DEQ USE ONLY
Application #
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DOC Conf:
Notes:

APPLICATION FOR NEW WATER POLLUTION CONTROL FACILITIES INDIVIDUAL PERMIT
(WPCF-N)

State of Oregon Department of Environmental Quality

OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY
(SEE PAGES 3-6 FOR DETAILED INSTRUCTIONS)

DEQ USE ONLY
Date Received: 11-12-15
Total Amount Received: 13,011.00
Add. Amt. Due (if any):
Check # 209113136
Deposit # 32085
Receipt # 163049
☐ IND ☐ DOM
☐ OSS Surcharge:

A. REFERENCE INFORMATION

1. Legal Name of Applicant: Williams Pacific Connector Gas Operator, LLC on behalf of Pacific Connector Gas Pipeline, LP
2. Is the name of the applicant the owner of the facility? ☒ Yes ☐ No
3. Legal Status of Applicant: ☐ Federal ☐ State ☐ Public ☒ Private ☐ Other (specify):
4. Name of Facility (if different than legal name): Pacific Connector Gas Pipeline
5. Facility SIC Code: 4922 or NAICS code: 221111; 221119; 221310; 221330

B. FACILITY LOCATION

1. Physical Street Address: 232-mile interstate natural gas pipeline from Coos Bay to Malin Oregon - See Maps in Appendix A
   City: State: Oregon Zip Code: County: Coos, Douglas, Jackson, Klamath
2. Latitude: degrees, minutes, seconds
   Longitude: degrees, minutes, seconds
3. Township: Section:
   Range: Tax Lot #

C. FACILITY CONTACTS

1. **RESPONSIBLE OFFICIAL**
   Full Name: Randy Miller Telephone # 801-584-6702
   Mailing Address: 295 Chipeta Way City: Salt Lake City State: UT Zip Code: 84108
2. **FACILITY CONTACT**
   Full Name: N/A Telephone #
   Mailing Address: City: State: Zip Code:
3. **INVOICE TO**
   Full Name: Williams Pacific Connector Gas Operator, LLC Telephone # 801-584-6702
   Billing Address: 295 Chipeta Way City: Salt Lake City State: UT ZipCode: 84108

D. GENERAL INFORMATION

1. Briefly describe the proposed facility, type of wastewater, and primary method of wastwater treatment and disposal:
   See Appendix A - Hydrostatic Test Plan and corresponding maps.
2. Is the proposed facility located within the service boundary of a municipal sanitary sewerage system? ☐ Yes ☒ No
   If "Yes", explain why this discharge is not being connected to a sanitary sewer:
3. Does the proposed facility described in D.1 discharge wastewater to an Underground Injection Control (UIC) system? ☐ Yes ☒ No
4. Is there any other wash water or wastewater that will be or is being discharged to a UIC system not described in D.1? If "Yes", also provide the information required in *Section C, Preliminary Engineering Report/Facility Plan for each UIC.* ☐ Yes ☒ No
5. Does or will stormwater at the facility be drained to a UIC system other than described by this application? If "Yes", also complete *UIC Registration Form: Stormwater Drainage Systems* (enclosed with this application). ☐ Yes ☒ No

LEGAL NAME OF APPLICANT: Williams Pacific Connector Gas Operator, LLC on behalf of Pacific Connector Gas Pipeline, LP

E. OTHER DEQ OR PUBLIC AGENCY PERMITS

List all other DEQ or public agency permits issued to or applied for this project:

A list of permits required for the project is provided in Appendix B.

F. PRELIMINARY ENGINEERING REPORT/FACILITY PLAN

Attach two copies of a Preliminary Engineering Report or Facility Plan Report that fully describes the proposed project using written discussion, maps, diagrams, and any other necessary materials. The report must contain the following information (see instructions for more detail):

1. Complete description of the proposal.
2. Location of the project, adjacent facilities, and waterways on a USGS topographic map. Include the location and latitude/ longitude for all UIC wastewater systems on this map. Also provide a tax lot map for the project.
3. Schedule for development, including future expansion plans if applicable.
4. Schematic diagrams of waste streams and treatment/disposal facilities. Include the source and quantity of drinking water and water used for processing or manufacturing.
5. Wastewater characterization.
6. Plans for disposal of solid waste and sludges.
7. Site evaluation report prepared as outlined by OAR 340-071-0150 (on-site sewage disposal systems only).
8. Groundwater information for all areas where wastewater or sludge will be stored or disposed.
9. Evaluation of groundwater and surface water impacts and the steps that will be taken to prevent impacts from occurring.
10. Operation and maintenance plan that specifies the normal operation parameters of the system.

G. LAND USE COMPATIBILITY STATEMENT

Attach a complete Land Use Compatibility Statement (LUCS) signed by the local land use authority. The application will not be processed without evidence that the proposal is approved by the local land use authority and meets statewide planning goals.

H. UNDERGROUND INJECTION CONTROL (UIC) REGISTRATION

Federal and state regulations require that all UIC systems be registered with DEQ. By completing this application, your wastewater UIC systems (UIC) will be registered with the DEQ and you will be sent a UIC registration conformation letter to be maintained at the facility. You will be informed by DEQ of any additional UIC regulations that are applicable to your UIC system once this application has been reviewed.

I. SIGNATURE OF LEGALLY AUTHORIZED REPRESENTATIVE

I hereby certify that the information contained in the application is true and correct to the best of my knowledge and belief. In addition, I agree to pay all permit fees required by Oregon Administrative rules 340-045 and/or 340-071. This includes a new application fee to obtain the permit and a compliance determination fee invoiced annually by DEQ to maintain the permit.

Name of Legally Authorized Representative (Type or Print): Randy Miller Title: Staff Environmental Scientist

William R. Miller
Signature of Legally Authorized Representative:

October 27, 2015
Date

DEQ USE ONLY

Regional WQ Permit Coordinator route copy of application and Preliminary Engineering Report/Facility Plan to HQ UIC Coordinator.

Date sent to HQ/Initials: Date Received by HQ/Initials:

EPA Well Type:

5A5 Electric Power Generator	5R21 Aquifer Recharge	5W20 Industrial Process Water	5X15 In Situ Fossil (fuel recovery)
[illegible] Geothermal Heat (open loop)	5W9 Untreated Sewage	5W31 Septic System (well disposal)	5X16 Spent Brine Return Flow
5A[illegible] Closed Loop Heat Pump Return	5W10 Cesspool	5W32 Septic System (drainfield)	5X25 Experimental Technology
5A19 Cooling Water Return	5W11 Septic System (general)	5X13 Mine Tailings Backfill	5X26 Aquifer Remediation
5G30 Special Drainage Water	5W12 Water Treatment Plant Effluent	5X14 Solution Mining	5X27 Other Wells

Please answer all questions and submit with the required application fees.
AN INCOMPLETE APPLICATION OR APPLICATION WITH INCORRECT FEES WILL NOT BE PROCESSED.
If the information requested is not applicable, please indicate as such

A. REFERENCE INFORMATION

1. Enter the legal name of the applicant. The permit will be issued to this entity. This is the person, business, public organization, or other entity that controls the facility described in this application and will be responsible for complying with the conditions of the permit. This must be the legal Oregon name (i.e., Acme Products, Inc.) or the legal representative of the company if it operates under an assumed business name (i.e. John Smith, dba Acme Products). The name must be a legal active name registered with the Oregon Department of Commerce, Corporation Division (503-378-4752), unless otherwise exempted by their regulations
2. Indicate if the applicant is the owner of the facility.
3. Provide the legal status of the applican. Indicate "public" for a facility solely owned by local government.
4. Enter the common name of the facility or operation if different than the legal name of the applicant.
5. Enter the Standard Industrial Classification (SIC) four-digit code **or** North American Industry Classification System five or six-digit code (NAICS) for the facility. These codes are used to describe the primary activity at the facility and may be found on fire marshal reports, insurance papers, or tax forms. The NAICS codes replaced the SIC system in 1997, however, it is usually easy to convert between the two systems so either code is acceptable. SIC or NAICS information is also available from the U.S. Census Bureau at 1-888-756-2427 or at http://www.naics.com/search.htm.

B. FACILITY LOCATION

1. Enter the physical location of the facility (street address, not mailing address), including city, state, zip code, and county.
2. Enter the latitude and longitude of the approximate center of the facility or site in degrees/minutes/seconds. Latitude and longitude can be obtained from DEQ's location finder web site at http://deq12.deq.state.or.us/website/findloc/ or from United States Geological Survey (USGS) quadrangle topographic maps by calling toll-free at 1-888-ASK-USGS (1-888-275-8747). For obtaining latitude and longitude from USGS maps, instructions may be obtained from DEQ's web site at http://www.deq.state.or.us/wq/wqpermit/LatLongInstr.pdf.
3. Enter the Township, Range, Section, and Tax Lot numbers for the regulated site.

C. FACILITY CONTACTS

1. Enter the name, telephone number, and mailing address of the Responsible Official. The Responsible Official is the person that receives official correspondence from DEQ, such as renewal notices or notices of noncompliance, and may be contacted if there are questions about this application.
2. Enter the name, telephone number and mailing address of the Facility Contact if different from the Responsible Official. The Facility Contact is the person located at the facility that has specific knowledge of the facility or operation under permit (e.g., the treatment plant operator), and may be contacted if there are specific questions about this application.
3. Enter invoicing information for billing purposes if different from the Responsible Official (e.g., "Invoice To: Business Office - Accounts Payable").

D GENERAL INFORMATION

1. Briefly describe the proposed facility, type of wastewater (industrial, sewage or both), and primary method of wastewater treatment and disposal. For example, "2 MGD domestic sewage treatment plant consisting of non-discharging, evaporative lagoons" or "Seasonal jelly processing facility with land irrigation of process wastewater."
2. Indicate if a sanitary sewer system is available to receive this wastewater. If "yes," explain why this discharge is not being connected to sanitary sewer.
3. Indicate if an Underground Injection Control (UIC) system will be used or is currently used to dispose of wastewater for the proposed facility described in D.1. Wastewater includes wash waster, process wastewater, and/or sewage. The following wastewater disposal systems are considered UICs:

- Non-residential onsite sewage system with a design flow of 2,500 gallons per day or designed to serve 20 or more people a day (excluding single-family residential systems)
- Multi-family residential onsite sewage systems regardless of size
- Any onsite sewage system, regardless of size, that receives industrial wastewater
- Dry wells or sumps
- Infiltration trenches
- French drains
- Industrial wastewater drain holes
- Cesspools/sewage drain holes

4. Indicate if there is any other wash water or wastewater at the regulated site that will be or is being discharged to a UIC system not included in the proposed facility description found in D.1. **If "yes," also provide the information required in *Section F, Preliminary Engineering Report/Facility Plan* for each UIC.**
5. Indicate if a UIC system other than the one described in this application will be used or is currently used to drain storm water. **If "yes," complete the *UIC Registration Form: Storm Water Drainage Systems* enclosed with this application.** The following storm drainage systems are considered UICs:
   - Any UIC wastewater system also used for storm damage
   - Dry wells or sumps
   - Infiltration trenches
   - French drains
   - Storm drain holes

E. OTHER DEQ OR PUBLIC AGENCY PERMITS:

In order for DEQ to coordinate with other DEQ divisions and public agencies, list all permits issued to or applied for this project.

F. PRELIMINARY ENGINEERING REPORT/FACILITY PLAN:

Two copies of a Preliminary Engineering Report or Facility Plan Report must accompany this application and contain the following minimum information:

[**Note:** When constructing community sewage treatment facilities, also refer to DEQ's *Guidelines for Planning Community Wastewater Projects (January 1998)* for assistance on developing a facility plan.]

1. A description that includes all aspects of the facility, including services to be provided and activities to be conducted.
2. A USGS topography map that shows the location and scope of the project, locations of adjacent facilities, waterways, wetlands, drainage ways, residential areas, industrial facilities, and commercial areas, including the location and latitude/longitude for all UIC wastewater systems. Also provide a tax lot map for the project.
3. The proposed development and construction schedule. Also include future expansion plans or potential plans.
4. Schematic diagrams that include each waste stream, collection facilities, treatment and control facilities, and ultimate disposal methods for each waste product or wastewater effluent. Include a water balance for each waste stream. If alternatives for treatment are also being considered, they should be included as well. Also include the source and quantity of drinking water and water used for processing or manufacturing if different from drinking water supply.
5. A characterization of the quantity and quality of each waste stream.
6. Plans for collection, storage, and disposal of any sludges generated by the treatment process, including a characterization of volume and quality.
7. For on-site sewage systems only, a site evaluation report prepared as outlined in OAR 340-071-0150 by an Agent of the Department or qualified consultant. The report shall contain, at a minimum, a site diagram and observations of the site characteristics.
8. Groundwater information for all areas where wastewater or sludge will be stored or disposed. The following minimum information is required:
   - Climatic information
   - Topography and soil profile description
   - Flooding and erosion potential
   - Groundwater aquifer characteristics, including quality and gradient
   - Location of all wells and springs within a 1/2 mile radius

   In areas of shallow, unprotected aquifers or other areas with high potential for groundwater contamination, additional information may be required (see OAR 340-040-0030)
9. A description of the groundwater and surface water impacts that may occur during construction and operation of the facility. Also detail the steps that will be taken to prevent such impacts from occurring.
10. An operation and maintenance plan that specifies the normal operating parameters of the system(s). Include, for example, the length and spacing of dose cycles, gallonage of a dose cycle, and calibration of flow meters or elapsed time meters. The maintenance schedule should address ALL components to be inspected and maintained, togetherwith procedures for doing so. For each item, include the frequency for inspecting it and the maintenance procedure. If available, include the manufacturer's operation and maintenance literature for system components.

G. LAND USE COMPATIBILITY STATEMENT:

A completed Land Use Compatibility Statement (LUCS) signed by the local land use authority must be submitted with this application. The application will not be processed without evidence that the proposal is approved by the local land use authority and meets statewide planning goals. A LUCS form is enclosed with this application.

H. UNDERGROUND INJECTION CONTROL (UIC) REGISTRATION:

Federal and state regulations require that all UIC systems be registered with DEQ. By completing this application, your wastewater UIC system(s) will be registered with DEQ and you will be sent a UIC registration confirmation letter to be maintained at the facility. You will be informed by DEQ of any additional UIC regulations that are applicable to your UIC system once this application has been reviewed.

I. SIGNATURE OF LEGALLY AUTHORIZED REPRESENTATIVE

The signature of a legally authorized representative must be provided in order to process this application. See the table below for more information.

DEFINITION OF LEGALLY AUTHORIZED REPRESENTATIVE: Please also provide the information requested in brackets *[ ]*
• **Corporation** - president, secretary, treasurer, vice-president, or any person who performs principal business functions; or a manager of one or more facilities that is authorized in accordance to corporate procedure to sign such documents • **Partnership** - General partner *[list of general partners, their addresses, and telephone numbers]* • **Sole Proprietorship** - Owner(s) *[each owner must sign the application]* • **City, County, State, Federal, or other Public Facility** - Principal executive officer or ranking elected offical • **Limited Liability Company** - Member *[articles of organization]* • **Trusts** - Acting trustee *[list of trustees, their addresses, and telephone numbers]*

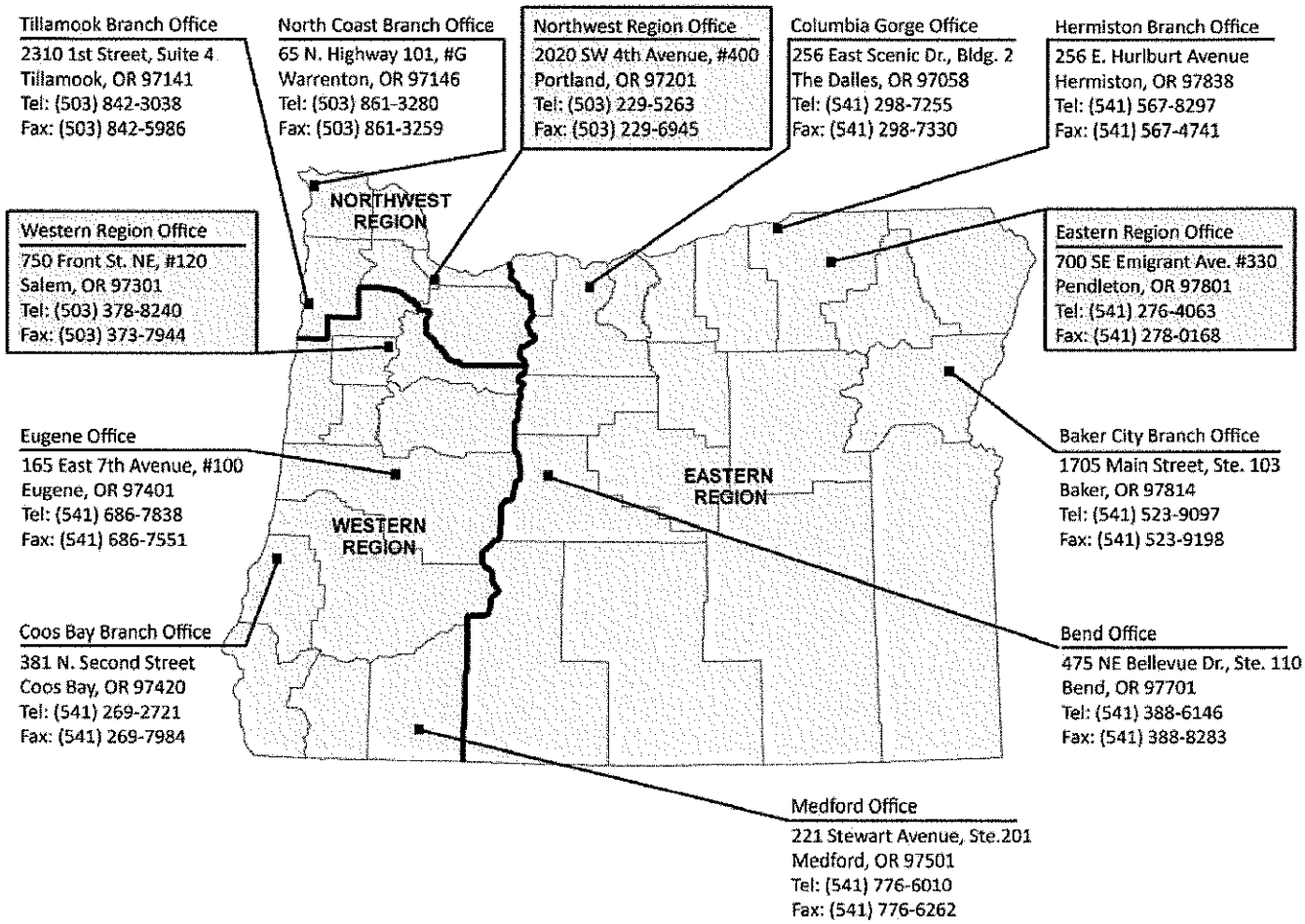
FEE AND APPLICATION SUBMITTAL:

Please see the cover letter enclosed with this application form or call the appropriate regional office below for fee information and to determine where to send this application. Send this form and fee to the regional office. Make your check payable to the Department of Environmental Quality.

