of the Project Area.

Impacts and Mitigation

Potential impacts to route segments and the TBS sites are present based on a review of the listed sites summarized in **Table B-35.** This evaluation consists of a cursory search of the WIMN database and did not include a thorough regulatory database review or onsite review. Potential impacts that may occur during construction or operation of the proposed project can be more thoroughly identified through completion of a Phase I Environmental Site Assessment (ESA) and potentially Phase II ESA, once a final route is selected.

[111] Potentially contaminated sites include properties that may have been contaminated prior to the creation of major federal and state regulation and cleanup programs, and thus the contamination and/or cleanup status of these properties is not certain.
[112] Minnesota Pollution Control Agency (2016) "What's In My Neighborhood?" Database queried on June 24, 2016.

Impacts are anticipated to be of short duration, small size and minimal intensity. Section 5.5.23 of the Generic Route Permit requires that construction of the proposed project must comply with all laws applicable to the generation, storage, transportation, clean up, and disposal of all wastes generated during pipeline construction or right-of-way restoration. Impacts can be mitigated by avoiding hazardous sites within the route width.

5.5 Archaeological, Cultural and Historical Resources

The ROI for cultural, archaeological, and historical resources is a 1-mile buffer around the Project Area. The proposed project falls within the western portion of the Southeast Riverine Archaeological Region of Minnesota. The Southeast Riverine Archaeological Region covers the southeast portion of Minnesota and also extends into adjacent areas of Wisconsin and Iowa. This region was not glaciated during the Wisconsin Glacial Period, and the area is characterized by stream-dissected, level to gently rolling loess-covered Pre-Wisconsinan till plains, with a notable absence of natural lakes. The major river systems in the region extend west from the Mississippi River and include the Cannon, Cedar, Root, and Zumbro rivers.[113] The region contains extensive rock outcroppings of high quality flaking materials suitable for manufacturing stone implements. Chert (hard, dark opaque rock composed of silica) concentrations are found along the Mississippi River Valley and also just below the surface of less-dissected areas in the western part of the region.[114]

During the late Holocene epoch, elm, ash, and cottonwood forests lined the river lowlands, and maple, elm, and basswood occupied the uplands near the Mississippi River. Oak barrens and patches of oak groves were scattered across the western portion of the region. The middle of the region was open prairie.[115]

Subsistence resources during the late Holocene epoch would have included deer, elk, and bison in the uplands, and mussels, fish, and waterfowl in the rich bottomlands and surface waters. Edible plants would have included water lilies and other aquatic flora, as well as upland plants like prairie turnips. The Southeast Riverine Archaeological Region's favorable climate and extensive bottomlands fostered Woodland period horticulture.[116]

5.5.1 Summary of Known Resources

The Applicant completed a Phase Ia Report in July 2014 and updated the Phase Ia Report in June 2016. The purpose of the Phase Ia Report was to determine the location of previously recorded historic properties and surveys (archaeological surveys, archaeological sites, and architectural structures), and to assess the potential for the presence of as yet unrecorded archaeological resources. The Phase Ia Report evaluated an area that included a 1-mile buffer surrounding the Project Area. The Phase Ia Report is included in **Appendix I**.

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[113] Gibbon, Guy E., C.M. Johnson, and E. Hobbs. 2002. Minnesota's Environment and Native American Culture History. In A Predictive Model of Precontact Archaeological Site Location of the State of Minnesota. Edited by G. J. Hudak, E. Hobbs, A. Brooks, C. A. Sersland, and C. Phillips. Minnesota Department of Transportation, St. Paul. Available from: http://www.dot.state.mn.us/mnmodel/P3FinalReport/chapter3.html.
[114] Ibid.
[115] Ibid.
[116] Ibid.

Nine cultural resources investigations were identified within the Phase Ia Study Area and provide an overview of the nature and type of cultural resources that may be encountered during construction of the proposed project. The surveys were conducted for natural gas pipelines, a rail line, highway and road projects, an energy cooperative, a watershed project, and disposal site projects. Seven of the nine cultural resources investigations intersect the Project Area.

Archaeological Sites

The Phase Ia Report listed one previously-recorded precontact archaeological site lead (21OLab) and three previously-recorded precontact archaeological sites (21OL0012, 21OL0019, and 21OL0023). A 'site lead' is unofficial documentation (such as recollection by a landowner) of a potential site; whereas, a 'site' has actual documentation.

Site lead 21OLab includes precontact artifact scatter. Sites include two precontact lithic scatters (21OL0012 and 21OL0019) and a single Durst Stemmed projectile point associated with the Prairie Archaic Tradition (21OL0023). None of the previously-recorded site leads or sites has been evaluated for National Register of Historic Places (NRHP) eligibility. None of the site leads/sites intersect the Project Area.

The *2010 Archaeological Reconnaissance Survey of Olmsted County, Minnesota* report (2010 Olmsted County Report) provides an overview of all precontact sites identified in the county (as of 2010), additional site types that may be encountered, and probable site locations.[117] According to the 2010 Olmsted County Report, information and predictive modeling were compiled using existing Olmsted County site files, pedestrian survey, and shovel testing in specific locations throughout the county (MnDOT Mn/Model, and a geomorphological study). While field survey of the Project Area was not completed for this assessment, the information presented in the 2010 Olmsted County Report provides valuable information about potential precontact site types that may be encountered and their probable locations.

Previously recorded precontact archaeological sites within Olmsted County range from the Paleoindian Period to the Woodland Period. Paleoindian sites within Olmsted County include a single Clovis point with additional lithic materials (21OL0039), a cache of bifaces and flakes likely associated with Clovis (21OL0044), and an isolated lanceolate point (21OL0043). These three sites are situated on terraces along three different drainages and in proximity to waterway junctions. In addition, geomorphological testing suggests that archaeological deposits may be identified on low terraces, in vertical accretion alluvium on floodplains, and in organic sediment in wetlands.[118]

Previously recorded Archaic sites within Olmsted County are also found along drainages and waterways. Available data suggests that in addition to being proximal to water, Archaic sites appear to lie within areas that may not have experienced regular prairie fires. These sheltered areas would have supported trees and edible plants, and would have attracted

[117] Arzigian, C.M. and M. Kolb. 2011. 2010 Archaeological Reconnaissance Survey of Olmsted County, Minnesota. Report of Investigations Number 873. Mississippi Valley Archaeology Center at the University of Wisconsin-La Crosse. https://mn.gov/admin/assets/2010-Archaeological-Reconnaissance-Survey-of-Olmsted-County,-Minnesota_tcm36-187014.pdf
[118] Ibid.

wildlife. These resources would have provided raw materials and food sources, thereby attracting people. It is suggested that sheltered areas are situated to the east of landforms and waterways and, as the wind typically blows from west to east, the landform/water would provide a natural firebreak, thereby protecting areas to the east.[119] The previously recorded Woodland sites within Olmsted County are also located adjacent to waterways. In similar fashion to the previously recorded Archaic sites, the previously recorded Woodland sites are also near junctions of streams or creeks. While mounds have been recorded within Olmsted County, none have been field verified by a qualified archaeologist.[120]

Based on the 2010 Olmsted County Report, previously-recorded precontact sites are relatively small and many consist of single artifacts. Artifact counts appear generally low, with no site containing more than 200 artifacts and most having less than 20. This suggests that precontact sites within Olmsted County may be associated with resource procurement and temporary encampment as opposed to long-term habitation. As the Southeast Riverine Archaeological Region contains outcrops of high quality flaking materials, therefore most raw materials identified at sites in Olmsted County are local. In adjacent counties, large village sites have been identified and recorded suggesting that precontact peoples may have entered the Olmsted County area to retrieve raw materials and resources, but did not necessarily stay to set up long term habitation areas.[121]

Architectural Structures

The Phase Ia Report identified 19 previously-recorded architectural structures within the Phase Ia Study Area. Structures include farmsteads and individual buildings associated with farmsteads or homesteads, a school, a town hall, and a bridge. One of the 19 previously recorded architectural structures, the St. Mary's Hospital Dairy Farmstead (OL-CAS-003), is listed on the NRHP. The remaining 18 previously-recorded architectural structures have not been evaluated for the NRHP. Six of the previously recorded architectural structures are within the TBS 1D buffer. The St. Mary's Hospital Dairy Farmstead (OL-CAS-003) is approximately 0.60 miles south of the nearest project component (TBS 1D).

Architectural properties, such as historic standing buildings and built structures, can be found wherever conditions are suitable (as in the case of houses and homesteads on higher elevation sites and sites suitable for agriculture), or in areas where structures were necessary (such as a bridge crossing a river or stream, or a road through a swamp). As such, the abundance of architectural properties can only be broadly described. In general, these types of properties tend to be located in areas that have a built environment already, and/or are located adjacent to road, railroad, and water transportation routes. Architectural properties mainly include farmsteads, homes, businesses, civic facilities, religious facilities, and industrial facilities. The time periods represented by these properties run from the early Euro-American settlement period through the modern industrial development period.

Historic Sites

The Phase 1a report reviewed official Government Land Office (GLO) maps and historic plat maps to identify areas with potential for containing historical era cultural resources. The

[119] Ibid.
[120] Ibid.
[121] Ibid.

Applicant accessed GLO maps online through the Bureau of Land Management (BLM) website at http://www.glorecords.blm.gov. Historic archaeological sites may be present in locations where resources have been documented on GLO maps. These maps revealed no evidence of Euro-American settlement at the time of survey.[122] Natural features, including rivers, streams, and wetlands, are noted on these maps.

The Applicant accessed historic plat maps online through the University of Minnesota Library website at https://www.lib.umn.edu/borchert/ digitized-plat-maps-and-atlases and the Minnesota Historical Society website at http://greatriversnetwork.org Maps from the years 1896 (Geo. A. Ogle & Co.) and 1914 (The Farmer) were examined. Plats portray features associated with the historic development of the Phase Ia Study Area. Notable on these maps are the locations of schools, factories, homesteads, quarries, and railways. A detailed list of individual resources can be found in the Phase Ia Report included at **Appendix I**.

The Phase Ia Report revealed one previously-recorded historic period archaeological site lead (21OLw); a structural ruin within the Phase Ia Study Area. The structural ruin does not intersect the Project Area. The GLO map (1854) review revealed many natural features, but did not reveal any cultural resources. A review of early plat maps (1896 and 1914) identified trails, roads, rail lines, and multiple structures. Structures included individual residences and farmsteads as well as commercial properties, religious facilities, and educational facilities.

Historic archaeology properties mainly include abandoned farmsteads, abandoned homes, abandoned businesses, and facilities related to railroads. The time periods represented by these properties may run from the Contact Period through the Modern Industrial Development Period of the 1940s, 1950s, and 1960s. Historic archaeological properties tend not to follow the same patterns of distribution as other resources since environmental, engineering, and/or socio-cultural values that restrict other properties do not apply to historic archaeological properties. In general, these types of properties tend to be located along water, railroad, or road transportation routes. Their documented presence along existing railroad or transportation routes may be coincidental, as this is where most historic resource surveys have been conducted.

5.5.2 Impacts and Mitigation

Based on known resources, potential impacts to cultural resources are anticipated to be minimal with use of standard permit conditions. Because previously undiscovered resources may be encountered during construction.

Table B-56, **Table B-57**, **Table B-58**, **Table B-59**, and **Table B-60** provide summaries of the recorded sites that are located near the routes and segment alternatives. For further understanding of the existing recorded cultural resources in the Project Area please review the Phase Ia Report included in **Appendix I**.

While most of the Project Area has not been surveyed, the available data indicates that Paleoindian, Archaic, and/or Woodland period sites may be encountered within the Phase Ia Study Area. Site types may include lithic scatters and artifact scatters that may be associated with raw material procurement and short-term habitation.

[122] BLM 1854 General Land Office maps and historic plat maps

Sites in Olmsted County appear to be concentrated along drainages, and as the anticipated alignment transects multiple drainages, streams, and rivers there is a high probability of encountering precontact archeological sites in these areas. The Project Area contains three major stream crossings, Cascade Creek, Zumbro River and Willow Creek that are crossed by Segments 1P/10, 11/13 and 8P/26/28, respectively. The alluvial settings of these stream/river crossings may be conducive to burying and preserving archaeological deposits, indicating there is potential for encountering deeply buried archaeological sites. Additionally, precontact sites may be identified along uplands in areas with steep topography and deeply incised rivers.

Although no previously recorded historic archaeological sites are recorded and the number of previously recorded architectural properties is relatively low, there is a moderate to high potential to encounter historic resources within the Project Area. Resources of concern that may be encountered within the Project Area include:

- Archaeological sites on river terraces, the interfluve between major drainage systems, and near springs and spring fed streams
- Archaeological sites correlated with lithic resource procurement
- Archaeological sites on uplands in areas with steep topography and deeply incised rivers
- Deeply buried archaeological deposits
- Historic sites and/or structures associated with the railroad
- Historic sites and/or structures associated with early settlement of the area
- Historic and/or structures associated with the City of Rochester

A geomorphological assessment could identify these sites.

The proposed project falls under the purview of the Minnesota Field Archaeology Act and the Minnesota Historic Sites Act.[123] Prior to construction, the Applicant will be required to conduct appropriate cultural resource surveys in consultation with the State Historic Preservation Office. These surveys will likely include archaeological and/or other inventories and consideration of impacts to recorded historic properties.

Section 5.5.18 of the Generic Route Permit that workers be trained about the need to avoid cultural properties, how to identify cultural resources, and procedures to follow if cultural properties or resources are encountered during construction. All work would be conducted in accordance with *the State Historic Preservation Office (SHPO) Manual for Archaeological Projects in Minnesota*,[124] and the Secretary of the Interior's *Standards and Guidelines for Archaeology and Historic Preservation*.[125]

In the event of an unanticipated discovery during project construction, the Applicant indicates it will immediately halt all construction activity within a 100-foot radius of the discovery and implement interim measures to protect the discovery from looting and

[123] Minnesota Statutes, Chapter 138
[124] Anfinson, S. 2001. SHPO Manual for Archaeological Projects in Minnesota. Revised version. State Historic Preservation Office, St. Paul, Minnesota.
[125] National Park Service. 1983. Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation. National Park Service, Department of the Interior, Washington D.C. http://www.nps.gov/history/local-law/arch_stnds_0.htm

vandalism. The Applicant would then notify the proper authorities to determine appropriate actions.

5.6 Natural Environment

5.6.1 Geology

The ROI for geology is the Project Area. Olmsted County lies close to the edge of continental glaciers that covered much of Minnesota. The most recent glaciation (the late Wisconsonian Des Moines lobe about 25,000 to 10,000 years ago) stopped about 20 miles short of Olmsted County. As a result, the county is covered by loamy glacial till (unsorted sediment deposited by glaciers) developed into loam and clay loam soils.[126]

Within the northern-most two miles of the Project Area, the glacial till is covered with loess deposits (windblown sediments) and the depth to bedrock ranges between 50 and 150 feet (**Figure 11**).[127] The loess deposits are composed of silt material with some clay and fine sand.[128]

Thicker alluvium (material deposited by rivers or streams) and material deposited by glacial streams (terrace deposits) are found within the Project Area in the vicinity of the Zumbro River and Willow Creek. The alluvium material consists of sand and gravel deposited within stream channels overlain by silt and clay deposited by overbank flow. The terrace deposits are mainly sand and gravel that contain minor amounts of silt and clay.[129] The depth to bedrock along waterways extends up to 125 feet (**Figure 11**).[130]

In the southern portion of the Project Area, the thickness of sediment thins and bedrock exposures and shallow bedrock (less than 25 feet) become more common (**Figure 11**).[131] The shallowest bedrock, ranging between 10 to 60 inches below the surface, is found in the southern portion of the Project Area between 60th Ave SW and 11th Ave SW and south of 40th Street SW.[132]

Bedrock within Olmsted County is primarily made up of sedimentary rock including limestone (the Galena Group and Platteville Formation), shale (Decorah Shale and Glenwood Formation), sandstone (St. Peter Sandstone), and dolomite, a carbonate rock (Prairie du Chien) (**Figure 12**).[133] The presence of carbonate rocks (such as dolomite) and bedrock high

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[126] Hobbs, Howard. 1988. Surficial Geology. County Atlas Series. Atlas C-3, Plate 3. Minnesota Geological Survey.
[127] Olsen, Bruce. 1988. Depth to Bedrock and Bedrock Topography. County Atlas Series. Atlas C-3, Plate 4. Minnesota Geological Survey
[128] DNR. 2016. Rochester Plateau Subsection. Available from: http://www.dnr.state.mn.us/ecs/222Lf/index.html
[129] Hobbs, Howard. 1988. Surficial Geology. County Atlas Series. Atlas C-3, Plate 3. Minnesota Geological Survey.
[130] Olsen, Bruce. 1988. Depth to Bedrock and Bedrock Topography. County Atlas Series. Atlas C-3, Plate 4. Minnesota Geological Survey
[131] Olsen, Bruce. 1988. Depth to Bedrock and Bedrock Topography. County Atlas Series. Atlas C-3, Plate 4. Minnesota Geological Survey
[132] Rochester-Olmsted Planning Department 2014
[133] Olsen, Bruce. 1988. Bedrock Geology. County Atlas Series. Atlas C-3, Plate 2. Minnesota Geological Survey.

in calcite (such as limestone) make the development of karst features (including sinkholes) more common.[134] The stratigraphy, or layering, of the different bedrock formations is important in influencing the flow and filtration of groundwater throughout the Rochester area.

The uppermost bedrock along the majority of the Project Area includes limestone and shale from the Galena Group and Decorah, Platteville, and Glenwood Formations. Small portions near the end and beginning of the Project Area are underlain by the older St. Peter Sandstone and Prairie du Chien dolomite units.[135] The Decorah Edge geologic feature, as it relates to groundwater, is discussed further in **Section 5.6.3** and shown in **Figure 17**.

Karst features, such as sinkholes, caves, and springs, are commonly found in Olmsted County, where mildly acidic groundwater is slowly dissolving carbonate bedrock. Much of the Project Area lies in a low probability or low to moderate probability area for sinkholes. The Project Area crosses a high probability area for sinkholes near 50th Street SW between 55th Avenue SW and County Road 8, near Route Segments 16 - 20. The Project Area also passes areas with known sinkholes in Sections 28 and 29 (Township 106N, Range 14W) (**Figure 13**).[136]

Geologic resources include sand and gravel deposits and limestone. St. Peter Sandstone is the primary source of sand mined for commercial applications. Sand and gravel resources are also found in glacial terrace and alluvium deposits along the Zumbro River and a small portion of Willow Creek. Limestone bedrock from the Galena Group is mined for use as crushed rock (aggregate).[137] This resource is present in Sections 28, 29, and 30 (Township 106N, Range 14W) (**Figure 14**). See **Section 5.7.5** for additional information on mining economies.

Impacts and Mitigation

Impacts to geologic resources are anticipated to range from minimal to moderate moving from north to south within the Project Area. Potential impacts would vary in duration, be of a small size, and affect unique resources. Impacts can be mitigated, but some are unavoidable.

Impacts to geology could occur as a result of pipeline installation through shallow bedrock. **Table B-4** provides the length of pipeline in areas of shallow bedrock (less than 5 feet) by route (**Figure 11**). Impacts to geologic resources associated with segment alternatives are listed in **Table B-5**, **Table B-6**, **Table B-7**, and **Table B-8**. Additional impacts could occur in areas where the pipeline overlaps the Decorah Edge (**Figure 17**) if boring, ripping, or shattering of bedrock alters area hydrology through creation of a new, lower resistance pathway for groundwater movement (**Section 5.6.3**).

Unmapped sinkholes and underground cavities could be encountered during pipeline construction. The greatest potential for encountering sinkholes is between the Proposed TBS

[134] Alexander, E.C. and G. Maki. 1988. Sinkholes and Sinkhole Probability. County Atlas Series. Atlas C-3, Plate 7. Minnesota Geological Survey
[135] Olsen, Bruce. 1988. Bedrock Geology. County Atlas Series. Atlas C-3, Plate 2. Minnesota Geological Survey.
[136] Alexander, E.C. and G. Maki. 1988. Sinkholes and Sinkhole Probability. County Atlas Series. Atlas C-3, Plate 7. Minnesota Geological Survey
[137] Kuhns, M. 1988. Geologic Resources. County Atlas Series. Atlas C-3, Plate 9. Minnesota Geological Survey.

and County Road 8 in Route Segments 16-20 (Segment Alternatives EF-2, EF-3, and EG-2 through EG-8). Subsurface excavation in areas with shallow carbonate bedrock may uncover or exacerbate karst features. **Table B-5** through **Table B-8** provides the acreage of permanent right-of-way and construction right-of-way in areas of low to high probability for sinkhole formation (**Figure 13**).

During construction, the potential for impacts to geologic resources can be minimized by using ground penetrating radar analysis in areas of high probability for sinkhole formation to determine if sinkholes, underground cavities, and enlarged fractures are present prior to trenching. If these features are identified along the route, the pipeline can be relocated to avoid impacting the karst feature. If one of these features is inadvertently encountered during trenching, the pipeline can be rerouted and the feature repaired that limits further sinkhole formation and subsidence and reduces the potential for changes in groundwater flow (**Section 5.6.3**). (The Applicant would need to secure approval from the Commission and other agencies to construct any portion of the pipeline outside of the approved route.)

5.6.2 Soils

The Project Area is located in the Northern Mississippi Valley Loess Hills and the Eastern Iowa and Minnesota Till Prairies, Major Land Resource Areas.[138] The dominant soil orders in these areas are Alfisols and Entisols, and to a lesser extent Mollisols. Soils in the Project Area are generally loamy, moderately deep to very deep, well drained to very poorly drained soils formed in loess, which can vary from 30 feet thick on ridge tops to less than one foot thick along valley walls.

Six soil associations make up the Project Area (**Figure 15**).[139] Mt. Carroll-Otter-Joy, Mt. Carrol-Marlean-Arenzville and Port Byron-Timula-Chaseburg soil associations occur in the northwestern portion of Project Area between TBS 1D and the proposed TBS. These soil associations consist of soils formed in loess (wind-blown soil particles). They include well drained (Mt. Carroll, Port Byron, Chaseburg and Marlean) soils on summits and sideslopes, well drained (Timula) soils on narrow flood plains, moderately well drained (Arenzville) soils in floodplains, somewhat poorly drained (Joy) and poorly-drained (Otter) soils in drainages. Most areas containing these soil associations are used for agriculture. However, erosion is a concern in steeper areas with Mt. Carroll and Marlean soils.[140]

The Waukee-Radford-Kalmarville soil association is dominant along the waterways in the Project Area.[141] This soil association is formed in sandy, silty, or loamy material from terraces or outwash plains. It includes the well-drained Waukee soil on stream terraces, and the somewhat-poorly drained Radford soil and poorly drained Kalmarville soil on floodplains along streams. Most areas containing these soil associations are used for agriculture;

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[138] Natural Resources Conservation Service (NRCS). 2006. Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin. United States Department of Agriculture Handbook 296.
[139] NRCS September 18, 2015.Web Soil Survey Olmsted County, Minnesota (MN109). United States Department of Agriculture, Natural Resources Conservation Service.
[140] National Cooperative Soil Survey. 1980. Soil Survey of Olmsted County Minnesota. Available from: http://www.nrcs.usda.gov/Internet/FSE_MANUSCRIPTS/minnesota/olmstedMN1980/olmstedMN1980.pdf
[141] National Cooperative Soil Survey. 1980. Soil Survey of Olmsted County Minnesota. Available from: http://www.nrcs.usda.gov/Internet/FSE_MANUSCRIPTS/minnesota/olmstedMN1980/olmstedMN1980.pdf

however, key concerns are droughtiness in the Waukee soils and wetness of the Radford and Kalmarville soils.[142]

The southeastern half of the Project Area, between the proposed TBS and the proposed DRS are dominated by of soils of the Rockton-Channahon-Atkinson and the Racine-Floyd-Maxfield associations. The Rockton-Channahon-Atkinson Association is formed in clay material overlaying shallow bedrock. Soils in this association are well-drained and generally occur on headslopes, sideslopes, rises, and knolls. Most of this association is used for agriculture; shallow bedrock and erosion on steeper areas are primary concerns. The Racine-Floyd-Maxfield Association is formed in loamy or silty material and in glacial till. This soil association includes well to moderately well drained Racine soils on summits and sideslopes, somewhat poorly drained Floyd soils above drainages, and poorly-drained Maxfield soils in drainages. Most of the soil association is farmed. As with other soil associations in the Project Area, erosion is a key concern. [143]

More than half of the soils in the Project Area are designated Prime Farmland, which is defined by the best combination of physical and chemical characteristics for the production of agricultural crops (**Figure 16**). Approximately 10 percent of the soils in the Project Area are designated Farmland of Statewide Importance, defined as land other than Prime Farmland that has a good combination of physical and chemical characteristics for the production of crops. Approximately 14 percent of soils in the Project Area are designated Prime Farmland if drained. [144] Approximately 30 percent of soils in the Project Area are hydric soils and 20 percent are highly erodible lands.[145]

Impacts and Mitigation

Direct impacts to soils along the various segment alternatives are anticipated to be minimal. Impacts are of a relative small size, and do not affect a unique resource. All route and segment alternatives would have similar impacts on soils. Impacts can be mitigated.

All segment alternatives would impact comparative amounts of designated Prime Farmland and highly erodible land. Temporary impacts to soils within the construction area may include soil compaction, soil erosion, and introduction of rock into the topsoil. Following construction and restoration, impacts on soils could continue to occur as a result of poor vegetative regrowth following restoration leading to continued erosion and loss of soil productivity resulting from the mixing of topsoil.

Section 5.5.8 of the Generic Route Permit requires that precautions be taken to minimize the mineral topsoil and subsoil unless otherwise negotiated with the landowner. Section 5.5.9 of the Generic Route Permit also requires that compaction of agricultural lands will be minimized and mitigated in accordance with the Agricultural Mitigation Plan (AMP).

Direct impacts to soils within the TBS 1D, Proposed TBS, and Proposed DRS footprints are significant. These soils would be permanently impacted by construction and operation of the

[142] Ibid.
[143] Ibid.
[144] NRCS September 18, 2015.Web Soil Survey Olmsted County, Minnesota (MN109). United States Department of Agriculture, Natural Resources Conservation Service.
[145] Ibid.

proposed facilities as a result of conversion to an industrial facility. Impacts are of a small size and do not affect a unique resource, but are unavoidable. Within a regional context, the overall impact intensity level of converting these soils to industrial use is minimal.

Table B-9 provides a summary of impacts to soil resources by route. Impacts to soil resources associated with the segment alternatives are listed in Table B-10, Table B-11, Table B-12, and Table B-13.

During construction, impacts to soils can be minimized though the implementation of BMPs. These include development of a required erosion control plan (SWPPP) pursuant to the MPCA NPDES Construction Stormwater Discharge Permit and Minnesota Rule 7852.3600. Temporary erosion controls, such as slope breakers, trench breakers, mulching, straw bales, and silt fences, can be installed as identified in the SWPPP to minimize soil erosion and sedimentation.

Track-out of soil onto public roads can be minimized by installing rock tracking pads at points of concentrated egress as well as sweeping road surfaces clear of soil as required by the SWPPP. Section 5.5.7 of the Generic Route Permit requires that erosion and sedimentation be minimized. BMPs include topsoil segregation, compaction alleviation, removal of excess rock from topsoil, and restoration of agricultural drainage systems. All BMPs will be installed and executed by the contractor consistent with the SWPPP and AMP. After the trench is backfilled, cleanup and restoration of the construction easement would occur in compliance with NPDES permit requirements. Any remaining construction related debris and surplus materials will be removed, with debris disposed of at a licensed waste management facility.

Following construction, locations impacted by the proposed project would be returned as closely as possible to pre-construction conditions in accordance with applicable permit requirements, landowner agreements, and Minnesota Rule 7852.3600 “Permit Conditions for Right-of-Way Preparation, Construction, Cleanup, and Restoration.” Restoration efforts can include: ground stabilization using erosion control devices; restoration of pre-construction contours; installation of permanent slope breakers on slopes; repair of drain tiles damaged during construction; and re-vegetation of areas disturbed by construction through the application of seed, mulch, fertilizer, and/or erosion control matting in accordance with permit requirements and landowner agreements. Permanent slope breakers are intended to reduce runoff and divert water off of the right-of-way to a stable area. Slope breaker spacing would be based upon the slope grade. The Applicant proposes to use an Environmental Inspector (EI) during construction and restoration as needed to ensure compliance with environmental requirements and Route Permit conditions.

The project site would be monitored in accordance with the MPCA NPDES Construction Stormwater Discharge Permit until the proposed Project was stabilized and vegetation was reestablished. Temporary erosion control measures would be removed after successful ground stabilization and re-vegetation. After restoration is complete, the Applicant must obtain a signed damage release form from affected landowners indicating that cleanup and restoration had been satisfactorily completed.

5.6.3 Groundwater Resources

The ROI for groundwater resources is the Project Area. Groundwater in the Project Area is characterized by an upper aquifer separated from a lower aquifer by a relatively low permeability layer of shale. Wells used for drinking water and water supply in the Project Area are mainly completed in the upper aquifer (where present) and the lower St. Peter-Prairie du Chien-Jordan aquifer. Sand and gravel layers found in the glacial till and deeper bedrock units are also locally occurring sources of groundwater.

The upper aquifer occurs in carbonate bedrock of the Galena Group and only occurs in the southeastern portion of the Project Area (**Section 5.6.1** and **Figure 12**). The aquifer occurs in bedrock of karst limestone and dolomite, and groundwater is stored in and moves rapidly through fractures and caverns formed as mildly acidic groundwater dissolves the carbonate bedrock. Where dissolution features are less common, groundwater moves more slowly through smaller fractures in the bedrock. Groundwater flow in this unit is north to northeast towards the City of Rochester.[146] Due to the shallow depth of the upper aquifer and the relatively rapid movement of water, the upper aquifer is highly sensitive to groundwater pollution.

Bedrock in the Decorah-Platteville-Glenwood units act as a confining layer that hydraulically separates the upper carbonate aquifer from the underlying St. Peter-Prairie du Chien-Jordan aquifer (**Figure 12**). This sequence of rocks is 80 feet thick. Though the Platteville is a limestone with dissolution features, it is "sandwiched" by the Decorah and Glenwood shale, which are low permeability units. Locations where the Decorah-Platteville-Glenwood units are the first encountered bedrock, where the depth to bedrock is less than 25 feet deep, and where the Decorah abuts the Cummingsville Formation are classified as the "Decorah Edge" (**Figure 17**).

The Decorah Edge is a geologic feature associated with groundwater discharge from the upper carbonate aquifer, water filtration, and movement of water back into the subsurface and into the lower St. Peter-Prairie du Chien-Jordan aquifer. Rochester and Olmsted County have adopted ordinances protecting the Decorah Edge and Edge Support Areas (non-wetland areas with features associated with perched groundwater tables, groundwater discharge, or groundwater supported wetlands) because this type of geologic formation is sensitive to potential groundwater pollution. The Project Area overlaps the Decorah Edge and Edge Support Areas in the southwestern and southeastern portions of the pipeline route along 70th Avenue SW near CSAH 25, 60th Ave SW near 40th Street SW, and 48th Street SW near the interchange with US Highway 63, as illustrated in **Figure 17**.

The lower St. Peter-Prairie du Chien-Jordan aquifer occurs in sandstone and dolomite bedrock of the St. Peter Sandstone and Prairie du Chien dolomite units. The aquifer is heavily pumped and supplies most of the groundwater for domestic and municipal supply for Rochester. Groundwater flow in this unit is similar to the upper carbonate aquifer and is

[146] Kanivetsky, Roman. 1988. *Bedrock Hydrogeology*. County Atlas Series. Atlas C-3, Plate 5. Minnesota Geological Survey

north to northeast towards Rochester.[147] The St. Peter-Prairie du Chien-Jordan aquifer is the first aquifer encountered in the northwestern portion of the Project Area.

With the exception of the northern portion of the Project Area (TBS 1D to Proposed TBS), which is underlain with a thick sequence of glacial till, the majority of the Project Area is classified as having high to very high geologic sensitivity to pollution due to the shallow depth to bedrock and low potential for soil filtration (**Figure 18**). High sensitivity to pollution means that contaminants at the surface can take anywhere from weeks to years to reach the underlying aquifer, whereas a very high sensitivity means contaminates can take anywhere from hours to months to reach the underlying aquifer. A thin cover of glacial till and a network of dissolved fractures and voids in the underlying carbonate bedrock results in faster travel times (residence time) for contaminants to impact drinking water.[148]

Impacts and Mitigation

Direct impacts to groundwater resources are anticipated to be short-term and minimal provided that preconstruction surveys are completed. The Decorah Edge contains resources that are unique, on a state-wide basis, but are not uncommon in the Project Area. Route Segments 3P, 4P, 9P, 11, 12, 18, 24, and 26-29 travel through the Decorah Edge.

Direct impacts to groundwater resources could occur if pipeline installation through shallow bedrock alters the flow of groundwater by creating a new, lower resistance pathway for groundwater movement. Impacts to groundwater quality could also occur as a result of temporary surface construction activities within areas, such as the Decorah Edge, that have been identified as serving important water filtration functions. **Table B-1, Table B-37, Table B-38, Table B-39 and Table B-40** provide detail on the length of each route alternative and segment alternative within the Decorah Edge feature (**Figure 17**).

Additional direct impacts to groundwater quality could occur as a result of a spill or leak of fuels or hazardous materials associated with construction or maintenance equipment if not cleaned up immediately. The impact of a spill or leak would be most severe in areas classified as having high to very high sensitivity to groundwater pollution (**Figure 18**). All of the segment alternatives between the Proposed TBS and DRS travel through areas that have high to very high sensitive to groundwater pollution. The presence of karst features could speed up travel times, because sinkholes, enlarged fractures, and conduits allow for much faster movement than through open pore space. **Table B-1** provides detail on the acreage of the permanent right-of-way and construction area for each route within areas of high to very high sensitivity. Proximity to sinkholes and karst features is discussed in **Section 5.6.1**.

To prevent spills and to minimize impacts to groundwater quality in the event of a spill, the Applicant indicates it will develop and implement a spill response plan to immediately clean spills. The Applicant indicates that specific requirements for construction crews to report and to respond to fuel spills and other accidental releases would be specified in the construction contract documents. The Applicant will share their hazard and mitigation

[147] Kanivetsky, R. 1988. *Bedrock Hydrogeology*. County Atlas Series. Atlas C-3, Plate 5. Minnesota Geological Survey.
[148] Olsen, B. and H. Hobbs. 1988. *Sensitivity of the Ground-Water System to Pollution*. County Atlas Series. Atlas C-3, Plate 6. Minnesota Geological Survey.

strategies with Olmsted County Sheriff Department, City of Rochester Emergency Management Department, and Rochester-Olmsted Planning Department. In addition, the Applicant would provide GIS shapefiles of the as-built pipeline route and right-of-way to the aforementioned departments and to the Commission, as required by the Route Permit.

Changes in groundwater flow in the Decorah Edge overlay area can be mitigated by (1) minimizing grading, (2) vegetating and controlling erosion, and (3) installing trench breakers or seep collars around the pipeline as necessary to control preferential groundwater movement along the pipe. Trench breakers are typically installed on steep slopes to minimize subsurface erosion within the trench along the pipe. Trench breakers are constructed from the bottom of the trench to near the surface, and spacing is based upon the slope grade. Temporary erosion controls measures would be properly maintained throughout construction, as necessary, until permanent measures are established per the permit conditions.

5.6.4 Surface Water Resources

The ROI for surface water resources is the Project Area. The Project Area includes portions of five minor watersheds, which include (generally listed from north to south) an unnamed agricultural drainage way, Cascade Creek, two South Fork Zumbro River sub-watersheds (which contain the South Fork Zumbro River itself, but no other major tributaries), and Willow Creek (**Figure 19**). The Project Area generally includes the upper portions of these watersheds, which are generally flat to rolling. Downstream and to the east of the Project Area, the topography of these watersheds transitions to small stream valleys as the waterways descend through the watershed towards the pronounced bluff country to the east. The process of erosion has formed somewhat prominent bluff lines, which delineate the boundaries between watersheds. Waterways draining these watersheds are ditched or curved and generally occupy flat, low-lying riparian corridors. All five minor watersheds are located within the Zumbro River major watershed, which drains into the Mississippi River to the east of the Project Area.[149]

The Project Area includes five waterways mapped on the Public Waters Inventory (PWI) by the DNR (**Figure 19**).[150] These PWI streams, from north to southeast, are two unnamed intermitted streams crossed by Route Segments 1P, 2P, and 10; Cascade Creek crossed by Route Segments 3P and 11; the South Fork Zumbro River crossed by Route Segments 3P and 11, and Willow Creek crossed by Route Segments 9P, 26, 27 and 28. **Figure 2** provides a more detailed look at these waterways. No PWI lakes are present in the Project Area.

The Project Area includes an unnamed intermittent stream (M-034-071-002), which is mapped as a PWI, in the northeast quarter of Section 25, Kalmar Township (Township 107 N, Range 15 W).[151] Two crossing locations, both located south of 19th Street NW between 60th Avenue NW and 70th Avenue NW, were evaluated. This intermittent stream originates at an unnamed impoundment that is located approximately 2,500 feet upstream from the

[149] MERC. November 3, 2015. Application. p. 31.
[150] Public waters are lakes, wetlands, and watercourses over which DNE Waters has regulatory jurisdiction under Minnesota Statute 103G.005 Subdiv. 15. DNR. 2008. Public Waters Inventory (PWI) Watercourse Delineations. Minnesota DNR - Division of Waters. St Paul, MN.
[151] Ibid.

crossing area, and follows a channelized ditch until it reaches a point south of 19th Street NW where it flows into a second unnamed intermittent stream. The pipeline would cross the stream within the channelized segment. The exact crossing location would depend on the route segment selected (Route Segment 1P versus Route Segment 10).

The Project Area includes a second unnamed intermittent stream (M-034-071-002-001) that is mapped as a PWI associated with the Kalmar Impoundment in the southwest quarter of Section 25 of Kalmar Township (Township 107 N, Range 15 W).[152] This stream originates at the culvert outlet on the east side of 70th Avenue NW. One crossing location (Segment 2P), located approximately 45 feet downstream on the west side of 70th Avenue NW, was evaluated. On aerial photography, the stream channel in this location appears undefined within an emergent wetland.

The Project Area includes Cascade Creek (M-034-071) in the northwest quarter of Section 12 of Salem Township (Township 106 N, Range 15 W).[153] Two crossing locations were evaluated; both would occur east of 70th Avenue NW, although the exact location would depend on the route segment used (Route Segment 3P versus Route Segment 11). Route Segment 11 would cross Cascade Creek in a location that has been mostly cleared of woody vegetation. Route Segment 3P would cross Cascade Creek directly adjacent to 70th Avenue SW in a narrow area that is mostly cleared of woody vegetation. Cascade Creek follows a natural course upstream and downstream from the crossing; a Minnesota Biological Survey (MBS) site of biological significance is located east of the crossings, but does not extend into either crossing area.

The Project Area includes the South Fork Zumbro River (M-034) in the southwest quarter of Section 13 of Salem Township (Township 106 N Range 15 W).[154] This crossing (Route Segment 12) would occur immediately west of 60th Avenue SW in a location where the forested riparian corridor is narrow when compared to the extent of riparian forests up and downstream from the crossing location.

The Project Area includes Willow Creek (M-034-073-001) in Section 26 of Rochester Township (Township 106 N, Range 14 W).[155] Three different Willow Creek crossing locations were evaluated based on different Route Segment Alternatives (Route Segment 8P, 26, or 27/28). The Route Segments 8P and 27/28 crossings would occur where the pipeline would parallel a road right-of-way (40th Street SW and 48th Street SW respectively). The Route Segment 26 pipeline crossing would occur in a location where the anticipated alignment does not parallel a road right-of-way. A narrow floodplain forest occupies the riparian corridor at the Route Segment 26 crossing location, which is approximately 270 feet wide, including the width of the stream channel. At the Proposed DRS, along Route Segment 9P, there is one MBS site, Rochester 24, adjacent to Willow Creek. Willow Creek is the northern border of the MBS site. This site was surveyed by the MBS in 1986. Field notes from that time reference a dense shrubby wetland with calcium carbonate mounds, bisected by a ditch with soils described as silt loam over sand. Further aerial photo review of the site show a ditched

[152] Ibid.
[153] Ibid.
[154] Ibid.
[155] Ibid.

field in agricultural use over most of the area; a smaller shrubby wetland complex appears to remain on the western side, surrounded by tilled land and a farm access road.

The Project Area includes the Willow Creek floodway/floodplain and MnDOT floodplain/floodway mitigation area along 40th Street SW and east of 11th Ave SW in Section 26 of Rochester Township (Township 106 N Range 14 W). A MnDOT levee/dike is located within the floodplain area east of Willow Creek near the 40th Street SW/US Highway 63 interchange.

Impacts and Mitigation

Direct impacts to surface water resources are anticipated to be short-term and minimal with use of general permit conditions, proposed construction practices, and BMPs. Impacts would be similar within the different comparison areas. Surface waters would be crossed using HDD. Aboveground facilities, including the TBS 1D, Proposed TBS, Proposed DRS, and the temporary storage yard would not be sited in waterbodies.

Direct impacts on surface waterbodies could occur as a result of construction activities associated with waterbody crossings. Table B-36 lists the number of waterbody crossings for the different routes. Segment alternatives for TBS 1D to the Proposed TBS, the Proposed TBS to County Road 8, County Road 8 to 11th Avenue SW, and 11th Avenue SW to the Proposed DRS are listed in Table B-37, Table B-38, Table B-39, and Table B-40, respectively.

The Applicant intends to minimize direct impacts on surface waterbodies by utilizing HDD to cross the streams. The Applicant will need to apply to the DNR for a License to Cross public waters for PWI crossings of the final permitted route. Selecting stream crossings in locations already impacted by adjacent infrastructure, such as existing roads or pipeline crossings, minimizes the number of locations where the stream corridor is interrupted by human disturbance. Route Segment 26 (Segment Alternatives HJ-2, and IJ-2) would cross Willow Creek in a location previously not impacted by adjacent infrastructure.

Use of HDD crossing methods for waterbody crossings could result in an inadvertent release of drilling fluids (a “frac-out”) that could temporarily affect water quality within the waterbody. A frac-out occurs when the drilling fluid (composed mostly of water and bentonite clay) finds pathways through natural fissures in the soil and rock along the drill path. Impacts on waterbodies from a frac-out would be primarily limited to increased turbidity. To minimize the potential impact from a frac-out, the Applicant would develop a frac-out response plan which would detail the actions necessary for monitoring, containment, and clean up.

5.6.5 Wetlands

The ROI for wetlands is the Project Area. The rolling topography and highly developed network of bluffs and stream valleys mostly restrict wetlands to the low elevations of stream valleys and along riparian corridors. As a result, most National Wetlands Inventory (NWI) wetland crossings are associated with water crossings. Most wetlands are relatively narrow and restricted to the immediate vicinity of the waterway. Table B-41 summarizes, and

Figure 19 illustrates, the wetland types identified within the Project Area.[156] Similar wetlands are expected to be crossed by the route alternatives.

The largest wetland within the Project Area is a relatively broad freshwater emergent wetland immediately south of Willow Creek. The wetland is crossed by Route Segment 9P (Segment Alternatives HJ-1, HJ-2, IJ-1 and IJ-2) at the eastern end of the Project Area near the Proposed DRS. This wetland is the same shrubby wetland complex mapped as moderate quality by the MBS as Rochester 24. The Route Segment Alternative across this MBS feature was selected by the Applicant based on consultation with DNR staff.[157] The vegetation section (Section 5.6.6) contains a more detailed discussion of the plant community in this area.

Two calcareous fens, Rochester 23 and Marion 30, were identified within 1 mile of the Project Area (Figure 19). Marion 30 fen is located north of 45th Street SE and west of County Road 1, within the buffer area for the Proposed DRS, within a 10 acre area of wet prairie/wet meadow wetland complex. Rochester 23 fen is located about 0.5 mile north of 40th St SW and east of 18th Ave SW. The Rochester 23 fen is located on the toe of slope atop a Decorah Shale outcrop.[158]

Impacts and Mitigation

Direct impacts to wetlands are anticipated to be short-term and minimal, and unique resources would not be affected. Wetlands would be crossed by HDD or trenching. Sections 5.5.12 and 5.5.21 of the Generic Route Permit require certain mitigation measures be followed.

The Applicant indicates that aboveground facilities, including the TBS 1D, Proposed TBS, Proposed DRS, and the temporary storage yard would not be sited in wetlands. No PWI wetlands are present in the Project Area. Wetland crossings associated with segment alternatives for TBS 1D to the Proposed TBS, the Proposed TBS to County Road 8, County Road 8 to 11th Avenue SW, and 11th Avenue SW to the Proposed DRS are listed in Table B-37, Table B-38, Table B-39, and Table B-40, respectively.

Direct impacts on wetlands could occur as a result of pipeline construction activities. These impacts would be short-term. Specifically, construction using the traditional trench method would require excavation and fill, meeting the definition of an impact under both the Minnesota Wetland Conservation Act and the United States Army Corps of Engineers Section 404 permit. Wetland impacts could be avoided by using HDD to install the pipeline. The Applicant has committed to crossing the wetland located within Route Segment 9P (Segment Alternatives HJ-1, HJ-2, IJ-1 and IJ-2) at the southeastern end of the Project Area using HDD and thus no impacts are anticipated at that location.

Additional impacts may occur as a result of vegetation clearing. It will be necessary to clear woody vegetation in shrub and forested wetlands to allow for routine surveys required during operation and maintenance. Leak surveys, in particular, require that the right-of-way be clear of woody vegetation to be completed properly. Removing woody vegetation within these

[156] USFWS. 2003. National Wetlands Inventory. Downloaded 2014.
[157] See Appendix A.
[158] DNR. June 22, 2016. *Natural Heritage Information System*. Minnesota Department of Natural Resources, Division of Ecological and Water Resources.

areas will not reduce overall wetland acreage, but will convert the wetland to a different vegetation community and wetland type. The Applicant indicates that any wetlands, or portions thereof, that will be converted from forested to non-forested wetlands as a result of vegetation clearing in the permanent right-of-way will be identified and reviewed by the United States Army Corps of Engineers to determine if any wetland mitigation is necessary.

The hydrology of wetlands would remain intact upon completion of the proposed project. The Applicant will need to complete a wetland delineation in order to confirm wetland locations and finalize the project design. If impacts are unavoidable, then the Applicant would need to work with regulatory agencies to obtain the necessary wetland permits. The Applicant would also need to apply to the DNR for a License to Cross public waters for PWI crossings of the final permitted route.

Calcareous fens are highly sensitive to groundwater disruption and surface water contamination. Direct and indirect impacts to the two calcareous fens identified in the vicinity of the proposed project would likely be avoided since both fens are located more than 0.5 miles from proposed route segments. The Marion 30 fen is located within the Proposed DRS buffer (**Figure 19**), however no impacts are anticipated to the fen as this aboveground station would be sited away from the fen location. Impacts to Decorah Edge support areas could impact the hydrology of the fens. The Applicant would continue to work with DNR staff to identify an appropriate location for the Proposed DRS, with the intention that direct and indirect impacts to the fen would be avoided.

When practical, impacts to wetlands would be avoided by going around wetlands or using HDD to install the pipeline underneath wetlands. In some cases, HDD may not be reasonable or feasible because of the characteristics of the site or engineering constraints. If impacts to wetlands are unavoidable, the Applicant would minimize impacts and provide appropriate mitigation. Measures to minimize impacts to wetlands include:

- Use tracked vehicles or construction mats to prevent creating deep ruts
- Segregate the top hydric soil layer prior to trenching and placed as the top layer of fill after pipe installation
- Reduce the construction area width to 75 feet
- Limit vehicle access to the equipment and vehicles necessary to install the pipe; all non-essential traffic will be routed around wetland
- Treat dewatering discharge prior to returning to wetland or stream
- Restore wetland vegetation after construction is completed; reseed using an annual cover crop such as oat, rye, or wheat because they germinate quickly and would help prevent the establishment of new invasive species
- Where native vegetation is present, use only a cover crop to establish vegetative cover and allow native seed bank re-establishment

The Applicant would minimize potential for increased sedimentation through implementation of an erosion and sedimentation control plan pursuant to the MPCA NPDES Construction Stormwater Discharge Permit and Minnesota Rules 7852.3600. Dewatering water would be discharged to a filter bag and placed in a well vegetated upland area. If an upland discharge is not possible, a dewatering structure would be constructed prior to discharging to a wetland or stream.

5.6.6 Vegetation

Both vegetation and native plant communities are studied in this CEA. The ROI for vegetation is the Project Area. The ROI for native plant communities is the area within one mile of the Project Area.

Pre-settlement vegetation in Paleozoic Plateau Section and Rochester Plateau Subsection, which contains the Project Area, was influenced by slope, flooding, and fire. Prairies dominated the flatter portions and bluff tops of the Rochester Plateau, where fires were more frequent. Mesic hardwood forests occupied steeply sloped valleys and wet/floodplain forests occupied valley bottoms and riparian floodplains.[159]

Pre-settlement prairie communities were made up of species such as big bluestem (*Andropogon gerardii*), little bluestem (*Schizachyrium scoparium*), prairie cordgrass (*Spartina pectinata*), side-oats grama (*Bouteloua curtipendula*), gray-headed coneflower (*Ratibida pinnata*), valerian (*Valeria* spp), purple prairie clover (*Dalea purpurea*), stiff sunflower (*Helianthus pauciflorus*), goldenrod (*Solidago* spp.) and aster (*Symphyotrichum* spp.).[160]

Common pre-settlement woodland species generally were influenced by elevation, with bur oak (*Quercus macrocarpa*) and northern pin oak (*Quercus ellipsoidalis*) occupying higher elevations, while basswood (*Tilia* sp.) and sugar maple (*Acer saccharum*) more prevalent downslope. Floodplain forests were made up of eastern cottonwood (*Populus deltoides*), silver maple (*Acer saccharinum*), green ash (*Fraxinus pennsylvanica*), and swamp white oak (*Quercus bicolor*).[161]

Human activities have converted nearly all native pre-settlement prairie and woodland communities in the Rochester Plateau Subsection to agricultural row crops. Fire suppression has allowed woodland canopies to become complete and woody species to encroach into areas historically dominated by grasses. Human influence has also allowed for non-native or disturbance species, such as smooth brome (*Bromus inermis*) and reed canarygrass (*Phalaris arundinacea*) to become widely established in road ditches and remnant grasslands. Invasive or undesirable woodland species have also become established and include common buckthorn (*Rhamnus cathartica*), boxelder (*Acer negundo*), and garlic mustard (*Alliaria periolata*).[162]

The Minnesota Land Cover Classification System (MLCCS) categorizes land cover features such as urban and built-up environments and natural and semi-natural vegetation for the entire state of Minnesota.[163] The land cover types, including vegetation, that occur in the Project Area are presented in **Table B-42** (**Figure 20**).

Based on land cover data in the MLCCS, approximately 54 percent of the Project Area is agricultural row crops. These fields provide very little ecological value in terms of the

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[159] DNR. 2016. Paleozoic Plateau Section. Available from: http://www.dnr.state.mn.us/ecs/222L/index.html
[160] Ibid.
[161] Ibid.
[162] MERC. November 3, 2015. *Route Permit Application for the Rochester Natural Gas Pipeline Project*. Docket No. G-011/GP-15-858 ("Application").
[163] DNR. December 17, 2015. *Minnesota Land Cover Classification System land cover data set*. Minnesota Department of Natural Resources.

vegetation community because the native plant community has been completely replaced by agricultural row crops and non-native or disturbance species. Approximately 12 percent of land cover in the Project Area is old field/dry tall grasslands, which are mostly associated with agricultural drainage ways, existing road rights-of-way, and hayfields. Grasslands associated with these areas are typically dominated by non-native smooth brome or reed canary grass, and are of poor ecological quality.

Approximately 8 to 10 percent of the Project Area is classified as impervious cover and tall grasses cover types. Impervious areas may contain buildings such as homes and pavement and some vegetative cover, generally consisting of grasses making up lawns or roadsides. These areas are of poor ecological quality. Tall grasslands within the Project Area include mesic prairie communities dominated by big bluestem (*Andropogon gerardii*) and Indiangrass (*Sorghastrum nutans*). These communities may have high biodiversity. About 6 percent of the Project Area is classified as upland forest.[164] Upland forests, comprised primarily of deciduous species, occur along the Zumbro River and in greenfield areas in the southern portion of the Project Area.

Eleven areas mapped by the MBS as having moderate to high biodiversity significance occur within one mile of the Project Area. **Figure 21** and **Table B-43** provide locations and descriptions of these areas.[165] Sites of Biodiversity Significance mapped by MBS may contain high-quality native plant communities, rare plants, rare animals, and/or animal aggregations. Many of these areas overlap with native plant communities identified during review of the DNR Natural Heritage Information System (NHIS) database. [166]

In addition to MBS- and NHIS-identified native plant communities, the DNR also identified one Railroad Rights-Of-Way Prairie conservation area located within 1 mile of the Project Area. Generally, railroad prairies are narrow bands along a railroad corridor that retain native vegetation due to lack of impacts related to farming and other human activities. The remnant prairies may contain rare species, and should be surveyed if impacts are proposed.

Impacts and Mitigation

Impacts to vegetation are anticipated to be minimal and would be relatively similar across route alternatives and segment alternatives. Impacts would vary in duration depending on the type of vegetation. Impacts would be of a small size. Impacts to herbaceous communities would be short-term, as these communities would be revegetated following construction. Impacts to forested communities within the permanent right-of-way would be permanent, as the permanent right-of-way would be permanently converted to an open vegetation community following construction. Impacts to unique vegetation resources (native plant communities and sites of high to moderate biodiversity) can be minimized through HDD and use of BMPs. Condition 5.5.13 of the Generic Route Permit requires that windbreaks, shelterbelts, living snow fences, and vegetation in areas such as trail and stream crossings where vegetative screening may minimize aesthetic impacts, be pressured to the extent that such pressure does not impede the safe construction, operation,

[164] Ibid.
[165] DNR. May 7, 2015. *MBS Sites of Biodiversity Significance*. The Minnesota County Biological Survey, Minnesota Department of Natural Resources, Division of Ecological and Water Resources.
[166] DNR. June 22, 2016. *Natural Heritage Information System*. Minnesota Department of Natural Resources, Division of Ecological and Water Resources.

maintenance and inspection of the pipeline and are in compliance with all applicable laws and regulations. Additionally, Section 5.5.10 of the Generic Route Permit requires that care be used to minimize the removal and prevent unnecessary destruction of the natural environment.

Construction activities could result in a range of impacts from compaction and partial removal of aboveground vegetation to full vegetation removal through clearing, chipping, grubbing, and blading. Construction impacts would be temporary to permanent depending on the type of vegetation cover affected. **Table B-44** presents the acreage of impacts within the construction easement and permanent right-of-way by MLCCS land cover type (**Figure 20**). MLCCS land cover types associated with segment alternatives for TBS 1D to the Proposed TBS, the Proposed TBS to County Road 8, County Road 8 to 11th Avenue SW, and 11th Avenue SW to the Proposed DRS are listed in **Table B-45**, **Table B-46**, **Table B-47**, and **Table B-48**, respectively.

Impacts to herbaceous communities, such as grasslands would be temporary as these areas would revegetate following construction and restoration. To encourage revegetation, the Applicant proposes to use native seed mixes unless another appropriate seed mix is requested by the landowner. Because naturally occurring vegetation (native or invasive) in agricultural fields is removed in the course of crop cultivation, there would be no impacts to vegetation as a result of locating the pipeline or associated facilities within existing agricultural fields.

Impacts to forested areas within the permanent right-of-way would be permanent as a result of tree clearing and conversion to an open vegetation type (that is, grasslands). Woody vegetation would be periodically cleared as part of regular maintenance activities. After construction, trees within the temporary right-of-way would be replanted or allowed to regenerate, depending on landowner preference. The amount of forest clearing varies by segment alternative. For example, for comparable Segment Alternatives EG-1 through EG-8, forest impacts vary from 2.1 acres for EG-1 to 6.8 acres for EG-6 (**Table B-46**). Similarly, for comparable Segment Alternatives IJ-1 through IJ-4, forest impacts vary from 0 acres for IJ-4 to 5.4 acres for IJ-1 (**Table B-48**).

Five sites of NHIS-identified native plant communities and/or MBS sites of high to moderate biodiversity occur within the Project Area: Marion 30, Rochester 24, Rochester 31, Salem 14, and the Railroad Rights-of-Way Prairie. The DNR recommends that greenfield crossings of these communities be avoided, particularly if the crossing would impact a Site of Biodiversity Significance, rare feature record, native plant community, or it fragments habitat.[167] Greenfield crossing are those route segments that are not parallel (immediately adjacent) to existing rights-of-way, for example, a road or transmission line. Most of the greenfield Route Segments are within agricultural cover types that typically do not contain native plant communities or rare features. Generally, areas in the Project area that might contain rare features are associated with riparian areas that would be crossed using HDD method.

[167] DNR. April 13, 2016. Scoping Comment Letter from Jamie Schrenzel, Environmental Review Unit DNR to Larry Hartman, Environmental Review Manager, Minnesota Department of Commerce.

The Marion 30 high biodiversity site is located within the buffer area for the Proposed DRS. The Applicant has indicated that direct impacts to this site would be avoided by locating the Proposed DRS away from this feature.

Portions of the shrubby wetland complex making up the Rochester 24 moderate biodiversity site occur within both the construction easement and permanent right-of-way of Route Segment 9P (Segment Alternatives HJ-1, HJ-2, IJ-1 and IJ-2). If this Route Segment is chosen, the Applicant has indicated that permanent impacts to Rochester 24 would be avoided by installing the pipeline using HDD underneath the wetland complex. However, shrubs may need to be periodically cleared within the permanent right-of-way as part of regular maintenance activities. Specifically, woody vegetation, including shrubs, cannot be allowed to establish over pipelines to ensure the integrity of the pipeline and for completion of routine surveys. The timing of vegetation is dependent on operation and maintenance schedules, but could be done in the winter months to minimize overall impacts to the wetland.

A portion of the Rochester 31 moderate biodiversity site is located within the Route Buffer of Route Segment 17. The Applicant has indicated that direct impacts to this site would be avoided by locating the permanent right-of-way and construction area outside of this feature. The Salem 14 moderate biodiversity site is located within the buffer area for the Proposed TBS. Direct impacts to this site can be avoided by locating the Proposed TBS away from this feature.

The construction area and permanent right-of-way of Route Segment 2P (Segment Alternative BC-1) cross the Railroad Rights-of-Way Prairie. The Applicant has indicated that direct impacts to the Railroad Rights-of-Way Prairie would be avoided through use of HDD underneath the railroad rights-of-way. The Applicant indicates that based on their experience elsewhere in the State, they anticipate that the railroad will complete routine maintenance within their right-of-way such that maintenance within the prairie would not be necessary.

Other NHIS-identified native plant communities and/or MBS sites of high to moderate biodiversity would not be crossed by any of the segment alternatives and thus would not be directly impacted. Indirect impacts to MBS sites could occur as a result of erosion and increased sedimentation to waterways or in the event of an inadvertent spill, leak, or release of drilling fluids that reaches surface or groundwater resources. The potential for these impacts can be minimized through implementation of erosion and sediment control BMPs, a spill response plan, and a drilling fluid-release response plan.

Overall impacts to vegetation of high ecological value can be avoided and minimized by locating the pipeline route, to the extent practicable, in existing agricultural fields. Similarly, the potential for tree clearing impacts can be minimized by locating the pipeline route along existing rights-of-way (**Section 5.3.4**, **Table B-34**) and generally avoiding forested areas. Impacts to wetland vegetation can be avoided, to the extent practicable, by directional drilling underneath using HDD methods.

Following construction, disturbed areas would be re-vegetation through the application of approved seed mixes, mulch, fertilizer, and/or erosion control matting in accordance with permit requirements and landowner agreements. Wetland areas can be planted with a cover

crop to quickly stabilize the area and provide erosion control, while allowing the existing seed bank to re-establish for the long term.

Construction and maintenance activities have the potential to introduce and increase the spread of noxious weed species, particularly in areas where vegetation is cleared. Typically, weed species can establish more quickly and effectively than native species. Once spread or newly established, noxious weed infestations can become permanent if left uncontrolled. To reduce the potential for impacts related to the introduction or spread of invasive species, the Applicant will be required to develop a Vegetation Management Plan and AMP. The plans would specify contractor requirements to minimize the spread of invasive weeds and to treat invasive species if they are present. The AMP has been developed and reviewed by the Minnesota Department of Agriculture, and is included in **Appendix F**. Sections 5.5.15 and 5.5.16 of the Generic Route Permit requires that precautions be taken during construction against the spread of noxious weeds and invasive species.

Impacts to vegetation related to modification of TBS 1D, the Proposed TBS, the Proposed DRS, and additional storage areas can be minimized by locating these facilities in existing disturbed areas or agricultural fields to the extent practicable. Impacts to the Marion 30 site can be avoided by locating the Proposed DRS away from this feature.

5.6.7 Wildlife and Wildlife Habitat

The ROI for wildlife and wildlife habitat is the Project Area. Wildlife habitat in the Project Area is divided into three categories: aquatic, woodland, and grassland. These categories are defined by the land cover classifications listed in **Table B-42.**

Aquatic Resources

Aquatic wildlife habitat consists of open water and wetland land cover classifications. As discussed in **Section 5.6.4**, the Project Area crosses five waterways mapped on the PWI by the DNR (**Figures 2 and 19**).[168] These waterways provide habitat for fish and other aquatic species. Most notably, Cascade Creek (Route Segments 3P and 11) , Willow Creek (Route Segments 8P and 26-28), and the South Fork of the Zumbro River (Route Segments 3P and 11) are perennial, free flowing watercourses that provide fishery habitats. Other waterways (PWIs and non-designated waterways) in the Project Area offer lower quality habitat due to erosion, lack of year-round flow, or channelization. No designated trout streams are located within the Project Area.[169]

Table B-49 lists fish species found in Zumbro Lake, an impoundment located downstream from the Project Area that spans the border between Olmsted and Wabasha Counties in numerous sections in Township 108 N Range 14 W (Oronoco Township) and Township 109 N Range 14 W (Mazeppa Township).[170] This species list likely represents a similar composition to the fish species that may be found in rivers and streams in the Project Area.

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[168] Public waters are lakes, wetlands, and watercourses over which DNE Waters has regulatory jurisdiction under Minnesota Statute 103G.005 Subdiv. 15. DNR. 2008. Public Waters Inventory Watercourse Delineations. Minnesota Department of Natural Resources Division of Waters. St Paul, MN.
[169] DNR. 2015. 2015 Trout Angling Opportunities Map. Retrieved 2015 from http://dnr.state.mn.us/fishing/trout_streams/south_mn_maps.html.
[170] DNR. 2016. Lakefinder Zumbro Lake. Minnesota Department of Natural Resources Division. Retrieved on July 13, 2016 from http://www.dnr.state.mn.us/lakefind/lake.html?id=55000400.

In addition to fish, the Zumbro River and its tributaries provide habitat for mollusks, crayfish, and other aquatic invertebrates.[171]

Impacts and Mitigation

Impacts to aquatic wildlife resources are anticipated to be minimal. Route alternatives and segment alternatives would have similar impacts to aquatic resources. Short-term impacts may result during construction and would be minimized through BMPs, as discussed above. Long-term impacts can be mitigated. No unique resources would be affected.

As described in **Section 5.6.4**, construction activities at and near waterbodies may affect aquatic resources as a result of inadvertent release of drilling fluids during HDD under waterbody and wetland crossings. Likewise, trenching through wetlands if HDD crossing of wetlands is not practical has potential to increase sedimentation to adjacent waterbodies as a result of construction and dewatering activities, and vehicle access.

A list of surface water crossings and measures to mitigate potential impacts to surface water resources are discussed in **Section 5.6.4**. These measures also mitigate potential impacts to aquatic resources.

Terrestrial and Avian Resources

Wildlife species occupying habitats in the Project Area are typical of agricultural, grassland, wetland, riparian, woods edge, and human development areas in the Upper Midwest. A list of mammal species likely to occur in the Project Area is included in **Table B-50**.[172] These species are common, although big brown bat and little brown bat populations are suffering significant declines due to white nose syndrome.[173] Bats are discussed in more detail in the Threatened and Endangered Species section, **Section 5.6.8**.

The Minnesota Breeding Bird Atlas (MBBA) has documented 104 breeding avian species in Olmsted County.[174] **Table B-50** includes a selection of avian species occurring in Olmsted County that typically use habitat types found within the Project Area. Reptilian and amphibian species occurring in Olmsted County are listed in **Table B-50.** Northern leopard frog, American toad, painted turtle, snapping turtle, and garter snakes are the most common reptile and amphibian species found in the Project Area.[175]

Woodland wildlife habitat in the Project Area consists of the forest and shrub land cover classifications. Grassland wildlife habitat consists of the maintained tall grasses, old field and dry tall grasses land cover classifications. Both agricultural land and lands with impervious cover (i.e., hard surfaces like roads that cannot effectively absorb or infiltrate rainfall) were not included as wildlife habitat as both provide limited habitat for wildlife.

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[171] Ibid.
[172] DNR. 2014
[173] Ibid.
[174] MBBA. 2014. "Breeding Bird County Checklists". Minnesota Breeding Bird Atlas Project – Online. http://www.mnbba.org/cgi-bin/countychecklist.pl.
[175] DNR. October 30, 2013. Minnesota Distribution Map of Salamanders and Amphibians of Minnesota. Minnesota Department of Natural Resources. http://files.dnr.state.mn.us/eco/mcbs/herp_maps/reptile_and_amphibian_maps_2ecs.pdf.

The Project Area includes the southern edge of the Rochester State Game Refuge (Refuge), a 42,000 acre area covering the entire Rochester area. The Refuge is managed by the DNR through hunting regulations only; it does not include any state owned land. The Refuge is closed to waterfowl hunting, but all other hunting, as legally defined by law and ordinance, is allowed. No further consultation on the Refuge is required as the Project Area does not involve impacts to state owned lands.[176] The Project Area does not include any other Wildlife Management Areas.

Wildlife habitats associated with segment alternatives for TBS 1D to the Proposed TBS, the Proposed TBS to County Road 8, County Road 8 to 11th Avenue SW, and 11th Avenue SW to the Proposed DRS are listed in Table B-52, Table B-53, Table B-54, and Table B-55, respectively.

Impacts and Mitigation

Impacts to terrestrial and avian wildlife resources are anticipated to be minimal. Segment alternatives would have similar impacts to wildlife resources. Impacts would vary in duration, would be of a relatively small size, and would not affect any unique resources. Short-term impacts would include temporary disturbance or displacement of individuals during construction, and temporary loss or alteration of habitat. Long-term impacts would include permanent loss of small areas of forested habitats.

Potential short-term impacts to wildlife from construction include the loss or alteration of wildlife habitats, which could result in disturbance and displacement of individuals from construction areas and adjacent habitats to less suitable habitats. Small, less-mobile mammals, reptiles, and amphibians could experience direct mortality as they may not be able to escape the construction area. As noted by DNR, wildlife may also be impacted by entanglement in, and death from, plastic netting and other man-made plastic materials frequently used for erosion control.

Impacts to vegetation with potential to provide wildlife habitat (that is, forest, shrub, maintained tall grasses, old field, and dry tall grasses land cover classifications in the MLCCS) are listed in Table B-51. Both agricultural land and impervious lands were not included as wildlife habitat as both provide limited habitat for wildlife.

The majority of impacts to wildlife and wildlife habitat would be short-term and temporary. However, the loss of forested habitat from tree clearing within the construction area and permanent right-of-way would be long-term to permanent, respectively. As noted in Section 5.6.6, impacts to forest habitats vary by segment alternative. Permanent impacts on wildlife would be limited to those species that depend on arboreal habitats, such as some species of birds, squirrels, and bats. Permanent impacts on wildlife would be restricted to individuals and not impact populations. Impacts related to habitat fragmentation or loss of habitat connectivity are unlikely as the Project would not cross large sections of undisturbed habitats.

Hunting activities on parcels within the Refuge may be temporarily affected during construction along Route Segments 4P, 5P, 8P, 9P, 12, and 29. Temporary impacts will be

[176] DNR. August 8, 2014. Information Letter from Brooke Haworth, Division of Ecological and Water Resources to Lydia Nelson, HDR.

localized disturbances including noise, dust, and visual intrusions associated with construction activities. These disturbances may result in wildlife avoidance of the Project Area within the Refuge. No permanent impacts to the Refuge are anticipated.

Impacts to wildlife and wildlife habitat can be minimized by locating the pipeline route and TBS 1D, the Proposed TBS, the Proposed DRS, and storage areas along existing rights-of-way and/or in previously disturbed areas and agricultural fields to the extent practicable.

Impacts related to wildlife entanglement in, and death from, plastic netting can be avoided through use of wildlife-friendly erosion control. Guidelines regarding use of wildlife friendly erosion control are provided by DNR.[177] Areas of higher priority for wildlife-friendly erosion control use include areas with higher amphibian use, such as wetland and water crossings and rare species habitat. Within the Project Area, priority habitat may be located along Cascade Creek (Route Segments 3P and 11), South Fork Zumbro River (Route Segments 3P and 11), Willow Creek (Route Segments 8P, 26, 27 and 28) and an MBS site (Route Segment 9P). .

5.6.8 Threatened, Endangered, and Other Special Status Species

Impacts to threatened, endangered, and other special status species are anticipated to be minimal. Impacts would vary in duration and would be of a relatively small size. Although threatened and endangered species are inherently unique resources, the threatened and endangered species that may be impacted by the proposed project are not endemic to or locally unique within Olmsted County.

Federally Listed Threatened and Endangered Species

Three federally listed species are documented as occurring in Olmsted County.[178] **Table 5-8** lists the species and their preferred habitat.[179]

Table 5-7. Federally Listed Species Occurring in Olmsted County

Species Name	Federal Status	Type of Species	Habitat
Northern long-eared bat (*Myotis septentrionalis*)	Threatened	Insectivorous Bat	Hibernates in mines and caves; roosts in upland forests in spring and summer
Leedy's roseroot (*Rhodiola integrifolia* ssp *leedyi*)	Threatened	Vascular Plant	Cool, wet, and groundwater-fed limestone cliffs
Prairie bush clover (*Lespedeza leptostachya*)	Threatened	Vascular Plant	Native prairie with well-drained soils

[177] DNR. 2012. Wildlife Friendly Erosion Control. MN DNR vF-2012. Minnesota Department of Natural Resources.
[178] USFWS. 2016. Information for Planning and Conservation. Accessed June 17, 2016. https://ecos.fws.gov/ipac/.
[179] NatureServe. 2016 NatureServe Explorer for Multiple Species. Accessed June 2016. http://www.natureserve.org.

Impacts and Mitigation

No direct impacts to any federally listed threatened and endangered species are anticipated, provided that preconstruction surveys are completed. All segment alternatives would have similar impacts as they all cross the same habitats that may be used by federally listed species. Indirect, long-term impacts to habitat suitable for northern long-eared bat may result from loss of forested habitat within the permanent right-of-way.

On January 14, 2016, the United States Fish and Wildlife Service (USFWS) published a final 4(d) rule for the northern long-eared bat under the Endangered Species Act (ESA) that identified prohibitions to protect the bat's sensitive life stages in areas affected by white-nose syndrome (81 Federal Register 1900–1922)[180]. Under this rule, incidental take of bats associated with tree removal activities outside of a winter hibernating habitat (hibernaculum) are not prohibited under the ESA if the activity is greater than 0.25 mile from a known hibernaculum or the activity does not occur within 150 feet of a known maternity roost tree during the pup season (June 1 through July 31).

No caves and mines that serve as hibernaculum or maternity roost trees for the northern long-eared bat have been identified in the Project Area.[181] As a result, no impacts to winter hibernaculum are anticipated to occur. Impacts to habitat suitable for northern long-eared bat summer roosting could occur as a result of long-term loss of forested/wooded vegetation (see **Section 5.6.6**). These impacts can be minimized by locating the pipeline route along existing rights-of-way or in agricultural fields to the extent practicable. The Applicant indicates that tree clearing would be conducted outside of the June 1 to July 31 pup season to avoid potential direct impacts to the bat. As a result, construction and operation of the proposed project would be in compliance with the final 4(d) rule and the USFWS January 5, 2015, intra-Service Programmatic Biological Opinion on the final 4(d) rule and no permit from USFWS would be required.[182]

Impacts on prairie bush clover and Leedy's roseroot could occur as a result of vegetation removal through clearing, chipping, grubbing, and blading during construction or as part of regular maintenance activities. Based upon a desktop review, the Project Area does not cross habitat suitable for Leedy's roseroot, specifically, cool, wet, groundwater-fed limestone cliffs. However, the project would cross railroad prairie that could harbor prairie bush clover.[183] The Applicant indicates that it will coordinate with USFWS and DNR to design and conduct field surveys by a qualified biologist at suitable habitat locations to identify and avoid these species.

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[180] USFWS. June 2, 2016. Northern Long-Eared Bat White Nose Syndrome Zone Around WNS/PD Positive Counties/Districts. Accessed July 13, 2016. https://www.fws.gov/midwest/endangered/mammals/nleb/pdf/WNSBufferZone.pdf.

[181] DNR. April 1, 2016. Townships Containing Documented Northern Long-Eared Bat (NLEB) Maternity Roost Trees and/or Hibernacula Entrances in Minnesota. Minnesota Department of Natural Resources and United States Fish and Wildlife Service. http://files.dnr.state.mn.us/eco/ereview/minnesota_nleb_township_list_and_map.pdf.

[182] USFWS. 2016. Key to the Northern Long-Eared Bat 4(d) Rule for Non-Federal Activities. United States Fish and Wildlife Service. https://www.fws.gov/midwest/endangered/mammals/nleb/KeyFinal4dNLEB.html.

[183] MERC. November 3, 2015. Route Permit Application. Docket No. G 011/GP-15-858.

State-Listed Threatened, Endangered, and Special Status Species

A review of DNR NHIS Data (DNR LA-717) for Olmsted County determined that 13 state-listed or watchlist species occur within 1 mile of the Project Area (**Table 5-9**).[184]

Table 5-8. Minnesota State Endangered and Threatened Species Occurrences within 1 mile of the Project Area[185]

Species Name	State Status (State Rank)[a]	Habitat
Plants		
Glade mallow (*Napaea dioica)*	Threatened (S2)	River shore, floodplain forest, wet meadow/carr marsh
Valerian (*Valeriana edulis* var. *ciliate*)	Threatened (S2)	Cliff, rock outcrop, upland prairie, lowland prairie, non-forested rich peatland, wet meadow/carr marsh
White wild indigo (*Baptisia lactea* var. *lactea*)	Special Concern (S3)	Mesic tallgrass prairies, dry, sandy prairies, savannas, and open upland woodlands. Also in old fields, pastures, lake and river shores, and roadsides.
Rattlesnake-master (*Eryngium yuccifolium*)	Special Concern (S3)	Prairies with soils comprised of dry to moist glacial tills.
Cowbane (*Oxypolis rigidior*)	Watchlist (NR)	Wet meadows, prairies, or fields and marshes.
Birds		
Loggerhead shrike (*Lanius ludovicianus*)	Endangered (S1B)	Upland prairies with scattered trees and shrubs.
Bell's Vireo (*Vireo bellii*)	Special Concern (S3B)	Riparian woodland and shrublands, grasslands, old fields, or mesquite brushlands.
Bald eagle (*Haliaeetus leucocephalus*)	Watchlist (S3B,S3N)	Nest near lakes and rivers in forested areas with tall, large diameter trees.
Mussels		
Elktoe (*Alasmidonta marginata*)	Threatened (S2)	Medium to large rivers with sand and gravel substrates.
Ellipse (*Venustaconcha ellipsiformis*)	Threatened (S2)	Headwater reaches of rivers and streams in gravel riffles and along stream banks.
Creek heelsplitter (*Lasmigona compressa*)	Special Concern (S3)	Creeks, small rivers, and upstream portions of large rivers in sand, fine gravel, and mud substrate.