FOR ONSITE SEWAGE SYSTEMS IN NORTHWEST REGION AND WESTERN REGION: *(see map on next page)*
DEQ Western Region Attn: WPCF-OS Section 165 East 7th Avenue, Suite 100 Eugene, OR 97401-3049 541-686-7838 or 1-800-844-8467

FOR ALL OTHER SYSTEMS OR FACILITIES: *(see map on next page)*		
DEQ Northwest Region 2020 SW 4th Avenue, Suite 400 Portland, OR 97201-4987 503-229-5263 or 1-800-452-4011	**DEQ Western Region** 750 Front Street NE, Suite 120 Salem, OR 97301-1039 503-378-8240 or 1-800-349-7677	**DEQ Eastern Region** 700 SE Emigrant Avenue, Suite 330 Pendleton, OR 97801 541-276-4063 or 1-800-452-4011

DEQ REGIONAL AND BRANCH OFFICES



NOTE: SUBMIT YOUR APPLICATION TO THE APPROPRIATE REGIONAL OFFICE					
NORTHWEST REGION COUNTIES					
Clackamas	Clatsop	Columbia	Multnomah	Tillamook	Washington
WESTERN REGION COUNTIES					
Benton	Coos	Curry	Douglas	Jackson	Josephine
Lane	Lincoln	Linn	Marion	Polk	Yamhill
EASTERN REGION COUNTIES					
Baker	Crook	Deschutes	Gilliam	Grant	Harney
Hood River	Jefferson	Klamath	Lake	Malheur	Morrow
Sherman	Umatilla	Union	Wallowa	Wasco	Wheeler

Appendix A

Pacific Connector Gas Pipeline
Hydrostatic Test Plan

Responses to Tim McFetridge's May 8, 2015 Comments on Pacific Connector's Hydrostatic Test Plan September 21, 2015

1. Throughout the document the term "discharge" is used when referring to the handling of the hydrostatic test water after use. DEQ generally uses the term "discharge" in reference to wastewater that enters surface waters. A better term to reference wastewater for this project is "land application water" or something similar, unless of course the intention is to discuss the discharge of wastewater to surface waters.

Response: **The use of the term "discharge" throughout the Hydrostatic Test Plan (Plan) is the act of releasing water from the end of the pipeline test sections. Pacific Connector does not intend to discharge water to surface waters as DEQ generally uses the term for discharge. As noted in Section 2.6 of the Plan, "...*where water is being discharged in an upland area, the contractor is responsible for taking water samples, if required, for analysis. Once the samples have been analyzed and meet the permit requirements, the water may be discharged through an approved discharge structure in an upland area.*"**

Throughout the plan, Pacific Connector has replaced, where appropriate, the term 'discharge' with 'dewater' or 'release.'

2. Section 2.1. The subject document is titled: "Hydrostatic Test Plan" and the plan to be required by the contractor is titled the same. Some difference in the titles should be used so as to decipher between the two. The current document could be called the "Hydrostatic Testing Predesign Report" and the plan required by the contractor could be called the "Final Construction Hydrostatic Test Plan". This document is general in nature, whereas the final plan will require much more detail in terms of upland location, proximity to streams, land application design, and emergency plan if there is a major test failure.

Response: **The 'specific hydrostatic test plan and schedule' referred to in Section 2.1, is an internal plan which details 'methods for cleaning, filling, pressurizing, proof testing, dewatering, and drying of the pipeline' to ensure that the testing procedures meet or exceed the requirements of DOT 49 CFR Part 192, Pacific Connector's engineering / design specifications, contract documents, and permit conditions. The Hydrostatic Test Plan has been revised to clarify the upland locations for the test section breaks (potential dewatering points), proximity to streams at each of the test segment breaks, and an emergency plan if there was an unlikely test failure. This document is the basis for permitting.**

3. Table 2. DEQ is concerned about the volume of water that will need to be handled during the testing of the pipe sections. Many sections will result in the handling of more than one million gallons. Land applying this volume of water will require relatively large areas of land to prevent ponding or runoff. The use of impoundments may be required. The content of the final hydrostatic test plan will

need to fully describe the design of each system.

Response: **Comment noted. Table 2 has been updated to specify the current pipeline test segment break locations that are based on detailed pipeline design. The test break locations provided in Table 2 reflect the proposed alignment based on civil and elevation surveys which incorporate reroutes recommended by agencies and landowners as well as other minor alignment adjustments for various site-specific conditions (i.e., topographic conditions to minimize grading requirements, incorporating appropriate offsets from existing powerlines, roads or other utilities easements, etc.). The test break locations are also based on pipeline design specifications (wall thickness/grade, etc.) and DOT class locations as well as topographic/elevation and hydrostatic test pressure conditions that would be experienced along the test segment. The test segment breaks were also selected based on available access and work areas. The Hydrostatic Test Plan includes fewer test segments (35 vs 75) that are longer for testing efficiency. Attachment A to the Plan provides dewatering structure typicals, which, as shown on Figure 3430.34-X-0012, may include a portable holding tank attached to multiple dewatering structures (filter bags) to spread out the land application area.**

4. The sequence of operations is unclear. It is stated that upon completion of testing of one section the water can be cascaded to the next section. Has the next section been cleaned and readied for testing. If so, two sections will have to be completed at nearly the same time. It is also stated that upon being cleaned, a section will be welded to the adjacent section, but the adjacent section would be full of water from the previous test. These details will certainly be required in the final test plan, but a general explanation should be provided in this document.

Response: **After testing one segment, the water can be cascaded to the next segment that has been cleaned and readied for testing. For testing efficiency, the contractor may choose to clean multiple test segments prior to conducting the test or clean the next test segment concurrently with testing the preceding test segment.**

The interpretation of the last sentence in Section 2.2 is inaccurate. The last sentence indicates that after cleaning, the pig launcher and receiver, which were welded onto the test segment to launch the cleaning pigs, are removed and the test headers are then welded onto the test segment to allow the test segment to be filled with water and tested. Minor edits have been included for clarification.

5. Section 2.6. Reference is made to "...the permit requirements...", but not to what type of permit, or which agency issued the permit. DEQ is currently working on the details regarding how best to permit the various activities of this project and when these decisions are made the correct permit should be referenced.

Response: **Comment noted. Section 7.3 of the plan has been revised to indicate:** ***"Permission to release the hydrostatic test water through land***

application will be applied for through ODEQ."

6. Section 3.0. The last paragraph on page 3 of this section states that "...Pacific Connector will not add unapproved chemicals to the hydrostatic test water" The statement implies that Pacific Connector will potentially be requesting the approval of the regulatory agencies for the use of chemicals in the test water. A list of such chemicals, and the applicable MSDS information are needed and should be provided as part of this test plan. Also, the reason the chemical is needed should be provided.

Response: **The last sentence in second paragraph of Section 3.0 has been revised to clarify that: *The only substance that would be added to the hydrostatic test water would be chlorine to prevent the potential transfer of aquatic invasive species, which was a concern for the BLM and Forest Service, as described in Section 7.0***

7. Section 4.0. The section appears to state that the test water will be applied to upland areas and potentially discharged to surface water. It is also stated that the test water will be monitored, but no indication of what parameters are proposed to be monitored. This is important since the type of permit DEQ drafts will be dependent on exactly what Pacific Connector is proposing to do.

Response: **As previously noted in the Response to DEQ Comment 1, Pacific Connector does not intend to discharge water to surface waters. As indicated in Section 2.6 of the Plan, "*...where water is being released in an upland area, the contractor is responsible for taking water samples, if required, for analysis. Once the samples have been analyzed and meet the permit requirements, the water may be released through an approved dewatering structure in an upland area."* The Hydrostatic Test Plan has also been revised (last paragraph in Section 7.3 to indicate: *"Permission to release the hydrostatic test water through land application will be applied for through ODEQ."* Pacific Connector would sample for the parameters stipulated in the permit. Pacific Connector is providing the following table which lists hydrostatic test water quality parameters for release to land for a recent pipeline project in Washington.**

Constituent	Concentration
Total Residual Chlorine	0.1 mg/l
pH	6.5-8.5 units
Dissolved Iron	0.30 mg/l
Total Dissolved Solids	500 mg/l

8. Section 7.1. It is stated that testing of the pipeline must be completed following completion of construction. The previous section indicated that the pipeline would be tested in sections. It should not be implied that the entire pipeline is proposed to be tested as a single test.

Response: **Correct, hydrostatic testing is the last phase of the construction process and is completed by testing the pipeline using test segments of varying lengths, which depends on various factors as stated in Section 4.0. Section 7.1 was not implying that the entire pipeline is proposed to be**

tested as a single test, which is not practical or feasible.

Section 7.1 describes the general schedule of hydrostatic testing, with the main point being: " . . . *Intentionally delaying hydrostatic testing after construction activities until late fall or winter would result in unnecessarily extending the entire construction duration of the project, extending the length the construction contractor remains on-site, continued right-of-way and access disturbance as well as delaying final cleanup and restoration of the right-of-way...*"

9. Section 7.2. It is stated that the water withdrawal will be "filtered". Is this actually the case or will the water only be screened? If the water will be filtered, what is proposed for the handling of the filter backwash water generated during the filtration process?

Response: **As noted in Section 7.2.4, under <u>Best Management Practices to Treat Non-Municipal Surface Water Sources Used for Hydrostatic Testing, #1 Screening/filtering,</u> water sources would be screened/filtered during the initial intake process using NOAA[1] and ODFW [2] fish screening criteria to prevent the entrainment of small fish. The screen/filter would also prevent the potential transfer of noxious weed seeds and other weed propagules. Other types of industrial screening technologies that exceed ODFW and NOAA fish screening criteria (i.e., sub-millimeter in size) would also be employed to prevent the potential transfer of zebra mussels or New Zealand mud snails. Although the specific filter technology (i.e., sand filters, bag filters, cartridge, or screens) that would be used would be determined by the contractor, the method to dispose of, clean, or backwash the filters would be conducted in a manner to prevent contamination of surface waters. Further, disposal of filtered materials or medium would be to an approved landfill. This section of the Hydrostatic Test Plan has been updated to clarify disposal requirements.**

10. Section 7.2.4. In reference to the handling of chlorinated water the section refers to the 1997 DEQ guidance for chlorinated water discharges. This document is mainly focused on how discharges to streams and storm sewers should be addressed. Again, there is confusion regarding whether or not surface water discharges are being proposed for the hydrostatic test water.

Response: **Pacific Connector does not intend to discharge water to surface waters. As noted in Section 2.6 of the Plan, "...*where water is being released in an upland area, the contractor is responsible for taking water samples, as required, for analysis. Once the samples have been analyzed and meet the permit requirements, the water may be released through an approved dewatering structure in an upland area.*"**

---

[1] http://www.nwr.noaa.gov/Salmon-Hydropower/FERC/upload/Fish_Passage_Design.pdf
[2] http://www.dfw.state.or.us/fish/screening/docs/pumpcert.pdf

11. Section 7.3. (a) The title implies that the project will result in the discharge of test water to surface water. The title should be changed. (b) Also, the last sentence of the first paragraph refers to the need to obtain "written permission" to discharge to surface water. Such permission is not available. If discharges to surface waters are proposed for this project application must be made for an NPDES permit. (c) In addition, it is stated that sheet flow will be collected and directed "back to the ground". The water did not come from the ground. (d) The second paragraph states that dissolved solids will be filtered out. Dissolved solids do not lend themselves well to being filtered from water. (e) In discussing the desire to minimize "overland flow" the implication is made that overland flow will occur. If this is the case, discharges to surface water bodies is highly likely. The sizing and operation of the land application areas should be such that overland flow does not occur.

Response:

(a) See Response to Comment 1.

(b) The last paragraph in Section in Section 7.3 has been changed to: Permission to release the hydrostatic test water through land application will be applied for through ODEQ (also see Response to Comment #5).

(c) The sentence that states: "... *allowing release of the test water as sheet flow back into the ground...*" has been revised to state: "... *allowing release of the test water as sheet flow onto the ground...*" This paragraph does not indicate that sheet flow will be collected once it is released.

(d) "Dissolved solids" has been revised to "suspended solids" in the sentence.

(e) Comment noted. The Hydrostatic Test Plan has been revised (last paragraph in Section 7.3) to: *"Permission to release the hydrostatic test water through land application will be applied for through ODEQ."*

Pacific Connector GAS PIPELINE

Pacific Connector Gas Pipeline, LP

Hydrostatic Test Plan

Pacific Connector Gas Pipeline Project

October 2015

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Attachment D Hydrostatic Test Dewatering Location Maps

1.0 INTRODUCTION

In accordance with DOT 49 CFR Part 192, Pacific Connector Gas Pipeline, LP (Pacific Connector) will strength test (or hydrostatic test) the pipeline system (in sections) after it has been lowered into the pipe trench and backfilled. The purpose of the hydrostatic test is to verify the manufacturing and construction integrity of the pipeline before placing it in service to flow natural gas. Should a leak or break occur during the hydrostatic test, the pipeline will be repaired and retested to ensure the required specifications are achieved. Once a segment of pipe has been successfully tested, cleaned, and dried the pipe will be joined to the adjacent pipeline segment. The physical capacity of the pipeline to hold hydrostatic test water is approximately 60.7 million gallons. The actual volume to be used is reduced below the total pipe capacity through the re-use of water by cascading test water from segment to segment as practically achievable. Figure 1 in Attachment D provides an overview of the Project alignment, test segment locations, potential hydrostatic test sources, and the basins crossed by the Project as described in this Plan.

2.0 GENERAL HYDROSTATIC TESTING PROCESS

2.1 Contractor Responsibility

The construction contractor is responsible for implementing Pacific Connector's hydrostatic test design, drawings, and specifications. The contractor is also responsible for following applicable environmental stipulations, right-of-way restrictions and completing the necessary hydrostatic test documentation as required in the construction contract. The construction contractor will then provide Pacific Connector with a specific hydrostatic test plan and schedule detailing the specific methods for cleaning, filling, pressurizing, proof testing, dewatering, and drying of the pipeline during the testing process. The contractor is also responsible to provide all of the necessary equipment, instrumentation, qualified personnel and materials necessary to complete the hydrostatic test plan. Pacific Connector will review and approve the contractors hydrostatic test plan and provide final acceptance of the test.

2.2 Cleaning

As part of the construction process and prior to hydrostatic testing, the pipeline is lowered into the trench and prepared for cleaning. The majority of the pipe should be backfilled and compacted with the exception of valve sites and test header break locations which are left open to access the pipeline during the hydrostatic test process. Pig launchers and receivers are welded onto the test segment and a series of cleaning pigs are pushed through the pipeline with compressed air. All debris removed from the pipeline during the cleaning process is disposed of at an authorized waste disposal facility or other appropriate locations if approved by the landowner. Once the cleaning pig runs are complete, the pig launcher and receiver are removed from the pipeline test segment, and the hydrostatic test headers are welded into place to allow the test segment to be filled with water and tested.

2.3 Filling

Once the contractor has cleaned the pipeline test segment, the contractor uses hoses/hard piping to fill the pipeline with clean test water (see Sections 3.0 and 7.2). Water is pumped via hose from the approved water source site(s) or from the previous test segment into the new test segment. Depending on the proximity of the source water location to the test segment, water trucks may be used to transport the water. All fill lines and water pumps are rated to sustain the

hydrostatic test procedures. Water is pumped into the test segment behind fill pigs to completely fill the test segment with water and to minimize potential air entrainment during the filling process. Fill plugs/pigs are pushed in a controlled manner with pressure during the filling process from one end of the test segment and are received at the other end to ensure all air is removed from the pipeline prior to testing.

2.4 Pressurizing

Calibrated temperature recorders, pressure recorders, and deadweight testers are connected to the hydrostatic test headers to document the test. The contractor secures the test area to prevent all unauthorized personnel from being in the area. Once the test segment is completely filled with water, the fill pump is removed, the pressure pump is connected, and the pipeline test segment pressurization begins. The test pressure is brought to 500 psig and held until the pressure and temperatures are stabilized. All connections are checked for leaks. Providing there are no leaks, the pressure pump raises the internal pipe pressure slowly to 80% of the required test pressure at the low point of the test section. Once the pressure and temperatures stabilize, the stroke count is started and continued until the internal pipe pressure reaches the required test pressure.

2.5 8-Hour Test

The hydrostatic test pressure is maintained on the test section for the duration of the test, which is anticipated to last 8-hours. During the first two hours of the pressure test the time, pipe temperature, ambient temperature, and dead weight pressure readings are recorded. After the second hour, the same readings are taken every half hour for the remainder of the test. Acceptance of the hydrostatic test is done by Pacific Connector's Chief Construction Inspector. If a leak is encountered during the hydrostatic test, the test is stopped, the leak is located, and the pipe is excavated to repair the leak. If at any time during the 8-hour hydrostatic test, the test pressure falls below the minimum test pressure, the test will be unacceptable and test section shall be re-pressurized and the entire test started again.

2.6 Dewatering

At the end of the 8-hour test, the contractor lowers the pipeline pressure by slowing venting water. The water that is vented may be cascaded into the next test section, or into a dewatering structure, or into a frac tank for further testing pending the location and need in the hydrostatic test plan. Test water is only released for land application at previously approved locations through an approved dewatering structure. Where water is being released in an upland area, the contractor is responsible for taking water samples, if required, for analysis. Once the samples have been analyzed and meet the permit requirements, the water may be released through an approved dewatering structure in an upland area.