[184] DNR. June 22, 2016. *Natural Heritage Information System*. Minnesota Department of Natural Resources, Division of Ecological and Water Resources.
[185] DNR. June 22, 2016. *Natural Heritage Information System*. Minnesota Department of Natural Resources, Division of Ecological and Water Resources;

Species Name	State Status (State Rank)[a]	Habitat
Fish		
Ozark minnow (*Notropis nubilus*)	Special Concern (S3)	Clear, small to medium perennial streams in areas of slow current.
American brook lamprey (*Lethenteron appendix*)	Watchlist (S4)	Clear, permanent, unpolluted, pool-riffle coldwater streams with sand-gravel substrates
Reptiles		
Western fox snake (*Pantherophis ramspotti*)	Watchlist (S4)	Forest edge habitat, often along forested edges of larger rivers

Note:
[a] S1 = Critically Imperiled; S2 = Imperiled; S3 = Vulnerable to Extirpation; S4 = Uncommon but not Rare; NR = Not Ranked; B= Breeding.

Notes included in the NHIS records provide more detail about state-listed species occurrences. For example, the last observation of loggerhead shrike within 1 mile of the Project Area occurred in 1992; no shrikes were observed during 1995 shrike surveys. The other shrike observation within 1 mile of the project area indicates this species has only been verified at this location once, but unverified observations did occur in 2009.[186] Live specimens of the elktoe and creek heelsplitter mussels were documented in the Zumbro River in the vicinity of the Project Area in 1988. In 2002, a mussel survey in the immediate vicinity of the proposed Zumbro River crossing documented a sub-fossilized shell of an elktoe and a freshly dead creek heelsplitter. The current conditions for mussels at the proposed Zumbro River crossing are unknown.[187]

Threatened plant occurrences within 1 mile of the Project Area were observed during surveys in 1994 and 1998. Notes indicate glade mallow was observed in a floodplain forest, and valerian was observed in a bluff prairie. No other data are available on surveys after 1994 and 1998, or on whether the previously-observed threatened plant occurrences still exist.[188]

Impacts and Mitigation

Potential impacts and mitigation measures to state-listed plant, bird, aquatic and reptile species are anticipated to be minimal with use of general permit conditions, proposed construction techniques and BMPS. Potential impacts are as follows:

State-Listed Plant Species

Impacts to state-listed plants could occur as a result of vegetation removal through clearing, chipping, grubbing, and blading during construction or as a result of periodic clearing of woody species as part of regular maintenance activities. All route alternatives and segment alternatives would have similar impacts as they all cross the same habitats that may be used by state-listed species. If surveys identify state-listed plants in the construction area,

[186] Ibid.
[187] Lisa Joyal. August 10, 2016. Personal Communication to Lydia Nelson, HDR. ERDB #20150007-0003.
[188] Ibid.

direct impacts would be moderate and long-term. The Applicant would work directly with the DNR to identify mitigation measures, as appropriate. If no species are present, no impacts would occur.

Within Route Segment 2P (Segment Alternative BC-1), impacts on valerian may occur, because this route segment crosses suitable prairie habitat in the railroad prairie (see Section 5.6.6)). Impacts to habitats within the railroad right-of-way would be minimized by using HDD to install the pipeline under this transportation feature and nearby habitat. To further ensure direct impacts on this species are avoided, field surveys for this species would be conducted by a qualified biologist in potentially suitable habitat present in the construction area prior to vegetation clearing activities. The Applicant would submit a survey proposal to DNR prior to conducting surveys for rare plant species.

Although no records of glade mallow occur within Project Area, a narrow band of floodplain forest is present at the Zumbro River crossing (south end of Route Segments 3P and 11), which could serve as suitable habitat for this species. Other areas of potential habitat for this species are at the Cascade Creek crossing (Route Segments 3P and 11) and the Willow Creek crossing (Route Segments 8P, 26, 27, and 28). To ensure direct impacts on this species are avoided, field surveys for this species would be conducted by a qualified biologist at the Cascade Creek crossing, the Zumbro River crossing, and the Willow Creek crossing. Surveys would be conducted prior to construction and in consultation with the DNR. Impacts on the contour of the streambanks and stream/river channels would be avoided by using HDD to install the pipeline beneath these features.

White wild indigo was documented within the greater Rochester area in 1904.[189] Current species distribution has not been mapped. Based on its preferred habitat, which includes mesic tall grasslands, old fields, pastures, and roadsides, the species has potential to occur within the Project Area and be impacted by vegetation removal during construction and by periodic clearing during maintenance activities. To ensure direct impacts on this species are avoided, field surveys for this species would be conducted by a qualified biologist in potentially suitable habitat in the construction area prior to vegetation clearing activities. The Applicant has indicated that they will submit a survey proposal to DNR prior to conducting surveys for rare plant species.

Rattlesnake master has been documented in the northern portion of the Project Area along existing railroad and highway rights-of-way. Based on its preferred habitat, which includes disturbed rights-of-way, the species has potential to be impacted by vegetation removal during construction and by periodic clearing during maintenance activities. Impacts to habitats within existing road and railroad rights-of-way would be minimized by using HDD to install the pipeline under these transportation features and nearby habitat. To further ensure direct impacts on this species are avoided, field surveys for this species would be conducted by a qualified biologist in potentially suitable habitat present in the construction area prior to vegetation clearing activities. The Applicant would submit a survey proposal to DNR prior to conducting surveys for rare plant species.

Cowbane has not been documented within the Project Area although its preferred habitats—wet meadows, prairies, fields, and marshes—occur within the temporary and permanent

[189] Lisa Joyal. August 10, 2016. Personal Communication to Lydia Nelson, HDR. ERDB #20150007-0003

rights-of-way in Route Segment 9P (Segment Alternatives HJ-1, HJ-2, IJ-1 and IJ-3) and within the proposed DRS buffer area. As a result, cowbane has the potential to occur in the proposed Project and to be impacted by vegetation removal during construction and by periodic clearing during maintenance activities. Impacts to wet meadow and marsh habitats would be avoided by using HDD to install the pipeline under wetlands. To ensure direct impacts on this species are avoided, field surveys for this species would be conducted by a qualified biologist in potentially suitable habitat in the construction area prior to vegetation clearing activities. The Applicant would submit a survey proposal to DNR prior to conducting surveys for rare plant species.

State-Listed Bird Species

Impacts to state-listed birds could occur as a result of the loss or alteration of bird habitats, which could result in disturbance and displacement of individuals from construction areas and adjacent habitats to less suitable habitats. Direct impacts are anticipated to be minimal..

Loggerhead shrikes have been documented in grassland habitats within one mile of the Project Area. Although upland prairies would be avoided, this species may occur in scrublands such as along Route Segments 3P or 11 (Segment Alternatives CD-1 and CD-2) or native plant communities along Route Segments 9P and 17 (Segment Alternatives EG-8, HJ-1, HJ-2, IJ-1 and IJ-3). To ensure impacts on this species from direct mortality through take of bird nests are avoided, a qualified biologist would conduct surveys for loggerhead shrikes in late May or June prior to construction. Survey protocol would be developed in consultation with the DNR, but would likely use a transect method similar to those utilized during the 1995 Loggerhead Shrike Survey conducted by the DNR.[190]

Bell's vireo has been documented within 1 mile of the proposed Project; however, the last recorded observation of the species in the area was in 1994. If present, impacts to Bell's vireo could occur as a result of vegetation clearing activities in scrubland and old fields. Impacts to Bell's vireo can be minimized by conducting riparian scrub and woodland and grassland vegetation clearing outside of the bird nesting season or, if vegetation clearing during the bird nesting season is required, conducting bird nest surveys, flagging found nests, and then consulting with the DNR if Bell's vireo nests are found. Bell's vireo nesting season ranges from May 25 through August 15.[191]

A bald eagle nest has been documented within 1 mile of the Proposed TBS buffer area in a large deciduous tree along Salem Creek. The eagle nest was last surveyed in 2007. The USFWS has published guidelines for avoiding disturbance to eagle nests sites as a result of construction activities.[192] The guidelines recommend buffer distances of 660 feet if a nest is visible from a construction site and 330 feet if a nest is not directly visible to avoid disturbing active nests. The documented eagle nest is more than 5,000 feet from the

[190] Etter, M.A. 1996. 1995 Minnesota Loggerhead Shrike Survey. Minnesota Department of Natural Resources, Division of Ecological and Water Resources. http://files.dnr.state.mn.us/eco/nongame/projects/consgrant_reports/1995/1995_etter.pdf.
[191] WDNR. September 11, 2013. Bell's Vireo (*Vireo bellii*) Species Guidance. http://dnr.wi.gov/files/PDF/pubs/er/ER0703.pdf.
[192] USFWS. 2007. National Bald Eagle Management Guidelines. Accessed June 21, 2016. https://www.fws.gov/southdakotafieldoffice/NationalBaldEagleManagementGuidelines.pdf.

Proposed TBS buffer area. Thus, no impacts are anticipated to the bald eagle nest from construction and operation activities.

State-Listed Aquatic Species

Impacts to state-listed mussels (Ellipse and Elktoe) and fish species (Ozark minnow) could occur as a result of construction activities associated with waterbody crossings or as a result of indirect impacts through increased sedimentation to adjacent waterbodies. All route alternatives and segment alternatives would have similar impacts because they all cross the same aquatic resource habitats. Impacts are anticipated to be minimal. Direct impacts to aquatic habitats and state-listed aquatic species are not anticipated because all stream crossings will be completed using HDD.

Indirect impacts can be minimized through use of erosion and sediment control BMPs through implementation of an erosion control plan pursuant to the MPCA NPDES Construction Stormwater Discharge Permit and Minnesota Rules 7852.3600. Indirect impacts can be further minimized through preconstruction surveys of mussel resources at the Zumbro River in the event that a spill, leak, or inadvertent release of drilling fluids reaches surface water resources.

Watch List Reptile Species

Impacts to the western fox snake are anticipated to be minimal. Impacts would mostly be temporary and short-term. Segment alternatives would have similar impacts because they all cross the same habitats. Potential short-term impacts on the western fox snake include the loss or alteration of habitats during construction, which could result in disturbance and displacement of individuals from construction areas and adjacent habitats to less suitable habitats. The western fox snake could experience direct mortality as they may be unable to escape the construction area.

The loss of forested habitat from tree clearing within the construction area and permanent right-of-way would be long-term to permanent impact. Permanent impacts would be restricted to individual members of a species and not cause a trend towards state or federal listing of the species. The permanent right-of-way would be maintained in a grassland or shrub cover that could provide edge habitat where the western fox snake is commonly found.

Wildlife may also be impacted by entanglement in, and death from, plastic netting and other man-made plastic materials frequently used for erosion control. Impacts related to wildlife entanglement in, and death from, plastic netting would be avoided through use of wildlife-friendly erosion control. Guidelines regarding use of wildlife friendly erosion control are provided by DNR.[193] Areas of higher priority for wildlife-friendly erosion control use include areas with higher amphibian use, water crossings, near wetlands, and rare species habitat.

[193] DNR. 2012. Wildlife Friendly Erosion Control. MN DNR vF-2012. Minnesota Department of Natural Resources.

5.7 Land-Based Economics

Land-based industries represent a significant portion of the economy and land uses in Olmsted County.

5.7.1 Agriculture

The ROI for agricultural economies is Olmsted County. Olmsted County's climate, soils, topography, and vegetation provide the basis for a highly productive agricultural industry. The agricultural boom of the late 19th century drew large numbers of European settlers to the region and established the agricultural character of the community. At 63 percent of the land area, agriculture is the top land use in Olmsted County.[194]

In 2012, there were about 1,150 farms covering approximately 264,407 acres in Olmsted County.[195] The total market value of all agricultural products sold in 2012 totaled $250,093,000 (66 percent crop sales and 34 percent livestock sales), ranking Olmsted County 42nd of the 87 counties in Minnesota by total value of agricultural products sold. The top crop items by acreage in the county are corn, soybeans, hay, and vegetables. The top livestock items by overall number are turkeys, hogs and pigs, and cattle.

In 2012, there were approximately 102 acres of land in orchards in Olmsted County. Of this, 58 acres were apples, 33 acres were grape vines, and 9 acres were hazelnut trees.[196]

Between 2007 and 2012, there was a 17 percent decrease in the number of farms and an 11 percent decrease in the acres of farmland in Olmsted County.[197] However, during this same time period, there was a 61 percent increase in the market value of agricultural products sold, which illustrates the continued importance of agriculture to the local economy.[198]

There are 10 certified organic farms in Olmsted County, of which three are near the Project Area (**Figure 22**).[199]

Impacts and Mitigation

Impacts to agriculture are anticipated to be minimal. Impacts would vary in duration, be of a relatively small size, and would not affect any unique resources. Segment alternatives would have similar impacts because they all cross similar amounts of agricultural land. Short-term impacts would occur during construction as the agricultural land within the construction area would not be available for cultivation. Long-term impacts would include permanent conversion of approximately 3 acres of agricultural land for the aboveground facilities.

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[194] This includes all land used for agricultural purposes (e.g. cropland, pasture and grazing land, rangeland, woodland, land with buildings, etc.).
[195] United States Department of Agriculture. 2012. 2012 Census of Agriculture County Profile: Olmsted County, Minnesota. National Agricultural Statistics Service. https://www.agcensus.usda.gov/Publications/2012/Online_Resources/County_Profiles/Minnesota/cp27109.pdf
[196] Ibid.
[197] Ibid.
[198] Ibid.
[199] Bob Patton (Minnesota Department of Agriculture). Email to Lydia Nelson (HDR), June 27, 2014.

Most of the land that would be temporarily disturbed by construction would be agricultural land (see **Table B-20** [Zoning] and **Table B-44** [Land Cover]). Land within the construction area would not be able to be cultivated during construction. Negotiated easements with affected landowners along the approved route would mitigate temporary impacts on agricultural production by providing payment for the inability to plant crops or for crop damage. Following construction and restoration, agricultural activities would be allowed to resume along the pipeline's permanent right-of-way, therefore the impacts on the agricultural land use would be temporary and minimal. The proposed project would preclude construction of structures within the permanent right-of-way, which may or may not impact future agricultural uses.

Other impacts to agricultural land that may occur during construction include soil compaction and rutting, bringing rocks into the upper soil horizon, spreading of weeds, trenching across a field drainageway, and inadvertently breaking drain tile. Mitigation of potential impacts to agriculture is discussed in the AMP included in **Appendix F**. The AMP includes measures to minimize impacts to soils by requiring that top soil be segregated from subsoil, prescribing measures for construction in wet conditions and measures for restoration of compaction and rutting. Consistent with county and state regulations, the AMP requires that the pipeline be buried at least 4.5 feet in tilled cropland. The AMP also contains requirements for weed management and measures to be taken should drain tile be encountered. Section 5.5.19 of the Generic Route Permit requires that if any agricultural livestock operations are encountered along the permitted right-of-way, care must be taken to protect livestock during construction.

No organic farmland would be directly impacted by the proposed project. There are three organic farm parcels within or near the Project Area (**Figure 22**). One farm is located about 0.25-mile east of Route Segment 11 in Section 7 T106N R14W (Rochester Township). The second farm is located about 200 feet east of Route Segment 12 in Section 19 T106N R14W (Rochester Township). The third farm is crossed by Route Segment 4P, along 60th Ave SW in Section 24 T106N R15W (Salem Township). Route Segment 4P crosses the driveway to the farm and the driveway would be crossed via HDD. No tilled land of the organic farms would be crossed by the proposed Project; therefore, no temporary or permanent impacts to organic farms are anticipated. Potential indirect impacts from wind-blown dust will be managed by surface watering, consistent with the Project's SWPPP. If potential access routes would require crossing organic farmland, contractors would take measures to minimize impacts as listed in the AMP.

Expansion or rebuild of TBS 1D and construction of the Proposed TBS and Proposed DRS would require permanent conversion of 2.76 acres of land to industrial uses. The exact location of these facilities has not yet been determined, but they would likely be sited in agricultural land. Agricultural activities would no longer occur within the fenced boundaries of the facilities.

Route Segments 3P and 11 (Segment Alternatives CD-1 and CD-2) cross an apple orchard at the northeast corner of the intersection of 60th Avenue SW and Heather Drive SW. Impacts to the orchard could be avoided by locating the right-of-way on the west side of 60th Avenue SW, and thus no impacts to the orchard would occur. If one of these Route Segments is selected for the Project, the Commission could specify a right-of-way location that avoids crossing the orchard.

5.7.2 Commercial/Industrial

The ROI for commercial/industrial economies is within one mile of the Project Area. Within the Project Area, land zoned for commercial and industrial uses is located primarily on the edges and outskirts of the City of Rochester (**Figures 6 and 7A/B**).

Industrial land uses near the Project Area include the RPU Westside Substation at 19th Street NW and 60th Avenue NW; the Kalmar Landfill on 19th Street NW; a commercial/industrial complex on 60th Avenue NW north of Highway 14 that includes warehouses, heavy equipment lots, and auto shops; and Rochester Asphalt & Concrete on County Road 15 SW.

There is a large commercial/industrial complex along Highway 63 between 40th Street SW and 48th Street SW. This area is within the City of Rochester limits and is zoned for mixed industrial/commercial and commercial development. The complex, called the Shoppes on Maine, includes large national chains like Target, Dick's Sporting Goods, Best Buy, and Lowe's Home Improvement; the Wehrenberg Theaters Rochester Galaxy 14 movie theater; car dealerships; restaurants and coffee shops; and several hotels.

Impacts and Mitigation

Direct impacts to existing commercial and industrial land-based economies would be avoided as no existing or proposed buildings or infrastructure would be impacted by construction of the pipeline or aboveground facilities. The proposed project would preclude construction of structures within the permanent right-of-way, which may or may not impact future commercial or industrial uses. Temporary impacts related to construction noise, traffic or short-term access changes may occur. These impacts will be mitigated using standard BMPs and access management and consultation with affected businesses.

5.7.3 Forestry

The ROI for forestry is Olmsted County. In 2012, 6.3 percent of the farmland in Olmsted County was classified as woodland.[200] The primary silviculture product is Christmas trees. In 2012, seven farms had 77 acres in production of Christmas trees. A small amount of maple syrup is also produced in Olmsted County.

Impacts and Mitigation

No direct or indirect impacts to forestry or silviculture are anticipated, **Table B-45, Table B-46, Table B-47, and Table B-48** in **Appendix B** provide the acreage of land covered by tree plantations per the MLCCS. The MLCCS land cover category 'tree plantation' includes 'upland soils with planted, maintained, or cultivated coniferous trees.'[201] Portions of Route Segments (4P, 5P, 21, 24, and 27 (Segment Alternatives DE-1, EF-1, EG-1, EG-2, EG-5, EG-8, FH-2, FH-3, FI-1, FI-3, GH-1, GH-2, GI-1, GI-2, GI-3, HJ-3 and IJ-3)) cross land mapped as

[200] United States Department of Agriculture. 2014. 2012 Census of Agriculture: Minnesota State and County Data. National Agricultural Statistics Service. Volume 1, Geographic Area Series, Part 23. AC-12-A-23. https://www.agcensus.usda.gov/Publications/2012/Full_Report/Volume_1,_Chapter_2_County_Level/Minnesota/mnv1.pdf.
[201] Minnesota Department of Natural Resources. December 12, 2014. *Minnesota Land Cover Classification System*.

tree plantation in the MLCCS. These locations were examined using aerial imagery[202] and Minnesota Grown[203] and were determined not to be Christmas tree farms or other silviculture activities.

5.7.4 Recreational

The ROI for recreational economies is within one mile of the Project Area. Recreational activities in Olmsted County include hunting, fishing, boating, hiking, biking, skiing, golfing and snowmobiling. Recreational resources near the Project Area are illustrated in **Figure 23**.

The Project Area includes the southern edge of the Refuge. The Refuge is closed to waterfowl hunting, but other hunting, as legally defined by law and ordinance, is allowed. Refer to **Section 5.6.7** for more information on the Refuge.

The Kalmar Reservoir is popular for fishing and boating. The Zumbro River is a DNR designated State Water Trail.[204]

Snowmobile trails traverse mostly agricultural areas outside of city limits to the west of the Project Area.

Olmsted County maintains the Mayowood Corridor, a 75-acre park along the Zumbro River and Bamber Lake. The park has 3.6 miles of hiking, biking, and skiing trails.[205]

There are three public parks maintained by the City of Rochester near the Project Area including Scenic Oaks Park, Southern Woods Park, and Gardens Park. Scenic Oaks Park, on Scenic Oak Drive SW, has a basketball court, open play field, playground, and sand volleyball court.[206] Southern Woods Park, on 11th Avenue SW, has a paved trail, playground, and soccer field.[207] The Gardens Park, on Garden Court SE, has an open play field and playground.[208]

The Izaak Walton League of America manages a wetland preserve east of the Project Area along the Zumbro River south of Salem Road SW. There is a trail to a wooden viewing platform within the wetlands. The League leads nature walks and organizes restoration projects in the area.[209]

Willow Creek Golf Course is a private golf course and country club located off Willow Creek south of 48th Street SW.

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[202] Google Earth. 2015. Rochester, Minnesota. 43°59'47.45"N and 92°30'56.31"W. Imagery Date April 26, 2015.
[203] Minnesota Grown web site: http://minnesotagrown.com/member-directory/?categories=christmas-trees&perpage=25&pagenum=1. Accessed 8/25/2016.
[204] Minnesota Department of Natural Resources. 2016. "Zumbro River State Water Trail." Available from: http://dnr.state.mn.us/watertrails/zumbroriver/index.html
[205] Olmsted County Parks. n.d. "Welcome to the Olmsted County Park System." Available from: https://www.co.olmsted.mn.us/pw/parks/Documents/3600-02%20Olmsted%20Parks.pdf
[206] City of Rochester Department of Parks and Recreation. 2016. "Scenic Oaks Park." Available from: http://www.rochestermn.gov/Home/Components/FacilityDirectory/FacilityDirectory/318/1354?npage=6
[207] City of Rochester Department of Parks and Recreation. 2016. "Southern Woods Park." Available from: http://www.rochestermn.gov/Home/Components/FacilityDirectory/FacilityDirectory/328/1354?npage=7
[208] City of Rochester Department of Parks and Recreation. 2016. "Southern Woods Park." Available from: http://www.rochestermn.gov/Home/Components/FacilityDirectory/FacilityDirectory/336/1354?npage=7
[209] Izaak Walton League of America Rochester, MN. 2016. Available from: http://www.rochestermnikes.org/

Impacts and Mitigation

Impacts to recreational areas are anticipated to be minimal. Segment alternatives would have similar impacts. Short-term impacts may occur during construction and can be mitigated. No long-term impacts are anticipated. No unique resources would be affected.

No known federal, state, or county parks, forests, or recreational areas would be affected by the proposed Project. While the City of Rochester offers several recreational opportunities and public infrastructure, the Project would be located away from these recreational resources (**Figure 23**).

Route Segment 24 (Segment Alternatives FH-2, FH-3, FI-1, FI-3, GH-1, GI-1 and GI-3) is located along 48th St SW, which forms the northern border of the Willow Creek Golf Course. Users may experience a short-term, temporary increase in traffic during construction as well as short-term, temporary noise and aesthetic impacts. No long-term impacts on golf courses and snowmobile trails would be anticipated from pipeline construction or operation.

Recreational activities on rivers and creeks (that is, fishing and boating) may be affected during pipeline construction. Route Segments 3P and 11 (Segment Alternatives CD-1 and CD-2) would cross the Zumbro River, a DNR designated State Water Trail, with HDD methods; therefore, no long-term impacts are anticipated. Other river crossings include Cascade Creek (Route Segments 3P and 11; Segment Alternatives CD-1 and CD-2) and Willow Creek (Route Segments 8P, 26, 27 and 28; Segment Alternatives HJ-1 through HJ-4 and IJ-1 through IJ-4). Short-term, temporary noise and aesthetic impacts would occur to river users during construction and HDD operations. The Applicant would coordinate with DNR and local governments to minimize potential recreational impacts at the river crossings. No long-term impacts on river users would be anticipated from pipeline construction or operation..

5.7.5 Mining

The ROI for mining is within one mile of the Project Area. Mining of St. Peter Sandstone occurs in the Project Area (see **Section 5.6.1**), although it is not a prominent sector of Olmsted County's socioeconomics. In 2009, mining and resource extraction accounted for less than 1 percent of jobs in Olmsted County.[210] St. Peter Sandstone has a relatively uniform size and shape, and it has multiple commercial applications. It is used in manufacturing glass, for filter and molding sand, and for abrasives. It is also used as "frac sand" in oil and gas drilling.

In addition to St. Peter Sandstone, glacial terrace deposits and alluvium deposits are also mined for sand and gravel. Limestone bedrock from the Galena Group is mined for use as crushed rock (aggregate).

Impacts and Mitigation

No direct impacts to mining are anticipated. Indirect impacts may occur in the future as the presence of a buried pipeline may preclude expansion or development of new mining operations. The Project Area contains areas of St. Peter Sandstone and other features with

[210] Rochester-Olmsted Planning Department. 2014. *Olmsted County General Land Use Plan*. Amended March 25, 2014. Recorded Document Number A-1258681.

high potential for sand and gravel. Five former or active quarries or mines are located near the Project Area (**Figure 22**).[211] While Route Segment 4P (Segment Alternative DE-1) crosses mine operations along 60th Ave SW, active mining areas would be avoided by selecting an alignment that is on the east side of 60th Ave SW. There is potential that future expansion of existing mines, such as expansion of the mines located near Route Segments 3P and 4P (**Figure 22**) or development of new mines at unknown locations could be affected, as mining would not be able to occur within the permanent right-of-way. The Applicant indicates it will coordinate with mining companies should future developments or expansions be identified.

5.8 Cumulative Potential Effects

Minnesota Rule 4410.0200, subpart 11a, defines "cumulative potential effects," in part, as the "effect on the environment that results from the incremental effects of a project in addition to other projects in the environmentally relevant area that might reasonably be expected to affect the same environmental resources, including future projects actually planned or for which a basis of expectation has been laid, regardless of what person undertakes the other projects or what jurisdictions have authority over the project."

The "environmentally relevant area" includes locations where the potential effects of the proposed project coincide with the potential effects of other projects to impact the resources studied in **Section 5.2** through **Section 5.7**. For the purposes of this analysis, the environmentally relevant area is the Project Area. As a result, cumulative potential effects are the sum impacts of the proposed project and other projects within the Project Area. Cumulative impact intensity levels are developed based on the ROI previously identified for each resource topic.

5.8.1 Future Projects in the Project Area

Future projects in the environmentally relevant area that contribute to cumulative potential effects include the following:

Rochester Public Utilities

Rochester Public Utilities (RPU) is planning to construct a new natural gas-fired generating plant at the site of its existing Westside Substation located at 19th Street NW and 60th Avenue NW, near the existing Town Border Station (TBS) 1D. Expansion or rebuild of TBS 1D would not interfere with construction or operation of this facility. The MPCA was responsible for the environmental review for the natural gas-fired plant. The Environmental Assessment Worksheet was published and noticed in the Environmental Quality Board Monitor on July 4, 2016.[212] Public comment was accepted until August 3, 2016. On August 9, 2016, the MPCA determined the RPU project does not require preparation of an Environmental Impact Statement.

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[211] Kostka, S. and J. Ellingson. 2010. Plate A, Report 375, Olmsted County Aggregate Resources, Sand and Gravel Potential. Produced by the Aggregate Resources Mapping Program, Minnesota Department of Natural Resources Division of Lands and Minerals. Available from: http://files.dnr.state.mn.us/lands_minerals/plate_a_olmsted_sandandgravel_potential.pdf.

[212] Environmental Assessment Worksheet, Rochester Public Utilities – Westside Energy Station, July 2, 2016, https://www.pca.state.mn.us/sites/default/files/p-ear2-104a.pdf [hereinafter RPU Westside EAW].

Northern Natural Gas

NNG is a natural gas transportation and storage company that owns and operates the largest interstate natural gas pipeline system in the United States. NNG has announced plans to develop its Northern Lights 2017 expansion project, which would expand pipeline facilities in Minnesota to accommodate growing demand. The project would include construction of approximately 2.6 miles of 12-inch diameter Rochester branch line loop.

As discussed in Section 2.2.1, NNG is also planning to make improvements in its Rochester area facilities to accommodate growing demands. Projects identified for the Rochester area include modifications at TBS 1D and installation of a new 12-mile pipeline lateral to the Proposed TBS. Because the NNG line is an interstate natural gas pipeline, the Northern Lights and Rochester area projects will be subject to FERC review and approval.

Proposed Future Development Projects

Section 5.3.4 includes a list of developments that are in various stages of planning. Generally, the projected growth within the Rochester area will require additional residential construction as well as other types of development. While the overall footprint of these projects has not been determined, these projects would likely affect the same types of resources as the proposed project. Each development project will undergo review and permitting, either through the local planning process or, in some cases, through a state environmental review process.

The analysis focuses on those developments that intersect with a portion of the route width for any route segment. This includes: Scenic Oaks West, Westridge Hills, Willow Creek Commons, Willow Creek Commons West, Willow Heights 5, Forest Knoll, Maine Heights, The Boulders, The Gardens, The Garden Apartments, and The Garden North.

5.8.2 Cumulative Potential Effects Analysis

Cumulative potential effects may increase the breadth of the impact to the resources evaluated in Sections 5.3 through 5.7. For the purposes of this CEA, actions that have occurred in the past and their associated impacts are considered part of the existing environment and are included in the analysis conducted in Sections 5.3 through 5.7.

Human Settlement

This section describes cumulative potential effects to the human settlement resources discussed in Section 5.3.

Population and Employment

The proposed projects will support the expected growth in population of Olmsted County. To the extent workers are hired locally, wages and salaries will increase. Expenditures will increase over the short-term at local businesses. Local governments will receive increased tax revenues. Cumulative potential effects within Olmsted County are anticipated to remain positive and minimal.

Displacement

The proposed NNG projects may cause displacement; however, given the rural character of the area it is anticipated that these projects will be able to avoid homes. Cumulative potential effects are not anticipated.

Land Use and Zoning

Collectively, the projects will occupy previously undeveloped land, encumbering future land use. In some cases land may be converted from agricultural to other uses. Generally, it is anticipated that the projects will be consistent with local zoning and land use rules. Cumulative potential effects within the Project Area are anticipated to remain minimal.

Planned Future Land Use

The proposed NNG projects may result in long-term, negative impacts to future land use within the permanent rights-of-way. Cumulative potential effects are anticipated to be minimal.

Existing Rights-of-Way

Consistent with orderly development practices, the proposed real estate and RPU generating plant projects are not anticipated to impact existing rights-of-way. The proposed NNG projects may or may not share or parallel existing infrastructure. Cumulative potential effects at this time are unknown.

Cultural Values

Collectively, the projects will not impact the cultural values of Olmsted County. Cumulative potential effects are not anticipated.

Transportation

Collectively, the projects will increase traffic over the short-term (project construction) and long-term (increased number of residents). Local governments have developed long-term plans to address increased traffic in the region. Cumulative potential effects are anticipated to be long-term and minimal.

Public Services

Collectively, the projects may cause temporary delays to emergency vehicles and public transportation during project construction. Construction of utility services (for example, water and sewer) associated with the real estate development projects will be necessary. As Rochester expands westward, increased access to public services, such as bus stops, will increase. Cumulative potential effects are anticipated to be short- and long-term, and minimal.

Noise and Vibration

Collectively, the projects will cause short-term noise impacts. These impacts may or may not exceed state noise standards. Long-term impacts include increased noise levels based on increased population in the Project Area. Cumulative potential effects are anticipated to be both short- and long-term, and minimal.

Aesthetics

Collectively, the projects will change the visual landscape, transitioning it towards a more urban environment. The RPU generating plant will introduce an industrial viewpoint on the landscape. The Project Area is in close proximity to a major urban center. Change should occur gradually and is generally expected on the urban fringe. The proposed NNG projects will likely be constructed in agricultural land, reducing their visual footprint on the landscape. Cumulative potential effects are anticipated to be long-term and minimal.

Human Health and Safety

This section describes cumulative potential effects to human health and safety as discussed in Section 5.4.

Public Safety

The potential projects will increase risks to workers during project construction. Impacts related to the normal operation of the proposed NNG projects and the RPU generating plant are anticipated to be minimal. Cumulative potential effects are anticipated to be minimal.

Air Quality

Collectively, the projects will cause temporary increases in exhaust and fugitive dust emissions during construction. Long-term impacts include increased vehicle traffic at developments and increased emission from burning natural gas at the RPU generating plant. The potential for long-term impacts to air quality from the generating plant was determined to be minimal by the MPCA. Cumulative potential effects are anticipated to be short- and long-term, and minimal.

Hazardous Waste and Regulated Materials

Collectively, the projects may encounter hazardous waste and regulated materials. Developers generally avoid known contaminated sites to the greatest extent possible. If sites cannot be avoided, developers must comply with applicable laws and regulations regarding these materials potential effects are anticipated to be minimal.

Archaeological, Cultural and Historic Resources

This section describes cumulative potential effects to the archaeological, cultural and historic resources discussed in Section 5.5.

Collectively, the projects have the potential to disturb previously undiscovered archaeological resources. Cumulative potential effects are unknown.

Natural Environment

This section describes cumulative potential effects to the natural resources discussed in Section 5.6.

Geology

Collectively, the projects may require boring, ripping or shattering bedrock during construction. Long-term impacts may occur if excavation during construction uncovers or exacerbates karst features, unmapped sinkholes, and/or underground cavities. Cumulative potential effects are anticipated to be moderate.

Soils

Collectively, the projects may result in short-term impacts to soils during project construction due to increased potential for erosion, mixing of topsoil and subsoil, compaction, or introduction of rock. Long-term impacts to soils are not anticipated, considering the proposed projects will require topsoil for remediation activities. Long-term impacts may occur if revegetation is ineffective. Cumulative potential effects are anticipated to be short-term, and be minimal.

Groundwater Resources

Collectively, the projects may increase the potential for altered groundwater flow if excavation occurs in areas of shallow bedrock or areas of high geologic sensitivity during project construction. Long-term impacts to groundwater from increased impervious surfaces do to future real estate development projects is anticipated to be minimal due to planning and permitting requirements. Cumulative potential effects are anticipated to be minimal.

Surface Water Resources

The proposed real estate development projects and the RPU generating plant will not impact surface waters. The proposed NNG projects may cross surface waters. Cumulative potential effects are anticipated to be short-term and minimal.

Wetlands

Wetland resources may experience long-term impacts from type conversion and increased sedimentation, resulting in higher levels of turbidity and possible wetland loss. Pipeline projects may cross wetlands. Cumulative potential effects are anticipated to be minimal.

Vegetation

Impervious surfaces within real estate developments will increase. Developers will plant grass and trees, and residents will maintain this vegetation. Cumulative potential effects are anticipated to be minimal.

Wildlife and Wildlife Habitat

Collectively, the projects will displace wildlife during construction. Some individuals may be inadvertently killed. Long-term impacts include habitat type change and possible increased fragmentation and edge effects. Because of the open, agricultural landscape in the Project Area, these impacts are anticipated to be minimal. Cumulative potential effects are anticipated to be minimal.

Threatened, Endangered, and Other Special Status Species

Collectively, the projects will displace wildlife during construction. Some individuals may be inadvertently killed. Long-term impacts include habitat type change and possible increased fragmentation and edge effects. Because of the open, agricultural landscape in the Project Area, these impacts are anticipated to be minimal. Cumulative potential effects are anticipated to be minimal.

Land-Based Economics

This section describes cumulative potential effects to the land-based economies discussed in Section 5.7.

Agriculture

The proposed NNG projects will result in short-term impacts to agricultural uses. Long-term impacts are not anticipated. The proposed real estate development projects and the RGU generating plant will decrease the amount of land available for agricultural use. These impacts will be mitigated by easement acquisition or land purchase. Cumulative potential effects are anticipated to be minimal.

Commercial/Industrial

Cumulative potential effects are not anticipated.

Forestry

Cumulative potential effects are not anticipated.

Recreational

Collectively, the projects will cause short-term disturbances to recreational users during construction. Long-term impacts are not anticipated. Cumulative potential effects are anticipated to be minimal.

Mining

Collectively, the projects will encumber land, which may potentially impact future mining expansion. Cumulative potential effects are anticipated to be minimal.

5.9 Unavoidable Impacts

This section discusses unavoidable impacts to resources associated with the proposed Project. These impacts are similar across all alternatives.

Natural gas pipelines are infrastructure projects that have unavoidable impacts to the human and natural environments. Potential impacts and the possible ways to mitigate against them are discussed in Chapter 5. However, even with mitigation strategies, certain impacts cannot be avoided.

Unavoidable adverse impacts associated with construction of the proposed Project include:

- Temporary visual and noise disturbance to nearby residences, businesses, and recreationalists.
- Vegetative clearing and loss of forested habitat.
- Temporary disturbance and displacement of wildlife during construction.

Unavoidable adverse impacts associated with operation of the proposed Project include:

- Limitations on future land uses within the permanent right-of-way.
- Permanent conversion of approximately three acres of agricultural land to industrial uses for construction of the associated facilities.
- Continued removal of woody vegetation from the permanent-right-of-way, resulting in permanent loss of forested and scrubland wildlife habitat within the permanent right-of-way.

5.10 Resource Commitments

Resource commitments are irreversible when it is impossible or very difficult to redirect that resource to a different future use. Irreversible impacts include the land required to construct the proposed project. While it is possible that the pipeline could be removed and the right-of-way restored to previous conditions, this is unlikely to happen in the reasonably foreseeable future. The loss of forested habitat is considered irreversible, because replacing these forests would take a significant amount of time. Certain land uses within the right-of-way will no longer be able to occur. Impacts to native plant communities results in an irreversible impact although such areas that are disturbed will be revegetated with native seed when agreeable with the underlying landowner.

An irretrievable commitment of resources means the resource is not recoverable for later use by future generations. These impacts are primarily related to project construction, including the use of water, aggregate, hydrocarbons, steel, concrete, and other consumable resources. The commitment of labor and fiscal resources is also considered irretrievable.

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6 Relative Merits of Segment Alternatives

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The analysis in Section 6 applies the information and data available in the route permit application and the CEA to the criteria the Commission needs to consider when making a permit decision. The Commission must locate proposed pipelines in an orderly manner that minimizes adverse human and environmental impacts, while ensuring that pipeline routing permit needs are met and fulfilled in an orderly and timely manner.[213]

Minnesota Rule 7852.1900 identifies 10 criteria the Commission must use when determining a pipeline route. These criteria are:

> A. human settlement, existence and density of populated areas, existing and planned future land use, and management plans;
>
> B. the natural environment, public and designated lands, including but not limited to natural areas, wildlife habitat, water, and recreational lands;
>
> C. lands of historical, archaeological, and cultural significance;
>
> D. economies within the route, including agricultural, commercial or industrial, forestry, recreational, and mining operations;
>
> E. pipeline cost and accessibility;
>
> F. use of existing rights-of-way and right-of-way sharing or paralleling;
>
> G. natural resources and features;
>
> H. the extent to which human or environmental effects are subject to mitigation by regulatory control and by application of the permit conditions contained in part 7852.3400 for pipeline right-of-way preparation, construction, cleanup, and restoration practices;
>
> I. cumulative potential effects of related or anticipated future pipeline construction; and
>
> J. the relevant applicable policies, rules, and regulations of other state and federal agencies, and local government land use laws including ordinances adopted under Minnesota Statutes, section 299J.05, relating to the location, design, construction, or operation of the proposed pipeline and associated facilities.[214]

This analysis is grouped by comparison area. It applies the routing criteria to the segment alternatives, and discusses the relative merits of each alternative. Graphics are used to illustrate the various impacts across comparison areas where impacts are different (**Table 6-1**).

[213] Minn. R. 7852.0200, subp. 4.
[214] Minn. R. 7852.1900, subp. 3.

Table 6-1. Guide to Section 6 Analysis

Anticipated Impact or Consistency with Routing Criteria	Symbol
Impacts are anticipated to be minimal with the application of best management practices (BMPs) and general route permit conditions OR routing option is consistent with routing criteria.	
Impacts are anticipated to be minimal to moderate with the application of BMPs and general route permit conditions, and may require special conditions or selection of a specific routing option to mitigate, or the routing option might be minimal but the potential for impacts greater than the other options OR routing option is consistent with routing criteria but less so than other options in this area.	
Impacts are anticipated to be moderate or significant and unable to be mitigated OR routing option is not consistent with routing criteria or consistent only in part.	

Criteria B (natural environment) and Criteria G (natural resources and features) are combined for the purposes of this analysis.

Criteria C (historical, archaeological, and cultural significant lands) is considered equal for all segment alternatives. Impacts to historic and archeological sites is anticipated to be minimal with the use of general permit conditions, construction practices and BMPs discussed in this CEA. Previously undiscovered resources may be encountered during construction. Additional mitigation (cultural surveys) will be conducted prior to construction. Further mitigation may be required to minimize impacts to any identified resources.

Criteria E (cost and accessibility) is considered equal for all segment alternatives. The Applicant did not indicate a significant difference in the costs associated with any of the segment alternatives studied in this CEA.

Criteria H (mitigation) is discussed throughout the different subsections in Section 6; therefore, a specific discussion regarding the extent to which human and environmental effects are subject to mitigation is not included here.

With respect to Criteria I (cumulative potential effects of future pipeline construction) it is assumed that all segment alternatives are equal because regardless of what particular segment alternatives are selected, the connected pipeline facilities (NNG) will be constructed in the same general location.

With respect to Criteria J (applicable policies, rules and regulations) it is assumed that all segment alternatives are equal insomuch that all route segments are subject to, and must comply with, the relevant applicable policies, rules and regulations of other state and federal agencies, and local government land use laws.

6.1 TBS 1D to Proposed TBS

Figure 4 illustrates this comparison area, which includes five segment alternatives: AB-1, AB-2, BC-1, CD-1 and CD-2 (Table 4-2). Potential impacts across all segment alternatives are

similar, except that the potential for Segment Alternative CD-1 to impact mining economies is greater than the other segment alternatives within this comparison area.

6.1.1 Criteria A: Human Settlement

Potential impacts and possible mitigation measures to human settlement are discussed in Section 5.3 and Section 5.4.

Population and Employment

Impacts to population and employment across all segment alternatives are anticipated to be short-and long-term, minimal and positive.

Displacement

It is anticipated that final pipeline design will place the pipeline within the permitted route, such that the permanent right-of-way would avoid direct impacts to residences or other buildings. Impacts are anticipated to be minimal.

Land Use and Zoning

Short-term impacts to agricultural land uses would occur across all segment alternatives. Following construction, land within the right-of-way would be available for agricultural use.

Planned Future Land Use

No segment alternative crosses a proposed future development area. No impacts will occur.

Cultural Values

Impacts to cultural values are not anticipated for any segment alternative.

Transportation

Short-term impacts to transportation (traffic delays) may occur across all segment alternatives. Construction will not impact road or rail beds. Long-term impacts to traffic patterns will not occur. Impacts are anticipated to be minimal with use of mitigation discussed in this CEA, including: use of HDD construction techniques at all road crossings, use of BMPs and by coordinating with appropriate road authorities.

Public Services

Short-term impacts to emergency services may occur as a result of traffic delays associated with project construction. These impacts are anticipated to be minimal. No long-term impacts are anticipated.

Noise and Vibration

Short-term, unavoidable noise impacts associated with project construction are anticipated to be minimal with use of standard permit conditions and mitigation discussed in this CEA. Long-term impacts associated with operation and maintenance of the pipeline are anticipated to be minimal and unavoidable.

Impacts from vibration are not anticipated.

Aesthetics

Across all segment alternatives, short-term, minimal impacts will occur during project construction. Impacts are unavoidable. Long-term aesthetic impacts in this comparison area are not anticipated. No additional mitigation is proposed.

Air Quality

Short- and long-term impacts associated with project construction (air emissions, fugitive dust) and operation (air emissions) will occur. These impacts are anticipated to be unavoidable, but minimal for all segment alternatives.

Hazardous Waste and Regulated Materials

It is anticipated that final pipeline design will align the pipeline within the approved route, such that the permanent right-of-way will generally avoid direct impacts to hazardous waste and regulated material sites. Impacts are anticipated to minimal.

Public Safety

Across all segment alternatives, impacts to public safety during normal construction and operation of a natural gas pipeline with the use of standard permit conditions and BMPs—as well compliance with federal pipeline safety regulations—are anticipated to be minimal.

6.1.2 Criteria B and G: Natural Environment, Resources and Features

Potential impacts and possible mitigation measures to the natural environment are discussed in Section 5.6.

Geology

Impacts to geologic resources within Segment Alternatives AB-1, AB-2, and BC-1 are not anticipated. Segment Alternatives CD-1 and CD-2 have a similar portion of their lengths within an area of low to moderate probability for sinkhole formation. These impacts are anticipated to be minimal. With the use of general permit conditions and construction techniques discussed in this CEA, this impact is anticipated to be minimal.

Soils

Impacts across all segment alternatives are anticipated to be minimal with the use of general permit conditions, construction practices, and BMPs. All segment alternatives impact prime farmland classifications.

Groundwater Resources

All segment alternatives have relatively similar geologic sensitivity. With the use of general permit conditions and construction techniques, as well as other mitigation discussed in this CEA, this impact is anticipated to be minimal.

Surface Water Resources

Impacts are anticipated to be short-term and minimal with use of HDD at all waterbody crossings and other mitigation discussed in this CEA. Segment Alternative AB-1 has one less crossing than Segment Alternative AB-2.

Wetlands

Segment Alternatives AB-1, AB-2, and BC-1 do not impact wetlands. Segment Alternatives CD-1 and CD-2 impact similar acreages of identical wetland types. Potential impacts across all segment alternatives are anticipated to be minimal with use of general permit conditions, construction techniques, and BMPs discussed in this CEA.

Vegetation

All segment alternatives impact similar vegetation (agricultural land). Impacts are anticipated to be minimal with use of general permit conditions, construction techniques, and BMPs.

Wildlife and Wildlife Habitat

Impacts to wildlife and wildlife habitat across all segment alternatives are anticipated to be minima with use of the mitigation measures discussed in this CEA. High priority wildlife habitat may be located along Segment Alternatives CD-1 and CD-2.

Threatened, Endangered, and Other Special Status Species

Impacts to threatened, endangered, or special status species is anticipated to be minimal across all segment alternatives with use of the mitigation discussed in this CEA.

6.1.3 Criteria D: Economies

Potential impacts and possible mitigation measures to land based economies are discussed in Section 5.7.

Agriculture

Impacts to agriculture across all segment alternatives will be short-term. Impacts can be mitigated by compensation to landowners though lease agreements, as well as general permit conditions, construction techniques, and BMPs. Long-term impacts are not anticipated.

Commercial/Industrial, Forestry, Recreational

Impacts across all segment alternatives are not anticipated.

Mining

Impacts to current mining operations across all segment alternatives are not anticipated. There is potential that future expansion of existing mines, such as expansion of the mine located near Segment Alternative CD-1 may occur. Therefore, the potential for Segment Alternative CD-1 to impact mining economies is greater than the other segment alternatives within this comparison area. No additional mitigation is proposed.

6.1.4 Criteria F: Right-of-way Paralleling

All segment alternatives parallel existing electrical, pipeline or road right-of-way for the majority of their length.

Table 6-2. Town Border Station 1D to Proposed Town Border Station

Element	Relative Merits of Routing Criteria	
	CD-1	Other Segment Alternatives
Mining		

6.2 Proposed TBS to County Road 8

Figure 4 illustrates this comparison area, which includes 13 segment alternatives: DE 1, DE-2, EF-1, EF-2, EF-3, EG-1, EG-2, EG-3, EG-4, EG-5, EG-6, EG-7 and EG-8 (Table 4-3). Potential impacts to human settlement across all segment alternatives are similar, except that the potential for Segment Alternative DE 1 to impact future land use (zoning) is greater than the other segment alternatives within this comparison area. Impacts to natural resources are also similar, except that Segment Alternatives DE 1, DE 2, EF 1 and EG 1 have a lesser potential to encounter sinkholes, and Segment Alternative EG 8 has a greater potential to impact groundwater resources. The potential for Segment Alternatives DE 1 to impact mining economies is greater than the other segment alternatives within this comparison area.

6.2.1 Criteria A: Human Settlement

Potential impacts and possible mitigation measures to human settlement are discussed in Section 5.3 and Section 5.4.

Population and Employment

Impacts to population and employment across all segment alternatives are anticipated to be short-and long-term, minimal and positive.

Displacement

It is anticipated that final pipeline design will place the pipeline within the permitted route, such that the permanent right-of-way would avoid direct impacts to residences or other buildings. Impacts are anticipated to be minimal.

Land Use and Zoning

Short-term impacts to agricultural land uses would occur across all segment alternatives. Following construction, land within the permanent right-of-way would be available for agricultural use. Segment Alternatives DE-1 and EF-1 cross land zoned for sand and gravel mining. Construction of the proposed project would preclude mining operations within the permanent right-of-way. Therefore, while the impact is minimal, the potential for Segment Alternatives DE-1 and EF-1 to impact future land use (zoning) is greater than the other segment alternatives within this comparison area.

Planned Future Land Use

No segment alternative crosses a proposed future development area. No impacts will occur.

Cultural Values

Impacts to cultural values are not anticipated for any segment alternative.

Transportation

Short-term impacts to transportation (traffic delays) may occur across all segment alternatives. Construction will not impact road or rail beds. Long-term impacts to traffic patterns will not occur. Impacts are anticipated to be minimal with use of mitigation discussed in this CEA, including: use of HDD construction techniques, use of BMPs and by coordinating with appropriate road authorities.

Public Services

Short-term impacts to emergency services may occur as a result of traffic delays associated with project construction. The Von Wald Group Home is adjacent to Segment Alternative EF-1 and EG-1. These impacts are anticipated to be minimal. No long-term impacts are anticipated.

Noise and Vibration

Short-term, unavoidable noise impacts associated with project construction are anticipated to be minimal with use of standard permit conditions and mitigation discussed in this CEA. Long-term impacts associated with operation and maintenance of the pipeline are anticipated to be minimal and unavoidable.

Impacts from vibration are not anticipated. No additional mitigation is proposed.

Aesthetics

Short-term, minimal impacts will occur during project construction. Impacts are unavoidable. Long-term aesthetic impacts in this comparison area are not anticipated.

Air Quality

Short- and long-term impacts associated with project construction (air emissions, fugitive dust) and operation (air emissions) will occur. These impacts are anticipated to be unavoidable, but minimal.

Hazardous Waste and Regulated Materials

It is anticipated that final pipeline design will align the pipeline within the approved route, such that the permanent right-of-way will generally avoid direct impacts to hazardous waste and regulated material sites. Impacts are anticipated to minimal.

Public Safety

Across all segment alternatives, impacts to public safety during normal construction and operation of a natural gas pipeline with the use of standard permit conditions and BMPs discussed in this CEA—as well compliance with federal pipeline safety regulations—are anticipated to be minimal.

6.2.2 Criteria B and G: Natural Environment, Resources and Features

Potential impacts and possible mitigation measures to the natural environment are discussed in Section 5.6.

Geology

Impacts to geologic resources across all segment alternatives are anticipated to be moderate with the use of general permit conditions and construction techniques discussed in this CEA, except that Segment Alternatives DE 1, DE 2, EF 1 and EG 1 do not have any portion of their length in an area of high probability for sinkholes; therefore, their impact intensity level is minimal.

Soils

Impacts across all segment alternatives are anticipated to be minimal with the use of general permit conditions, construction practices, and BMPs. All segment alternatives impact comparable areas of prime farmland classifications and highly erodible lands.

Groundwater Resources

Segment Alternatives DE 2, EF 2 and EF 3 have the least amount of their length in bedrock less than five feet. EG 8 has a greater portion of its length in the Decorah Edge. Therefore, while the impact is minimal, the potential for Segment Alternative EG 8 to groundwater is greater than the other "EG" segment alternatives within this comparison area. All route segments have relatively similar geologic sensitivity. With the use of general permit conditions, construction techniques, and BMPs discussed in this CEA, impacts are anticipated to be minimal.

Surface Water Resources

No waterbody crossings are present within any segment alternative. No impacts are anticipated.

Wetlands

Segment Alternatives "EF" and "EG" do not impact wetlands. Segment Alternatives DE-1 and DE-2 impact similar acreages of identical wetland types. Segment Alternative DE 2 impacts one-tenth of an acre within the construction area—this area can likely be avoided. Potential impacts across all segment alternatives are anticipated to be minimal with use of general permit conditions and construction techniques discussed in this CEA.

Vegetation

All segment alternatives impact similar vegetation types, including forested cover types. Impacts within the permanent right-of-way to these cover types will be permanent. Impacts are anticipated to be minimal with use of general permit conditions, construction techniques, avoidance within the route width, and BMPs.

Wildlife and Wildlife Habitat

Impacts to wildlife and wildlife habitat across all segment alternatives are anticipated to be minimal with use of mitigation discussed in this CEA. Removal of tall woody vegetation will impact upland forest habitat. Impacts are relatively similar across all segment alternatives.

Threatened, Endangered, and Other Special Status Species

Impacts to threatened, endangered, or special status species is anticipated to be minimal across all segment alternatives with use of general permit conditions, BMPs, and other mitigation discussed in this CEA.

6.2.3 Criteria D: Economies

Potential impacts and possible mitigation measures to land based economies are discussed in **Section 5.7**.

Agriculture

Impacts to agriculture across all segment alternatives will be short-term. Impacts can be mitigated by compensation to landowners though lease agreements, as well as general permit conditions, construction techniques, and BMPs. Long-term impacts are not anticipated. No additional mitigation is proposed.

Commercial/Industrial, Forestry, Recreational

Impacts across all segment alternatives are not anticipated.

Mining

Impacts to current mining operations across all segment alternatives are not anticipated. There is potential that future expansion of existing mines, such as expansion of the mine located near Segment Alternative EF 1 may occur. Therefore, while the impact is minimal, the potential for Segment Alternative EF 1 to impact mining economies is greater than the other segment alternatives within this comparison area. No additional mitigation is proposed.

Table 6-3. Proposed Town Border Station to County Road 8

Element	Relative Merits of Routing Criteria					
Land Use and Zoning	DE-1	Other Segment Alternatives				
	▲	●				
Geology	Other Segment Alternatives	DE-1	DE-2	EF-1	EG-1	
	▲	●	●	●	●	
Groundwater Resources	EG-8	Other Segment Alternatives				
	▲	●				
Mining	DE-1	Other Segment Alternatives				
	▲	●				
Paralleling	EF-2	EF-3	EG-2	EG-3	EG-6	Other Segment Alternatives
	▲	▲	▲	▲	▲	●

6.2.4 Criteria F: Right-of-way Paralleling

Segment Alternatives EF 2, EF 3, EG 2, EG 3 and EG 6 have significant portions of their length that do not parallel existing electrical, pipeline or road right-of-way.

6.3 County Road 8 to 11th Avenue SW

Figure 4 illustrates this comparison area, which includes 11 segment alternatives: FH 1, FH 2, FH 3, FI 1, FI 2, FI 3, GH 1, GH 2, GI 1, GI 2, and GI 3 (Table 4-4). Potential impacts to human settlement across all segment alternatives are similar, except that Segment Alternatives FH 1, FI 2, GH 2, and GI 2 bisect planned future land use causing significant impacts. Segment Alternatives FH 3, FI 3, GH 1, and GI 1 parallel existing electrical, pipeline or road right-of-way for a significant portion of their length.

6.3.1 Criteria A: Human Settlement

Potential impacts and possible mitigation measures to human settlement are discussed in Section 5.3 and Section 5.4.

Population and Employment

Impacts to population and employment across all segment alternatives are anticipated to be short-and long-term, minimal and positive.

Displacement

It is anticipated that final pipeline design will place the pipeline within the permitted route, such that the permanent right-of-way would avoid direct impacts to residences or other buildings. Impacts are anticipated to be minimal.

Land Use and Zoning

Impacts to land use and zoning are similar across all segment alternatives. Impacts are anticipated to be minimal.

Planned Future Land Use

Segment Alternatives FH 1, FI 2, GH 2, and GI 2 bisect planned future land use. These impacts will be significant. All other segment alternatives follow the edge of planned development for a portion of their length; therefore, impacts will be moderate.

Cultural Values

Impacts to cultural values are not anticipated for any segment alternative.

Transportation

Short-term impacts to transportation (traffic delays) may occur across all segment alternatives. Construction will not impact road or rail beds. Long-term impacts to traffic patterns will not occur. Impacts are anticipated to be minimal with use of mitigation discussed in this CEA, including: use of HDD construction techniques, use of BMPs and by coordinating with appropriate road authorities.

Public Services

Short-term impacts to emergency services may occur as a result of traffic delays associated with project construction. These impacts are anticipated to be minimal. No long-term impacts are anticipated.

Noise and Vibration

Short-term, unavoidable noise impacts associated with project construction are anticipated to be minimal with use of standard permit conditions and mitigation discussed in this CEA. Long-term impacts associated with operation and maintenance of the pipeline are anticipated to be minimal and unavoidable.

Impacts from vibration are not anticipated.

Aesthetics

Short-term, minimal impacts will occur during project construction. Impacts are unavoidable. Long-term aesthetic impacts in this comparison area are not anticipated.

Air Quality

Short- and long-term impacts associated with project construction (air emissions, fugitive dust) and operation (air emissions) will occur. These impacts are anticipated to be unavoidable, but minimal.

Hazardous Waste and Regulated Materials

It is anticipated that final pipeline design will align the pipeline within the approved route, such that the permanent right-of-way will generally avoid direct impacts to hazardous waste and regulated material sites. Impacts are anticipated to minimal.

Public Safety

Across all segment alternatives, impacts to public safety during normal construction and operation of a natural gas pipeline with the use of standard permit conditions and BMPs discussed in this CEA—as well compliance with federal pipeline safety regulations—are anticipated to be minimal.

6.3.2 Criteria B and G: Natural Environment, Resources and Features

Potential impacts and possible mitigation measures to the natural environment are discussed in Section 5.6.

Geology

Impacts to geologic resources across all segment alternatives are anticipated to be moderate with the use of general permit conditions and construction techniques discussed in this CEA.

Soils

Impacts across all segment alternatives are anticipated to be minimal with the use of general permit conditions, construction practices, and BMPs. All segment alternatives impact comparable areas of prime farmland classifications and highly erodible lands.

Groundwater Resources

All route segments have relatively similar geologic sensitivity and length of pipeline within the Decorah Edge and in bedrock less than five feet. With the use of general permit conditions and construction techniques discussed in this CEA, this impact is anticipated to be minimal.

Surface Water Resources

No waterbody crossing are present within any segment alternative. No impacts are anticipated.

Wetlands

Potential impacts across all segment alternatives are anticipated to be minimal with use of general permit conditions and construction techniques discussed in this CEA.

Vegetation

All segment alternatives impact similar vegetation types, including forested cover types. Impacts will be greater for Segment Alternatives FH 3 and GH 1, but will remain minimal. Within the permanent right-of-way impacts to these cover types will be permanent. Impacts are anticipated to be minimal with use of general permit conditions, construction techniques, avoidance within the route width, and BMPs.

Wildlife and Wildlife Habitat

Impacts to wildlife and wildlife habitat across all segment alternatives are anticipated to be minimal with use of the mitigation discussed in this CEA. Removal of tall woody vegetation will impact upland forest habitat. Impacts are relatively similar across all segment alternatives, except that impacts will be slightly greater for Segment Alternatives FH 3 and GH 1. Impacts to these segment alternatives will remain minimal.

Threatened, Endangered, and Other Special Status Species

Impacts to threatened, endangered, or special status species is anticipated to be minimal across all segment alternatives with use of general permit conditions and BMPs and other mitigation discussed in this CEA.

6.3.3 Criteria D: Economies

Potential impacts and possible mitigation measures to land based economies are discussed in Section 5.7.

Agriculture

Impacts to agriculture across all segment alternatives will be short-term. Impacts can be mitigated by compensation to landowners though lease agreements, as well as general permit conditions, construction techniques, and BMPs. Long-term impacts are not anticipated. No additional mitigation is proposed.

Commercial/Industrial, Forestry, Recreational and Mining

Impacts across all segment alternatives are anticipated to be minimal.

6.3.4 Criteria F: Right-of-way Paralleling

Segment Alternatives FH-3, FI-3, GH-1, and GI-1 parallel existing electrical, pipeline or road right-of-way for a significant portion of their length. All other segment alternatives do not.

Table 6-4. County Road 8 to 11th Avenue SW

Element	Relative Merits of Routing Criteria					
Planned Future Development	FH-1	FI-2	GH-2	GI-2	Other Segment Alternatives	
	■	■	■	■	▲	
Paralleling	Other Segment Alternatives		FH-3	FI-3	GH-1	GI-1
	▲		●	●	●	●

6.4 11th Avenue SW to Proposed DRS

Figure 4 illustrates this comparison area, which includes eight segment alternatives: HJ 1, HJ 2, HJ 3, HJ 4, IJ 1, IJ 2, IJ 3 and IJ 4 (Table 4-5). Potential impacts to human settlement across all segment alternatives are similar, except that Segment Alternatives bisect planned future land use causing significant impacts.

6.4.1 Criteria A: Human Settlement

Potential impacts and possible mitigation measures to human settlement are discussed in Section 5.3 and Section 5.4.

Population and Employment

Impacts to population and employment across all segment alternatives are anticipated to be short-and long-term, minimal and positive.

Displacement

It is anticipated that final pipeline design will place the pipeline within the permitted route, such that the permanent right-of-way would avoid direct impacts to residences or other buildings. Impacts are anticipated to be minimal.

Land Use and Zoning

Impacts to land use and zoning are similar across all segment alternatives.

Planned Future Land Use

Segment Alternatives HJ 2 and IJ 2 bisect planned future land use. These impacts will be significant. All other segment alternatives follow the edge of planned development for a portion of their length; therefore, impacts will be moderate.

Cultural Values

Impacts to cultural values are not anticipated for any segment alternative.

Transportation

Short-term impacts to transportation (traffic delays) may occur across all segment alternatives. Construction will not impact road or rail beds. Long-term impacts to traffic patterns will not occur. Impacts are anticipated to be minimal with use of mitigation discussed in this CEA, including: use of HDD construction techniques, use of BMPs and by coordinating with appropriate road authorities.

Public Services

Short-term impacts to emergency services may occur as a result of traffic delays associated with project construction. These impacts are anticipated to be minimal. No long-term impacts are anticipated.

Noise and Vibration

Short-term, unavoidable noise impacts associated with project construction are anticipated to be minimal with use of standard permit conditions and mitigation discussed in this CEA. Long-term impacts associated with operation and maintenance of the pipeline are anticipated to be minimal and unavoidable.

Impacts from vibration are not anticipated.

Aesthetics

Short-term, minimal impacts will occur during project construction. Impacts are unavoidable. Long-term aesthetic impacts in this comparison area are not anticipated.

Air Quality

Short- and long-term impacts associated with project construction (air emissions, fugitive dust) and operation (air emissions) will occur. These impacts are anticipated to be unavoidable, but minimal.

Hazardous Waste and Regulated Materials

It is anticipated that final pipeline design will align the pipeline within the approved route, such that the permanent right-of-way will generally avoid direct impacts to hazardous waste and regulated material sites. Impacts are anticipated to minimal.

Public Safety

Across all segment alternatives, impacts to public safety during normal construction and operation of a natural gas pipeline with the use of standard permit conditions and BMPs discussed in this CEA—as well compliance with federal pipeline safety regulations—are anticipated to be minimal.

6.4.2 Criteria B and G: Natural Environment, Resources and Features

Potential impacts and possible mitigation measures to the natural environment are discussed in Section 5.6.

Geology

Route Segments HJ 2, HJ 4, IJ 2 and IJ 4 have a greater portion of their length within bedrock of less than five feet. Impacts to geologic resources across all segment alternatives are anticipated to be moderate with the use of general permit conditions and construction techniques discussed in this CEA.

Soils

Impacts across all segment alternatives are anticipated to be minimal with the use of general permit conditions, construction practices, and BMPs discussed in this CEA. All segment alternatives impact comparable areas of prime farmland classifications and highly erodible lands.

Groundwater Resources

Route Segments HJ 1, HJ 2, IJ 1 and IJ 2 have as relatively higher geologic sensitivity, but less of their length within the Decorah Edge. Route Segments HJ 2, HJ 4, IJ 2 and IJ 4 have a greater portion of their length within bedrock of less than five feet. With the use of general permit conditions and construction techniques discussed in this CEA, this impact is anticipated to be minimal, except that Route Segments HJ 2 and IJ 2 have a greater potential for impact than the other segment alternatives. Additional mitigation (spill response plan, minimized grading, erosion control, and trench breakers) is proposed.

Surface Water Resources

Impacts are anticipated to be short-term and minimal with use of HDD at all waterbody crossings with use of construction techniques and other mitigation discussed in this CEA.

Wetlands

Conversion of woody wetlands to a different wetland type may occur. Segment Alternatives HJ 4 and IJ 4 do not impact forested or shrub wetland types. Potential impacts across all segment alternatives are anticipated to be minimal with use of general permit conditions and construction techniques discussed in this CEA.

Vegetation

All segment alternatives impact similar vegetation types, including forested cover types. Impacts will be greater for Segment Alternatives HJ 1 and HI 1, but will remain minimal. Within the permanent right-of-way impacts to these cover types will be permanent. Impacts are anticipated to be minimal with use of general permit conditions, construction techniques, avoidance within the route width, and BMPs discussed in this CEA.

Wildlife and Wildlife Habitat

Impacts to wildlife and wildlife habitat across all segment alternatives are anticipated to be minimal with use of mitigation discussed in this CEA. Removal of tall woody vegetation will impact upland forest habitat. Impacts are relatively similar across all segment alternatives, except that impacts will be slightly greater for Segment Alternatives HJ 1 and HI 1. These impacts will remain minimal.

Threatened, Endangered, and Other Special Status Species

Impacts to threatened, endangered, or special status species is anticipated to be minimal across all segment alternatives with use of general permit conditions and BMPs discussed in this CEA.

6.4.3 Criteria D: Economies

Potential impacts and possible mitigation measures to land based economies are discussed in Section 5.7.

Agriculture, Forestry and Mining

Impacts are not anticipated.

Commercial/Industrial and Recreational

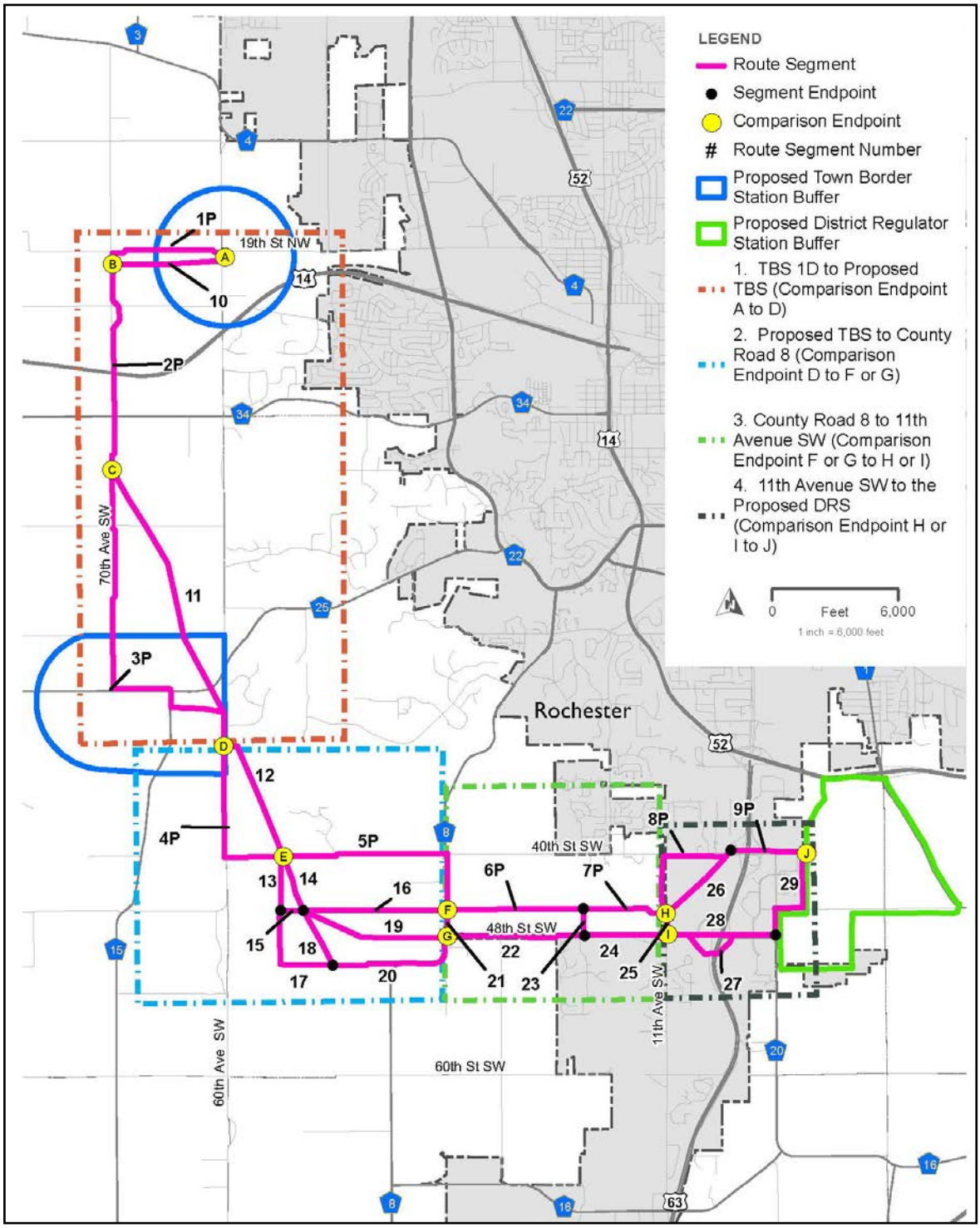
Potential impacts across all segment alternatives are anticipated to be similar and minimal.

6.4.4 Criteria F: Right-of-way Paralleling

Segment Alternatives HJ 1 and IJ 1 parallel existing electrical, pipeline or road right-of-way for a significant portion of their length.