2.7 Drying

Once the hydrostatic test has been approved and the water removed from the pipeline, the contractor will use dry compressed air to push a series of drying pigs through the pipeline. Pigs will be run until the pipeline is dried to a specified dew point.

2.8 Tie-Ins

Following the pipeline drying, the test segments are welded together. The welds are x-rayed and the pipeline is prepared for service.

3.0 SOURCE WATER

Water for hydrostatic testing will be obtained from commercial or municipal sources, private supply wells, or surface water right owners (see Table 1). Hydrostatic test water for the compressor station will be obtained from nearby municipalities. If water for hydrostatic testing is acquired from public surface water sources, Pacific Connector will obtain all necessary appropriations and withdrawal permits through the Oregon Water Resources Department (OWRD). As part of the application process, OWRD provides the application(s) to the Oregon Department of Environmental Quality (ODEQ) and the Oregon Department of Fish and Wildlife (ODFW) for review. These agencies comment if there are concerns regarding the impacts the withdrawal(s) may have on water quality, or other beneficial uses, and/or fish and wildlife species and their habitat, respectively. OWRD also provides public notice of the application(s) and encourages comments. OWRD then completes its review and issues the permit(s) or denies the application(s). Private owners will be contacted to discuss water acquisition during landowner negotiations in the year prior to construction.

As required by ODFW, pumps used to withdraw surface water will be screened according to NOAA Fisheries' screening criteria to prevent entrainment of aquatic species. When pumping water from a source location, the pump head will be submerged and maintained on average at the center of the water column so as to prevent sucking in sediments and/or algae lying at the water level surface or sediments (i.e. heavy metals) resting on the bed of the waterbody. The targeted ramping rate will be managed such that there is no significant decrease of river flows. Estimated ramping rates will be submitted to ODFW as part of the ODWR permitting process. The only substance that would be added to the hydrostatic test water would be chlorine to prevent the potential transfer of aquatic invasive species, which was a concern for the BLM and Forest Service, as described in Section 7.0

Table 1
Potential Hydrostatic Source Locations

County	MP	Source		Owner	Estimated Withdrawal Requirement *(Longest Test Segment Volume)*[1]
South Coast Basin - Coos Bay Frontal Pacific Ocean (1710030403) - Fifth Field Watershed					
Coos	1.47R	Coos Bay - North Bend Water Board		Coos Bay - North Bend Water Board	4,999,228
South Coast Basin - M. F. Coquille River (1710030501) - Fifth Field Watershed					
Douglas	50.20	Water Impoundment	Kinnan Lake	5-J Limited Partnership, Donald R. Johnson 29080601300	3,315,584
Umpqua Basin - Olalla Creek-Lookingglass Creek (1710030212) - Fifth Field Watershed					
Douglas	55.90	Water Impoundment	Ben Irving Reservoir	Douglas County Public Works/ Looking Glass Olalla Water District/ Winston-Dillard Water District	3,315,584
Douglas	58.75	Looking Glass Olalla Water District (Olalla Creek Crossing)		Looking Glass Olalla Water	3,315,584

County	MP	Source		Owner	Estimated Withdrawal Requirement *(Longest Test Segment Volume)*[1]
				District	
Umpqua Basin - Clark Branch-South Umpqua River (1710030211) - Fifth Field Watershed					
Douglas	71.30	S. Umpqua River Crossing #1		Oregon Department of Water Resources	2,037,230
Umpqua Basin - Days Creek-South Umpqua River (1710030205) - Fifth Field Watershed					
Jackson	94.73	S. Umpqua River Crossing #2		Oregon Department of Water Resources	2,525,177
Rogue Basin - Shady Cove-Rogue River (1710030707) - Fifth Field Watershed					
Jackson	122.5	Rogue River Crossing		Oregon Department of Water Resources	1,951,591
Rogue Basin - Little Butte Creek (1710030708) - Fifth Field Watershed					
Jackson	133.38	Medford Aqueduct		Eagle Point Irrigation	2,256,357
Jackson	146.70	N. Fork Little Butte Creek Crossing		Medford Irrigation District/ Rogue River Valley Irrigation District	2,847,495
Jackson	161.40	Water Impoundment	Fish Lake		2,847,495
Klamath Basin - Fourmile Creek (1801020302) - Fifth Field Watershed					
Klamath	168.90	Water Impoundment	Lake Of The Woods National Forest Lake	United States (Rogue River-Siskiyou NF)	5,565,825
Klamath Basin -John C Boyle Reservoir-Klamath River (1801020602)					
Klamath	184.30	Water Impoundment	John C. Boyle Reservoir	Oregon Department of Water Resources	5,565,825
Klamath Basin -Lake Ewauna-Klamath River (1801020412)					
Klamath	189.00	Water Impoundment	Keno Reservoir	Oregon Department of Water Resources	5,565,825
Klamath	199.20	Klamath River			5,565,825
Klamath Basin -Mills Creek–Lost River (1801020409)					
Klamath	228.1	High Line Canal		Malin Irrigation District	4,560,666
				Total	**N/A** [2]

[1] The volumes in the table represent the estimated withdrawal volume from a potential hydrostatic test source, and, in some cases, multiple sources are identified for the same test segment(s) because water withdrawals would be based on conditions at the time of construction (see Table 2 for potential water sources identified for each test segment).

[2] Totaling the potential withdrawal volumes is not applicable because, as stated in footnote #1, multiple (alternate) sources have been identified for the same test segments. Without cascading (not proposed), the physical volume for all individual test segments would be 60.7 million gallons. With the use of cascading, which is proposed, the minimum test water volume to be withdrawn would be 15,928,725 gallons across all sources. The actual volume will be within this range and is expected to be at the lower end of the range.

4.0 DEWATERING

The pipeline will be tested in approximately 35 sections, each with varying lengths and water volume requirements (see Table 2). The required test pressure ranges, pipe strength (wall thickness and pipe grade), topography (specifically elevation changes), available access and work areas to stage testing equipment, and the availability of test water are used to determine the length of each test segment. During the test, it may be necessary to release some volume of water at each of the section breaks; however, Pacific Connector will conserve water as much as practical and minimize dewatering, where feasible, by cascading, or transferring, water between test sections. If the volume of water required to test the successive segment(s) is less than the preceding test segment, the extra test water may be stored in the previously tested segments or portable tanks and then pumped to subsequent segments for testing as necessary to minimize water withdrawals and potential water hauling requirements. After testing of the segment or series of segments is complete, the hydrostatic test water will be released to an upland area within the basin from which it was withdrawn. The hydrostatic test would be dewatered through a filter bag or straw bale structure to remove particulates and prevent the potential for sediment transport and ground surface erosion (see Attachment A). Pacific Connector does not propose to release hydrostatic test water outside the basin from which it was withdrawn (i.e., South Coast, Umpqua, Rogue, or Klamath). It is expected that the volume of water to be released within a basin would be the largest volume of water associated with the longest test segment within the basin. Table 2 provides the volume of water for each test segment and footnotes the largest volumes for each basin, which are listed below:

- South Coast Basin - 4,990,228 gallons (15.31 ac/ft)
- Umpqua Basin - 2,525,177 gallons (7.75 ac/ft)
- Rogue Basin - 2,847,495 gallons (8.74)
- Klamath Basin – 5,565,825 (17.08 ac/ft)
  Total = 15,928,725 (48.88 ac/ft)

At some locations it may be necessary to locate the dewatering structures outside the construction right-of-way, as allowed under FERC Procedures (IV. A. 1.), to direct water away from the disturbed right-of-way areas. In these locations, small brush or trees may be cleared by a rubber-tired rotary or flail motor (brush hog) or by hand with machetes/chainsaws. No soil disturbance will occur. A rubber-tired or track hoe will be utilized to lay the dewater line and to remove the saturated straw bales or filter bags upon completion of hydrostatic dewatering.

The hydrostatic test dewater locations are shown on the maps provided in Attachment D. The hydrostatic test design was developed from alignment and elevation surveys and detailed pipe design. The design will be provided to construction contractors, once selected. Potential stream flow effects (or ramping rates) from hydrostatic test dewatering are not expected because water will be released to an upland area and through an energy dissipation dewatering structure to promote infiltration into the ground and will not occur within 150 feet of any sensitive wetland (i.e., non-agricultural wetland) or waterbody, where feasible. Further, BMPs, as described in Section 7.0, will be implemented to control dewatering to minimize potential increases in stream flow.

Table 2
Potential Hydrostatic Dewatering (Test Header) Locations within the Construction Right-of-Way

Test Segment	Oregon Plan Watershed	HUC (10-digit) (Begin MP)	HUC (10-digit) (Ending MP)	Begin MP [1]	End MP	Section Length [2] (feet)	Volume [3, 4] (gallons) (acre feet)	Potential Water Source	Jurisdiction (ending MP)	Waterbodies Closest to Dewatering Locations [5] (LLID)	Distance to Waterbodies [5] (feet)	End Latitude End Longitude
Spread - Haynes Inlet												
1	South Coast	Coos Bay Frontal Pacific Ocean 1710030403	Coos Bay Frontal Pacific Ocean 1710030403	1.47R (Private)	4.20R	14,840	735,523 (2.26)	Coos Bay - North Bend Water Board	Private	Coos Bay /Coos River / Jordan Cove (1243397433543)	650	Beg. 43.432564 Beg. -124.240191
										Haynes Inlet (1242326434319)	1000	
										Trib to Haynes Inlet (1242017434500)	550	
										Trib to Haynes Inlet (1242011434514)	377	End 43.449395
										Haynes Inlet (1242266434305)	355	End -124.198395
Spread 1												
2	South Coast	Coos Bay Frontal Pacific Ocean 1710030403	Coos Bay Frontal Pacific Ocean 1710030403	4.20R	10.13	52,760	2,612,411 (8.02)	Coos Bay - North Bend Water Board	Private	Trib. to Stock Slough (1241467433377)	90	43.338261
										Trib. to Stock Slough – Monkey Gulch (1241504433368)	100	-124.147804
3	South Coast	Coos Bay Frontal Pacific Ocean 1710030403	Coos Bay Frontal Pacific Ocean 1710030403	10.13	17.1-17.25	38,800	1,922,158 (5.90)	Coos Bay - North Bend Water Board	Private/BLM-Coos	Trib. to Catching Creek (1241615432585)	275	43.255887
										Catching Creek (1241452433077)	575	-124.160713
4	South Coast	Coos Bay Frontal Pacific Ocean 1710030403	E. F. Coquille River 1710030503	17.1-17.25	35.80	100,760	4,990,228 [4] (15.31)	Coos Bay - North Bend Water Board	BLM-Coos	Tribs. to South Fork Elk Creek (1239351431117 & 1239152431074)	415 650	43.105719
										Trib to Big Creek (1239061430967)	363	-123.912717
5	South Coast	E. F. Coquille River 1710030501	M. F. Coquille River 1710030501	35.80	37.20	7,280	360,166 (1.11)	Coos Bay - North Bend Water Board	BLM-Coos	Big Creek (1240115430262)	400	43.105499
										Tribs to Big Creek (1240115430262, 1238846431056, & 1238882431046)	395 105 375	-123.888347
6	South Coast	M. F. Coquille River 1710030501	E. F. Coquille River 1710030501	37.20	39.20	10,520	520,468 (1.60)	Coos Bay - North Bend Water Board, Kinnan Lake	Private	Tribs. To Camas Creek (1238306431319, 1238519431172 & 1238491431056)	243 350 650	43.104265
										Trib to Sandy Creek (1238500430999)	675	-123.855397
Spreads 1 and 2												
7	South Coast	E. F. Coquille River 1710030501	M. F. Coquille River 1710030501	39.20	51.61	67,000	3,315,584 (10.18)	Coos Bay - North Bend Water Board, or Kinnan Lake, or Looking Glass Olalla Water District(Olalla Creek	Private	Trib to Belieu Creek (1236803430462)	1525	43.050453 -123.658493

Test Segment	Oregon Plan Watershed	HUC (10-digit) (Begin MP)	HUC (10-digit) (Ending MP)	Begin MP [1]	End MP	Section Length [2] (feet)	Volume [3, 4] (gallons) (acre feet)	Potential Water Source	Jurisdiction (ending MP)	Waterbodies Closest to Dewatering Locations [5] (LLID)	Distance to Waterbodies [5] (feet)	End Latitude End Longitude
								Crossing), or Ben Irving Reservoir				
8	South Coast Umpqua (MP 53.16)	M. F. Coquille River 1710030501	Olalla / Lookingglass Creek 1710030212	51.61	58.85	39,320	1,946,641 (5.97)	Looking Glass Olalla Water District(Olalla Creek Crossing)or Ben Irving Reservoir	Private	Olalla Creek (1234905431631)	228	43.073273 -123.531991
9	Umpqua	Olalla / Lookingglass Creek 1710030212	Clark Branch – South Umpqua 1710030211	58.85	66.48	40,320	1,997,530 (6.13)	Looking Glass Olalla Water District(Olalla Creek Crossing)or Ben Irving Reservoir	Private	Tribs. to Willis Creek (1234009430728 & 1233983430694) Tribs. to Rice Creek (1234180430725 & 1234136430721)	420 652 1400	43.072111 -123.40666
10	Umpqua	Clark Branch – South Umpqua 1710030211	Clark Branch – South Umpqua 1710030211	66.48	71.42	26,320	1,302,297 (4.00)	Looking Glass Olalla Water District(Olalla Creek Crossing)or Ben Irving Reservoir, or S. Umpqua River Crossing #1	Private	Tribs to South Umpqua River (1233302430519, 1233289430525 & 1233303430545)	193 83 785	43.054403 -123.329152
10A	Umpqua	Clark Branch – South Umpqua 1710030211	South Umpqua 1710030211	71.42	72.68	6,920	342,765 (1.05)	S. Umpqua River Crossing #1	Private	Tribs to South Umpqua River (1233086430593 & 1233346430680)	345 657	43.062635 -123.309245
11	Umpqua	Clark Branch – South Umpqua 1710030211	Myrtle Creek 1710030210	72.68	75.72	19,800	980,638 (3.01)	S. Umpqua River Crossing #1	Private	Tribs to Biger Creek (1232543430838, 1232534430792, & 1232600430803)	342 512 485	43.08197 -123.257641
12	Umpqua	Myrtle Creek 1710030210	Myrtle Creek 1710030210	75.72	82.32	35,200	1,741,192 (5.34)	S. Umpqua River Crossing #1	Private	Tribs to South Myrtle Creek (1231803430263,1231848430210, 1231837430216, & 1231921430292)	385 545 485 800	43.023663 -123.18033
13	Umpqua	Myrtle Creek 1710030210	Days Creek-South Umpqua River 1710030205	82.32	89.50	41,160	2,037,230 (6.25)	S. Umpqua River Crossing #1	Private	Tribs to Days Creek (Doe Hollow) (1230858429848) Tribs to Days Creek (Bailey Gulch) (1230937429813 & 1231032429810)	1145 1353 992	42.979162 -123.090206
Spreads 2 and 3												
14	Umpqua	Days Creek-South Umpqua River 1710030205	Days Creek-South Umpqua River 1710030205	89.50	94.71	27,720	1,372,593 (4.21)	S. Umpqua River Crossing #1, or S Umpqua River Crossing #2	Private	South Umpqua River (1234460432680) Trib. to South Umpqua River (1230442429313)	140 308	42.932972 -123.039405
15	Umpqua	Days Creek-South Umpqua River 1710030205	Days Creek-South Umpqua River 1710030205	94.71	95.51	4,240	210,102 (0.64)	S. Umpqua River Crossing #2	BLM-Roseburg	Tribs. to South Umpqua (1230357429250 & 1230382429323)	252 775	42.922722 -123.034451
16	Umpqua	Days Creek-South Umpqua	Days Creek-South Umpqua	95.51	100.77	27,560	1,365,564 (4.19)	S. Umpqua River Crossing	Private	Trib to Hatchet Creek (1229971428706)	205	42.870433

Test Segment	Oregon Plan Watershed	HUC (10-digit) (Begin MP)	HUC (10-digit) (Ending MP)	Begin MP [1]	End MP	Section Length [2] (feet)	Volume [3, 4] (gallons) (acre feet)	Potential Water Source	Jurisdiction (ending MP)	Waterbodies Closest to Dewatering Locations [5] (LLID)	Distance to Waterbodies [5] (feet)	End Latitude End Longitude
		River 1710030205	River 1710030205					#2		Trib to East Fork Stouts Creek (1230111428734)	350	-123.003209
17	Umpqua	Days Creek-South Umpqua River 1710030205	Upper Cow Creek 1710030206	100.77	110.37	50,960	2,525,177 [4] (7.75)	S. Umpqua River Crossing #2	USFS-Umpqua	East Fork Cow Creek (1229918428021)	870	42.77114
										Tribs to East Fork Cow Creek (1229258427752 & 1229337427754)	810 830	-122.926565
18	Umpqua Rogue (MP 111.11)	Upper Cow Creek 1710030206	Trail Creek 1710030706	110.37	113.67	15,600	771,945 (2.37)	Rogue River Crossing	Private	Tribs to Dead Horse Creek (1228736427515 & 1228712427513)	2145 2075	42.74529
										Trib to West Fork Trail Creek (1228839427397)	1270	-122.885218
19	Rogue	Trail Creek 1710030706	Trail Creek 1710030706	113.67	117.84	22,000	1,088,400 (3.34)	Rogue River Crossing	Private	Trib to Trail Creek (1228449426932)	475	42.693386
										Trib to West Fork Trail Creek (1228571426840)	215	-122.885284
20	Rogue	Trail Creek 1710030706	Shady Cove - Rogue River 1710030707	117.84	122.20	23,080	1,141,707 (3.50)	Rogue River Crossing	Private	Trib to Cricket Creek (1228167426451 & 1228177426455)	55 450	42.645528
										Cricket Creek (1228054426435)	233	-122.817437
20A	Rogue	Trail Creek 1710030706	Shady Cove - Rogue River 1710030707	122.20	122.81	3,200	158,595 (0.49)	Rogue River Crossing	Private	Rogue River (1244292424210)	625	42.645567 -122.805571
20B	Rogue	Shady Cove - Rogue River 1710030707	Shady Cove - Rogue River 1710030707	122.81	124.97	11,280	559,100 (1.72)	Rogue River Crossing	BLM-Medford	Tribs. to Brush Creek (1227674426310 & 1227761426291)	387 400	42.628191
										Trib to Rogue River (1228061426243)	850	-122.780074
										Trib to Indian Creek (1227770426261)	590	
21	Rogue	Shady Cove - Rogue River 1710030707	Big Butte Creek 1710030704	124.97	132.47	39,440	1,951,591 (5.99)	Rogue River Crossing, or Medford Aqueduct, Eagle Point Irrigation	Private	Trib to Quartz Creek (1226768425794)	232	42.577736 -122.680439
Spread 4												
22	Rogue	Big Butte Creek 1710030704	Little Butte Creek 1710030708	132.47	141.11	45,520	2,256,357 (6.92)	Medford Aqueduct, Eagle Point Irrigation	BLM-Medford	Tribs to Salt Creek (1226086424700 & 1226075424805)	550 220	42.483863 -122.610407
23	Rogue	LittleButte Creek 1710030708	Little Butte Creek 1710030708	141.11	147.75	37,280	1,844,080 (5.66)	Medford Aqueduct, Eagle Point Irrigation, or North Fork Little Butte Creek	Private	Trib to North Fork Little Butte Creek (1225688424078)	490	42.403061
										Trib to South Fork Little Butte Creek (1225728424006)	840	-122.570909
24	Rogue	Little Butte Creek 1710030708	Little Butte Creek 1710030708	147.75	150.66	12,520	620,533 (1.90)	North Fork Little Butte Creek	BLM-Medford	Trib to North Fork Little Butte Creek (1225334423894,1225327423928 & 1225339423878)	1204 1440 1369	42.383192 -122.539368
										Trib to South Fork	1123	