Table 6-5. 11th Avenue SW to Proposed District Regulator Station

Element	Relative Merits of Routing Criteria			
Planned Future Development	HJ-2	IJ-2	Other Segment Alternatives	
	■	■	▲	
Groundwater Resources	HJ-2	IJ-2	Other Segment Alternatives	
	▲	▲	●	
Paralleling	Other Segment Alternatives		HJ-1	IJ-1
	▲		●	●



Rochester Natural Gas Pipeline Project
Docket No. G-011/GP-15-858

Comparative Environmental Analysis
September 16, 2016

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MINNESOTA DEPARTMENT OF COMMERCE

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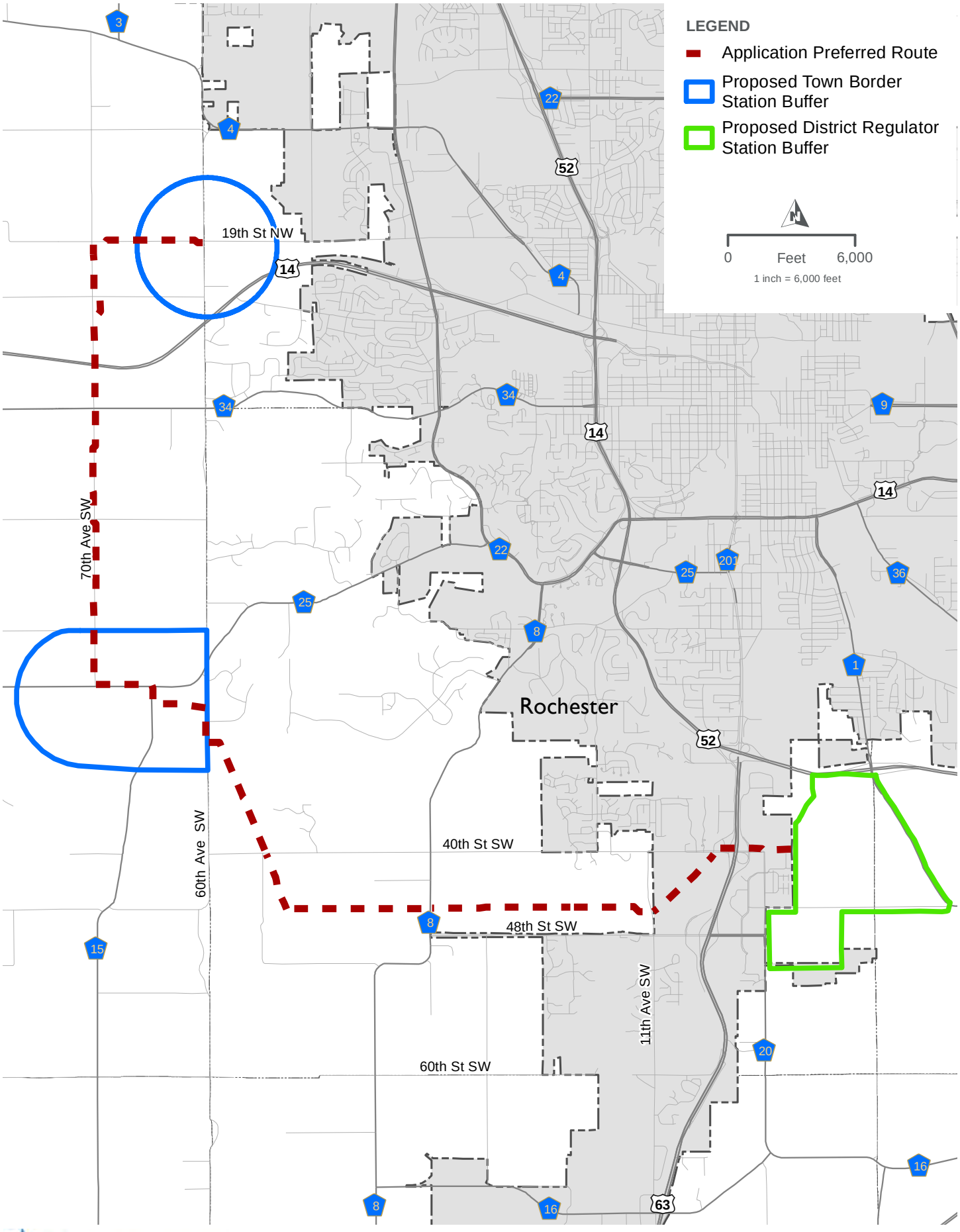
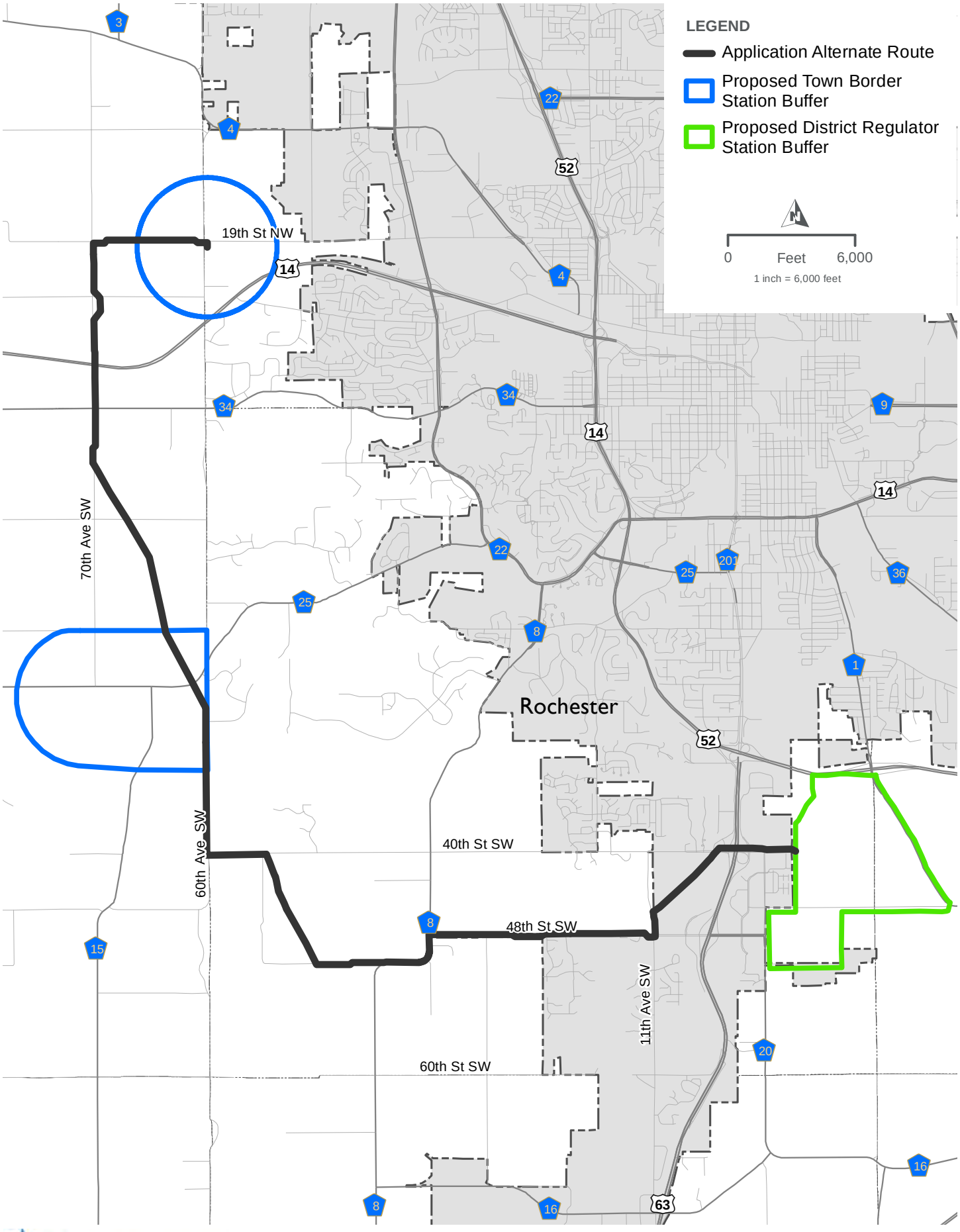


MINNESOTA DEPARTMENT OF COMMERCE

APPLICATION PREFERRED ROUTE

ROCHESTER NATURAL GAS PIPELINE

FIGURE 1A

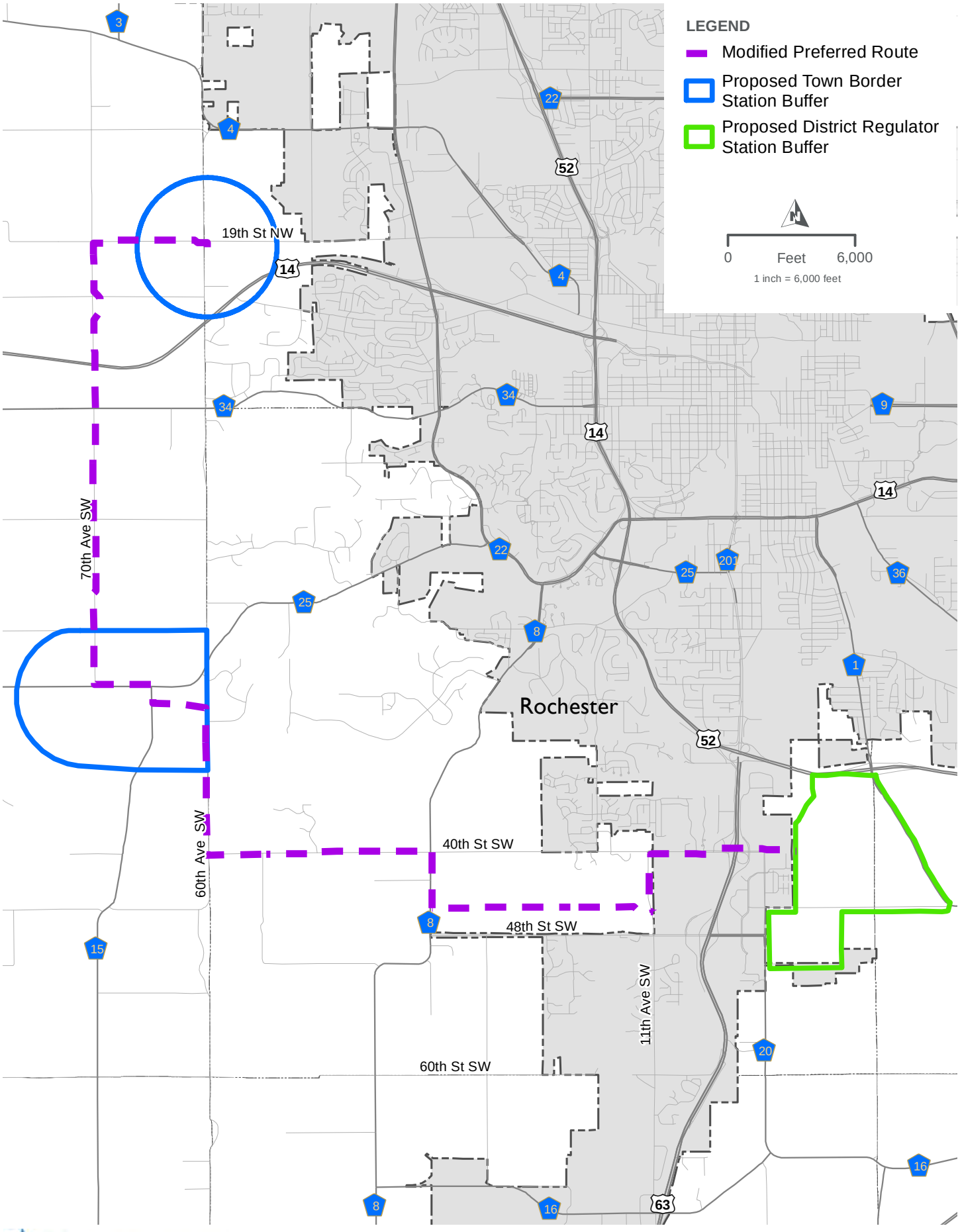


MINNESOTA DEPARTMENT OF COMMERCE

APPLICATION ALTERNATIVE ROUTE

ROCHESTER NATURAL GAS PIPELINE

FIGURE 1B



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MODIFIED PREFERRED ROUTE

ROCHESTER NATURAL GAS PIPELINE

FIGURE 1C

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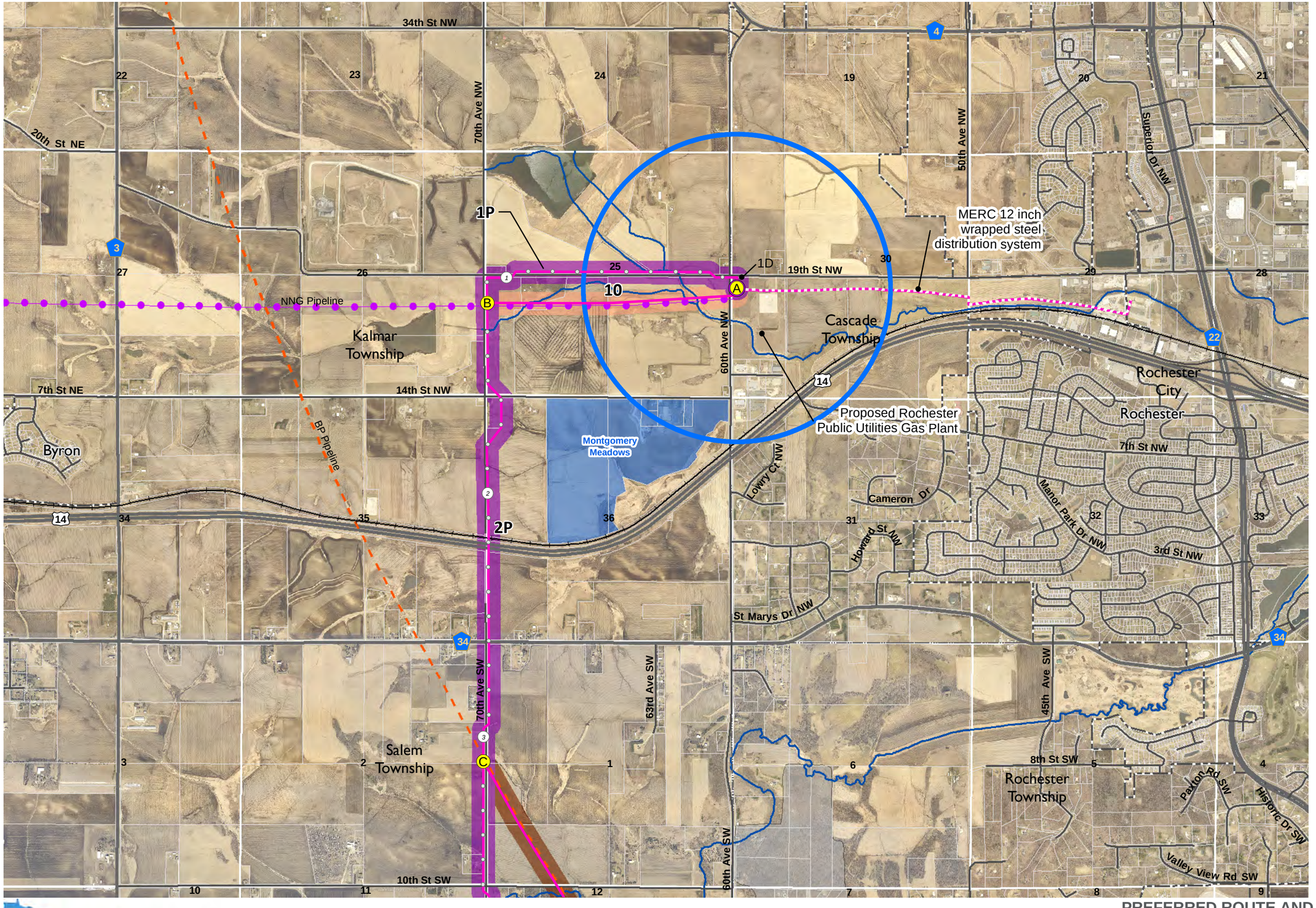
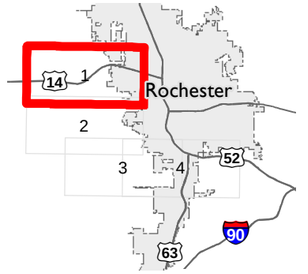




LEGEND

- Route Segment
- Segment Endpoint
- Comparison Endpoint
- # Route Segment Number
- Application Preferred Route
- Application Alternate Route
- Modified Preferred Route
- Scoping Route
- Proposed Town Border Station Buffer
- Proposed District Regulator Station Buffer
- Town Border Station (TBS)
- Future Development
- City Boundary
- Township Boundary
- PWI Stream

MBS Sites of Biodiversity Significance

- Outstanding
- High
- Moderate
- Below
- Milepost (1/10th mile)
- Milepost (1 mile)

0 Feet 2,000

1 inch = 2,000 feet

MINNESOTA DEPARTMENT OF COMMERCE

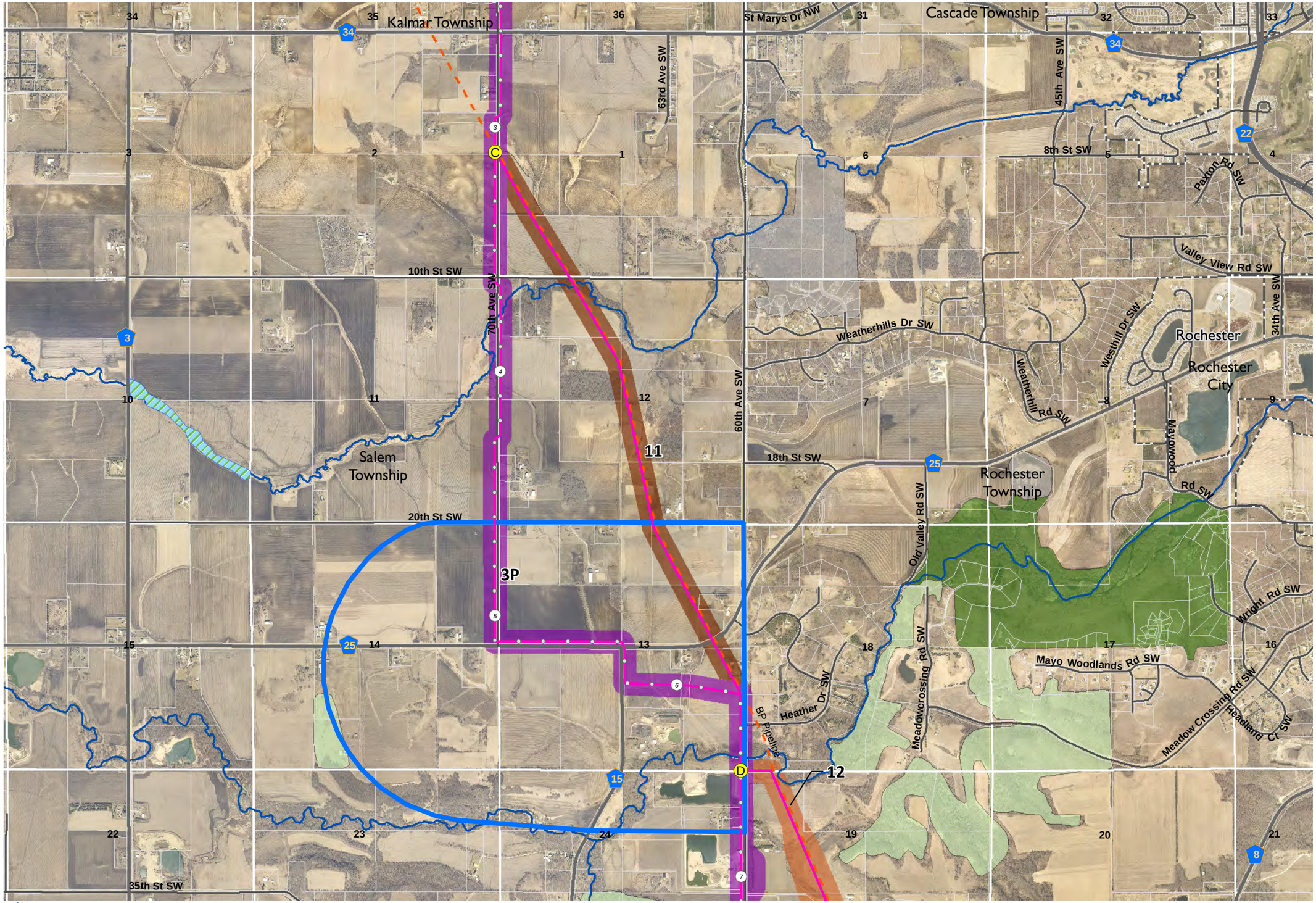
PREFERRED ROUTE AND PROPOSED FACILITIES

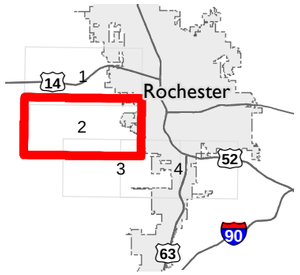
ROCHESTER NATURAL GAS PIPELINE

FIGURE 2 (PAGE 1 OF 4)

PATH: \\MSPE-GIS-FILE\GISPROJ\050_DEN\232026_MERC\MAP_DOCS\CEA\02_PREFERREDROUTE_PROPOSEDFACILITY_11X17.MXD - USER: JWALTER - DATE: 9/13/2016

COMPARATIVE ENVIRONMENTAL ANALYSIS





LEGEND

- Route Segment
- Segment Endpoint
- Comparison Endpoint
- # Route Segment Number
- Application Preferred Route
- Application Alternate Route
- Modified Preferred Route
- Scoping Route
- Proposed Town Border Station Buffer
- Proposed District Regulator Station Buffer
- Town Border Station (TBS)
- Future Development
- Wetland Bank
- City Boundary
- Township Boundary
- PWI Stream

MBS Sites of Biodiversity Significance

- Outstanding
- High
- Moderate
- Below
- Milepost (1/10th mile)
- Milepost (1 mile)

0 Feet 2,000

1 inch = 2,000 feet

MINNESOTA DEPARTMENT OF COMMERCE

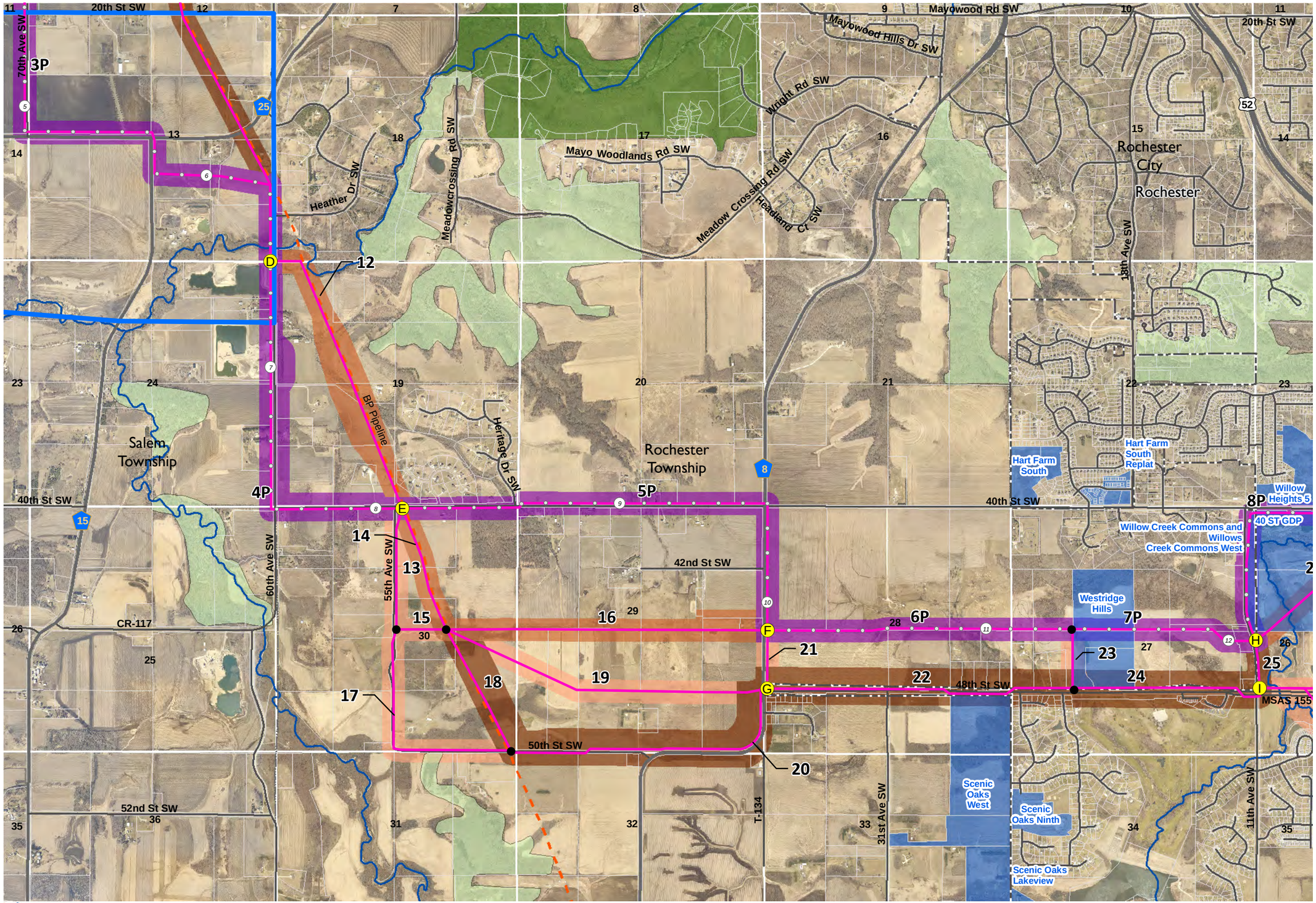
PREFERRED ROUTE AND PROPOSED FACILITIES

ROCHESTER NATURAL GAS PIPELINE

FIGURE 2 (PAGE 2 OF 4)

PATH: \\MSPE-GIS-FILE\GISPROJ\050_DEN\232026_MERC\MAP_DOCS\CEA\02_PREFERREDROUTE_PROPOSEDFACILITY_11X17.MXD - USER: JWALTER - DATE: 9/13/2016

COMPARATIVE ENVIRONMENTAL ANALYSIS



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MINNESOTA DEPARTMENT OF COMMERCE

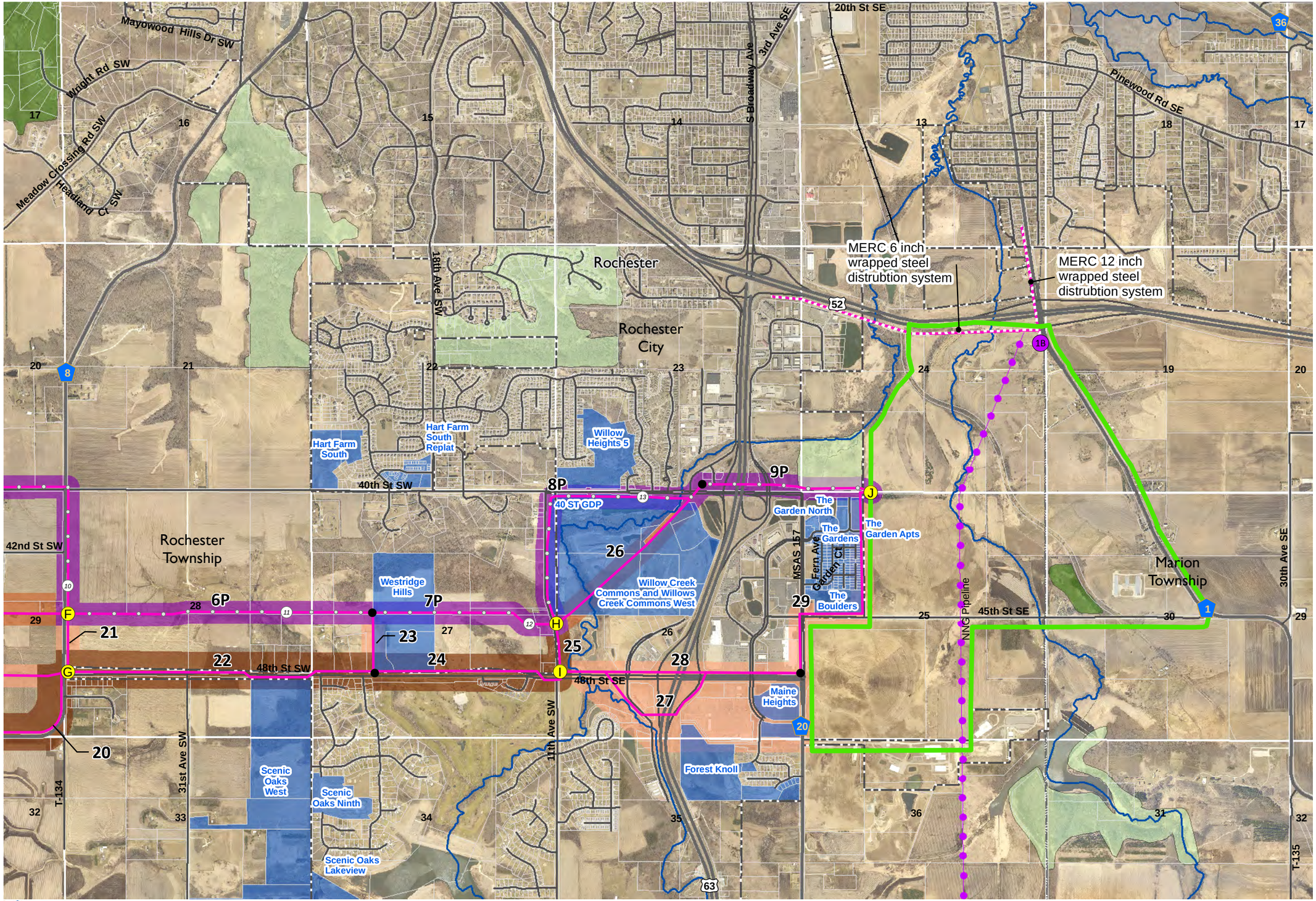
PREFERRED ROUTE AND PROPOSED FACILITIES

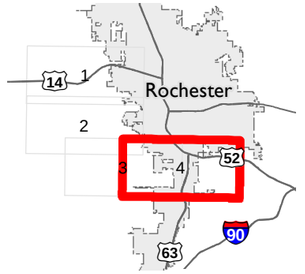
ROCHESTER NATURAL GAS PIPELINE

FIGURE 2 (PAGE 3 OF 4)

PATH: \\MSPE-GIS-FILE\GISPROJ\050_DEN\232026_MERC\MAP_DOCS\CEA\02_PREFERREDROUTE_PROPOSEDFACILITY_11X17.MXD - USER: JWALTER - DATE: 9/13/2016

COMPARATIVE ENVIRONMENTAL ANALYSIS





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- Route Segment
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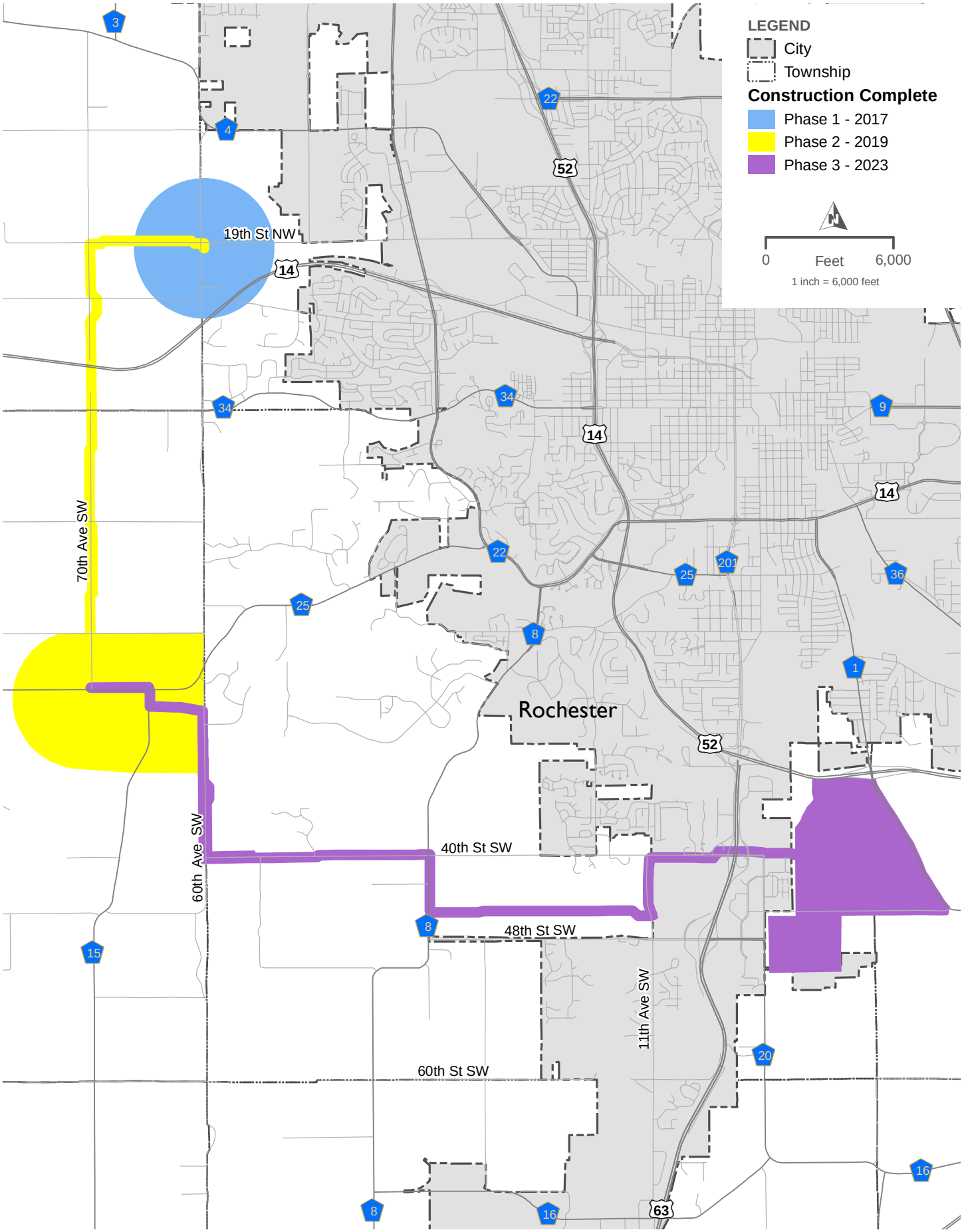
MINNESOTA DEPARTMENT OF COMMERCE

PREFERRED ROUTE AND PROPOSED FACILITIES

ROCHESTER NATURAL GAS PIPELINE

FIGURE 2 (PAGE 4 OF 4)

PATH: \\MSPE-GIS-FILE\GISPROJ\050_DEN\232026_MERC\MAP_DOCS\CEA\02_PREFERREDROUTE_PROPOSEDFACILITY_11X17.MXD - USER: JWALTER - DATE: 9/13/2016

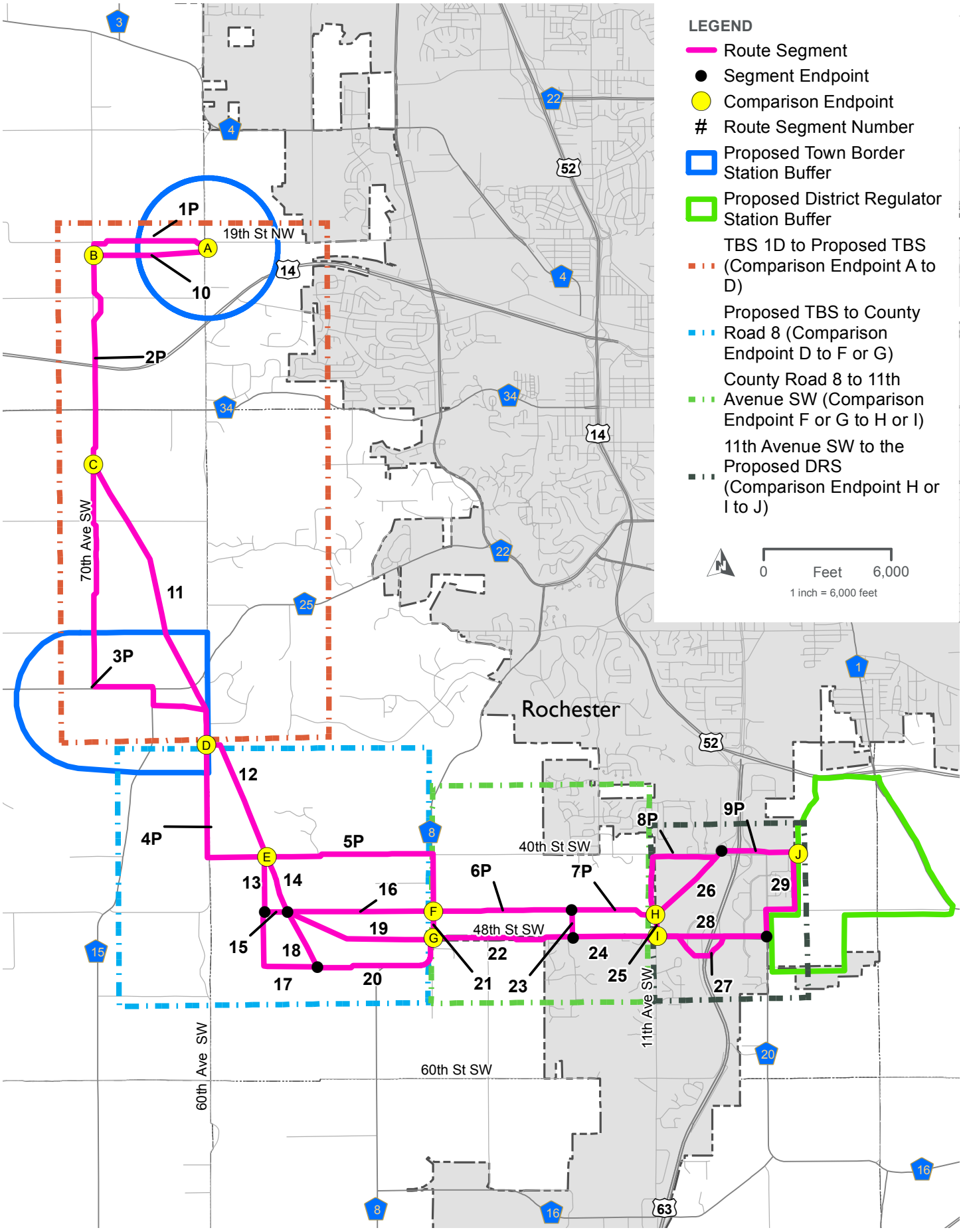


MINNESOTA DEPARTMENT OF COMMERCE

CONSTRUCTION COMPLETION PHASES

ROCHESTER NATURAL GAS PIPELINE

FIGURE 3

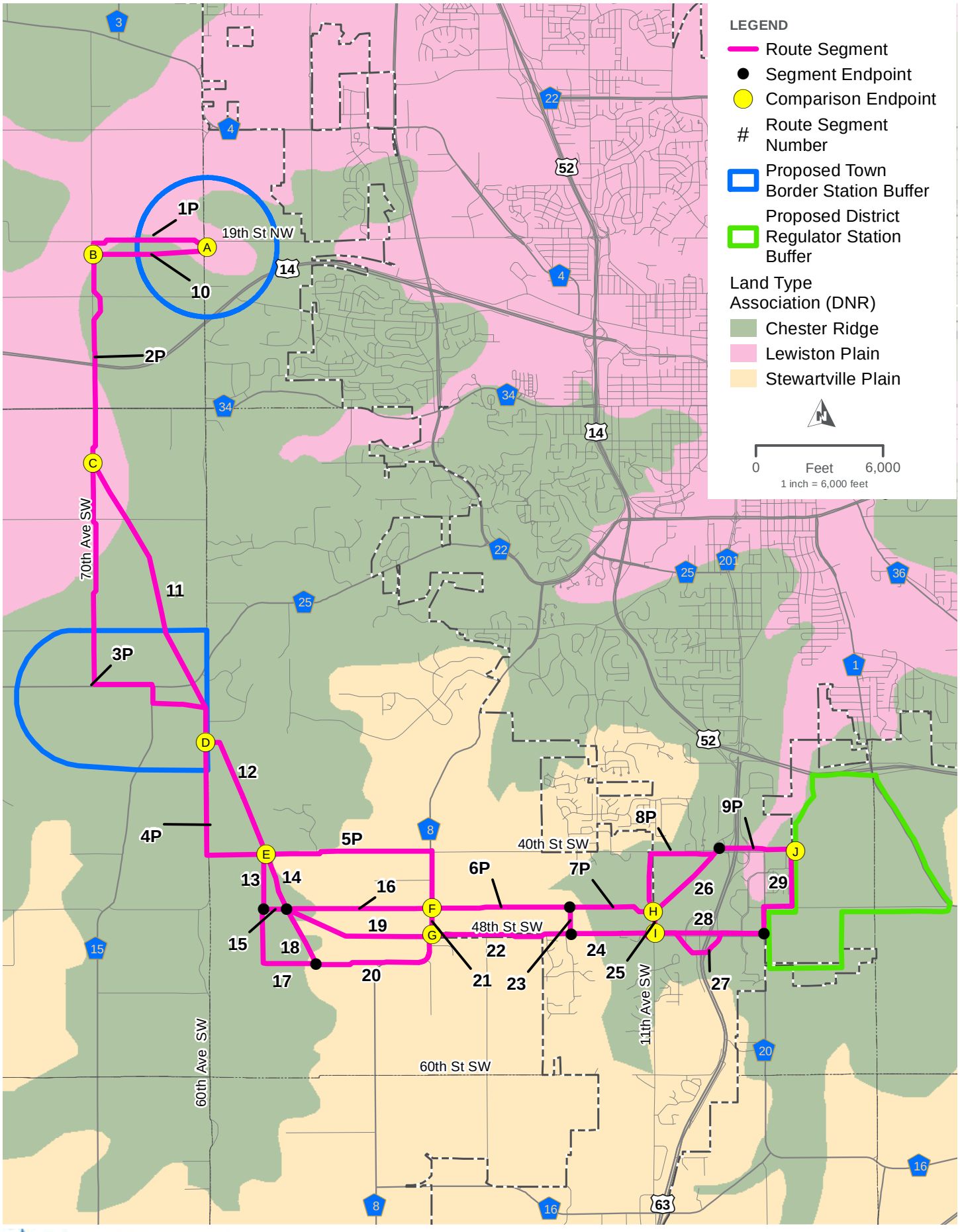


MINNESOTA DEPARTMENT OF COMMERCE

ROUTE SEGMENTS AND COMPARISON AREAS

ROCHESTER NATURAL GAS PIPELINE

FIGURE 4

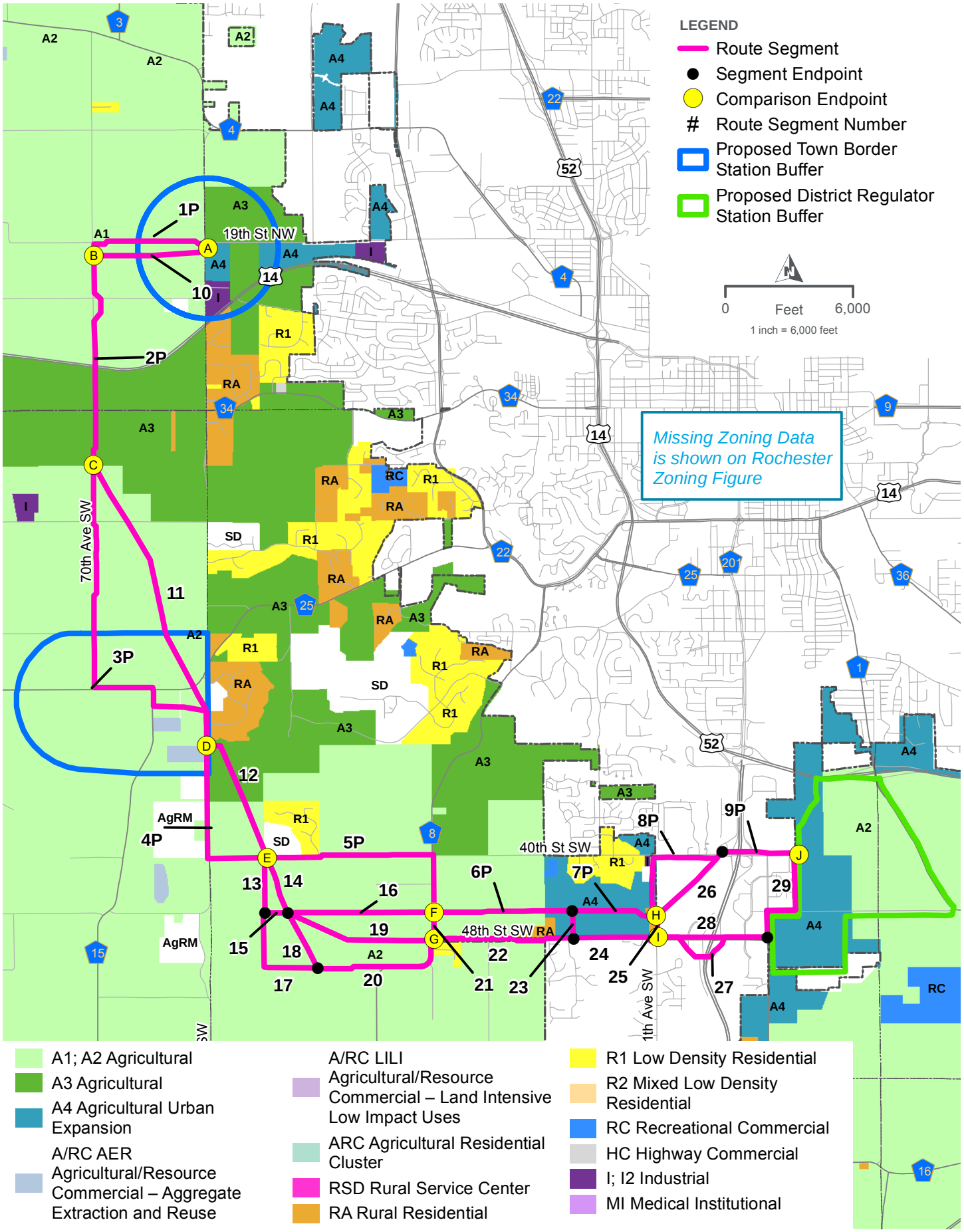


MINNESOTA DEPARTMENT OF COMMERCE

ENVIRONMENTAL SETTING

ROCHESTER NATURAL GAS PIPELINE

FIGURE 5

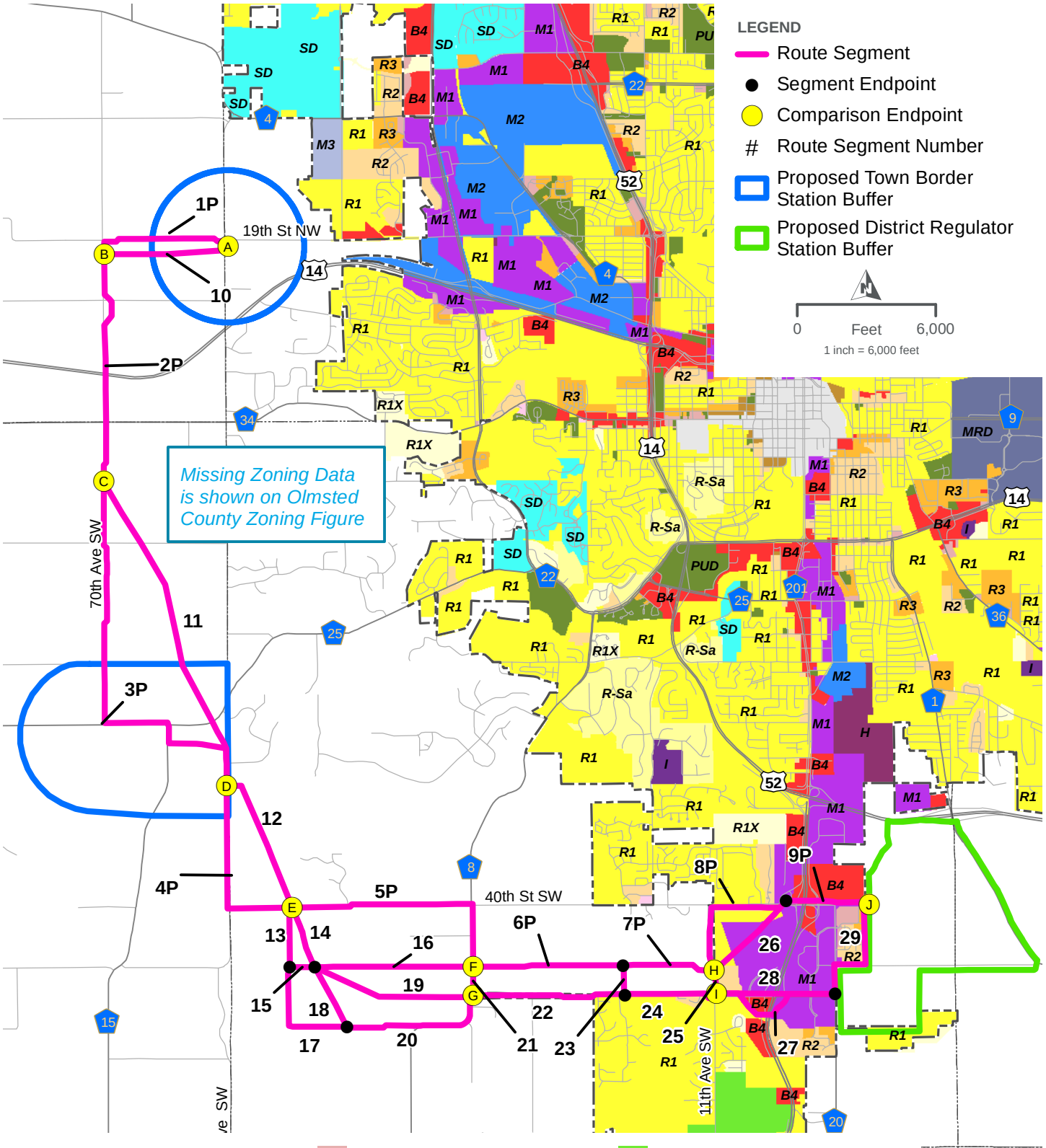


MINNESOTA DEPARTMENT OF COMMERCE

OLMSTED COUNTY ZONING

ROCHESTER NATURAL GAS PIPELINE

FIGURE 6



R-Sa Mixed Single Family Overlay
R1 Mixed Single Family
R1X Mixed Single Family Extra
R2 Low Density Residential
R3 Medium Density Residential
R4 High Density Residential

B1 Restricted Commercial
B4 General Commercial
B5 Residential Commercial
M1 Mixed Commercial-Industrial
M2 Industrial
M3 Low Intensity Mixed Commercial-Industrial

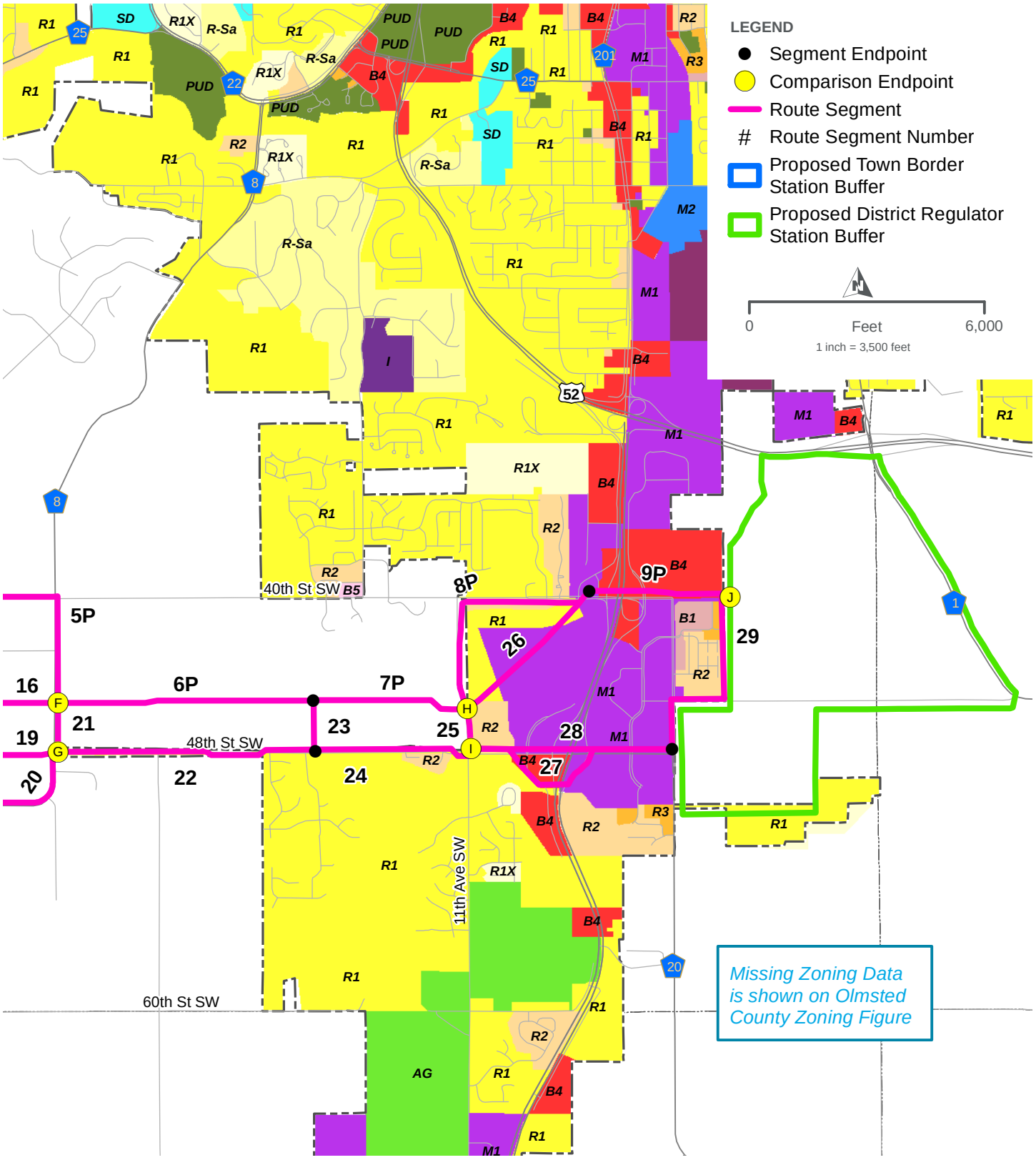
AG Agricultural
MRD Mixed Redevelopment
PUD Planned Unit Development
SD Special District
H Holding Zone
I Interim Zone
Central Core Development

MINNESOTA DEPARTMENT OF COMMERCE

CITY OF ROCHESTER ZONING

ROCHESTER NATURAL GAS PIPELINE

FIGURE 7A



MINNESOTA DEPARTMENT OF COMMERCE

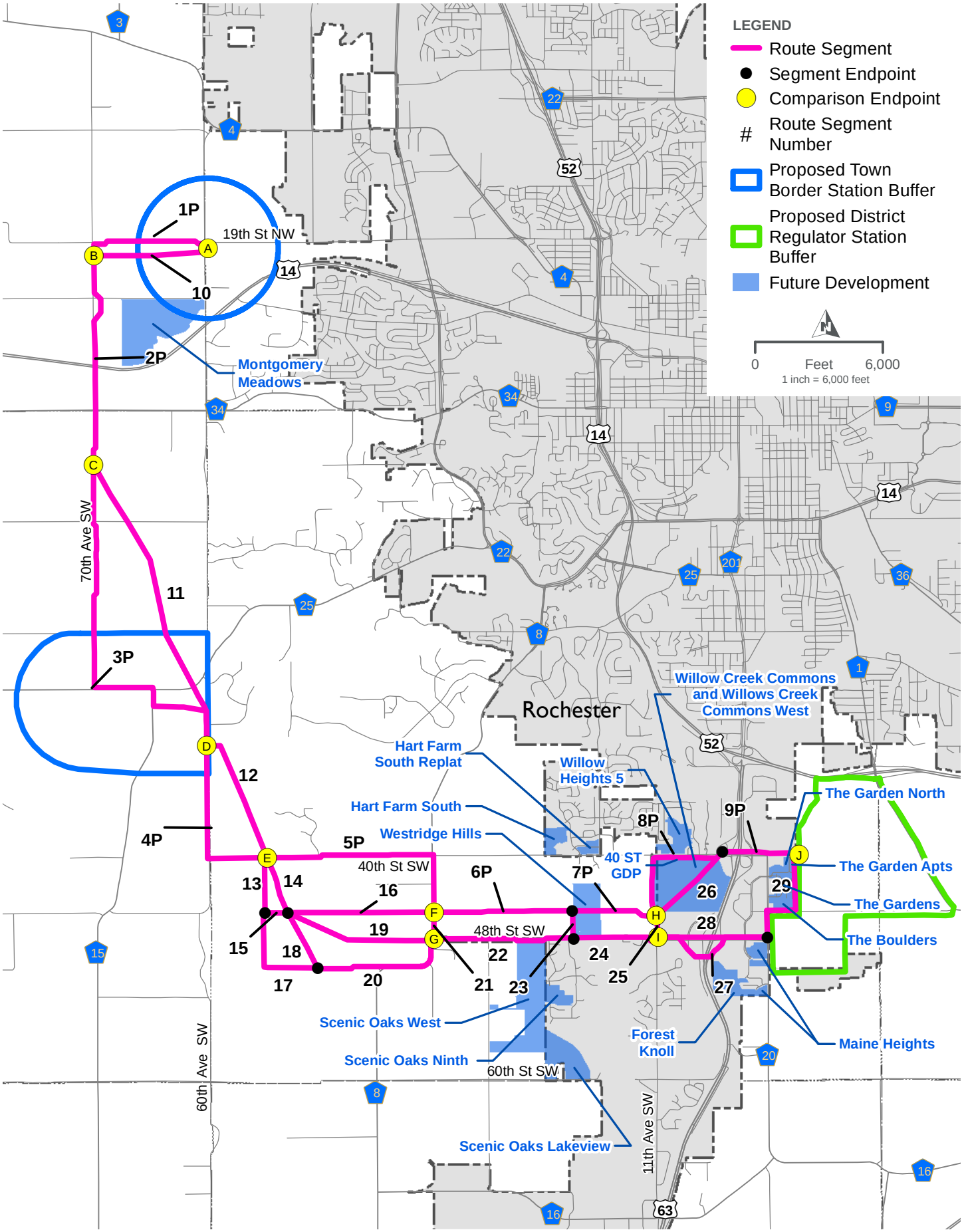
CITY OF ROCHESTER ZONING

ROCHESTER NATURAL GAS PIPELINE

FIGURE 7B

PATH: \\MSPE-GIS-FILE\GISPROJ\050_DEN\232026_MERC\MAP_DOCS\CEA\07B_ROCHESTERZONING_ZOOM.MXD - USER: JWALTER - DATE: 9/13/2016

COMPARATIVE ENVIRONMENTAL ANALYSIS

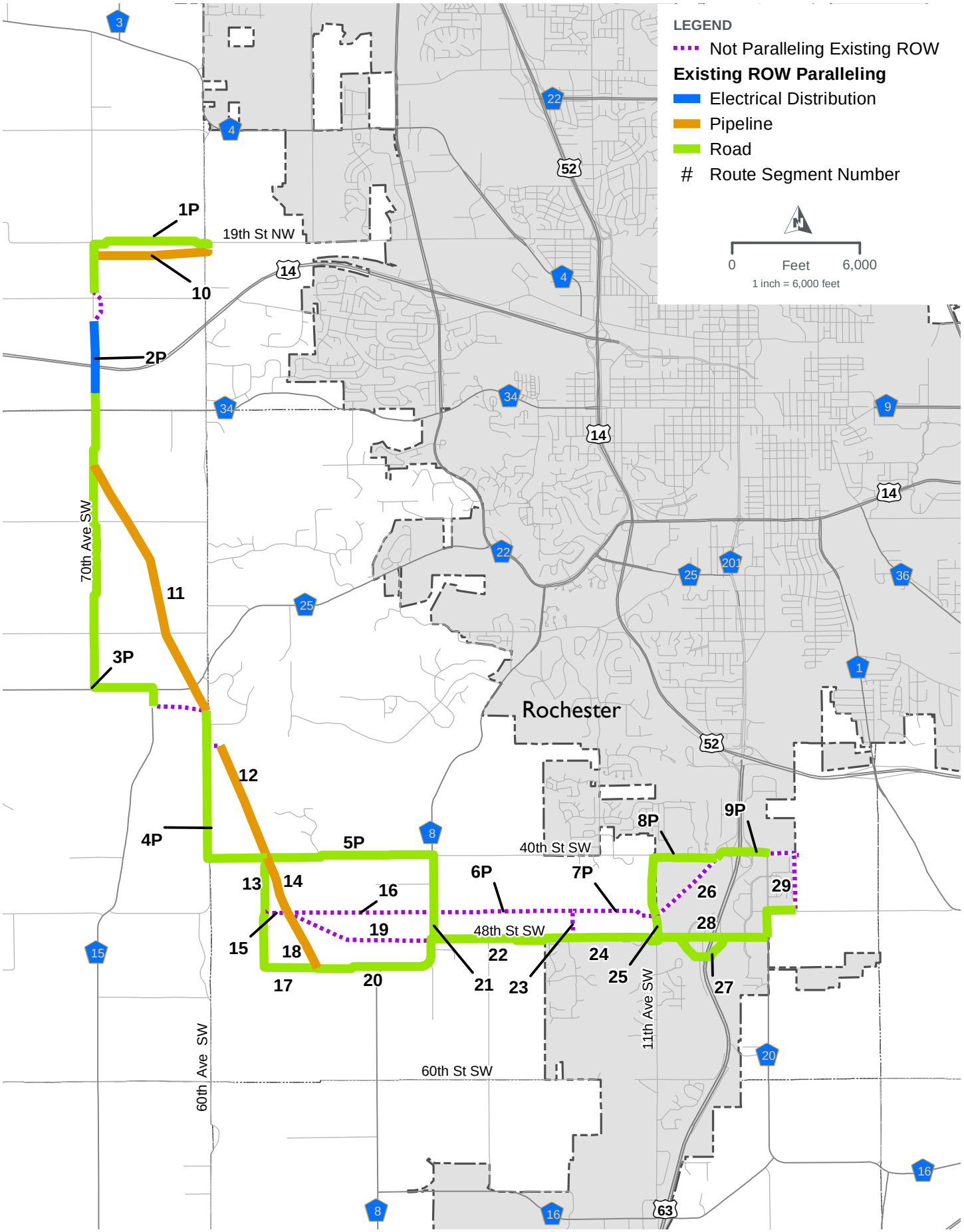


MINNESOTA DEPARTMENT OF COMMERCE

PLANNED FUTURE DEVELOPMENTS

ROCHESTER NATURAL GAS PIPELINE

FIGURE 8

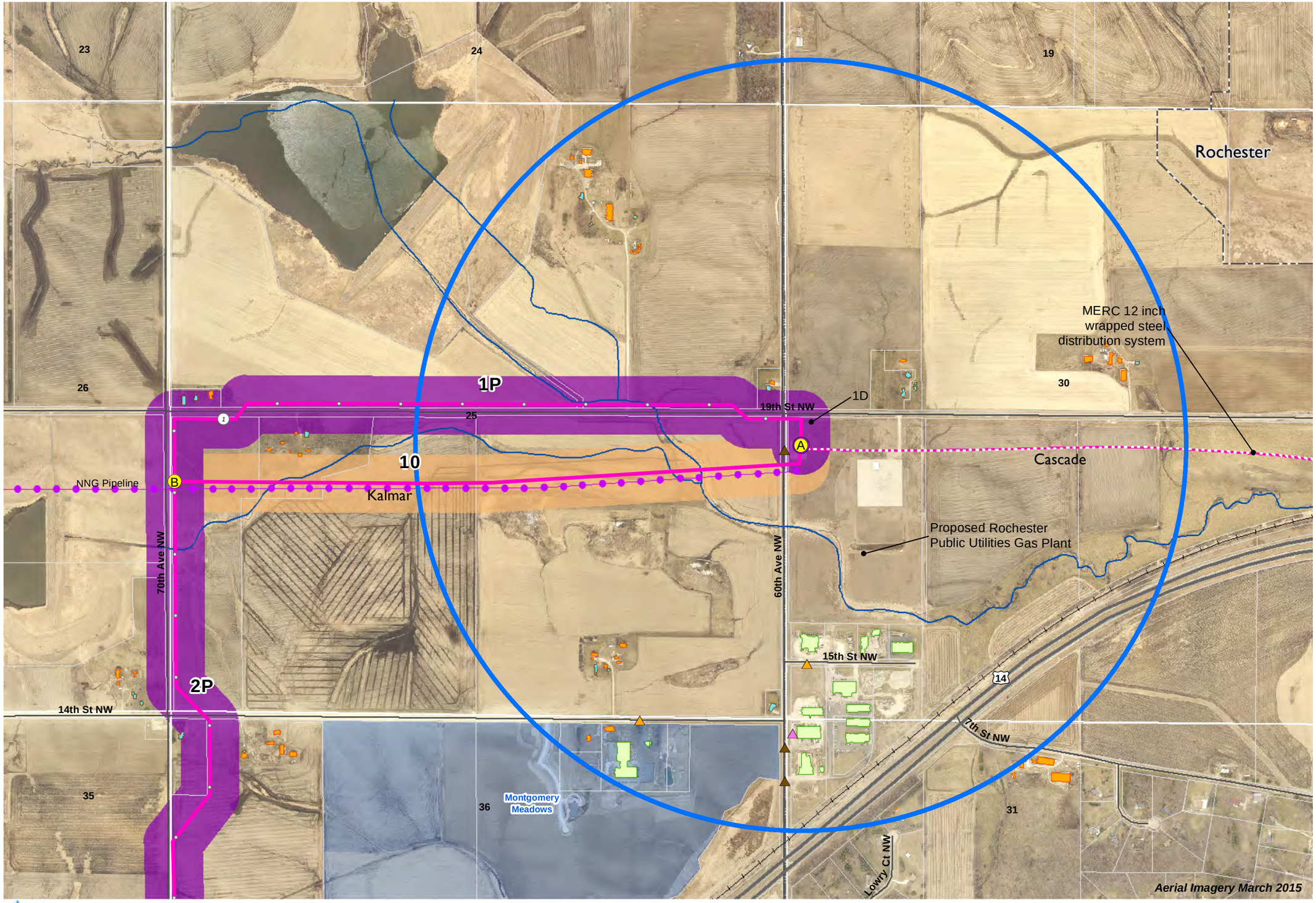


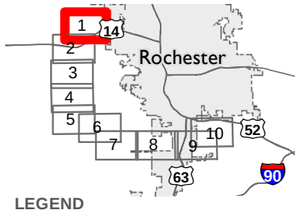
EXISTING RIGHTS-OF-WAY PARALLELING

ROCHESTER NATURAL GAS PIPELINE

FIGURE 9

MINNESOTA DEPARTMENT OF COMMERCE





LEGEND

- Route Segment
- Segment Endpoint
- Comparison Endpoint
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- Application Alternate Route
- Modified Preferred Route
- Scoping Route
- # Route Segment Number
- Proposed Town Border Station Buffer
- Proposed District Regulator Station Buffer
- Town Border Station (TBS)
- Future Development
- City Boundary
- Township Boundary
- PWI Stream

Structures 100ft from Permanent ROW *

- Home
- Outbuilding / Garage / Shed
- Business

Building Footprint *

- Home
- Garage / Shed / Outbuilding
- Business
- LP Tank / Tower

Minnesota Pollution Control Agency Listing of Regulated Facilities and Sites

- Hazardous Waste, Small to Minimal QG
- Landfill, Open
- Leak Site
- Multiple Activities
- Tank Site
- Milepost (1/10th mile)
- Milepost (1 mile)

** Structures built after the date of the photography are not included in the tabulations*

0 Feet 1,000

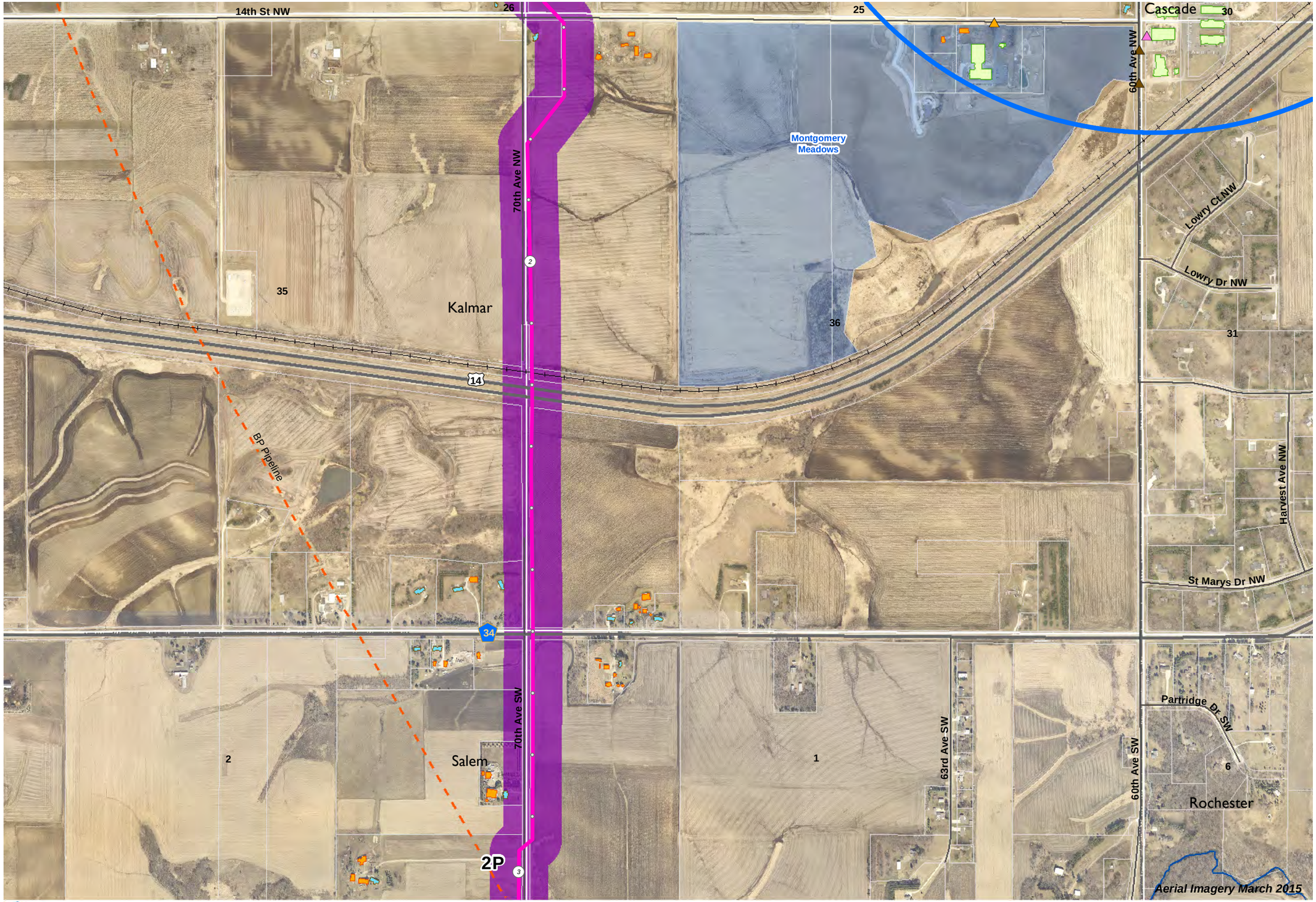
1 inch = 800 feet

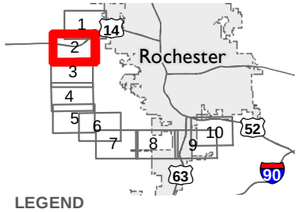
MINNESOTA DEPARTMENT OF COMMERCE

RESIDENCES, COMMERCIAL AND OUT BUILDINGS AND MINNESOTA POLLUTION CONTROL AGENCY LISTINGS

ROCHESTER NATURAL GAS PIPELINE

FIGURE 10 (PAGE 1 OF 10)





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- PWI Stream

Structures 100ft from Permanent ROW *

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- Outbuilding / Garage / Shed
- Business

Building Footprint *

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- LP Tank / Tower

Minnesota Pollution Control Agency Listing of Regulated Facilities and Sites

- Hazardous Waste, Small to Minimal QG
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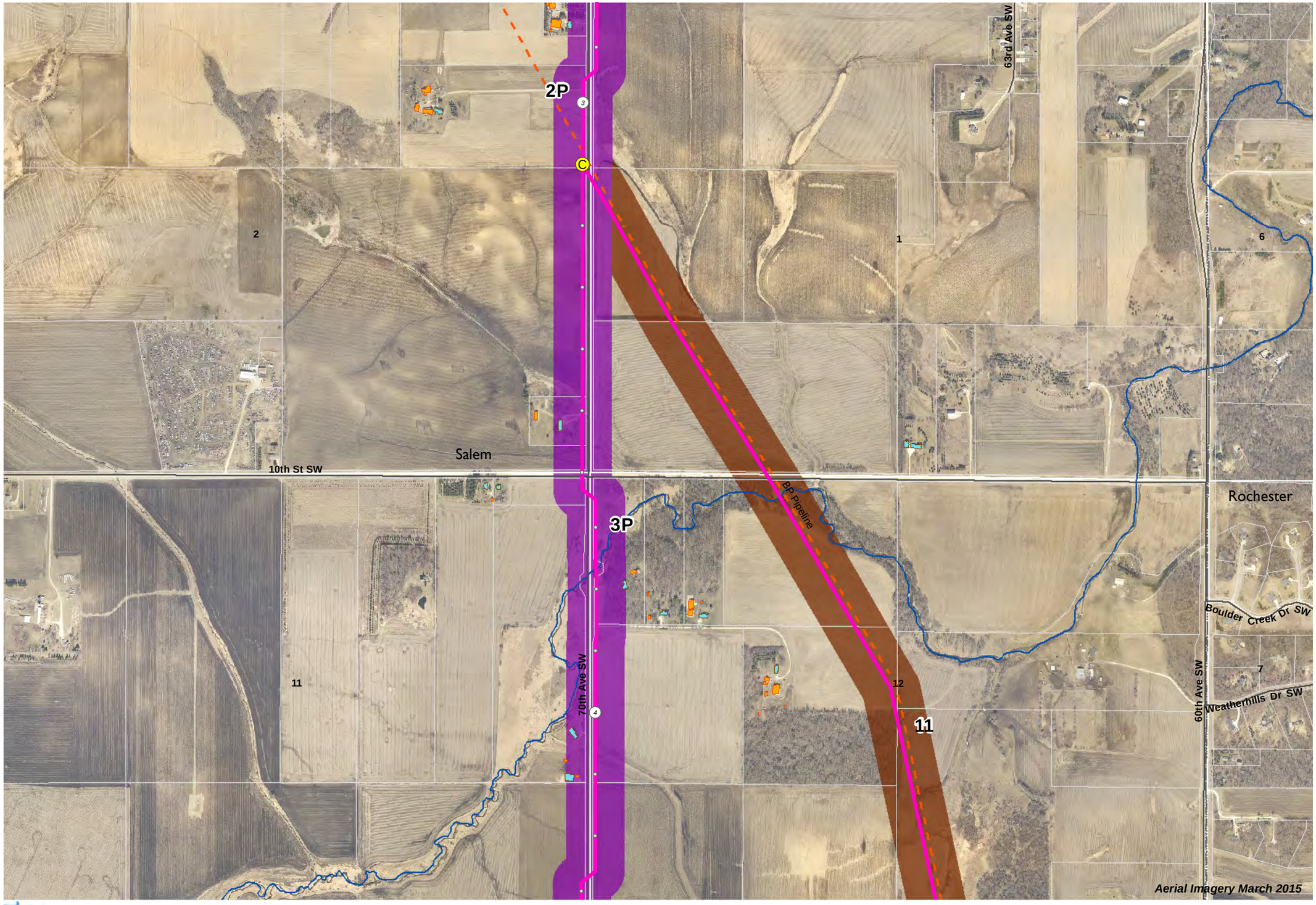
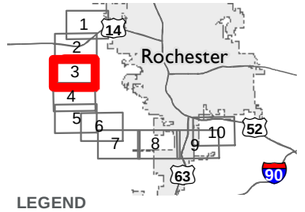
MINNESOTA DEPARTMENT OF COMMERCE

RESIDENCES, COMMERCIAL AND OUT BUILDINGS AND MINNESOTA POLLUTION CONTROL AGENCY LISTINGS

ROCHESTER NATURAL GAS PIPELINE

FIGURE 10 (PAGE 2 OF 10)





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- Township Boundary
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Structures 100ft from Permanent ROW *

- Home
- Outbuilding / Garage / Shed
- Business

Building Footprint *

- Home
- Garage / Shed / Outbuilding
- Business
- LP Tank / Tower

Minnesota Pollution Control Agency Listing of Regulated Facilities and Sites

- Hazardous Waste, Small to Minimal QG
- Landfill, Open
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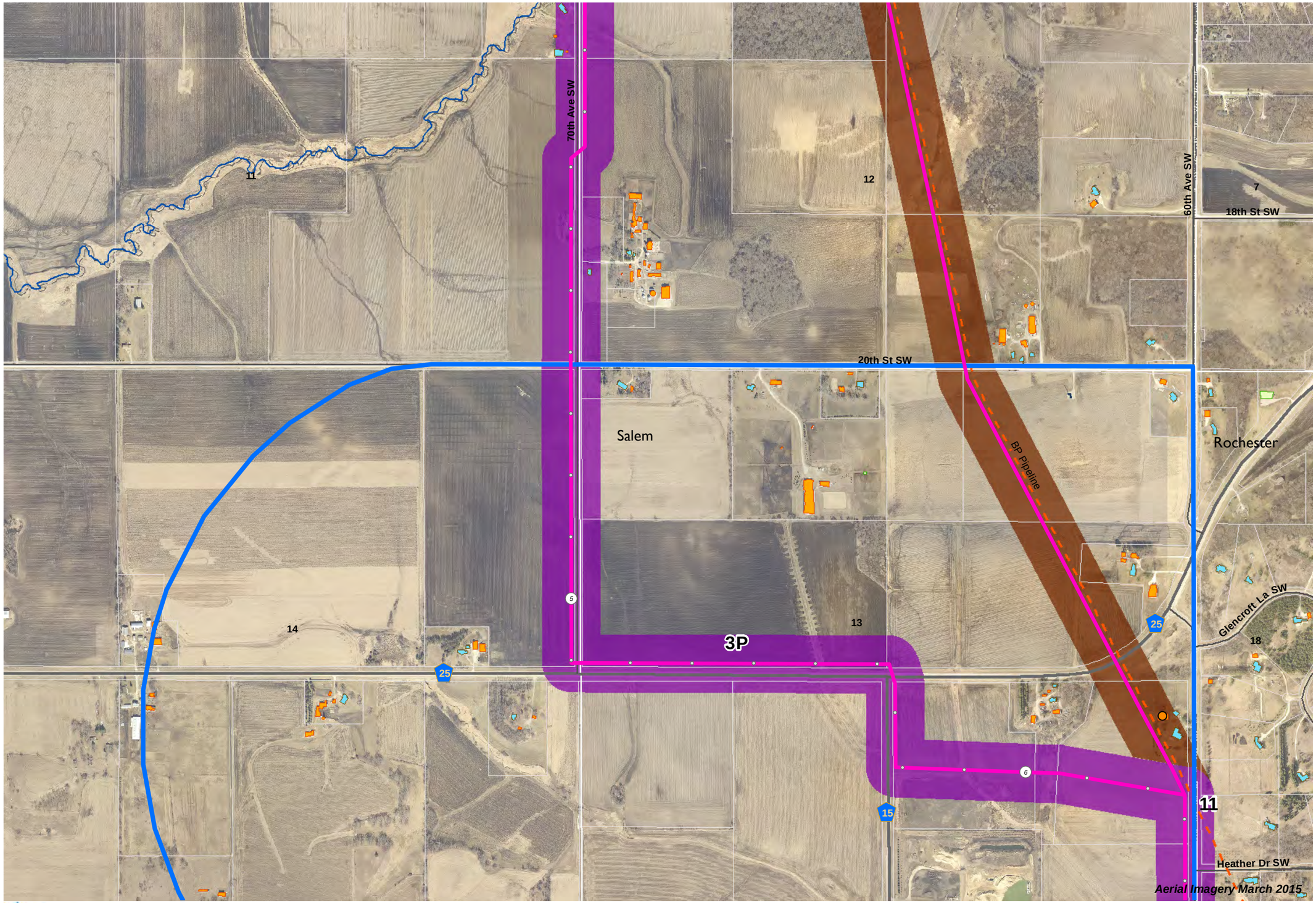
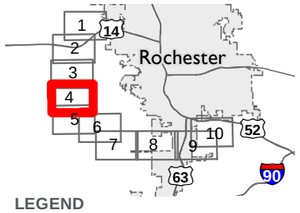
MINNESOTA DEPARTMENT OF COMMERCE