Test Segment	Oregon Plan Watershed	HUC (10-digit) (Begin MP)	HUC (10-digit) (Ending MP)	Begin MP [1]	End MP	Section Length [2] (feet)	Volume [3,4] (gallons) (acre feet)	Potential Water Source	Jurisdiction (ending MP)	Waterbodies Closest to Dewatering Locations [5] (LLID)	Distance to Waterbodies [5] (feet)	End Latitude End Longitude
										Little Butte Creek (1225408423780 &1225410423779)	1180	
25	Rogue	Little Butte Creek 1710030708	Little Butte Creek 1710030708	150.66	158.75	42,920	2,126,306 (6.53)	North Fork Little Butte Creek, or Fish Lake	USFS-Rogue River	Trib. to Grizzly Creek (1224112423587)	280	42.364171
										Trib to North Fork Little Butte Creek (1224135423837)	5340	-122.397398
26	Rogue Klamath (MP 168.00)	Little Butte Creek 1710030708	Spencer Creek 1801020601	158.75	169.52	57,480	2,847,495 [4] (8.74)	North Fork Little Butte Creek, or Fish Lake, or Lake of the Wooks	Private	Trib to Spencer Creek (1222399423006)	1275	42.29569 -122.237525
Spread 5												
27	Klamath	Spencer Creek 1801020601	Lake Ewauna / Upper Klamath River 1801020412	169.52	190.79	112,520	5,565,825 [4] (17.08)	Klamath River, or Lake of the Woods, or Keno Reservoir, or John C Boyle Reservoir	Private	Trib to Klamath River (1219079421383, 1219022421436 & 1218746421442)	2305 470 1750	42.144256 -121.90652
28	Klamath	Lake Ewauna / Upper Klamath River 1801020412	Lake Ewauna / Upper Klamath River 1801020412	190.79	197.49	29,480	1,459,243 (4.48)	Klamath River, or Keno Reservoir, or John C Boyle Reservoir	Private	Trib to Klamath River (1218411421604)	3740	42.170991 -121.833676
29	Klamath	Lake Ewauna / Upper Klamath River 1801020412	Mills Creek - Lower Lost River 1801020409	197.49	199.17	8,840	438,075 (1.34)	Klamath River, or Keno Reservoir, or John C Boyle Reservoir, or Lake of the Woods	Private	Klamath River (1221913420005)	750	42.171113 -121.805705
30	Klamath	Lake Ewauna / Upper Klamath River 1801020412	Mills Creek - Lower Lost River 1801020409	199.17	210.52	60,000	2,970,150 (9.12)	Klamath River, or High Line Canal	Private	Irrigation Canal – Trib to L Canal (1217128420861 & 1216541420747)	1415	42.067422 -121.660354
31	Klamath	Mills Creek - Lower Lost River 1801020409	Mills Creek - Lower Lost River 1801020409	210.52	210.77	1,280	63,519 (0.20)	Klamath River or High Line Canal	Private	Irrigation Canal – Trib to L Canal (1217128420861 & 1216541420747)	1265 390	42.064856 -121.657176
32	Klamath	Mills Creek - Lower Lost River 1801020409	Mills Creek - Lower Lost River 1801020409	210.77	228.13	92,080	4,560,666 (14.00)	Klamath River, or High Line Canal	Private	High Line Canal (1214066420153)	1785	42.032735 -121.374896
						Total [6]	**60,701,864 (186.29)**					

[1] Mileposts were not calculated from engineering stationing and may not provide a direct correlation between milepost and engineering stationing. "R" represents a revised milepost location based on the incorporation of reroutes into the proposed route.
[2] Section length reflects actual footage calculated directly from engineering stationing.
[3] Section volumes were calculated using section length directly from engineering stationing.
[4] Water will be cascaded between test sections, where practical, to minimize test water volume requirements, withdrawals, and potential water hauling. It is expected that the largest volume of water to be released would be associated with the longest test segment within a basin.
[5] Waterbodies were determined from USGS National Hydrography Dataset water course data(http://nhd.usgs.gov/). Distances were to the closest water course regardless of flow characteristics (i.e., perennial, intermittent, or ephemeral).
[6] Without cascading (not proposed), the maximum test volume for all individual test segments would be 60,701,864 gallons. With the use of cascading, which is proposed, the minimum test water volume to be withdrawn would be 15,928,725 gallons. The actual volume will be within this range and is expected to be at the lower end of the range.

Typical dewatering rates can range from several hundred gallons per minute to several thousand gallons per minute and are dependent on the following, which will be reviewed by the contractor and EI to determine the appropriate dewatering rate prior to construction:

- Length of test section (volume);
- Profile of test section (head);
- Position of dewatering site relative to streams, drainages, roads, housing, cropland;
- Topography (slope);
- Land use (vegetation); and
- Soil type (ability to absorb).

The pipeline test segment(s) will be dewatered once the hydrostatic test has been successfully completed. Dewatering pigs driven by compressed air will be utilized to remove the water. The volumes and rates of dewatering will be determined at the time of construction based on site-specific conditions and released at a rate to prevent scour and erosion (see Section 7.3). Prior to dewatering, water quality will be tested and monitored according to permit conditions to ensure test water meets upland application requirements; however, since the pipe will be internally coated and cleaned prior to filling, the water quality is not expected to differ significantly from the quality of the fill water used. Dewatering to land will follow specific procedures developed to minimize water quality impacts and localized erosion and will comply with hydrostatic test permits and approvals (see Section 7.3). In the unlikely event a testing parameter does not meet the release requirements/limits, Pacific Connector would implement appropriate treatment methods to ensure that the limits are satisfied.

Pacific Connector will implement FERC's Wetland and Waterbody Procedures regarding hydrostatic testing as well as any conditions specified in individual state permits. Pacific Connector will follow FERC's Wetland and Waterbody Procedures (Section VII. C.4.) and will locate all hydrostatic test manifolds/dewatering structures at least 150 feet outside of wetlands and riparian areas to the maximum extent practicable based on engineering test constraints to ensure that water infiltrates into the ground and does not flow into wetlands or waterbodies (see Section 7.3).

5.0 HORIZONTAL DIRECTIONAL DRILL (HDD)/DIRECT PIPE HYDROSTATIC TESTING

Each HDD and Direct Pipe crossing require pre-installation and post-installation hydrostatic testing. Should a leak or break occur, the pipeline would be repaired and retested to ensure the required specifications are achieved. HDD segment testing requires a small volume of water due to the relatively short section of pipe involved.

6.0 TEST FAILURE

As experienced by Pacific Connector on previous pipeline projects and as reported by Kirkwood and Cosham (2000), hydrostatic test failure on new pipeline construction is extremely rare due to modern steel and construction techniques that include better controls, non-destructive testing (e.g., X-Ray or ultrasonic testing), and inspection of the whole pipeline fabrication process. In the unlikely event a failure occurs during hydrostatic testing, water may be released at the point of the failure. The quantity of water released at the point of failure is dependent on the nature and location of the failure; typically a test failure is the result of a small pin hole leak with little water loss. During testing, the contractor's testing engineers and Pacific Connector's inspectors will monitor the testing results for pressure drops. Pacific Connector's EIs will monitor the length

of the test section if a failure occurs to mitigate potential effects from a water release and will implement appropriate BMPs to minimize erosion or sedimentation into sensitive areas. Extra straw bales, silt fencing, stakes, fabric, and other appropriate erosion control devices will be available during the hydrostatic testing process and will be utilized as necessary to control any released water that may seep to the surface and into a sensitive area. As stated above, the water used for the test will be from surface water or municipal sources, permitted as necessary for appropriations and no additives (other than potentially chlorine, see Section 7.2.4) will be included in the water for the testing. If a discharge to surface waters occurred from a hydrostatic test, the appropriate agency would be notified if required by permit conditions. Should a leak or break occur during the hydrostatic test, the pipeline will be repaired and retested to ensure the required specifications are achieved.

7.0 POTENTIAL EFFECTS AND BEST MANAGEMENT PRACTICES

The measures outlined below are to ensure the protection of aquatic and terrestrial resources at water withdrawal and dewatering locations.

7.1 Schedule

It is projected that pipeline construction would be completed in late summer to early fall of the pipeline construction season which will also minimize potential adverse impacts to terrestrial and aquatic ecosystems. The pipeline must be tested immediately following completion of construction so that any failures could be repaired and retested. Also, the hydrostatic test must be completed prior to introducing natural gas into the pipeline system and putting it in-service. Intentionally delaying hydrostatic testing after construction activities until late fall or winter would result in unnecessarily extending the entire construction duration of the project, extending the length the construction contractor remains on-site, continued right-of-way and access disturbance as well as delaying final cleanup and restoration of the right-of-way. Winter testing would be particularly problematic in that much of the right-of-way would be under snow and in wet/muddy condition.

7.2 Water Withdrawal

Water withdrawal requirements for each identified water source are noted in Table 1 in Section 3.0. The construction contractor will filter all water removed from the source locations to ensure clean "debris free" water is used for the hydrostatic testing of the pipeline. There is a potential for transfer of water-borne aquatic pathogens, forest pathogens, and invasive species between watershed drainages. This section outlines the steps Pacific Connector will follow to prevent the potential inter-drainage transfer of pathogens and invasive species of concern of the federal and state agencies.

7.2.1 Waterbody Source Testing

During development of this Plan, Pacific Connector included commitments to test all non-municipal waterbody sources to determine if there is a presence of water-borne aquatic and forest pathogens. The intent of the proposed waterbody testing program was to prevent the potential transfer of these pathogens and invasive species from one watershed to another. However, during a consultation meeting with the federal land-managing agencies and the Center for Lakes and Reservoirs and Aquatic Bioinvasion Research and Policy Institute (Portland State University) on November 19, 2009, it was determined that testing was not a definitive tool to establish the absence of a potential invasive species or forest pathogens in non-municipal source waters. As suggested by Mark Sytsma with Aquatic Bioinvasion

Research and Policy Institute, water testing would only confirm the absence of a potential invasive species in the sample aliquot and therefore would not confirm the potential presence of an invasive species within the entire waterbody source. Because of the lack of certainty in sampling and testing results and the impracticality of testing the entire volume of hydrostatic test water that would be required for the project, it was concluded that Pacific Connector should assume that all non-municipal test water sources could contain a potential invasive species and that water treatment methods should be implemented to prevent the potential spread of aquatic invasive species or forest pathogens.

7.2.2 Invasive Species and Pathogens

Below is a list of invasive species and pathogens that are currently of concern that potentially may occur within identified water sources that have been targeted for treatment in non-municipal test water sources. Attachment B provides current information on the presence of these species in the project area.

- Scotch broom
- Himalayan blackberry
- Yellow starthistle
- Port-Orford-cedar root disease
- Sudden Oak Death
- Quagga mussel
- Zebra mussel
- New Zealand mud snail
- Brackish water snail
- Whirling disease
- Didymo
- Blue-green algae (Cyanobacteria)
- Chytrid fungus
- Freshwater mold
- Other terrestrial and aquatic non-native, noxious weed fragments and seeds that may be identified at the time of construction
- Other forest and fish pathogens that may be identified at the time of construction.

7.2.3 Bio-Invasive Research

Prior to water withdrawal, Pacific Connector will review United States Geological Survey (USGS) biological research division data, as well as other pertinent presence data sources as referenced in Attachment B, to determine where known locations of invasive species and pathogen infestations exist along the project area and at proposed water source locations. Attachment B provides documentation of the presence of the aquatic invasive species and pathogens in Oregon.

Pacific Connector has evaluated the locations where the potential exists for Port-Orford-cedar root disease based on Oregon Department of Forestry statewide forest health survey data available between 2003 and 2008 (http://www.oregon.gov/ODF/privateforests/fh.shtml). Based on this data, Port-Orford-cedar root disease is most prevalent in the project area between about MPs 1.47R and 50.20. The proposed water source for hydrostatic testing between MPs 1.47R and 50.20 (see Table 1) would come from a treated municipal source (i.e., Coos Bay – North Bend Water Board). Therefore, the risk of spreading Port-Orford-cedar root disease or any other invasive species or pathogens from hydrostatic test dewatering from this source is avoided.

Other potential water sources for hydrostatic testing include Kinnan Lake located in the Middle Fork Coquille watershed which is crossed by the project between MPs 35.81 and 52.91. According to the Oregon Department of Forestry annual survey data between 2003 and 2008, Kinnan Lake is located above Port-Orford-cedar root disease infestations in the Middle Fork Coquille watershed. Ben Irving Reservoir, a potential hydrostatic test water source in the Olalla Creek-Lookingglass Creek Watershed, which is crossed by the project between MPs 52.91 and 62.41, does not have recorded infestations of Port-Orford-cedar root disease nor does any other watershed east of MP 62.41 (based on Oregon Department of Forestry survey data 2003 through 2008). Therefore, the potential for transmission of this pathogen should be low.

As noted in Attachment B, currently there are no quagga or zebra mussels known to occur in Oregon. Although both New Zealand mud snails and brackish water snails are known to occur in the Coos Bay Estuary, hydrostatic test water sources for the project between MPs 1.47R and 50.20 would be from a municipal source and would not occur from the bay, preventing the potential spread or transfer of these invasive species.

Whirling disease is known to occur in the South Umpqua Watershed (Montana Water Center, 2010); however, the potential risk of transferring or spreading this disease is low because the principle vector for the spread of whirling disease is contaminated fish parts, and according to BLM (2009), this disease is typically not spread through water withdrawal activities. The proposed treatment BMPs outlined in Section 7.2.4 are designed to minimize the potential pathways through which this disease is known to spread.

Currently, in Oregon there have been no nuisance blooms of didymo (Draheim, 2009). Blue-green algae (Cyanobacteria) blooms are commonly found in many freshwater systems across the world and also occur in many lakes, rivers and reservoirs in Oregon. The Oregon Department of Human Services (2009a) monitors harmful algae blooms across Oregon, and Pacific Connector would verify that no health advisories have been posted[1] for a proposed hydrostatic test water source prior to withdrawal to prevent potential transfer of high levels of toxins. To date there have been no health advisories posted for any of the proposed hydrostatic test water sources posted by the Oregon Department of Human Services (2009a).

As noted in Attachment B, both chytrid fungus and freshwater mold (Saprolegnia) likely occur in the project area, but specific locations are not known from the literature Pacific Connector has reviewed. The proposed water treatment BMPs outlined in Section 7.2.4 are intended to minimize the potential spread of these species, if present.

7.2.4 Waterbody Source Best Management Practices

Pacific Connector will implement the following BMPs to avoid the potential spread of the aquatic invasive species and pathogens of concern:

- If determined to be feasible for hydrostatic testing requirements, return all water back to its withdrawal source location after use; however, cascading water from one test section to another to minimize water withdrawal requirements may make it impractical to release water within the same fifth field watershed where the water was withdrawn. Pacific Connector will return or release all water from the same basin from which it was withdrawn (i.e., South Coast, Umpqua, Rogue or Klamath).

[1] http://www.oregon.gov/DHS/ph/hab/advisories.shtml

- Because of the BLM and Forest Service concern regarding the potential for the spread of aquatic invasive species and pathogens, if hydrostatic test water cannot be returned to the same fifth field watershed from where it was withdrawn, Pacific Connector would employ an effective and practical water treatment method described below. The hydrostatic test water would be treated after it is withdrawn and prior to hydrostatic testing.

Pacific Connector researched various water treatment methods to disinfect non-municipal surface water sources that might harbor potential aquatic invasive species and pathogens. The potential treatment methods considered were previously identified and discussed with the land-managing agencies during the development of this Plan and included: various filtrations/screening treatment methods, UV treatment, Acrolein and Chlorine treatment. It was noted during the agency conversations that only chlorine has been approved for use as treatment for disinfection purposes on BLM-managed lands. The Forest Service also noted that a Pesticide Use Proposal would need to be prepared prior to the use of any chemical to treat/disinfect water on NFS lands. A Pesticide Use Proposal form is provided in Appendix 3 of the Integrated Pest Management Plan which is included as Appendix N to the POD.

The use of ultraviolet irradiation (UV) was initially considered as a potential treatment method because it is used extensively in municipal and industrial water treatment applications and is well known to be effective against a wide range of microganisms, including viruses and cysts (Lloyd's Register, 2007). However, it was concluded during the consultation meeting held on November 19, 2009, that because there is limited information available regarding the rate/dose and effectiveness of UV treatment on the various invasive species and pathogens (OSU, 2009; EPA, 1999; and Bettina, et al., 2000) that potential UV treatment methods would not be considered further at this time. UV treatment was not effective on chytrid fungus (Johnson et al., 2003). Currently, UV disinfection treatment technologies are being employed in some marine ballast water treatment applications (Lloyd's Register, 2007). Pacific Connector may consider this treatment technology in the future if additional information is available regarding its effectiveness on the aquatic invasives and pathogens of concern and if it is a cost effective and efficient treatment method.