RESIDENCES, COMMERCIAL AND OUT BUILDINGS AND MINNESOTA POLLUTION CONTROL AGENCY LISTINGS

ROCHESTER NATURAL GAS PIPELINE

FIGURE 10 (PAGE 3 OF 10)





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Structures 100ft from Permanent ROW *

- Home
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- Business

Building Footprint *

- Home
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- LP Tank / Tower

Minnesota Pollution Control Agency Listing of Regulated Facilities and Sites

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N

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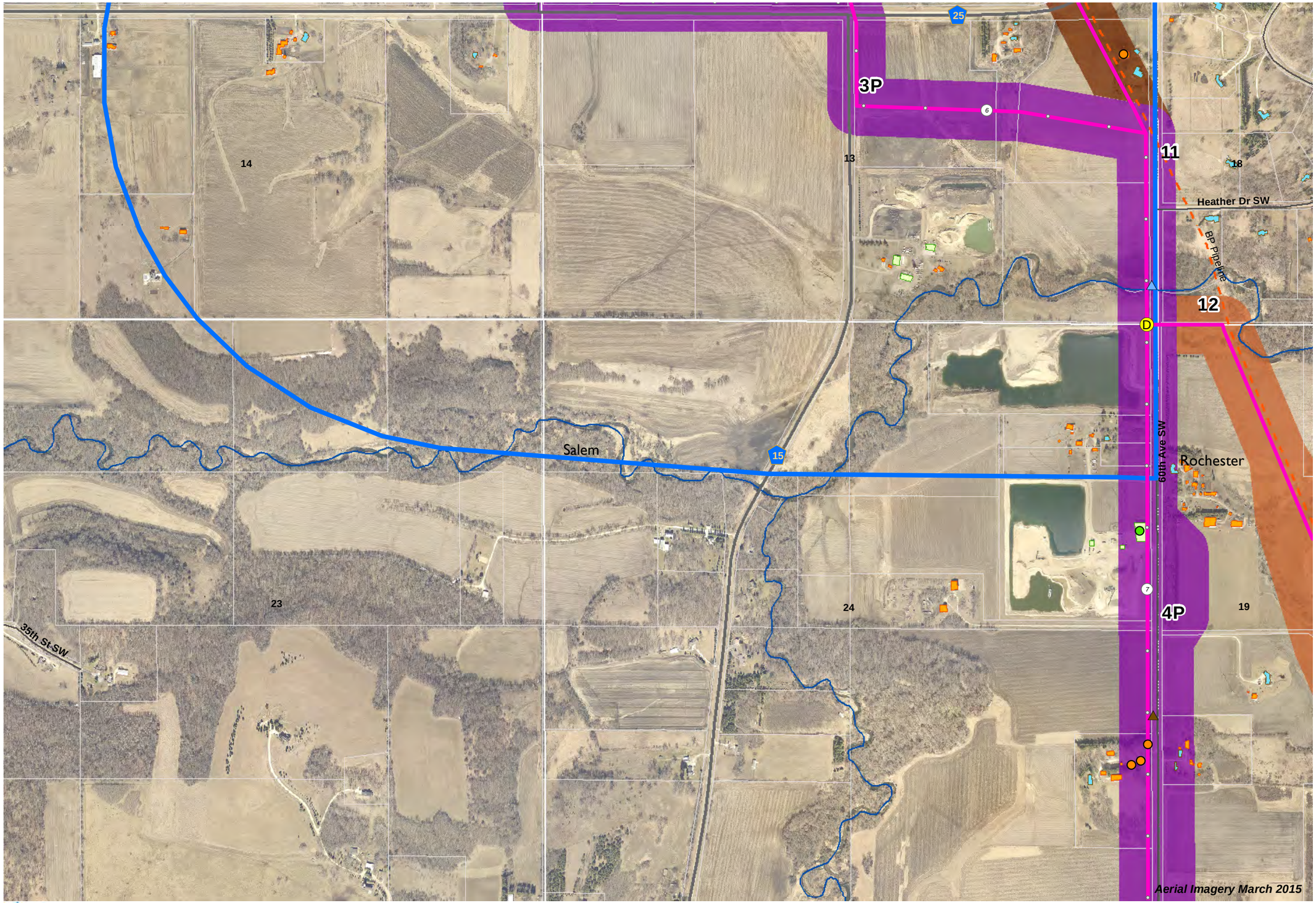
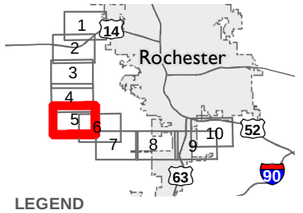
MINNESOTA DEPARTMENT OF COMMERCE

RESIDENCES, COMMERCIAL AND OUT BUILDINGS AND MINNESOTA POLLUTION CONTROL AGENCY LISTINGS

ROCHESTER NATURAL GAS PIPELINE

FIGURE 10 (PAGE 4 OF 10)





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Structures 100ft from Permanent ROW *

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Building Footprint *

- Home
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- LP Tank / Tower

Minnesota Pollution Control Agency Listing of Regulated Facilities and Sites

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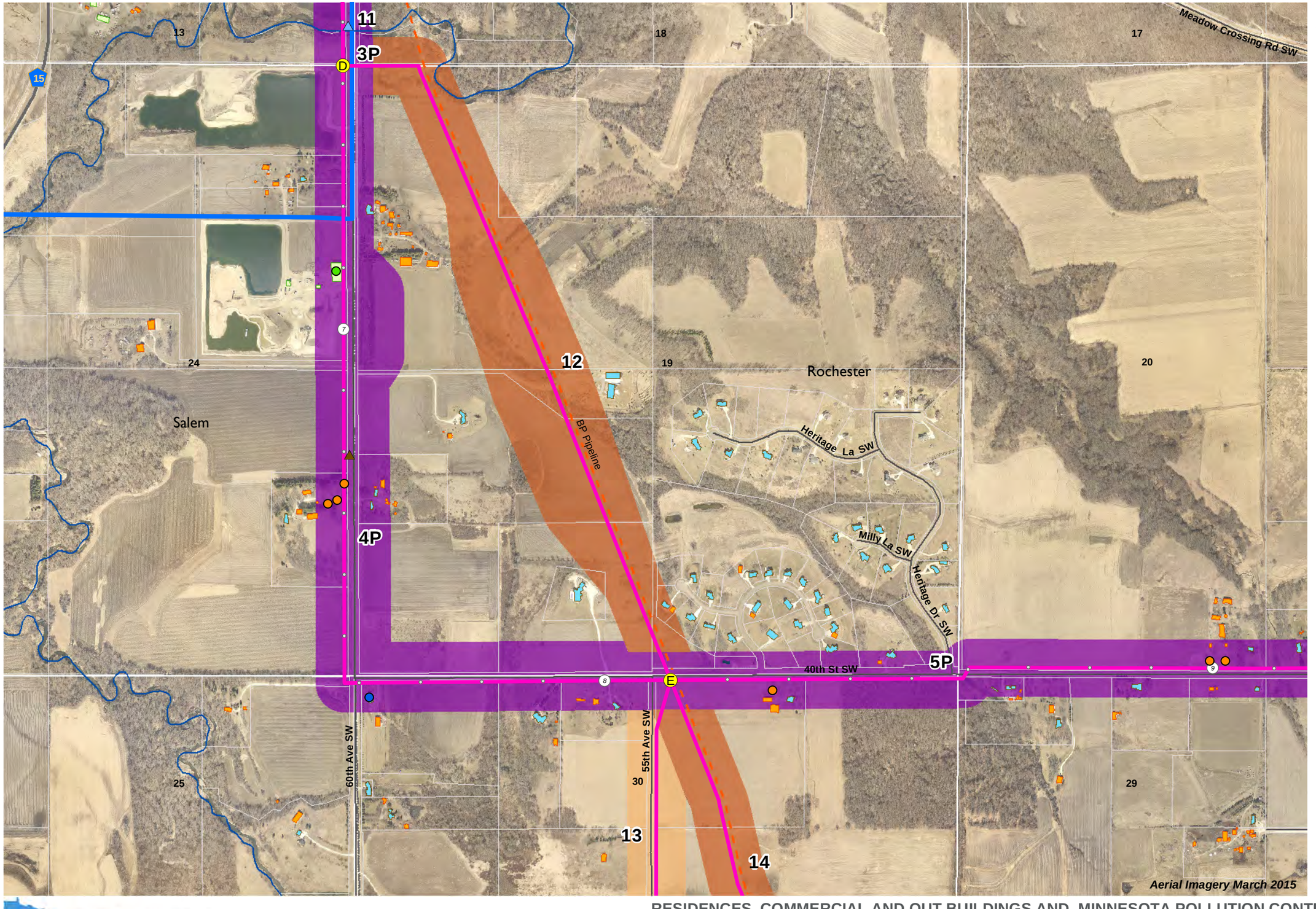
Aerial Imagery March 2015

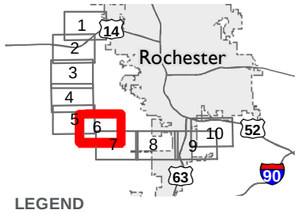
MINNESOTA DEPARTMENT OF COMMERCE

RESIDENCES, COMMERCIAL AND OUT BUILDINGS AND MINNESOTA POLLUTION CONTROL AGENCY LISTINGS

ROCHESTER NATURAL GAS PIPELINE

FIGURE 10 (PAGE 5 OF 10)





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Structures 100ft from Permanent ROW *

- Home
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- Business

Building Footprint *

- Home
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Minnesota Pollution Control Agency Listing of Regulated Facilities and Sites

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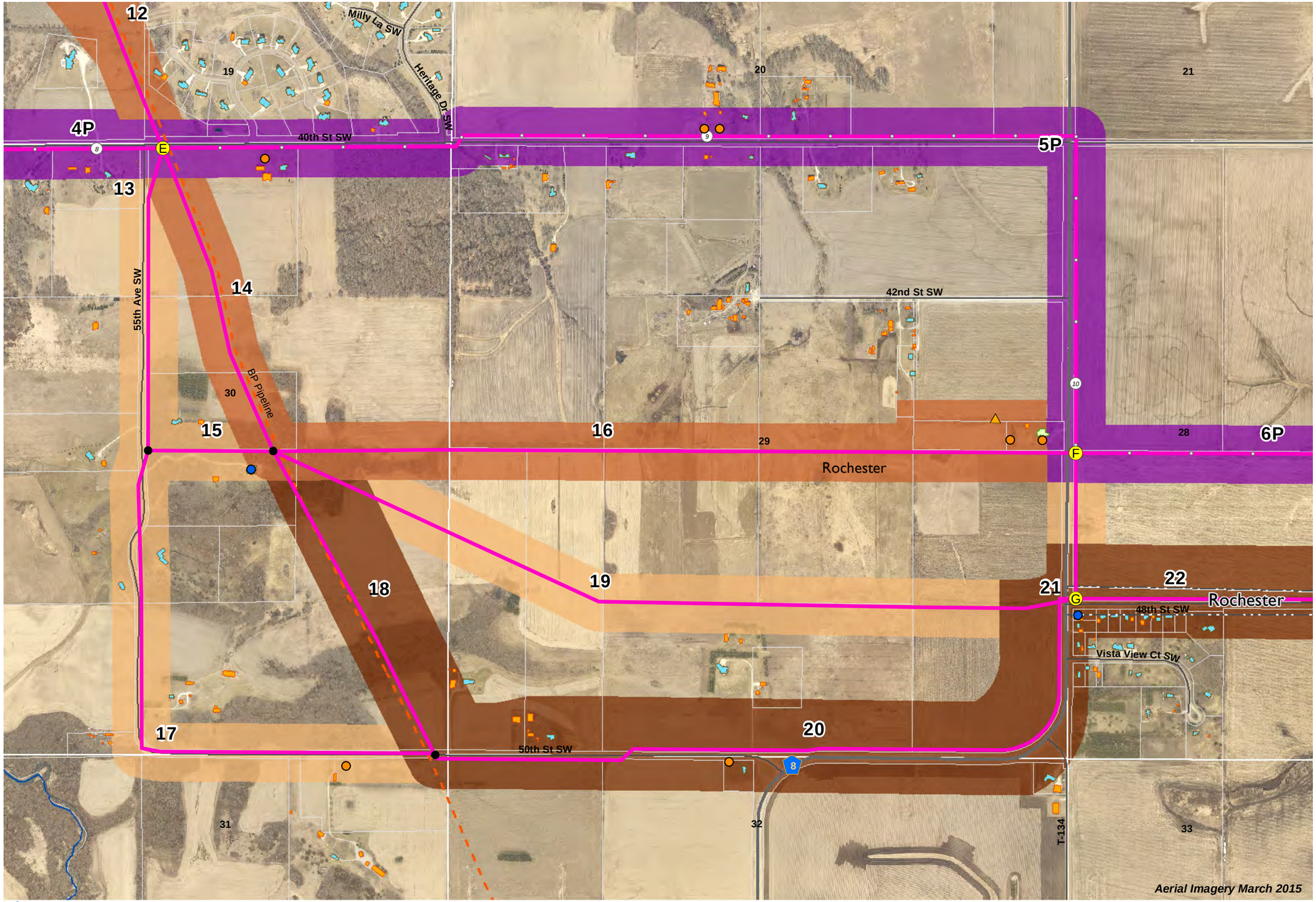
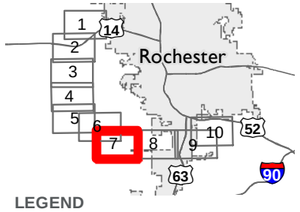
MINNESOTA DEPARTMENT OF COMMERCE

RESIDENCES, COMMERCIAL AND OUT BUILDINGS AND MINNESOTA POLLUTION CONTROL AGENCY LISTINGS

ROCHESTER NATURAL GAS PIPELINE

FIGURE 10 (PAGE 6 OF 10)





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Building Footprint *

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Minnesota Pollution Control Agency Listing of Regulated Facilities and Sites

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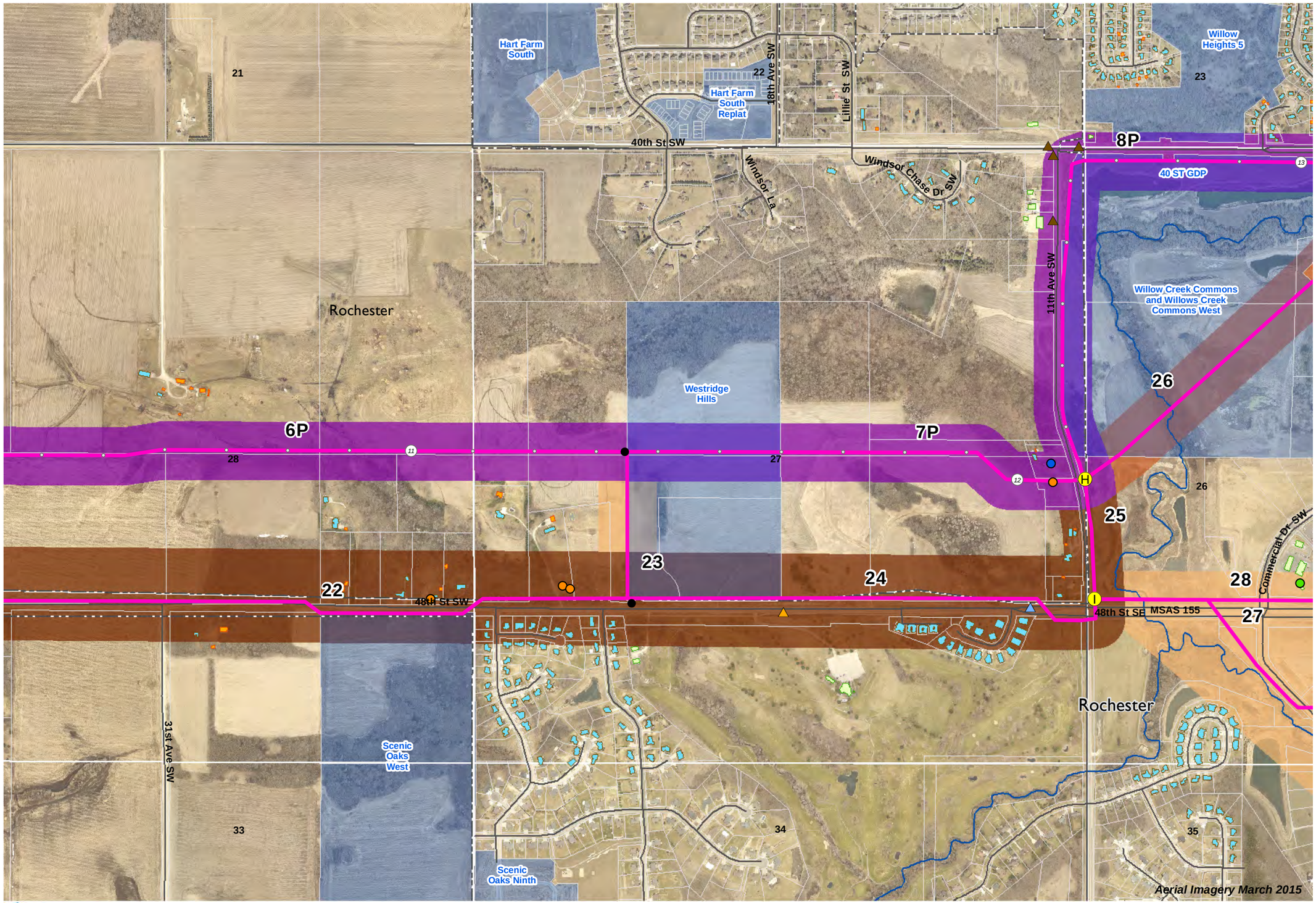
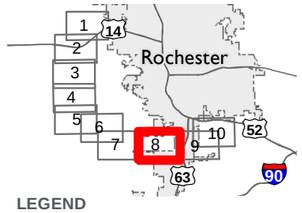
MINNESOTA DEPARTMENT OF COMMERCE

RESIDENCES, COMMERCIAL AND OUT BUILDINGS AND MINNESOTA POLLUTION CONTROL AGENCY LISTINGS

ROCHESTER NATURAL GAS PIPELINE

FIGURE 10 (PAGE 7 OF 10)





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Minnesota Pollution Control Agency Listing of Regulated Facilities and Sites

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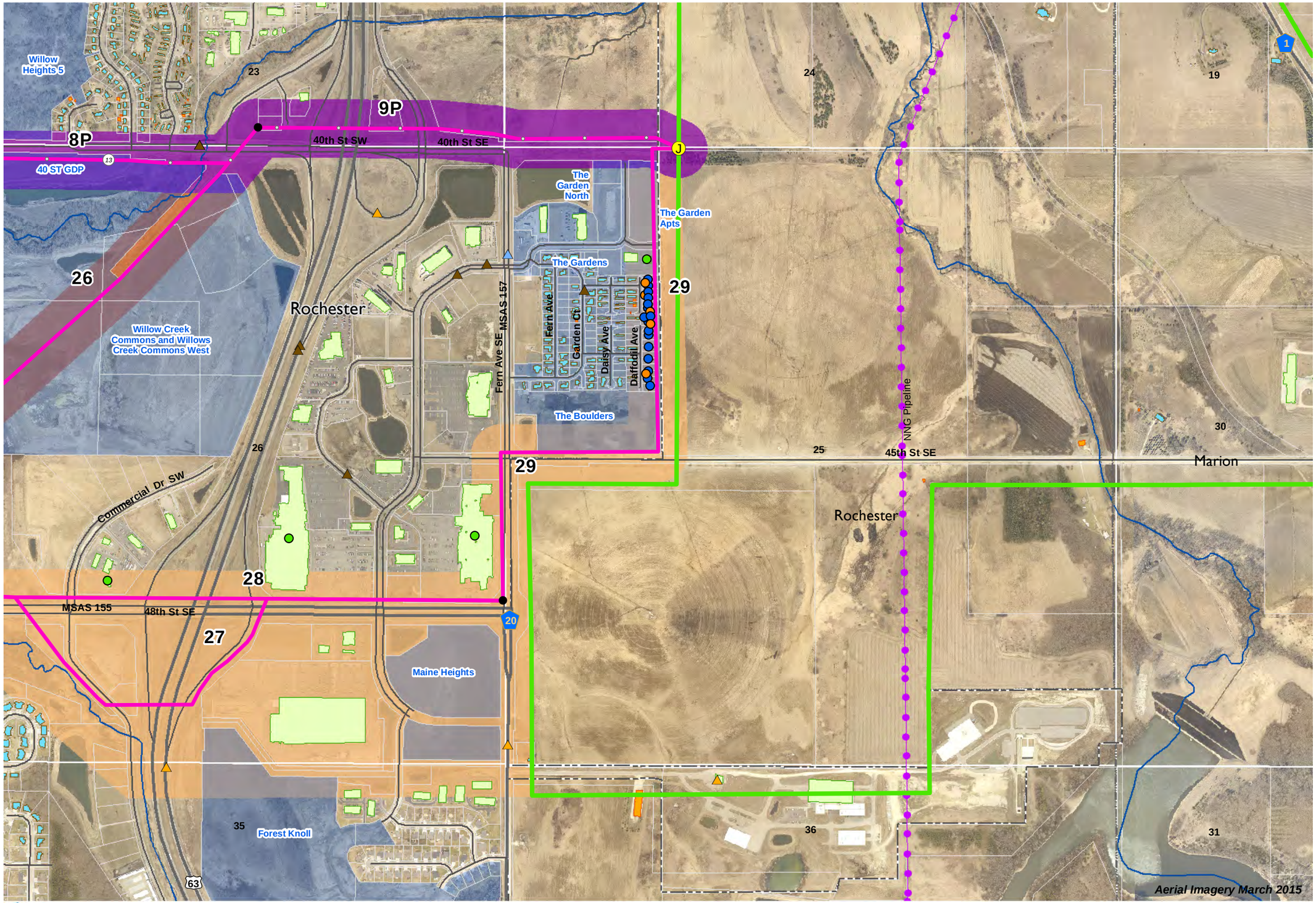
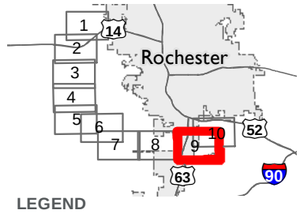
MINNESOTA DEPARTMENT OF COMMERCE

RESIDENCES, COMMERCIAL AND OUT BUILDINGS AND MINNESOTA POLLUTION CONTROL AGENCY LISTINGS

ROCHESTER NATURAL GAS PIPELINE

FIGURE 10 (PAGE 8 OF 10)





LEGEND

- Route Segment
- Segment Endpoint
- Comparison Endpoint
- Application Preferred Route
- Application Alternate Route
- Modified Preferred Route
- Scoping Route
- # Route Segment Number
- Proposed Town Border Station Buffer
- Proposed District Regulator Station Buffer
- Town Border Station (TBS)
- Future Development
- City Boundary
- Township Boundary
- PWI Stream

Structures 100ft from Permanent ROW *

- Home
- Outbuilding / Garage / Shed
- Business

Building Footprint *

- Home
- Garage / Shed / Outbuilding
- Business
- LP Tank / Tower

Minnesota Pollution Control Agency Listing of Regulated Facilities and Sites

- Hazardous Waste, Small to Minimal QG
- Landfill, Open
- Leak Site
- Multiple Activities
- Tank Site
- Milepost (1/10th mile)
- Milepost (1 mile)

** Structures built after the date of the photography are not included in the tabulations*

0 Feet 1,000

1 inch = 800 feet

MINNESOTA DEPARTMENT OF COMMERCE

RESIDENCES, COMMERCIAL AND OUT BUILDINGS AND MINNESOTA POLLUTION CONTROL AGENCY LISTINGS

ROCHESTER NATURAL GAS PIPELINE

FIGURE 10 (PAGE 9 OF 10)

MERC 12 inch wrapped steel distrubtion system

MERC 6 inch wrapped steel distrubtion system

Rochester

Rochester

Marion

WNG Pipeline

The Garden Apts

The Garden North

The Gardens

The Boulders

Fern Ave SE

MSAS 157

Fern Ave

Garden Ct

Daisy Ave

Daffodil Ave

45th St SE

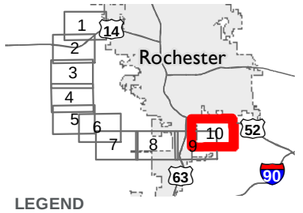
37th St SE

30th Ave SE

23 24 25 26 19 20 29 30

9P 29 29

J 1B 52 1



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0 Feet 1,000

1 inch = 800 feet

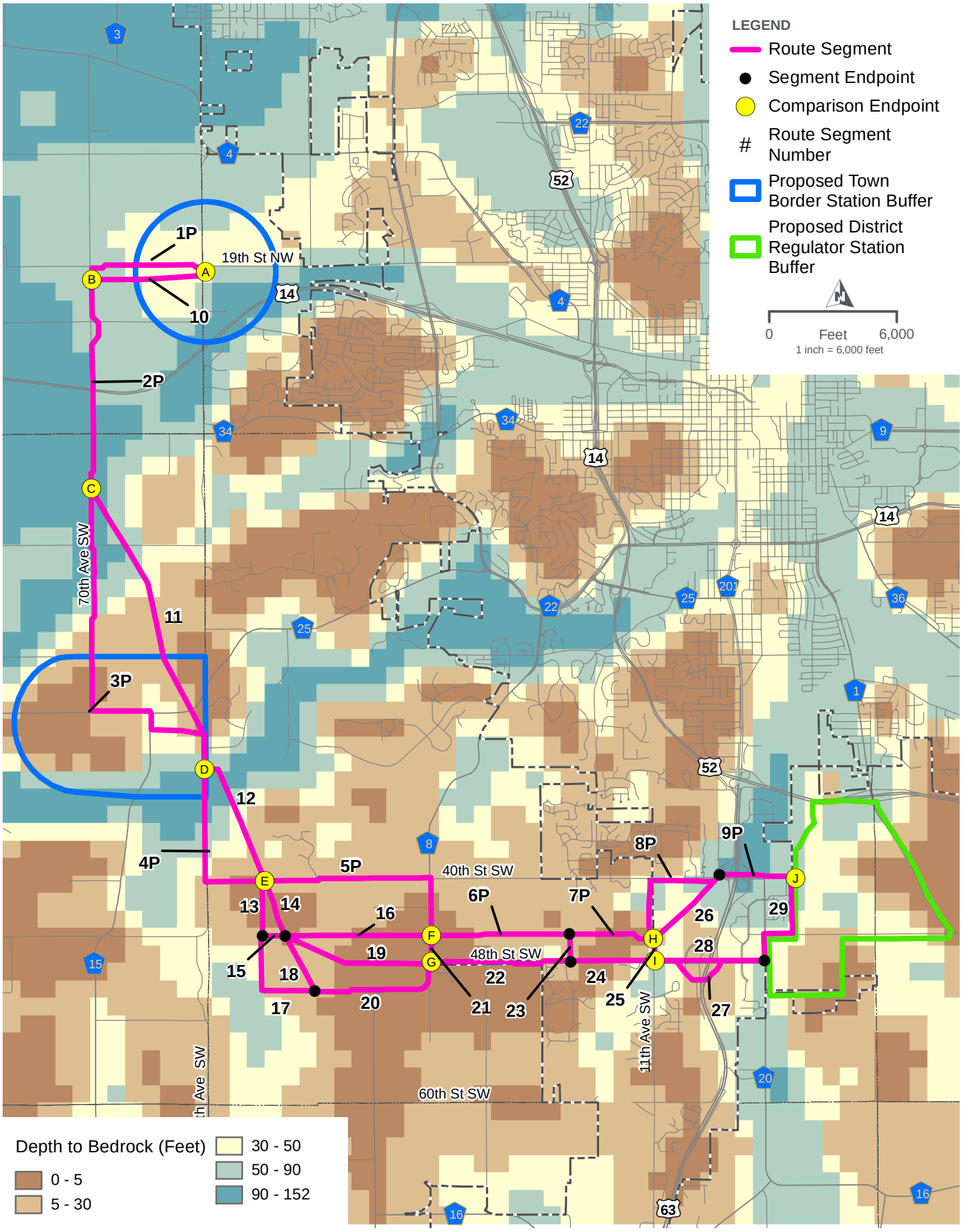
Aerial Imagery March 2015

MINNESOTA DEPARTMENT OF COMMERCE

RESIDENCES, COMMERCIAL AND OUT BUILDINGS AND MINNESOTA POLLUTION CONTROL AGENCY LISTINGS

ROCHESTER NATURAL GAS PIPELINE

FIGURE 10 (PAGE 10 OF 10)

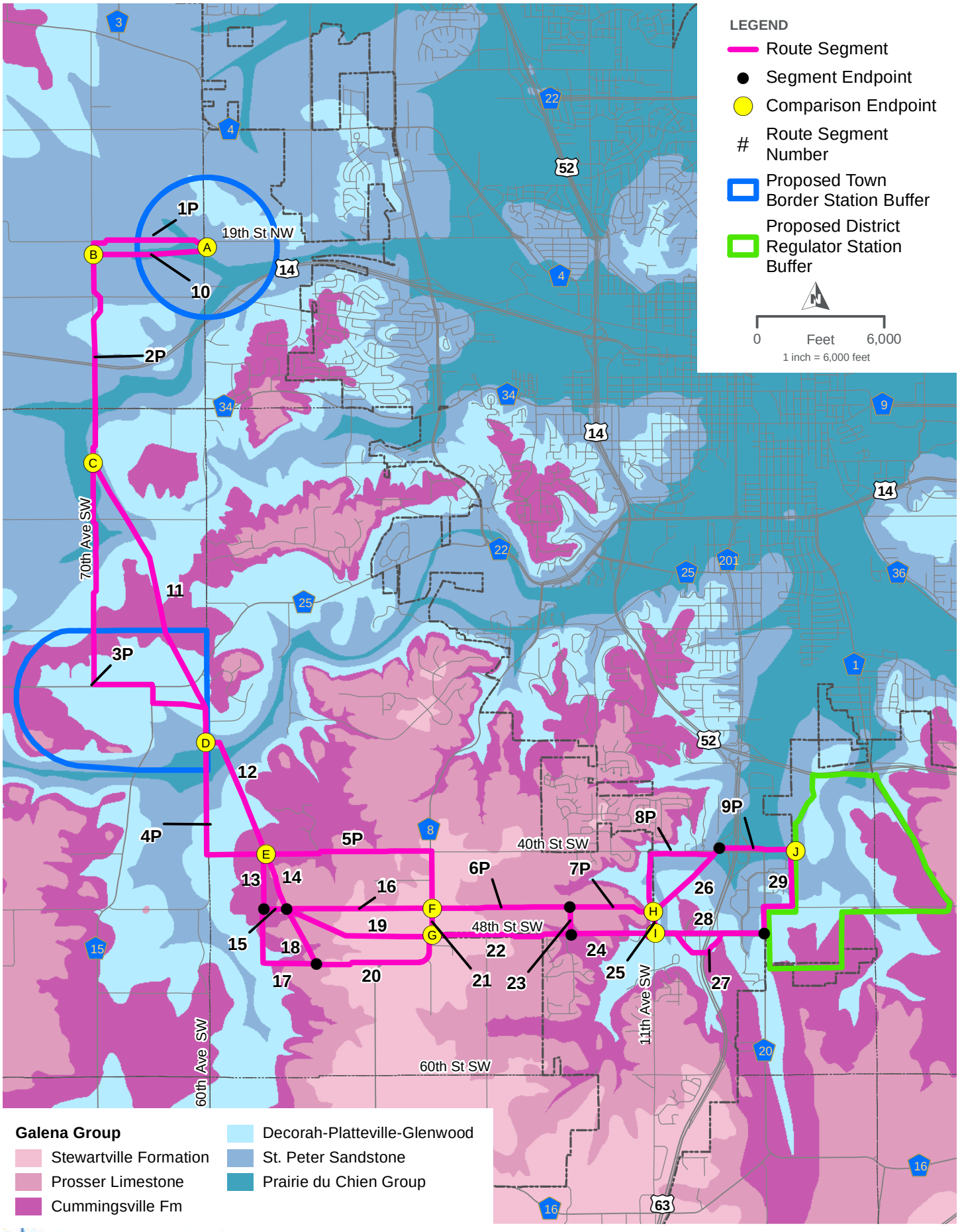


MINNESOTA DEPARTMENT OF COMMERCE

DEPTH TO BEDROCK

ROCHESTER NATURAL GAS PIPELINE

FIGURE 11

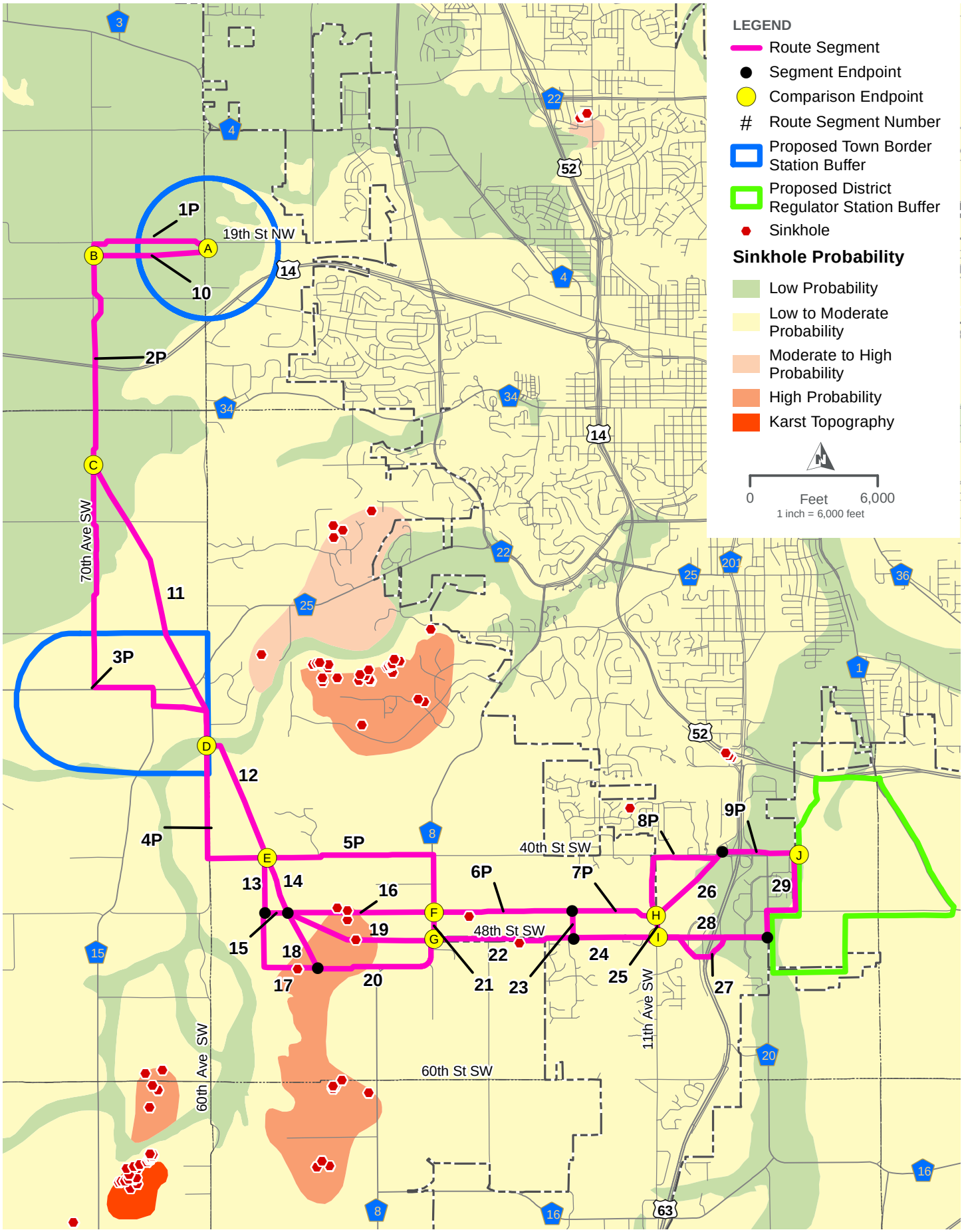


MINNESOTA DEPARTMENT OF COMMERCE

BEDROCK UNITS

ROCHESTER NATURAL GAS PIPELINE

FIGURE 12

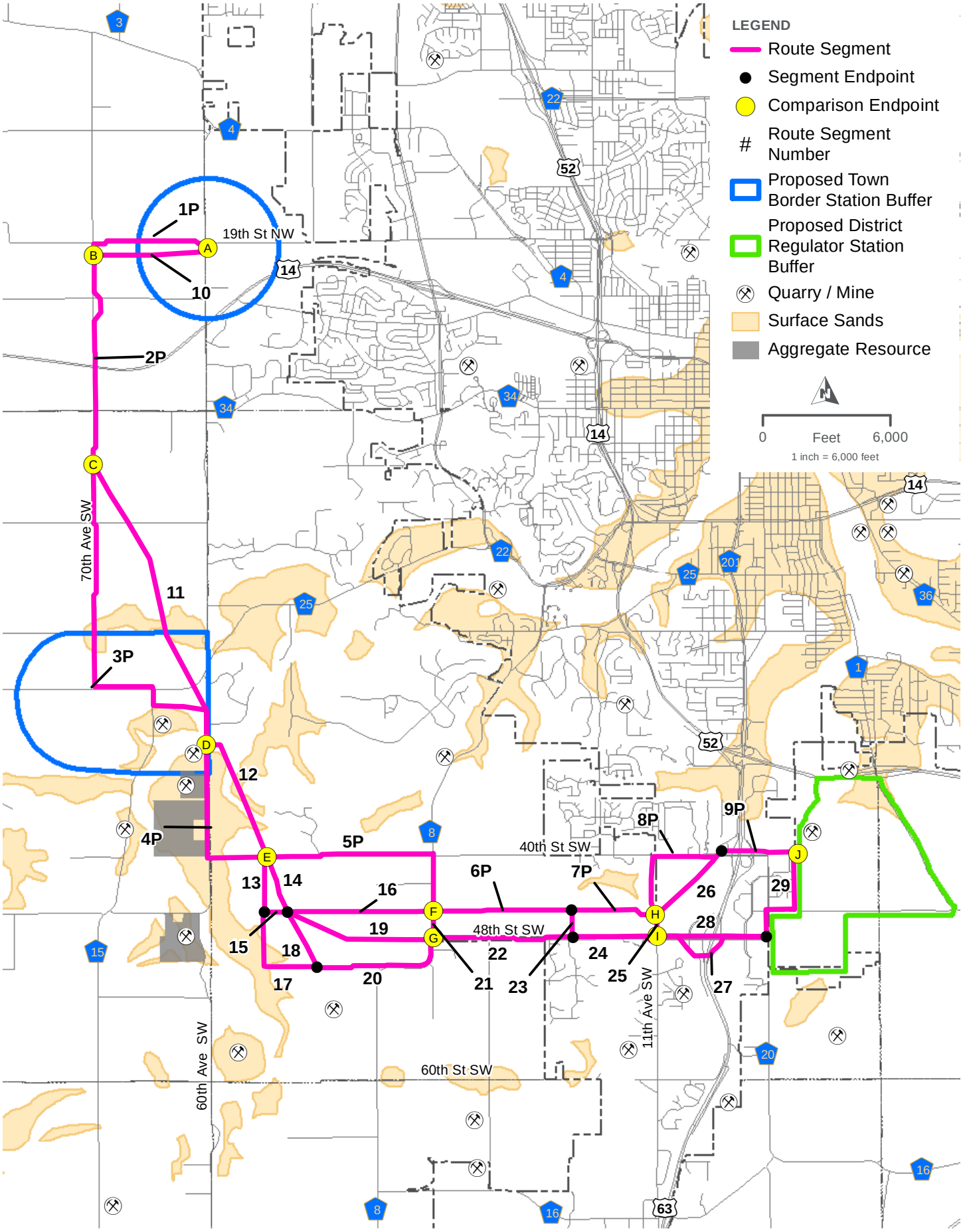


MINNESOTA DEPARTMENT OF COMMERCE

SINKHOLE PROBABILITY

ROCHESTER NATURAL GAS PIPELINE

FIGURE 13

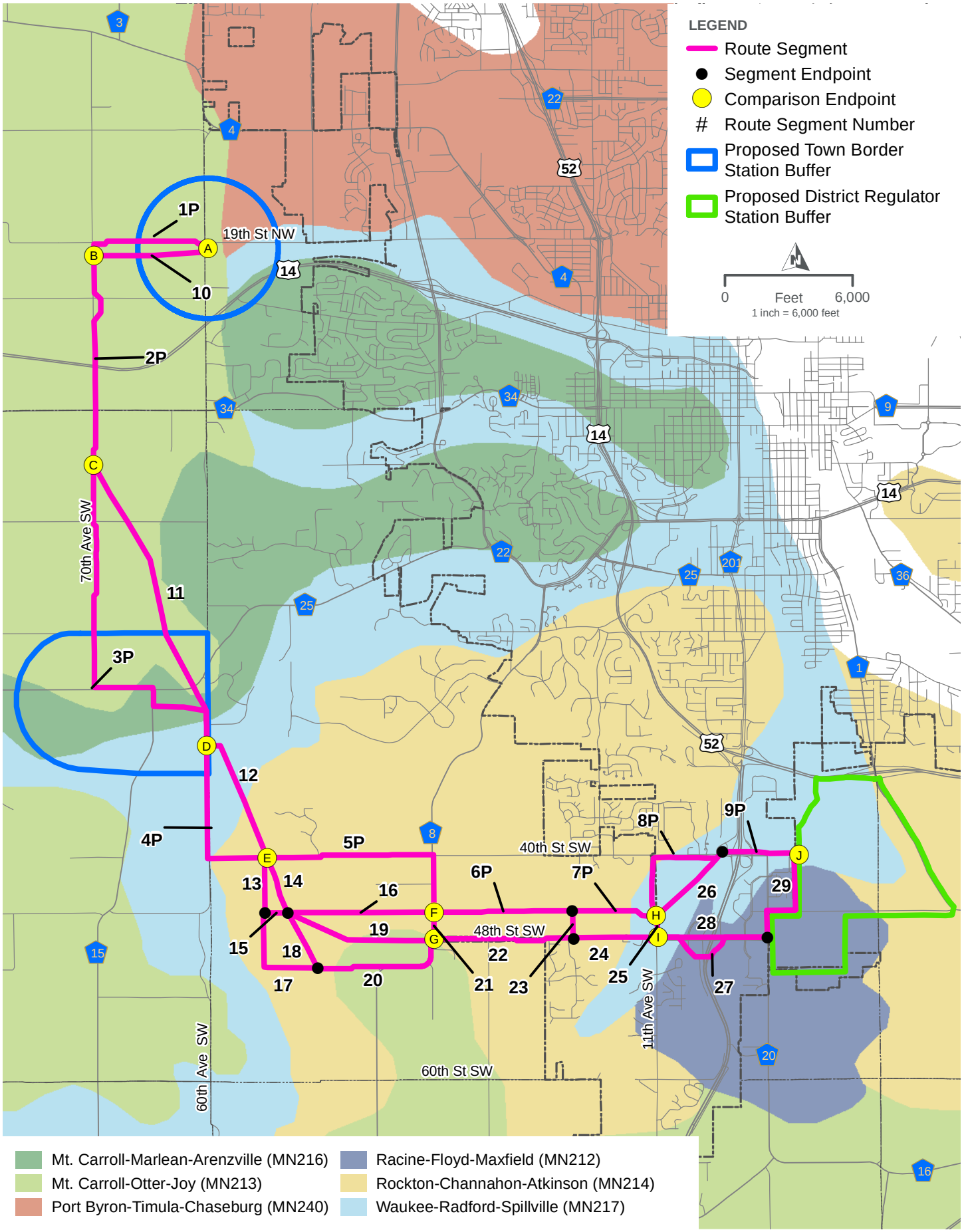


MINNESOTA DEPARTMENT OF COMMERCE

GEOLOGIC RESOURCES

ROCHESTER NATURAL GAS PIPELINE

FIGURE 14



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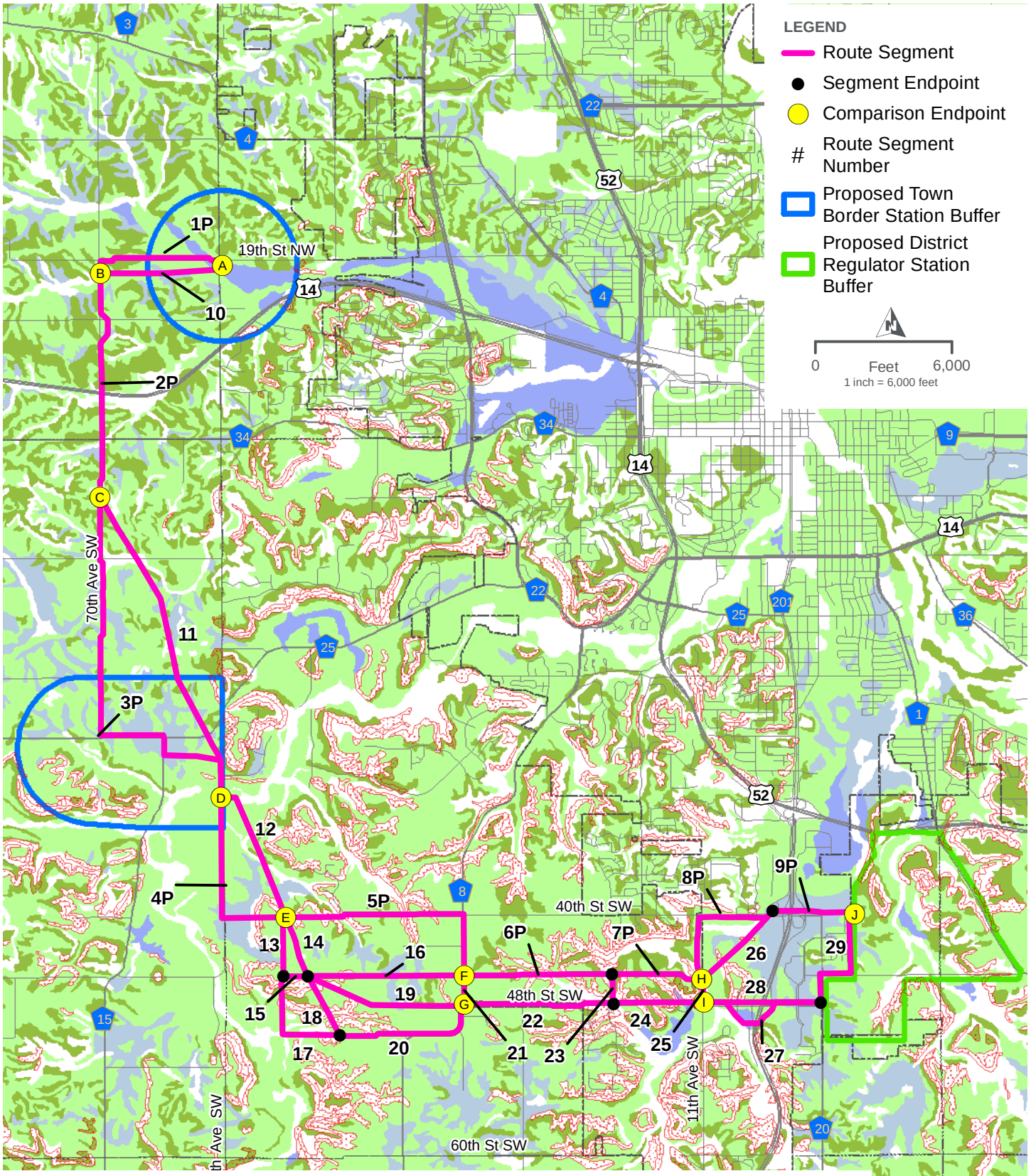
SOIL ASSOCIATIONS

ROCHESTER NATURAL GAS PIPELINE

FIGURE 15

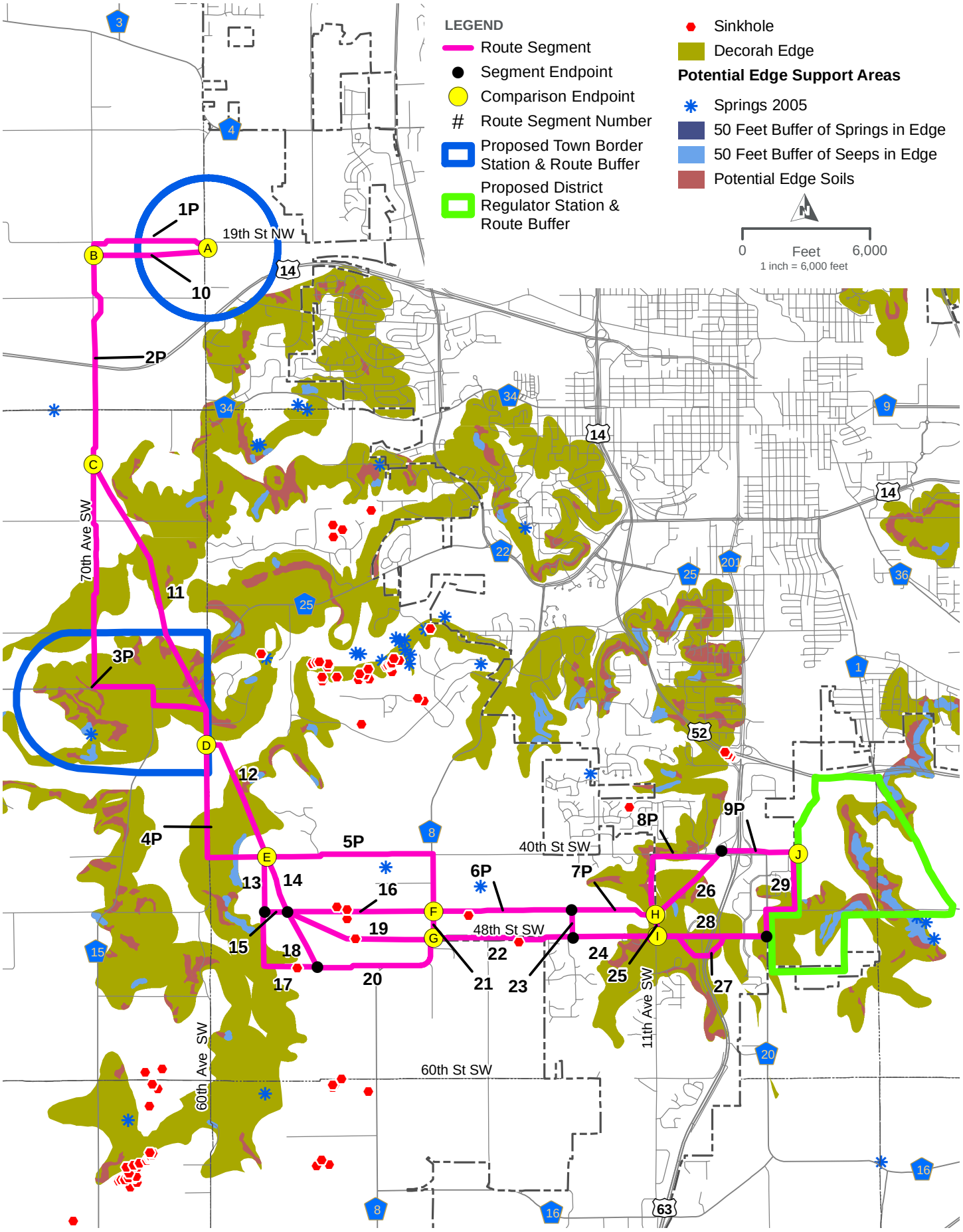


MINNESOTA DEPARTMENT OF COMMERCE

PRIME FARMLAND AND HIGHLY ERODIBLE LAND

ROCHESTER NATURAL GAS PIPELINE

FIGURE 16

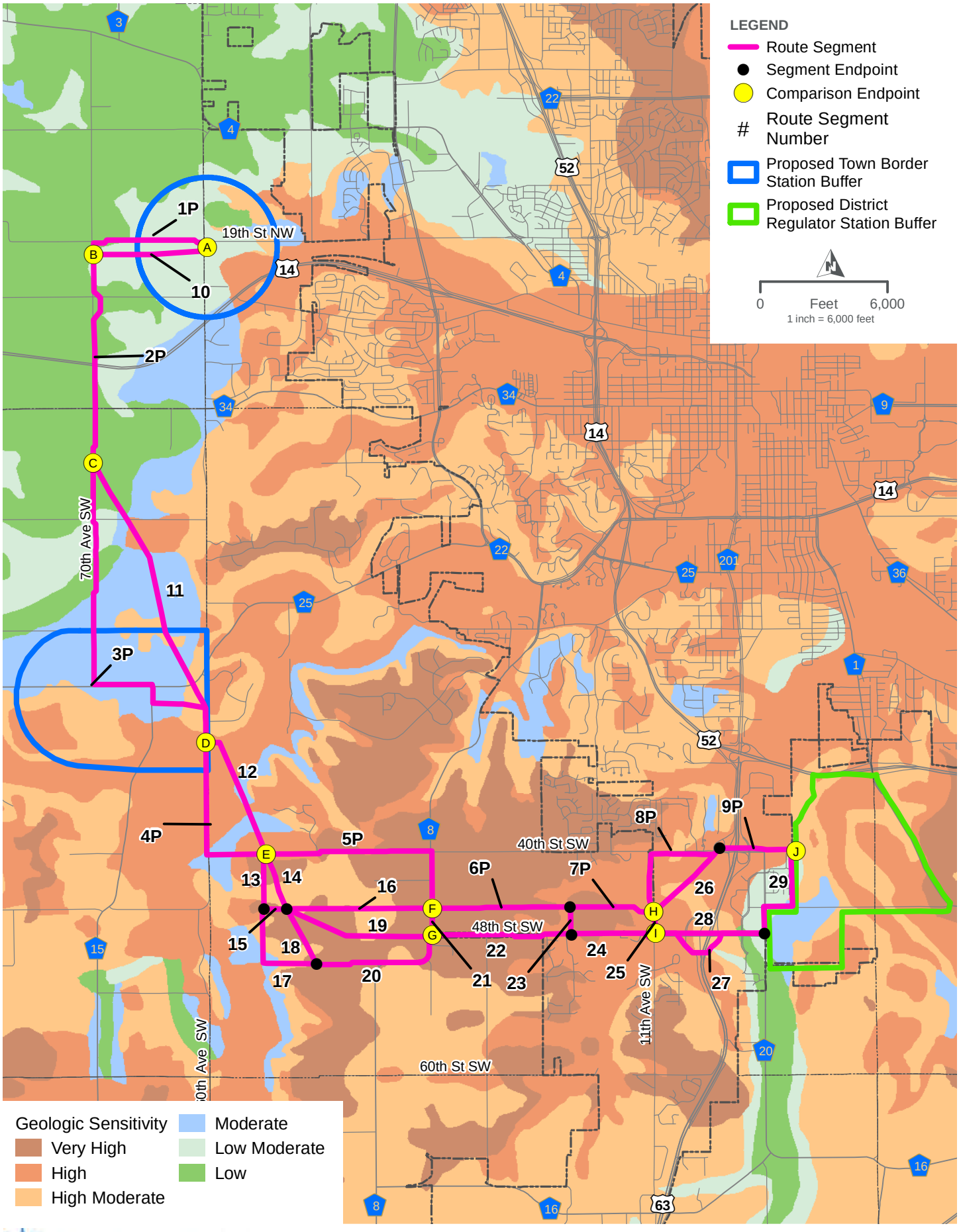


MINNESOTA DEPARTMENT OF COMMERCE

DECORAH EDGE

ROCHESTER NATURAL GAS PIPELINE

FIGURE 17

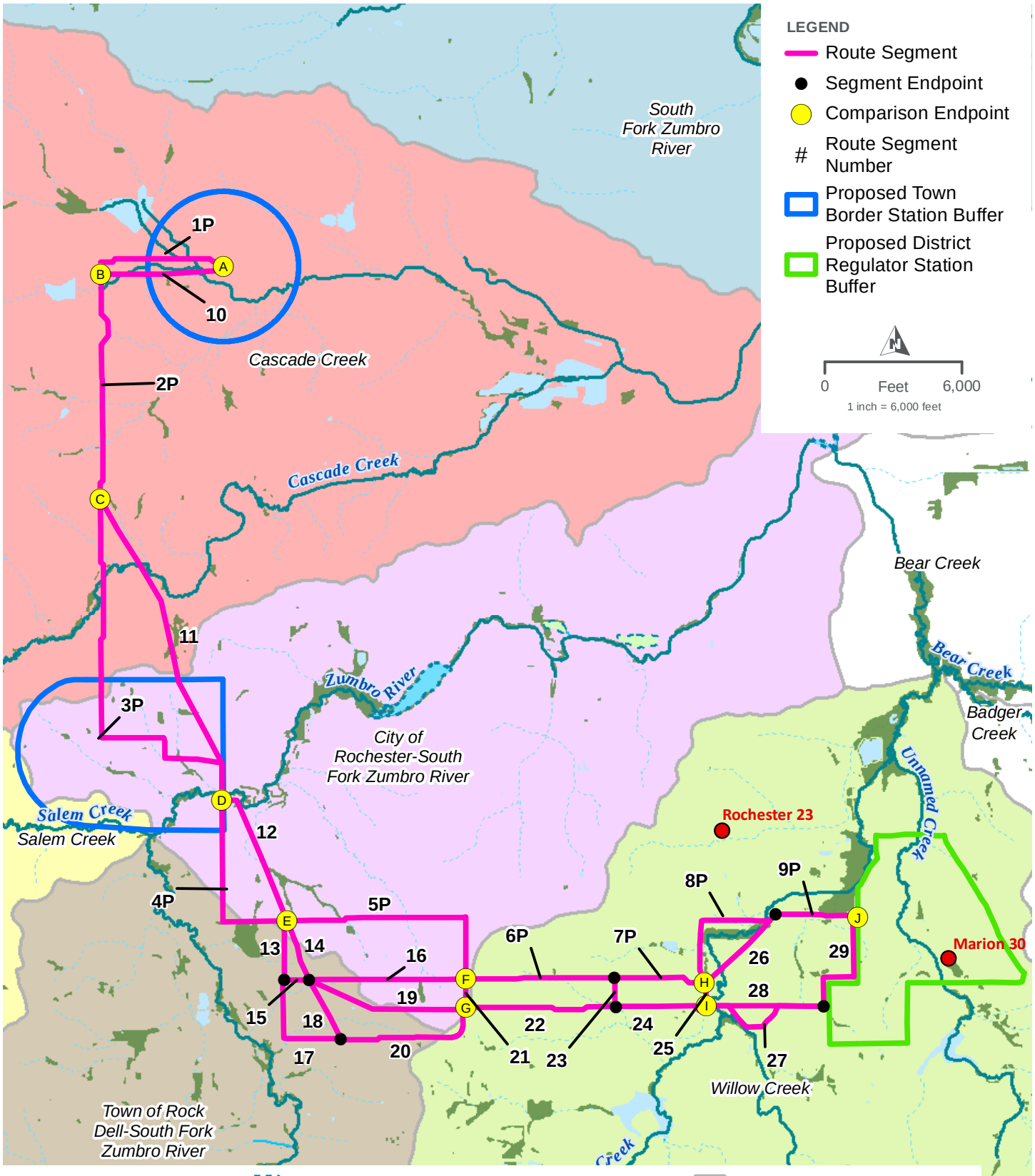


AREAS OF HIGH GEOLOGIC SENSITIVITY

ROCHESTER NATURAL GAS PIPELINE

MINNESOTA DEPARTMENT OF COMMERCE

FIGURE 18

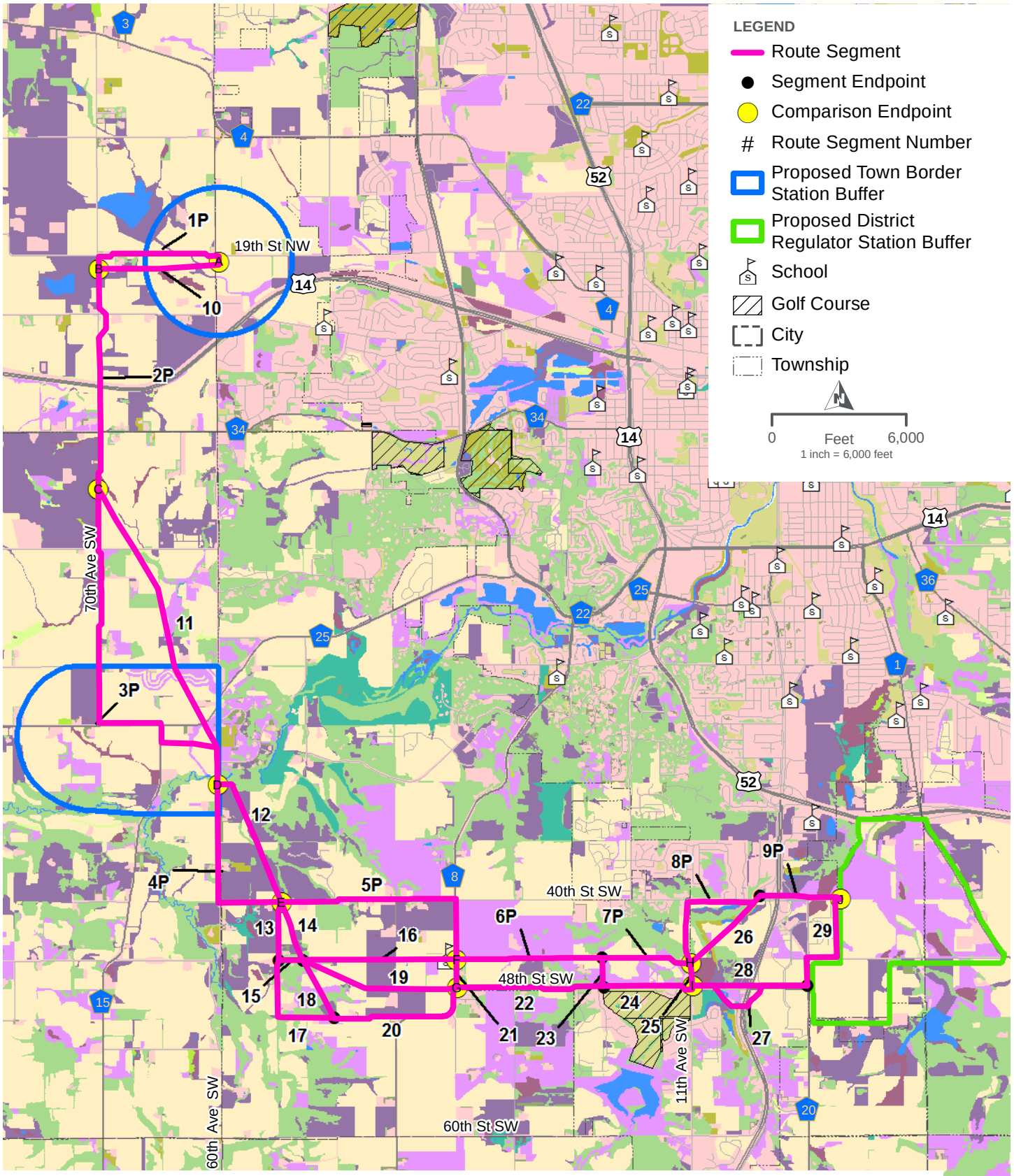


MINNESOTA DEPARTMENT OF COMMERCE

SURFACE WATER AND WETLAND RESOURCES

ROCHESTER NATURAL GAS PIPELINE

FIGURE 19



Minnesota Land Cover Classification System

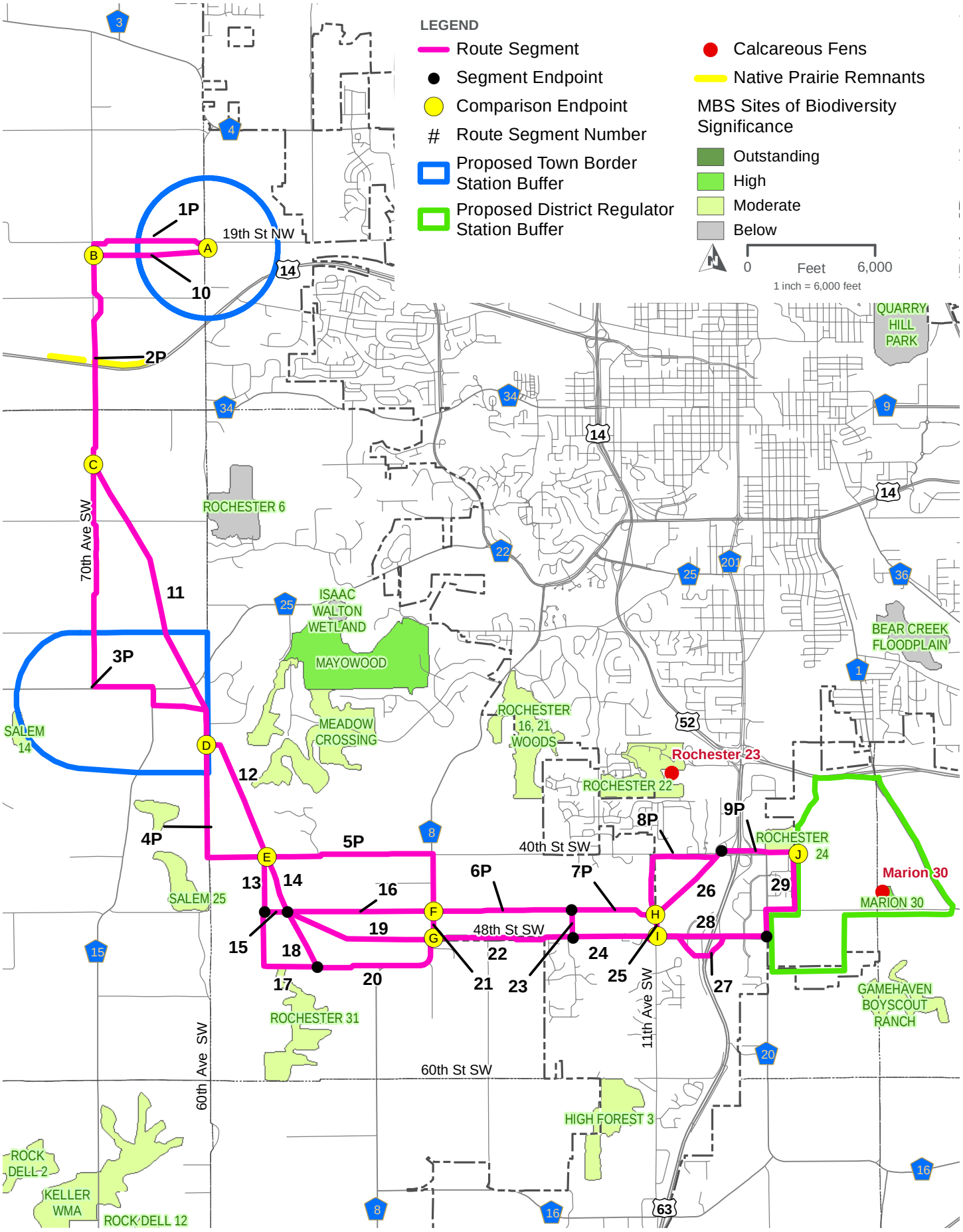
- Agricultural Land
- Maintained Tall Grass
- Tree Plantation
- Forest
- Wetland Forest
- Wetland Shrubs
- Shrubland
- Wetland Emergent Veg.
- Short Grasses
- Tall Grasses
- Dry Tall Grasses
- Open Water
- Impervious lands

MINNESOTA DEPARTMENT OF COMMERCE

LAND COVER

ROCHESTER NATURAL GAS PIPELINE

FIGURE 20

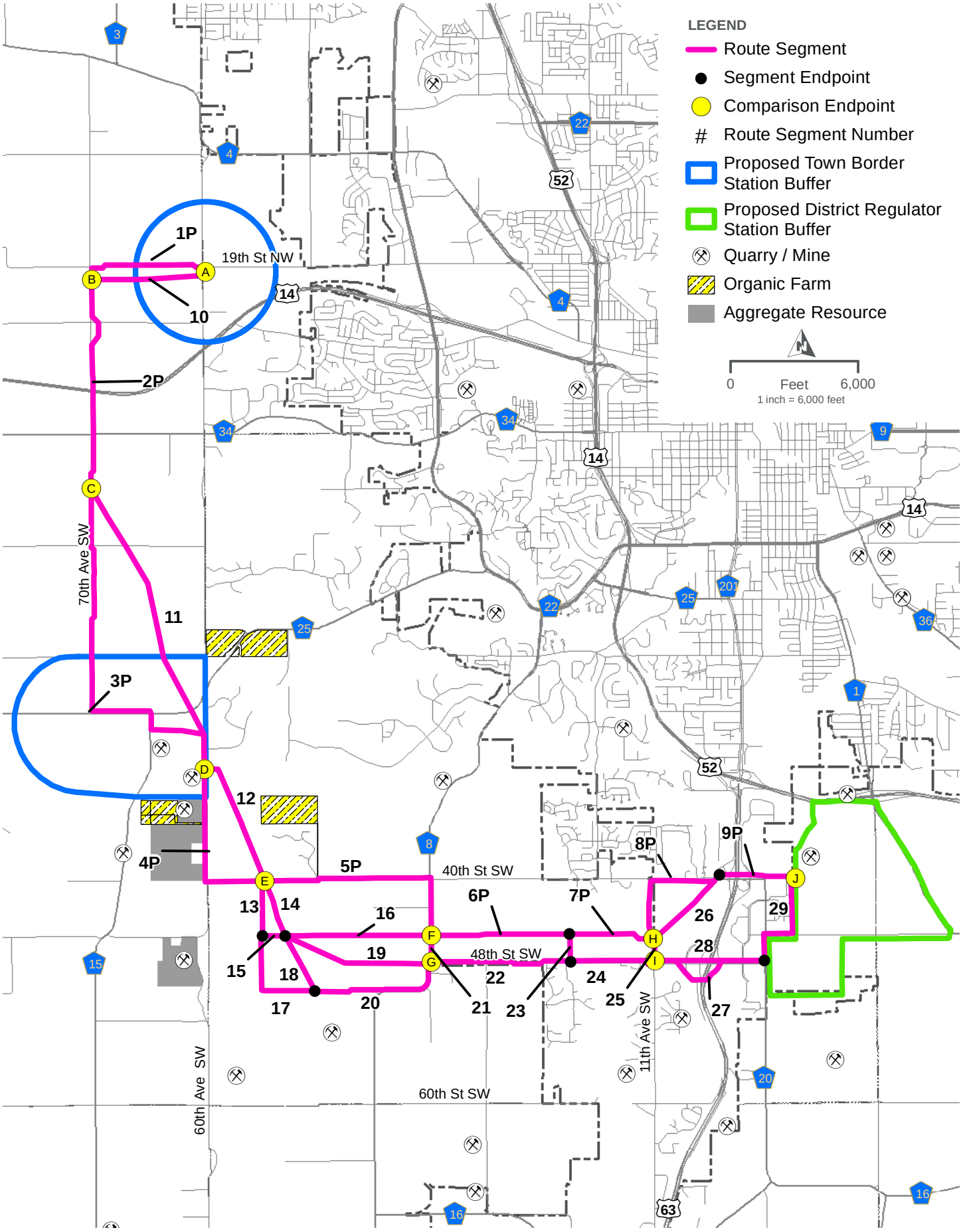


VEGETATION RESOURCES

ROCHESTER NATURAL GAS PIPELINE

FIGURE 21

MINNESOTA DEPARTMENT OF COMMERCE

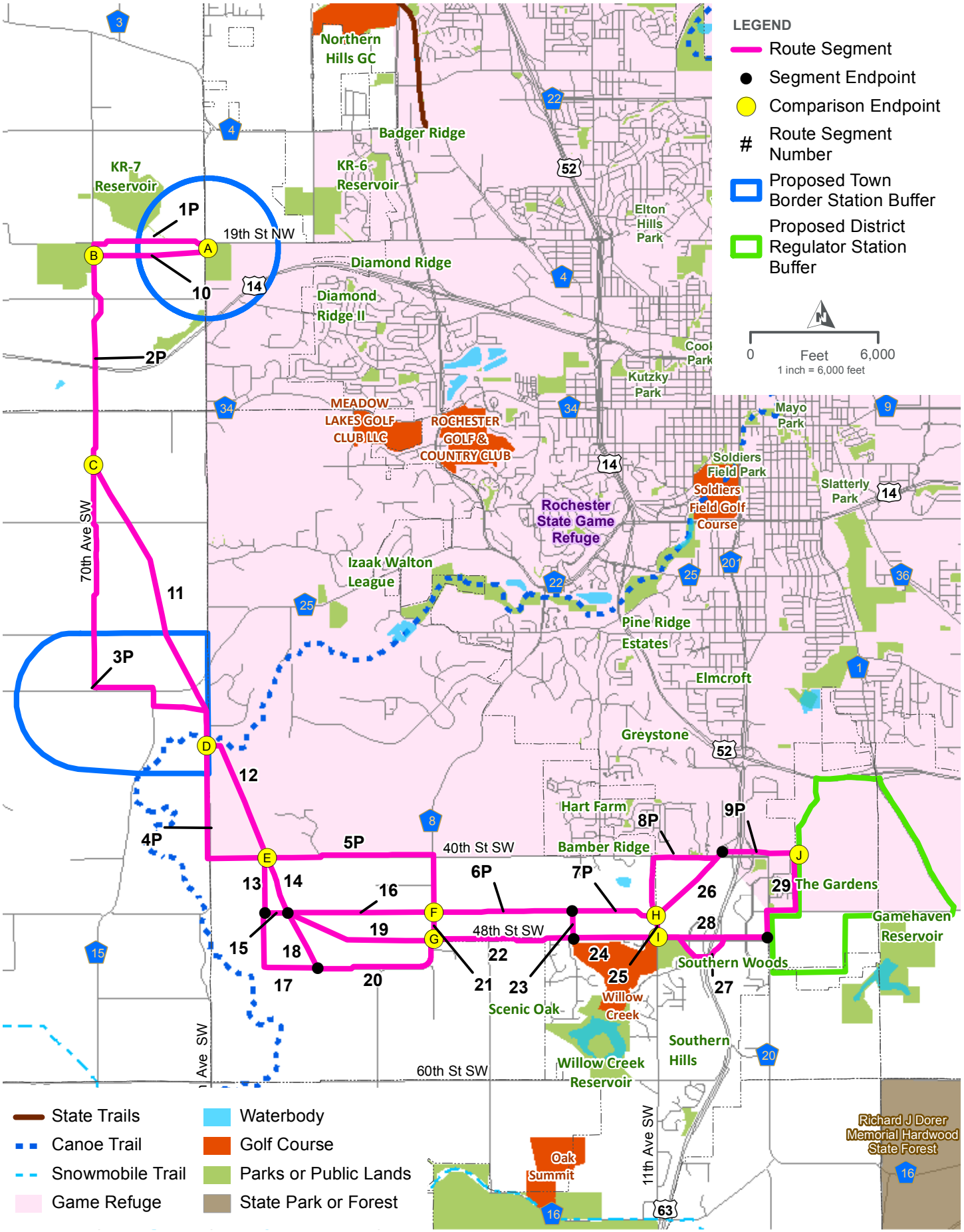


MINNESOTA DEPARTMENT OF COMMERCE

LAND-BASED ECONOMIES

ROCHESTER NATURAL GAS PIPELINE

FIGURE 22



RECREATION AREAS

ROCHESTER NATURAL GAS PIPELINE

FIGURE 23

MINNESOTA DEPARTMENT OF COMMERCE

PATH: \\MSPE-GIS-FILE\GISPROJ\050_DEN\232026_MERC\MAP_DOCS\CEA\23_RECREATION.MXD - USER: JWALTER - DATE: 9/15/2016

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