Pacific Connector also concluded during the consultation meeting held on November 19, 2009, that while Acrolein (Magnacide H Aquatic Herbicide) is a registered aquatic herbicide for the control of invasive aquatic plants in canals, this potential treatment method would be dropped from further consideration because of its extreme toxicity to humans and fish species (Baker Hughes, 2009 and EPA, 2009). Baker Hughes, the manufacturer of Magnacide H Aquatic Herbicide, provides that fish are very sensitive to this herbicide and that fish are killed at concentrations less than those required for aquatic weed control and that as a rule, MAGNACIDE H Herbicide should not be used where fish are considered a resource (Baker Hughes, 2009).

Chlorine, an oxidizing agent, is approved for use in drinking water and is effective in disinfecting a number of aquatic invasive species. Chlorine is one of the most widely used drinking water disinfectants in the world (Oregon Department of Human Services, 2009b). Chlorine guidelines have been established to treat waterborne diseases such as cholera, typhoid, and dysentery. Chlorine also eliminates slime bacteria, molds, and algae that commonly grow in water supply reservoirs, on the walls of water mains, and in storage tanks. To disinfect drinking water, chlorine is applied as either elemental chlorine (chlorine gas) or through the use of chlorinating chemicals such as calcium hypochlorite (tablets or granules) or solutions of sodium hypochlorite (liquid bleach or Clorox®) (World Chlorine Council, 2008). On federal lands, Clorox® bleach is

registered for Port-Orford-cedar root disease management activities (Forest Service and BLM, 2004). Diluted bleach solutions are used to disinfect equipment, shoes, and boots when working in areas infested with Sudden Oak Death (California Oak Mortality Task Force, 2006) and to treat irrigation water in nurseries that grow *Phytophthora*-susceptible plants (for Port-Orford-cedar root disease and Sudden Oak Death) (OSU, 2009). Because of chlorine's use as a disinfectant for drinking water and vehicles and equipment potentially contaminated with various aquatic invasive and pathogens (see Attachment B), it was determined during the November 19, 2009 consultation meeting that chlorine treatment should be considered as a practical water treatment method for all non-municipal surface water sources that would be utilized for hydrostatic testing purposes.

Best Management Practices to Treat Non-Municipal Surface Water Sources Used for Hydrostatic Testing

Pacific Connector would implement a three-step BMP treatment process to prevent the potential spread of invasive species and forest pathogens from non-municipal surface water sources used during hydrostatic testing. The hydrostatic test water treatment process would incorporate screening/filtration during water withdrawal, chlorine treatment, and upland dewatering at least 150 feet from sensitive wetlands (i.e., non-agricultural wetlands) or waterbodies, where feasible, with no dewatering to these features. Further, all hydrostatic dewatering locations would be monitored after construction to ensure noxious weeds have not established. Any weed populations would be treated as described in the Integrated Pest Management Plan (see Appendix N to the POD). This hydrostatic test water treatment process has been developed based on the invasive species and pathogens of concern and the management information available for their control (see Attachment B). A summary of and rationale for the proposed treatment process is described below:

1. **Screening/filtering.** Hydrostatic test water withdrawal from non-municipal surface water sources would be screened during the initial intake process. The screening/filtration process would meet NOAA[2] and ODFW[3] criteria to prevent the entrainment of small fish. These screening requirements would prevent the potential transfer of the noted noxious weeds of concern listed in Section 7.2.2 and Attachment B as the maximum screen mesh size (i.e., 2.38 mm) required by NOAA and ODFW is smaller than the smallest seed size documented for these weeds in Attachment B (i.e., 1/8 inch or about 3mm for seeds of yellow starthistle). Therefore, the screening/filtering requirements should prevent the potential transfer of noxious weed seeds and other weed propagules (i.e., rhizomes, roots, stems) from hydrostatic test dewatering.

   There are other types of industrial screening technologies that exceed ODFW and NOAA fish screening criteria that Pacific Connector would also employ to further remove solids and organics from non-municipal surface water sources. These types of filters include media or sand filters, bag filters[4], or various types of cartridge or screen filters[5]. These filters can remove solids and organic materials from water significantly smaller than 1 millimeter in size with some types having a submicron filter rating or capacity. However, smaller filtering capacities (i.e., < 100-200 µm) may not be practical because

[2] http://www.nwr.noaa.gov/Salmon-Hydropower/FERC/upload/Fish_Passage_Design.pdf
[3] http://www.dfw.state.or.us/fish/screening/docs/pumpcert.pdf
[4] http://www.rainforrent.com/products/filters.htm
[5] http://www.rainforrent.com/products/filters.htm

of required hydrostatic testing pumping requirements. Depending on the filter technology selected, any potential disposal, cleaning, or backwashing of the filters would be conducted in a manner to prevent contamination of surface waters. Further, any necessary disposal of filtered materials or medium would occur to an approved disposal area or landfill.

Although currently there are no known infestations of quagga or zebra mussels in Oregon, micro filtration has been shown to be effective in preventing the potential spread of these mussels, as well as New Zealand mud snails downstream of research facilities (Cope, et al. 2002) or into hatcheries (Oplinger et al. 2009).

The principle vector for the spread of whirling disease is contaminated fish parts, and according to BLM (2009), this disease is typically not spread through water withdrawal activities. Although spores may reside in organics and mud (BLM, 2009), as noted in Section 3.0, when pumping water from a source location, the pump head will be submerged and maintained on average at the center of the water column so as to prevent sucking in organic materials, sediments and/or algae lying on the surface or in sediments resting on the bed of the waterbody. Therefore, Pacific Connector's proposed screening procedures should prevent the potential transfer of this disease.

2. **Chlorine Treatment.** As shown in Attachment B, chlorine disinfection is effective for most aquatic invasive species and forest pathogens of concern. However, most of the disinfection guidelines in the literature are for preventative treatments used on equipment, boats, boots/waders, etc. that may be infected from working or recreating in waters; they are not developed for treating entire waterbody sources. According to Oregon State University (2009), chlorine injection (Sodium hypochlorite) at a maximum concentration of 2 ppm for a contact time of at least 10 minutes is used to treat irrigation water in nurseries to kill *Phytophthora (*Port-Orford-cedar root disease and Sudden Oak Death*).*

   For treating potentially contaminated materials and equipment, chlorine treatments as low as 0.5 ppm have also been shown to be an effective control on *Dreissenia* spp. mussels (quagga and zebra mussels) (Utah Division of Wildlife Resources, 2009; Brooks, 1993). Although higher concentrations of chlorine (i.e., 1 percent solutions) are recommended for disinfecting equipment or flushing tanks to prevent the potential spread of whirling disease, a type of zooplankton (BLM, 2009), ballast water research indicates most zooplankton are killed with filtration and chlorine treatments of 0.5 ppm (USGS, 2006). Chlorine treatments of 0.5 ppm and above have been shown to be effective in destructing cyclic peptides (toxin) of cyanobacteria, a blue-green algae (Hoeger, et. al., 2002). According to the World Health Organization (1999), chlorine is used mainly for control of algae in water treatment works but is also known to have been employed in reservoir situations. The effective dose rates are dependent on the chlorine demand of the water, but most algae are reported to be controlled by residuals of free chlorine between 0.25 and 2.0 mg/L.

   Using bleach to disinfect field equipment of chytrid fungus requires a minimum exposure of 10 minutes using a concentration of 0.4 percent sodium hypochlorite (Johnson, et al, 2003). Chlorine treatment is expected to be effective on Saprolegnia, a freshwater mold, known primarily to be problematic in fish hatcheries. Oregon Department of Human Services (2009b) requires chlorinated water systems to provide a minimum free chlorine

residual of 0.2 mg/L with a detention time of 30 minutes before reaching the first point of use.

Proposed Treatment Dose. Based on the various chlorine treatments methods for the various aquatic invasive species and pathogens that potentially may occur within identified water sources, Pacific Connector proposes to use a treatment of 2 ppm or 2 mg/L of free chlorine residual with a detention time of 30 minutes to treat all non-municipal surface waters that would be used as a water source for hydrostatic testing purposes. Higher chlorine treatment concentrations (i.e., 1 percent solutions), such as those suggested to treat potential contaminated equipment for whirling disease (zooplankton), are not proposed because, as noted by the BLM (2009), the principle vector for the spread of whirling disease is contaminated fish parts, not water withdrawal activities. Further, as noted by the USGS (2006), filtration and 0.5 ppm chlorine is shown to be effective in killing most zooplankton in ballast water research. The higher chlorine concentrations recommended to decontaminate equipment for didymo (1 minute of 2 percent bleach) are also not proposed because currently there are no nuisance blooms reported in Oregon (Draheim, 2009) and all dewatering of hydrostatic test water would occur to an upland area at least 150 feet from sensitive wetlands (i.e., non-agricultural wetlands) and waterbodies, where feasible, with no discharge to features.

3. **Upland Dewatering.** During the hydrostatic testing process, all hydrostatic test water will be released to an upland area through a dewatering device such as a straw bale structure or sediment bag, in a manner to promote inflation. All dewatering devices will be at least 150 feet from sensitive wetlands (i.e., non-agricultural wetlands) and waterbodies, where feasible, and dewatering will not occur to these features, as described in Section 7.3 below. The hydrostatic test dewatering BMPs are important measures to prevent the potential spread of aquatic invasives. As noted in Section 7.3 below, chlorinated water would be released according to the Oregon Department of Environmental Quality criteria to prevent water quality impacts, potential effects to aquatic species, and to minimize potential impacts to sensitive areas . Additionally, as described in Section 8.0 below, all dewatering locations will be monitored after construction for potential noxious weed establishment and treated if necessary.

After hydrostatic test water withdrawal, all equipment used in the withdrawal process would be cleaned and sanitized to prevent the potential spread of aquatic invasives and pathogens from the use of this equipment in other waterbody sources. Attachment C provides equipment cleaning and sanitization procedures.

These hydrostatic test water treatment BMPs are intended to ensure the prevention of invasive species and pathogen transfer between watershed drainages. The final design of the treatment BMPs will be completed once Pacific Connector has finalized the design of the pipeline and prepared the preliminary hydrostatic test plan and has selected the construction contractors for the project. Prior to implementing the final BMP treatment design, Pacific Connector would notify and receive appropriate approvals from federal land-managing agencies and state agencies.

7.2.5 Temperature and Flow Effects

Based on data from the USGS National Water Information System, anticipated average flow rate of the Rogue River near the proposed crossing location (near Dodge Bridge) is 1330 cubic feet per second (cfs). Anticipated withdrawal volumes from the Rogue for hydrostatic testing will

be approximately 800 gallons per minute (gpm) (1.78 cfs) which will have an immeasurable impact on the flow rate and temperature of the crossing at the time (average daily temperatures ranges from 68-71.6 degrees Farenheight).

Based on the estimated size of Fish Lake (483 acres of surface area and average depth ranging from 18 – 31 feet), the proposed withdrawal of approximately 8.7 acre-feet will have an immeasurable effect on lake levels and temperatures.

The one-time withdrawal of approximately 17.1 acre-feet of water from the Lake of the Woods for hydrostatic testing will likely occur in the late summer/early fall. Based on the estimated size of Lake of the Woods of just less than 1,200 acres of surface area and average depth of 27 feet, this withdrawal will have an immeasurable effect on lake levels and temperature.

Considering that water is essentially a non-compressible material, temperature increases from pressurization during hydrostatic testing is negligible. During the hydrostatic testing phase of the project, the pipeline will already be buried and is therefore not exposed to potential solar heating, except for a small area (approximately 200 feet) at either end of the test segment where the hydrostatic test headers are located. Therefore, the test water is at ground temperature and the potential to increase water temperatures during hydrostatic testing is inconsequential.

Where water source locations are proposed to be withdrawn from waterbodies, Pacific Connector's Environmental Inspectors (EIs) will monitor the streamflows prior to withdrawal to ensure that aquatic biota within the streams are not adversely affected.

7.3 Dewatering – Land Application

Hydrostatic test water will be released at a rate to prevent scour, erosion, and sediment migration to sensitive resources such as wetlands and waterbodies. The test water will be released into a dewatering device such as a straw bale structure or sediment bag to minimize possible peak flow effects by dissipating the energy of the test water flow, filter the test water to avoid sedimentation, and by allowing release of the test water as sheet flow onto the ground (see Attachment A - Drawing 3430.34-X-0012 (Sheets 1-3) and Drawing 3430.34-X-0013 (Sheets 1 of 3 and 3 of 3)). The dewatering will occur to an appropriately sized dewatering structure based on the expected quantity of water. Hydrostatic test water will be released in upland areas through a dewatering structure prior to entering the ground at least 150 feet from sensitive wetlands (i.e., non-agricultural wetlands) and waterbodies, where feasible. The hydrostatic test water will not be allowed to discharge to wetlands or waterbodies.

The hydrostatic test dewatering will be conducted utilizing dewatering structures that dissipate the velocity of the release and filter out any potentially-present dirt, grit or oxidation that would be present collectively as total suspended solids (see Attachment A). All bales used to construct straw bale structures will be certified weed free. On federally managed lands, straw bales are required to consist of an annual variety of straw such as annual wheat, rye, or rice straw. The dewatering structures will be placed in upland locations that are topographically appropriate to allow the flow to "pool" and dewater uniformly through the structure to promote infiltration of the water. The water is not released at any appreciable pressure regardless of site location as the test pressure is bled off prior to dewatering the test segment. Flow rates to the dewatering structure can be controlled using the dewatering valve to ensure flows do not exceed the carrying capacity of the structure(s). Additionally, dewatering rates/volumes can be controlled by releasing the water into a central tank and then pumping the water to multiple

dewatering structures concurrently or successively (one then the other) to promote infiltration, minimize overland flow, and to prevent overland flow to waterbodies (see Attachment A - Drawing 3430.34-X-0012 (Sheets 1-3) and Drawing 3430.34-X-0013 (Sheets 1 of 3 and 3 of 3)). Pacific Connector's EIs will be responsible for monitoring dewatering activities (rate and quantity) and making appropriate adjustments to facilitate proper infiltration through the dewatering structures to stay in compliance with permit conditions. Pacific Connector's EIs will also monitor the structures to prevent any potential failures or "break outs" from occurring to the structure during dewatering activities by adding additional straw bales, fabric, or stakes as needed. The success rate of straw bale structures is solely dependent on the construction, inspection, monitoring, and maintenance of each structure. Pacific Connector's EIs will ensure all structures meet the performance standard of 100%.

If chlorinated municipal water or non-municipal treated water (see Section 7.2.3 above) is used, dewatering will be treated, if necessary, according to Oregon Department of Environmental Quality criteria to prevent water quality impacts, potential effects to aquatic species, and to minimize potential impacts to sensitive areas . It is not expected that contamination of the hydrostatic test water with oil and grease will occur during hydrostatic testing because the test will be conducted on a new pipeline system constructed with new pipe. Pacific Connector's EIs will also ensure that all threaded valves and fittings that may be used on the hydrostatic test headers are cleaned of potential incidental oil and grease before the hydrostatic operations are conducted to minimize the potential for oil and grease contact from these potential incidental sources. Straw bales have been effective in removing oil and grease from test water (Tallon et al., 1992).

In addition, the EIs will ensure that turbid water is not discharged to waters of the state. If an inadvertent discharge to a surface water occurs, the dewatering operations would be immediately halted and modified to ensure that the discharge to surface water is stopped and/or minimized and water quality standards are not exceeded.

Permission to release the hydrostatic test water through land application will be applied for through ODEQ.

8.0 MONITORING

After project construction, Pacific Connector's operations personnel will be responsible for inspecting the right-of-way for a period of three to five years in areas where noxious weeds were identified prior to construction and were previously mapped to ensure that potential infestations do not reestablish and spread. Monitoring will also occur in areas along the right-of-way where equipment cleaning stations and hydrostatic dewatering sites were located to ensure that infestations at these locations do not occur. If necessary, Pacific Connector will contract with local weed control boards, qualified biologists, or agronomists to conduct these operations. All areas of the right-of-way will be monitored by Pacific Connector's staff over the operational life of the pipeline. Pacific Connector will fulfill easement obligations with all landowners crossed by the project during the life of the project including weed control. As stated in Section 3.0 in the Integrated Pest Management Plan (Appendix N to the POD), herbicides may be used to control weeds, if necessary, based on integrated weed management principles and landowner requirements.

9.0 REFERENCES

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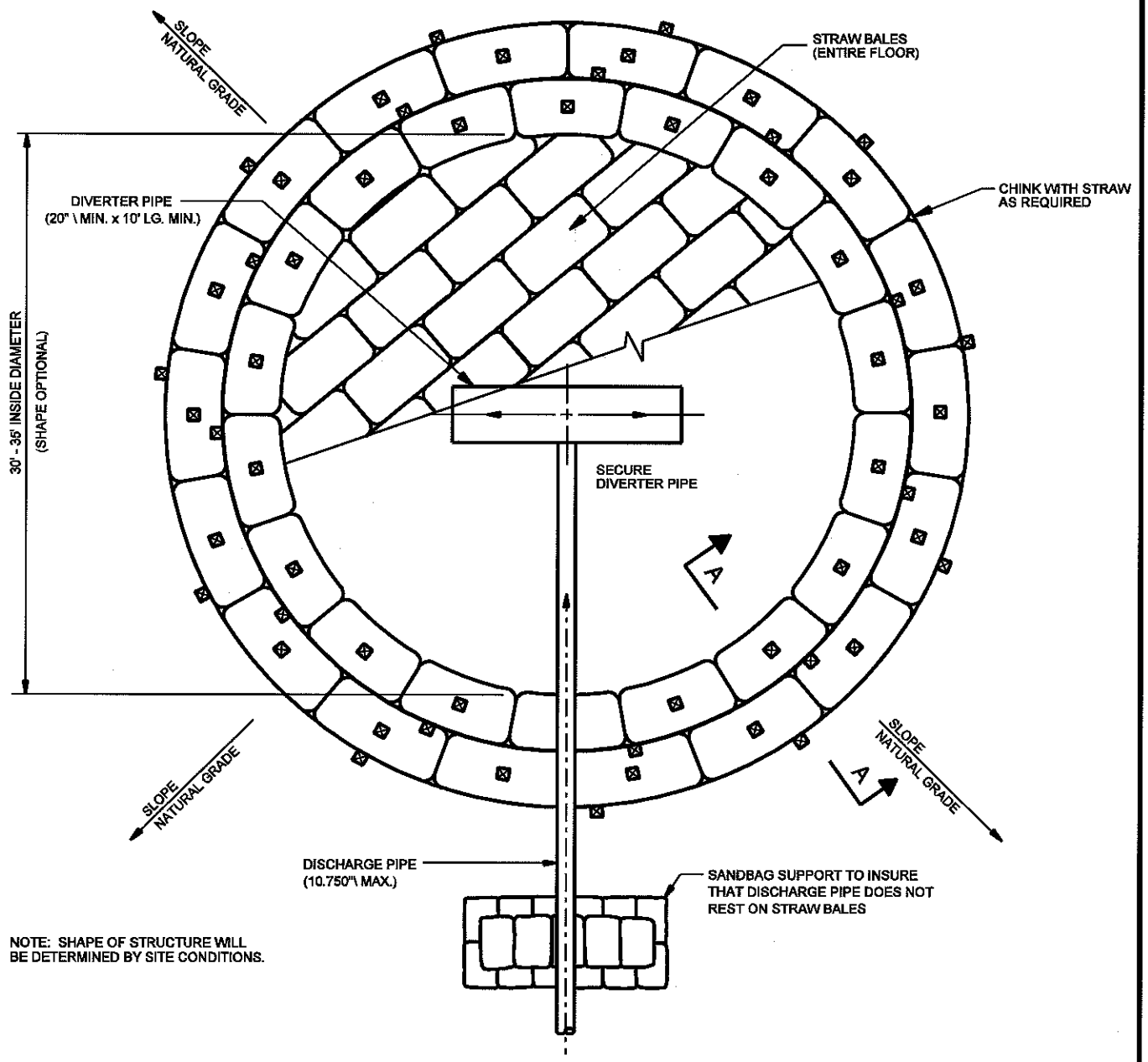
Attachment A

Hydrostatic Test Dewatering Structure Typicals

Drawing 3430.34-X-0012 (Sheets 1-3) and Drawing 3430.34-X-0013 (Sheets 1 of 3 and 3 of 3)



NOTE: SHAPE OF STRUCTURE WILL
BE DETERMINED BY SITE CONDITIONS.

HYDROSTATIC TEST DEWATERING STRUCTURE

TEMPORARY EROSION CONTROL MEASURE

DRAWING NO.	REFERENCE TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
TYPICAL HYDROSTATIC TEST
DEWATERING STRUCTURE

HDW

Pacific Connector GAS PIPELINE

DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.

DRAWN BY: KLL	DATE: 02-02-2001	ISSUED FOR BID:	SCALE: NOT TO SCALE
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.34-X-0012	SHEET 1 OF 3

6/13/2007
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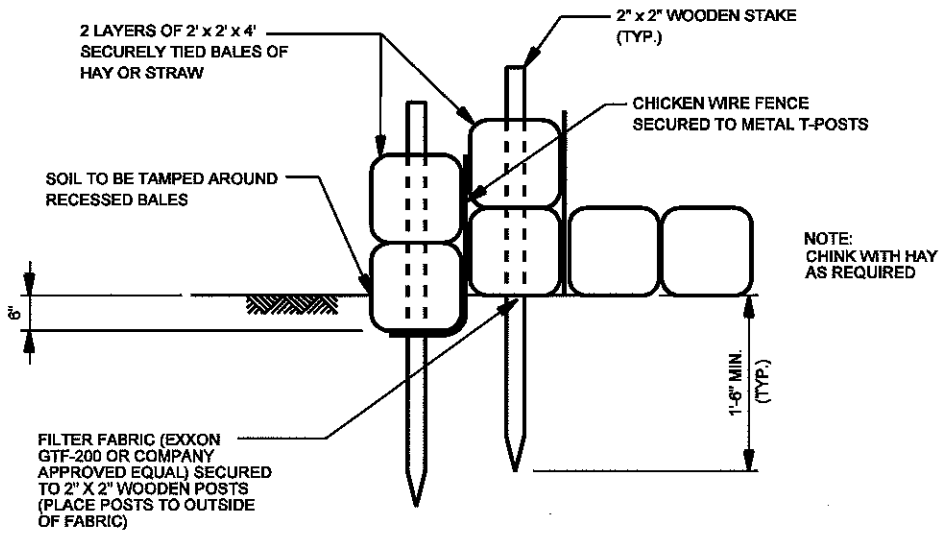

SECTION A-A

NOTE:

STAKES SECURING FILTER FABRIC AND CHICKEN WIRE FENCE ARE NOT SHOWN FOR CLARITY

NOTES:

1. STRUCTURE SHALL BE PLACED ON A LEVEL WELL VEGETATED SITE SUCH THAT WATER WILL FLOW AWAY FROM STRUCTURE AND ANY WORK AREAS.
2. FLOW RATES THROUGH DISCHARGE AND DIVERTER PIPES SHALL BE SUCH THAT STRUCTURE WILL NOT OVERFLOW.
3. WHERE CONDITIONS WARRANT A 30' x 30' RECTANGULAR STRUCTURE MAY BE SUBSTITUTED FOR THE CIRCULAR CONFIGURATION SHOWN.
4. DIMENSIONS SHOWN ARE THE MINIMUM ACCEPTABLE VALUES AND MAY BE VARIED DEPENDING UPON SPECIFIC LOCATION.
5. CONTRACTOR SHALL USE CERTIFIED NOXIOUS WEED FREE HAY OR STRAW FOR STRUCTURE.

HYDROSTATIC TEST DEWATERING STRUCTURE

TEMPORARY EROSION CONTROL MEASURE

DRAWING NO.	REFERENCE TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
TYPICAL HYDROSTATIC TEST
DEWATERING STRUCTURE

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DRAWN BY: KLL	DATE: 02-02-2001	ISSUED FOR BID:	SCALE: NOT TO SCALE	
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:		
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.34-X-0012	SHEET 2 OF 3	

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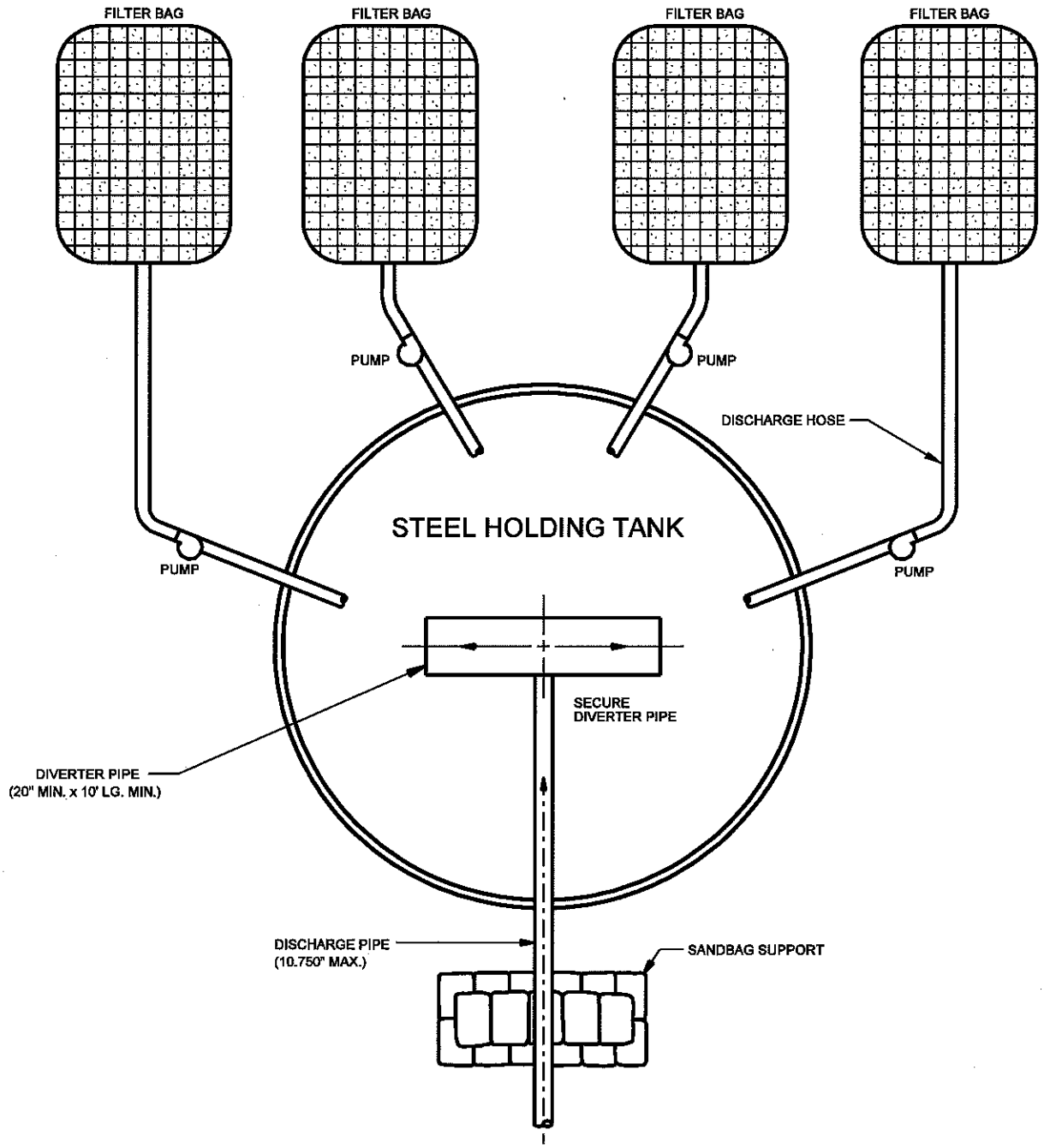

HYDROSTATIC TEST DEWATERING STRUCTURE

TEMPORARY EROSION CONTROL MEASURE

DRAWING NO.	REFERENCE TITLE

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PACIFIC CONNECTOR GAS PIPELINE, LP
TYPICAL HYDROSTATIC TEST
DEWATERING STRUCTURE

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Pacific Connector GAS PIPELINE

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APPROVED BY:	DATE:	DRAWING NUMBER: 3430.34-X-0012	SHEET 3 OF 3

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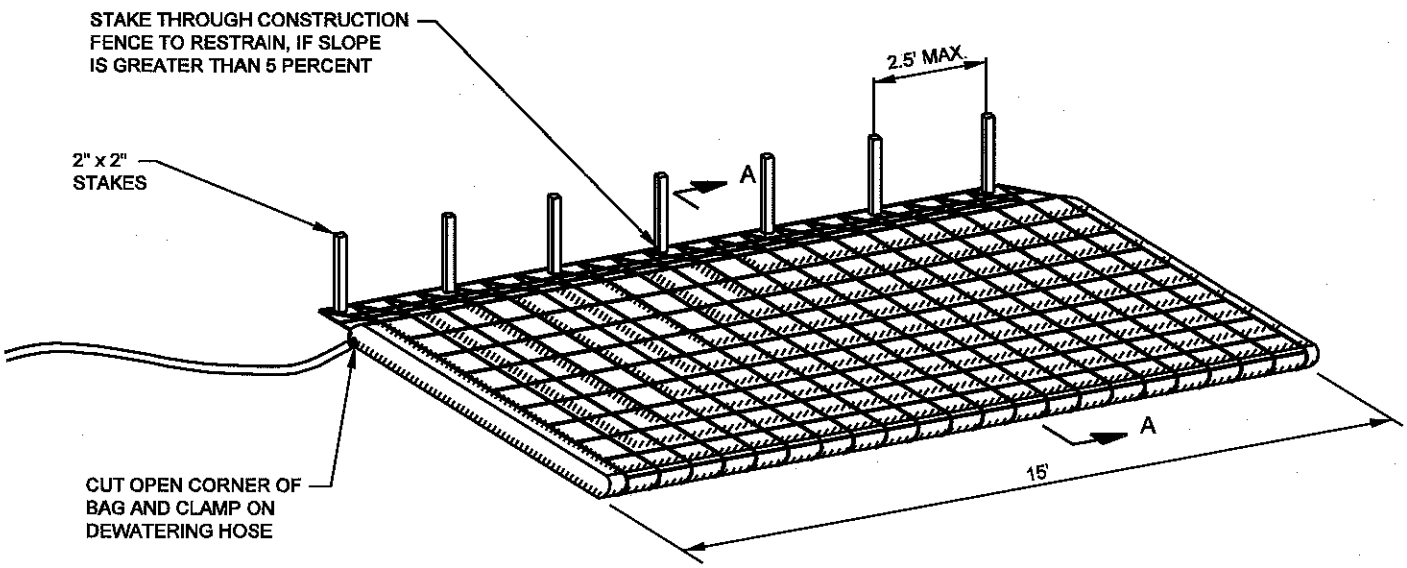
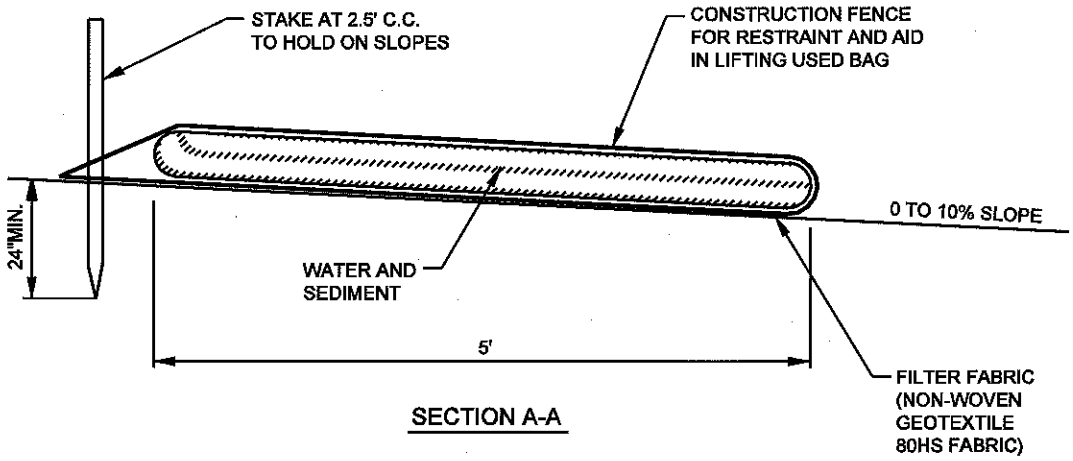




SECTION A-A

NOTES:

1. FILTER BAG SHALL BE PLACED ON A GENTLY SLOPING OR LEVEL, WELL GRADED VEGETATED SITE SUCH THAT WATER WILL FLOW AWAY FROM DEVICE, ANY WORK AREAS, WATERBODIES OR WETLANDS.
2. THE FILTER BAG MUST BE STAKED IN PLACE AND SECURED TO THE PUMP DISCHARGE LINE.
3. FILTER BAG SHALL NOT BE USED FOR DISCHARGE FLOWS GREATER THAN 300 GPM.
4. DEVICE SHALL BE REMOVED AND DISPOSED OF AFTER BAG IS FILLED WITH SEDIMENT. SEDIMENT FROM BAG SHALL BE SPREAD IN AN UPLAND AREA.

TRENCH DEWATERING

TEMPORARY EROSION CONTROL MEASURE

DRAWING NO.	REFERENCE TITLE

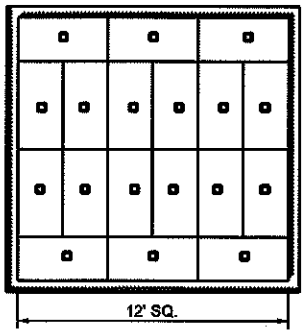
PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
TYPICAL
TRENCH DEWATERING

TDW

Pacific Connector GAS PIPELINE

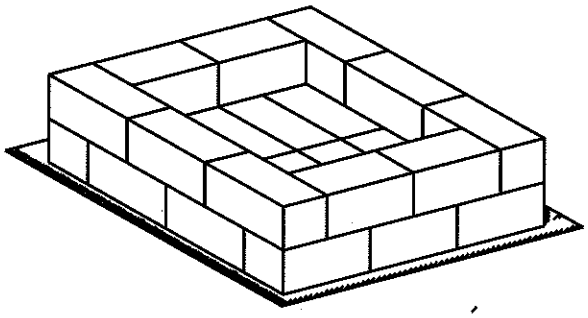
DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.

DRAWN BY: KLL	DATE: 02-02-2001	ISSUED FOR BID:	SCALE: NOT TO SCALE
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.34-X-0013 6/13/2007 Q:\Oregon_gas\Mapping\Typicals\BMP_03.dgn	SHEET 1 OF 3



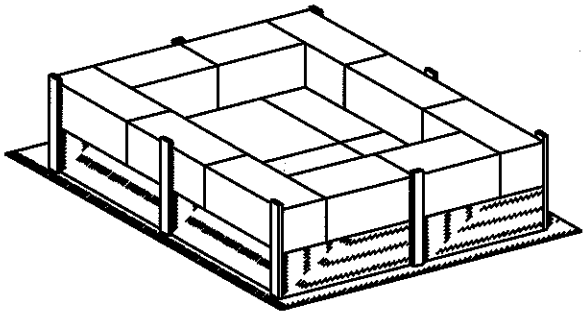
STEP 1

ARRANGE HAY BALES OVER FILTER FABRIC ON LEVEL LAND TIGHTLY PACKED AS SHOWN TO COVER AN AREA APPROXIMATELY 12' x 12'. SECURE EACH HAYBALE IN PLACE BY DRIVING REBAR OR A WOODEN STAKE THROUGH EACH OF THE HAY BALES



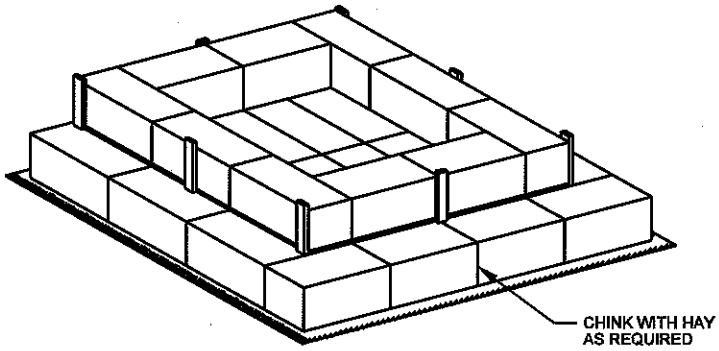
STEP 2

INSTALL ANOTHER LAYER OF HAY BALES ON THE OUTER EDGE AS SHOWN



STEP 3

INSTALL FILTER FABRIC ALL AROUND HAY BALE STRUCTURE AS SHOWN



STEP 4

INSTALL ANOTHER LAYER OF HAY BALES ON THE OUTSIDE OF THE FILTER FABRIC AND SECURE IN PLACE BY DRIVING REBAR OR A WOODEN STAKE THROUGH EACH OF THE OUTER HAY BALES

NOTES:

1. WHERE POSSIBLE STRUCTURE SHALL BE PLACED ON A LEVEL, WELL VEGETATED SITE SUCH THAT WATER WILL FLOW AWAY FROM STRUCTURE AND ANY WORK AREAS, WATERBODIES OR WETLANDS.
2. THIS MEASURE SHALL BE REMOVED UPON COMPLETION OF THE PROJECT. REMOVAL IS NOT CONTINGENT UPON ESTABLISHMENT OF PERMANENT VEGETATION. MATERIAL FROM BALES MAY BE SCATTERED ON RIGHT-OF-WAY.
3. CONTRACTOR SHALL USE CERTIFIED NOXIOUS WEED FREE HAY OR STRAW FOR STRUCTURE.

TRENCH DEWATERING

TEMPORARY EROSION CONTROL MEASURE

DRAWING NO.	REFERENCE TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
TYPICAL
TRENCH DEWATERING

TDW

Pacific Connector GAS PIPELINE

DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.

DRAWN BY: KLL	DATE: 02-02-2001	ISSUED FOR BID:	SCALE: NOT TO SCALE
CHECKED BY:	DATE:	ISSUED FOR CONSTRUCTION:	
APPROVED BY:	DATE:	DRAWING NUMBER: 3430.34-X-0013	SHEET 3 OF 3
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Attachment B

Potential Treatment Matrix

Attachment B
Treatment Matrix

Invasive Species (*Scientific Name*)	Occurrence in the Project Area	Individual Size	Effectiveness of Potential Treatment Methods: Filter Intake (NOAA/ODFW Criteria) with Discharge to Upland Straw Bale Structure for Infiltration. Implement Integrated Pest Management BMPs	Chlorine Treatment	Secondary Filtration: Media, Bag or Cartridge (filter limits to 100 µm- required pumping rate will limit filter size).
Weeds					
Scotch broom (*Cytisus scoparius*)	Yes-Coos, Douglas & Jackson counties (PCGP, 2009 & ODA)	Plant produces a 2-5 cm long pea-pod-like fruit (Peterson and Prasad 1998). Seed size 5 mm diameter (Myers, J.H, and D. Bazely, 2003),	Yes	No data	Yes
Himalayan blackberry (*Rubus discolor*)	Yes- All Project counties (PCGP, 2009 & ODA)	Fruit: up to 0.8 in (2 cm) long, with large succulent drupelets (California Invasive Plant Council)	Yes	No data	Yes
Yellow starthistle (*Centaurea solstitialis*)	Yes- All Project counties (PCGP, 2009 & ODA)	Seeds 1/8 inch long; Fruits 2-4 mm long (California Invasive Plant Council)	Yes	No data	Yes
Forest Pathogens					
Port Orford cedar root disease (*Phytophthora lateralis*)	Yes – Coos County; three locations in Douglas County distant from project area & outside crossed watersheds (PCGP, 2009 & ODF)	Zoospores form cysts, 10–12 µm diameter which germinate to produce hyphae; resting spores 50 µm diameter (CAB International, 1998). (note: 1 µm = 1 x 10-6 m)	No	Yes Treatments for cleaning equipment/potentially contaminated materials: Clorox® Ultra Institutional (1 gallon of Clorox® to each 1,000 gallons of water) (BLM, 2003) Chlorine injection to treat irrigation water to kill *Phytophthora*. Sodium hypochlorite is injected, at a maximum concentration of 2 ppm, for a contact time of at least 10 minutes (Oregon State University, 2009). In California, the registration rate for the treatment of drafted water with Ultra Clorox in areas of Phytophthora is 1 gallon infestation of Ultra Clorox Bleach per 10,000 gallons of water (California Oak Mortality Task Force, 2006).	Sand filtration is suggested to use with other treatments but typical nursery irrigation pumping rates/volumes limit use (i.e., 250-300 GPM per acre) (Oregon State University, 2009). Sand filtration is effective at reducing chlorine demand by removing organics from source waters, which improves treatment.
Sudden Oak Death (*Phytophthora ramorum*)	Outside project area - nine sites totaling less than 40 acres in Curry County (USDA, 2010 & California Oak Mortality Task Force, 2006)	Sporangia are oval-shaped, 30-90 µm (Global Invasive Species Database, 2009)	No	Yes Chlorine injection to treat irrigation water to kill *Phytophthora*. Sodium hypochlorite is injected, at a maximum concentration of 2 ppm, for a contact time of at least 10 minutes (Oregon State University, 2009). In California, the treatment of drafted water with Ultra Clorox is similar to the recommended water treatment for *P. lateralis*, which causes Port-Orford Cedar Root Disease. The registration rate is 1 gallon of Ultra Clorox Bleach per 10,000 gallons of water (California Oak Mortality Task Force, 2006)	Sand filtration is suggested to use with other treatments but typical nursery irrigation pumping rates/volumes limit use (i.e., 250-300 GPM per acre) (Oregon State University, 2009). Sand filtration is effective at reducing chlorine demand by removing organics from source waters, which improves treatment.
Aquatic Invasives					
Mollusks					
Quagga Mussels (*Dreissena rostriformis bugensis*)	None in OR (USGS, 2009)	Microscopic to about two inches long (U.S. Fish & Wildlife Service, 2007). Dreissena mussel larvae (planktonic veligers) are approximately 40µm in length for one to two weeks. Within two to five weeks, the larvae become too large (200 µm) and heavy to freely swim and settle out of the water column (Nichols and Black, 1994).	Yes – (i.e., upland discharge, no direct discharge to waterbodies). Current Risk = low	Yes Treatment to disinfect contaminated equipment with a bleach rinse ranging between 0.5 mg/L to 250 mg/L (Cope et al., 2003 & Utah Division of Wildlife Resources, 2009) and 3 oz of bleach to 5 gallons of water for 1hr (U.S. Fish & Wildlife Service, 2007)	No data but expected to be similar to effectiveness for zebra mussels

Invasive Species (*Scientific Name*)	Occurrence in the Project Area	Individual Size	Effectiveness of Potential Treatment Methods: Filter Intake (NOAA/ODFW Criteria) with Discharge to Upland Straw Bale Structure for Infiltration. Implement Integrated Pest Management BMPs	Chlorine Treatment	Secondary Filtration: Media, Bag or Cartridge (filter limits to 100µ m- required pumping rate will limit filter size).
Zebra Mussels (*Dreissena polymorpha*)	None in OR (USGS, 2009)	Microscopic to about two inches long. Dreissena mussel larvae (planktonic veligers) are approximately 40µm in length for one to two weeks. Within two to five weeks the larvae become too large (200 µm) and heavy to freely swim and settle out of the water column (Nichols and Black, 1994).	Yes (i.e., upland discharge, no direct discharge to waterbodies)	Yes Treatment rates to prevent fouling of water intakes was 0.5 ppm for 24 hours (Brooks, 1993) Treatment to disinfect contaminated equipment with a bleach rinse ranging between 0.5 mg/L to 250 mg/L and 3 oz of bleach to 5 gallons of water for 1hr (Cope et al., 2003; U.S. Fish & Wildlife Service, 2007; Cope, et al. 2002 & Utah Division of Wildlife Resources, 2009)	Yes - Containment procedures commonly used at facilities conducting zebra mussel research have included filtration or disinfectant treatments to remove or kill potential zebra mussels before water is discharged. Filtration of outflow water through small mesh bags (100 µm or smaller), chlorine treatment tanks and sand filters (Cope, et al., 2002)
New Zealand mud snails (*Potamopyrgus antipodarum*)	Yes –Coos Bay Estuary & Lower Coos River (USGS, 2009 & Montana State University, 2009)	Sexually mature females (3-6 months old); size from 3 mm long in western Montana & Idaho; average length 4-5 mm in western US, maximum 11 mm in New Zealand. Embryos born live with 3 mm shell length (US Army Corps of Engineers)	Yes (i.e., upland discharge, no direct discharge to waterbodies) No hydrostatic test water will be acquired from the Coos Bay Estuary or Lower Coos River. Municipal water is proposed for use in Coos County.	Not Effective (BLM, 2009) Ely (2009) indicated that chlorine bleach solutions were not effective on adult snails and provided a recommendation of 1 tablespoon bleach /gallon water (i.e., 0.5 oz/gallon) for cleaning equipment for zebra and quagga mussels as a minimum.	Yes - According to Oplinger et al (2009), filtration of incoming water to a hatchery is a controlling option for New Zealand mud snails. Hydrocyclones have been successfully used to remove drifting New Zealand mud snails from hatchery inflow and noted that media filters (e.g., sand) and membrane filters could also be used.
Brackish water snail (*Assiminea parasitologica*)	Yes – Including Coos Bay Estuary (USGS, 2009 & Carlton, J., 2008)	Mature snails up to 4-6 mm (Carlton, J., 2008).	Yes (i.e., upland discharge, no direct discharge to waterbodies)	No data, but assumed to be effective based on results with Quagga and Zebra mussels.	No data but expected to be similar to effectiveness for zebra mussels
Zooplankton					
(Whirling Disease - *Myxobolus cerebralis*)	Present in Oregon and in South Umpqua HUC (Montana Water Center, 2010)	Microscopic myxozoan; myxospores produced in salmonids are 7-10µ m long; infectious triactinomyxon spores are 150µ m long with three tails each 200µ m long (US Army Corps of Engineers)	Yes (i.e., upland discharge, no direct discharge to waterbodies)	Yes The principle vector for spread of whirling disease is contaminated fish parts; it is not typically spread through fire water withdrawal activities. Avoiding and removing organics (the spores reside in mud), power washing, and flushing will greatly reduce or eliminate spores on external gear surfaces. 10 minutes with 1 percent bleach (e.g., Clorox – 6 percent sodium hypochlorite (NaClO)) is recommended for washing equipment or flushing tanks (BLM, 2009). Whirling disease and New Zealand mud snails are the most difficult organisms to kill. Treatment for these species will be effective for all other species as well Ballast water research results from experiments with filtration and chlorine are most promising: 0.5 ppm chlorine with filtration killed most of the zooplankton (USGS, 2006)	Expected to be effective since, as noted by (BLM, 2009), the principle vector for spread of whirling disease is contaminated fish parts.

Invasive Species (*Scientific Name*)	Occurrence in the Project Area	Individual Size	Effectiveness of Potential Treatment Methods: Filter Intake (NOAA/ODFW Criteria) with Discharge to Upland Straw Bale Structure for Infiltration. Implement Integrated Pest Management BMPs	Chlorine Treatment	Secondary Filtration: Media, Bag or Cartridge (filter limits to 100µ m- required pumping rate will limit filter size).
Algae					
Didymo (*Didymosphenia geminate*)	No nuisance blooms in Oregon reported (Draheim, 2009)	Cell≈ 70µ m (Spaulding and Elwell, 2007)	Yes (i.e., upland discharge, no direct discharge to waterbodies)	Yes Decontaminate equipment for 1 minute in 2 percent bleach solution (BLM, 2009 & Spaulding and Elwell, 2007). Also indicated that the treatment for whirling disease may apply to this species (BLM, 2009)	No data
Cyanobacteria - blue-green algae	Yes – Cyanobacteria are commonly found in many freshwater systems across the world and blooms occur in many lakes, rivers, and reservoirs across Oregon. No health advisories have been posted for any of the proposed test water sources. (Oregon Department of Human Services, 2009a).	Anabaena spp. akinetes cells 6-13 microns (µ m) diameter, 20-50µ m long; heterocysts are 7-9µ m diameter, 6-10µ m long, for example (Washington State Department of Health, 2009)	Yes (i.e., upland discharge, no direct discharge to waterbodies) Pacific Connector would also review Oregon Department of Human Services, 2009a health advisories to ensure harmful algae bloom have not been posted for proposed water sources.	Yes To be effective, a residual of≥ 0.5 Cl_2 mg/l with at least a 30-minute contact time is required to destruct cyanobacteria cyclic peptides (toxin) (Hoeger, et. al., 2002). Chlorine is used mainly for control of algae in water treatment works but is also known to have been employed in reservoir situations. The effective dose rates are dependent on the chlorine demand of the water, but most algae are reported to be controlled by free chlorine residual rates between 0.25 and 2.0 mg/L (WHO, 1999).	Not effective (Bettina, et al., 2000)
Fungi/Mold					
Chytrid fungus (*Batrachochytrium dendrobatidis*)	Yes (Pearl et. al., 2009)	Disease-causing zoospores are 3- 5 µ m with a single flagellum 19-20µ m long; zoosporangian ~30µ m across (Johnson and Speare, 2003)	Yes (i.e., upland discharge, no direct discharge to waterbodies)	Yes Bleach, was rapidly effective for disinfecting equipment at concentrations of 1 percent sodium hypochlorite and above. At 0.4 percent, it required a minimum exposure time of 10 minutes to kill Chytrid fungus. (Johnson et al., 2003) Spraying down equipment with 409 cleaner and then letting it dry in the sun also effectively kills the spores (Utah Division of Wildlife Resources, 2009)	No data
Water Mold (*Saprolegnia*)	Likely (Kiesecker, et al., 2001) Aquatic fungi (Saprolegniales) are ubiquitous in natural waters supplies of fish hatcheries (Schreck et al., 1993)	5 – 100 (µ m) Spores, Oospore Mycellum and Zoosporangia (Mayer Kent, 2000)	Yes (i.e., upland discharge, no direct discharge to waterbodies)	Yes Chlorine guidelines have been established to treat waterborne diseases such as cholera, typhoid, and dysentery. Chlorine also eliminates slime bacteria, molds, and algae that commonly grow in water supply reservoirs, on the walls of water mains, and in storage tanks (World Chlorine Council, 2008). Oregon Department of Human Services (2009) requires chlorinated water systems to administer a minimum free chlorine residual of 0.2 mg/L with a detention time of 30 minutes before reaching the first point of use in the system (Oregon Department of Human Services. 2009b)	No data

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Bettina C. Hitzfeld, Stefan J. Hoger, and Daniel R. Dietrich. 2000. Cyanobacterial Toxins: Removal during Drinking Water Treatment, and Human Risk Assessment. Environmental Health Perspectives. Vol 108, supplement 1. March:113-122

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Attachment C

Hydrostatic Test Water Withdrawal Equipment Cleaning and Sanitizing Procedures

Cleaning and Sanitizing Procedures[1]

1) All hydrostatic test water withdrawal equipment that comes into contact with raw water (non-municipal surface water) should be sanitized. Aquatic invasive species and pathogens can be transported in tanks, buckets, hoses, bilges, and any other equipment that holds water.

2) Drying alone may be effective in some situations, depending upon the target species, types of equipment, temperature, and relative humidity; however, precautionary cleaning and/or sanitization should be performed.

3) Clean and/or sanitize all equipment before moving from one location to another or when moving between watersheds. Cleaning and sanitizing equipment, as described here, will be necessary before use as well as after use if equipment has been obtained from a source where sanitizing history is unknown.

4) Pacific Connector's Environmental Inspector (EI) will establish sanitation areas where there is no potential for runoff into storm drains, waterways, or sensitive habitats. The EI will ensure that wash water will not contaminate another water source.

5) Remove all visible plant parts, soil, and other materials from external surfaces of equipment and gear. Powerwash all accessible surfaces with clean, hot water (≥140°F, if possible). Powerwashing with hot water will greatly reduce the likelihood that aquatic invasive species are present, and chemical sanitation of external surfaces would not be necessary (BLM, 2009).

6) Intake hoses, pumps, and tanks can become contaminated with infected water or by sucking the organisms up from the bottom of a stream or pond. Disinfect tanks after each incident, and disinfect tanks before use if previous sanitation of the equipment has not occurred or is unknown. Set up a portable disinfection tank (e.g. fold-a-tank, 55-gallon barrel, 5-gallon bucket, etc., depending on the cleaning capacity needed) using a 1 to 2 percent bleach solution.

   Pump cleaning solution through portable pumps for 10 minutes. Pump the solution through the hose and then rinse with water. Discharge used cleaning solution back into the disinfection tank for re-use. Alternatively, use a 5% cleaning solution of quaternary ammonium compound. This is a common cleaning agent used in homes, swimming pools, and hospitals, and is safe when used at the recommended concentration (BLM, 2009).

Disposal

Use caution when disposing of the used cleaning solution and follow all federal, state, and local regulations. Do not dump cleaning solution into any stream or lake or on areas where it can migrate into any stormdrain, waterbody, or sensitive habitat. Chlorinated water may be released according to ODEQ criteria. Small quantities may be disposed of down sanitary drains into a municipal sewer system. Larger quantities may need to be transported to a municipal wastewater treatment facility.

[1] Developed from:

Bureau of Land Management. 2009. Interagency Guidance. Preventing Spread of Aquatic Invasive Organisms Common to the Southwest Region. Technical Guidelines for Fire Operations. Bureau of Land Management, National Park Service, U.S. Fish and Wildlife Service, U.S. Forest Service, Arizona Game and Fish Department, and New Mexico Department of Game and Fish.

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Attachment D

Maps

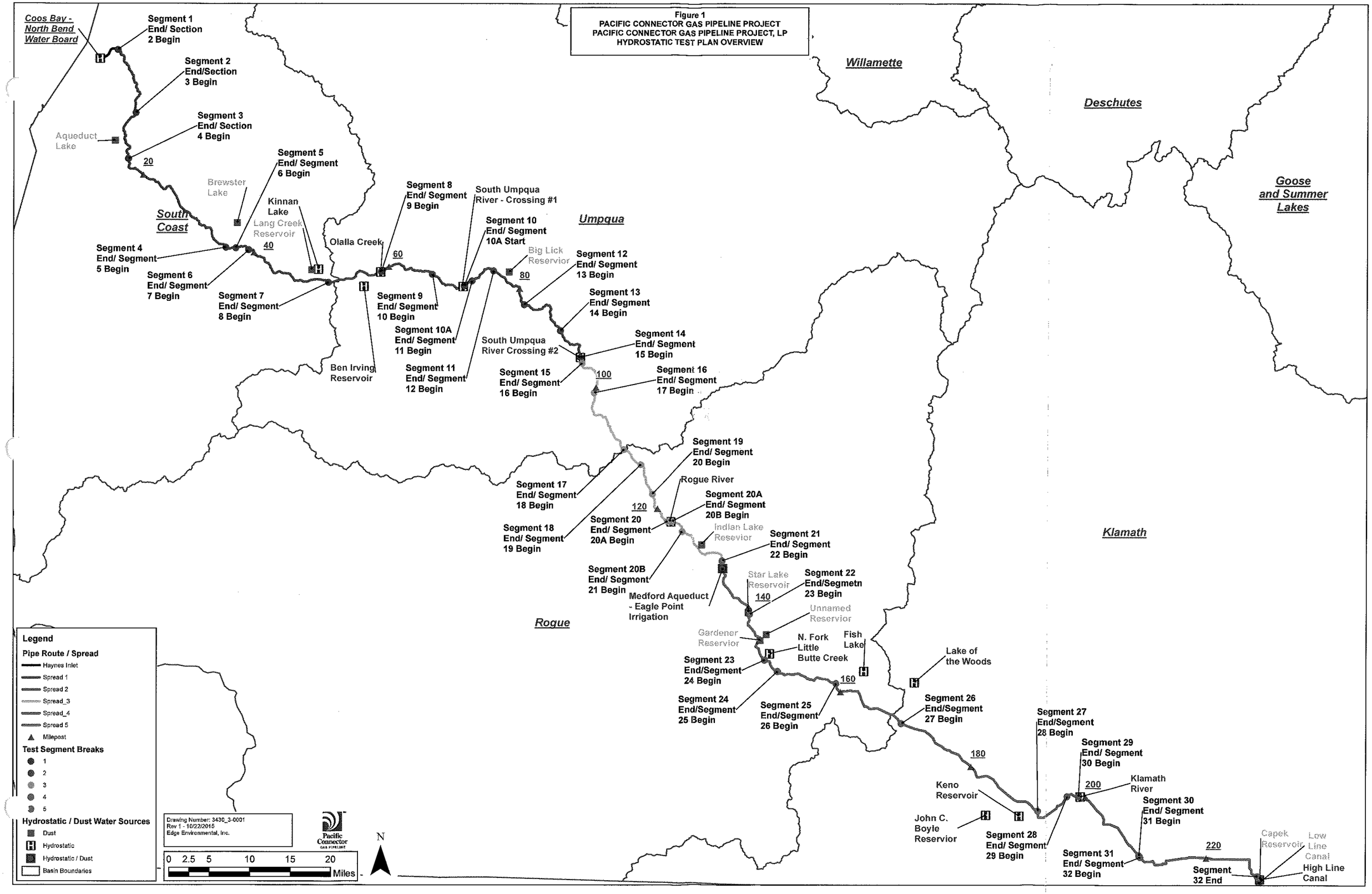
Figure 1
PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE PROJECT, LP
HYDROSTATIC TEST PLAN OVERVIEW
Coos Bay - North Bend Water Board
Segment 1 End/ Section 2 Begin
Segment 2 End/Section 3 Begin
Segment 3 End/ Section 4 Begin
Aqueduct Lake
20
Segment 5 End/ Segment 6 Begin
Brewster Lake
Kinnan Lake
Lang Creek Reservoir
South Coast
40
Segment 4 End/ Segment 5 Begin
Segment 6 End/ Segment 7 Begin
Segment 7 End/ Segment 8 Begin
Olalla Creek
60
Segment 8 End/ Segment 9 Begin
Segment 9 End/ Segment 10 Begin
Segment 10A End/ Segment 11 Begin
Segment 11 End/ Segment 12 Begin
Ben Irving Reservoir
South Umpqua River - Crossing #1
Segment 10 End/ Segment 10A Start
Umpqua
Big Lick Reservior
80
Segment 12 End/ Segment 13 Begin
Segment 13 End/ Segment 14 Begin
South Umpqua River Crossing #2
Segment 14 End/ Segment 15 Begin
Segment 15 End/ Segment 16 Begin
100
Segment 16 End/ Segment 17 Begin
Segment 17 End/ Segment 18 Begin
Segment 18 End/ Segment 19 Begin
Segment 19 End/ Segment 20 Begin
Rogue River
120
Segment 20 End/ Segment 20A Begin
Segment 20A End/ Segment 20B Begin
Indian Lake Resevior
Segment 20B End/ Segment 21 Begin
Segment 21 End/ Segment 22 Begin
Medford Aqueduct - Eagle Point Irrigation
Star Lake Reservoir
140
Segment 22 End/Segmetn 23 Begin
Unnamed Reservior
Rogue
Gardener Reservior
N. Fork Little Butte Creek
Fish Lake
Segment 23 End/Segment 24 Begin
160
Segment 24 End/Segment 25 Begin
Segment 25 End/Segment 26 Begin
Lake of the Woods
Segment 26 End/Segment 27 Begin
Segment 27 End/Segment 28 Begin
180
Segment 29 End/ Segment 30 Begin
200
Klamath River
Keno Reservoir
John C. Boyle Reservior
Segment 28 End/ Segment 29 Begin
Segment 30 End/ Segment 31 Begin
Segment 31 End/ Segment 32 Begin
220
Segment 32 End
Capek Reservoir
Low Line Canal
High Line Canal
Willamette
Deschutes
Goose and Summer Lakes
Klamath
Legend
Pipe Route / Spread
Haynes Inlet
Spread 1
Spread 2
Spread_3
Spread_4
Spread 5
Milepost
Test Segment Breaks
1
2
3
4
5
Hydrostatic / Dust Water Sources
Dust
Hydrostatic
Hydrostatic / Dust
Basin Boundaries
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Rev 1 - 10/22/2015
Edge Environmental, Inc.
Pacific Connector GAS PIPELINE
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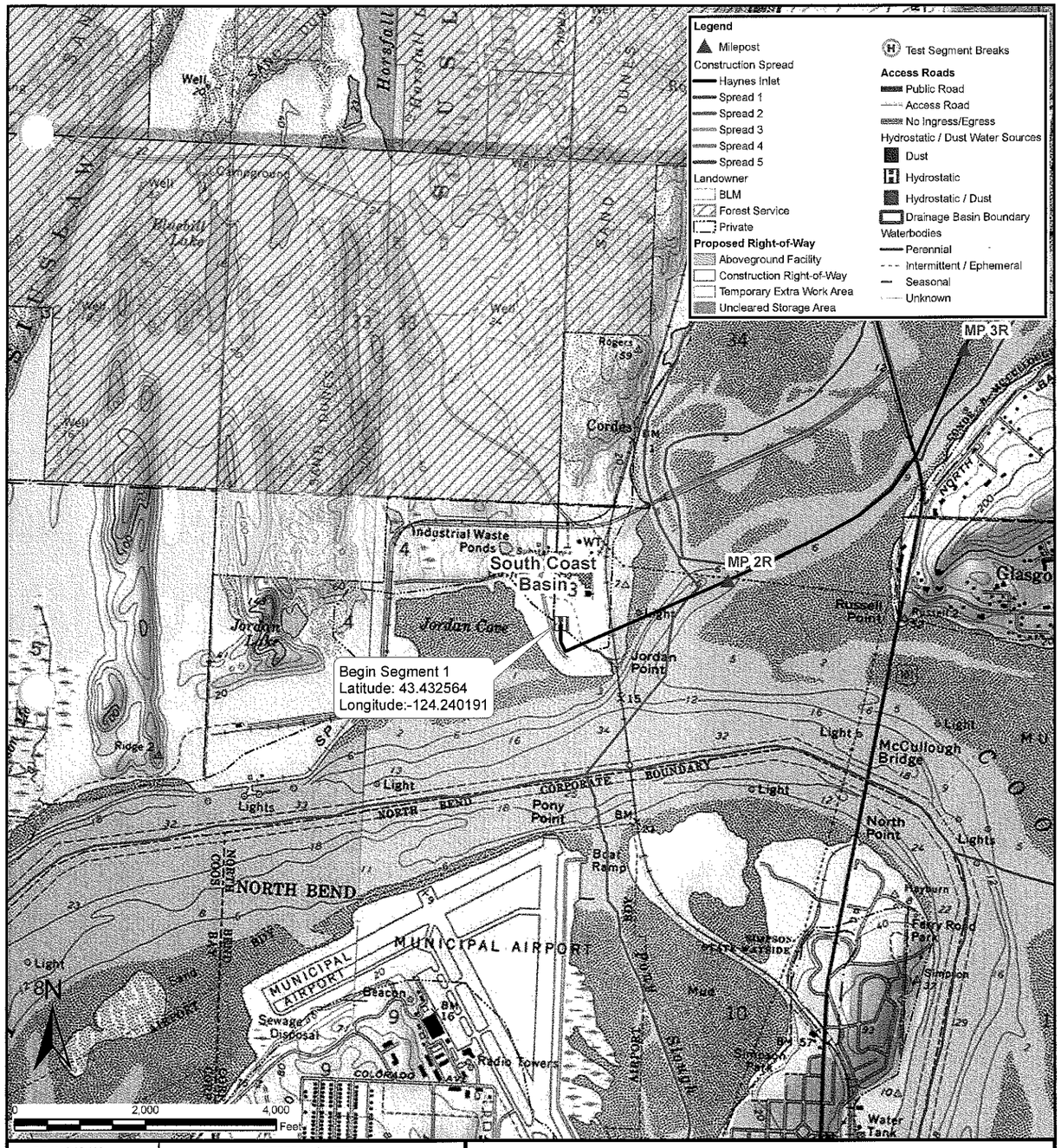

DRAWING NO.	REFERENCE TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENT 1 BEGIN
S-3, T-25-S, R-13-W
COOS COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: Sept - 2015	ISSUED FOR BID:	SCALE: 1 : 2000
CHK BY:	DATE:	ISSUED FOR CONST:	
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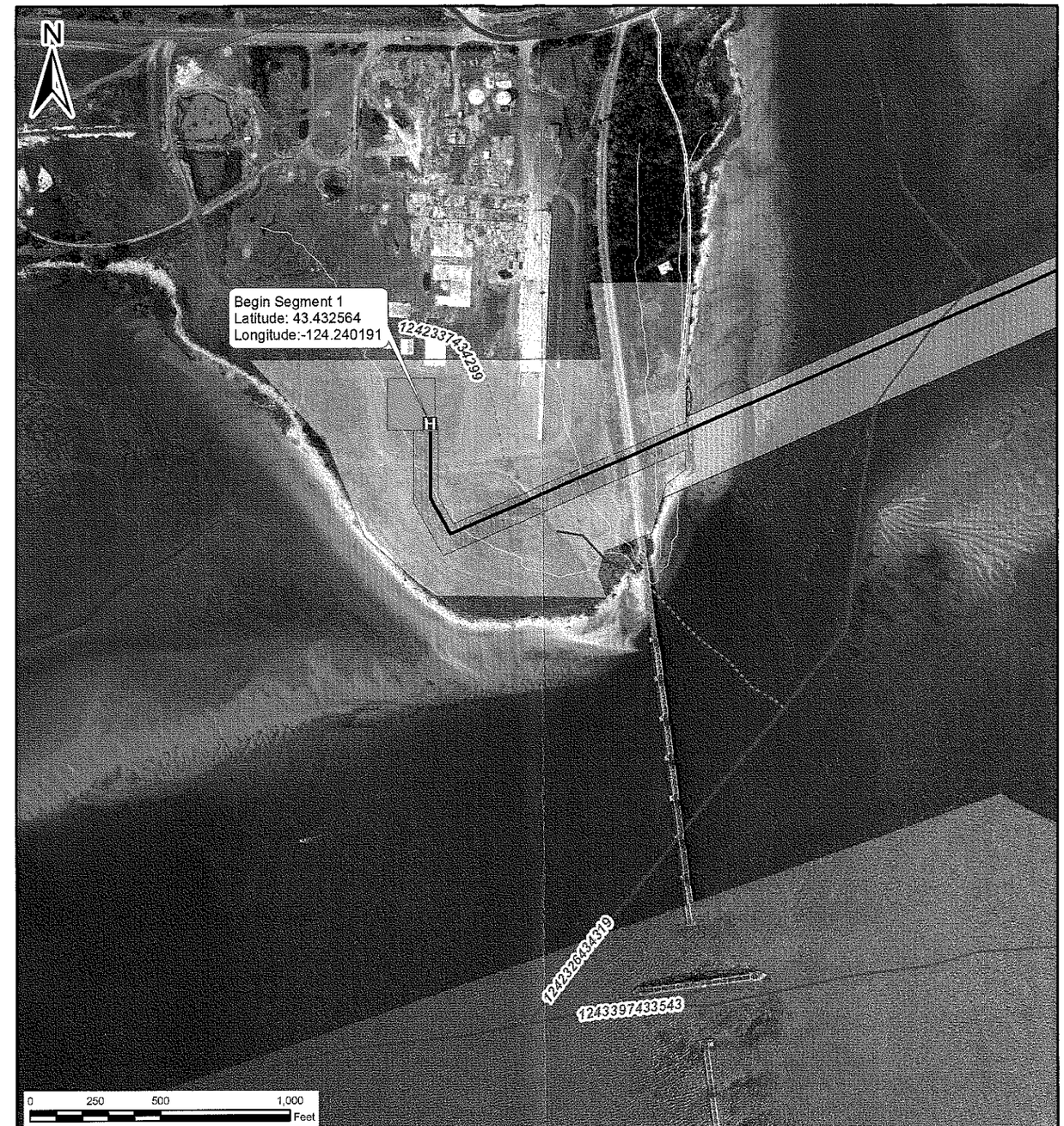

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36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENT 1 BEGIN
S-3, T-25-S, R-13-W
COOS COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

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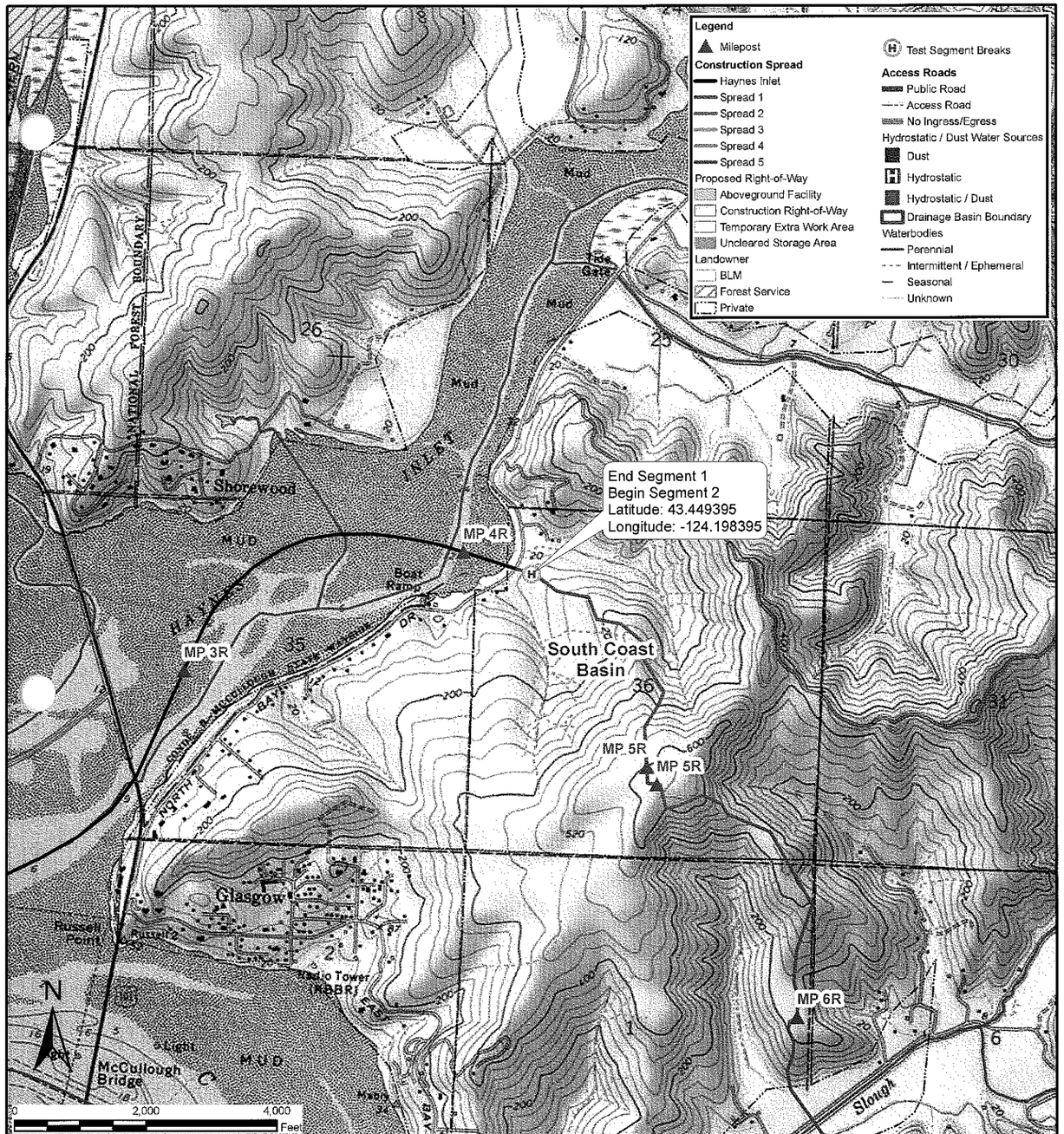

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36" PACIFIC CONNECTOR GAS PIPELINE
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S-36, T-24-S, R-13-W
COOS COUNTY, OREGON

Pacific Connector GAS PIPELINE

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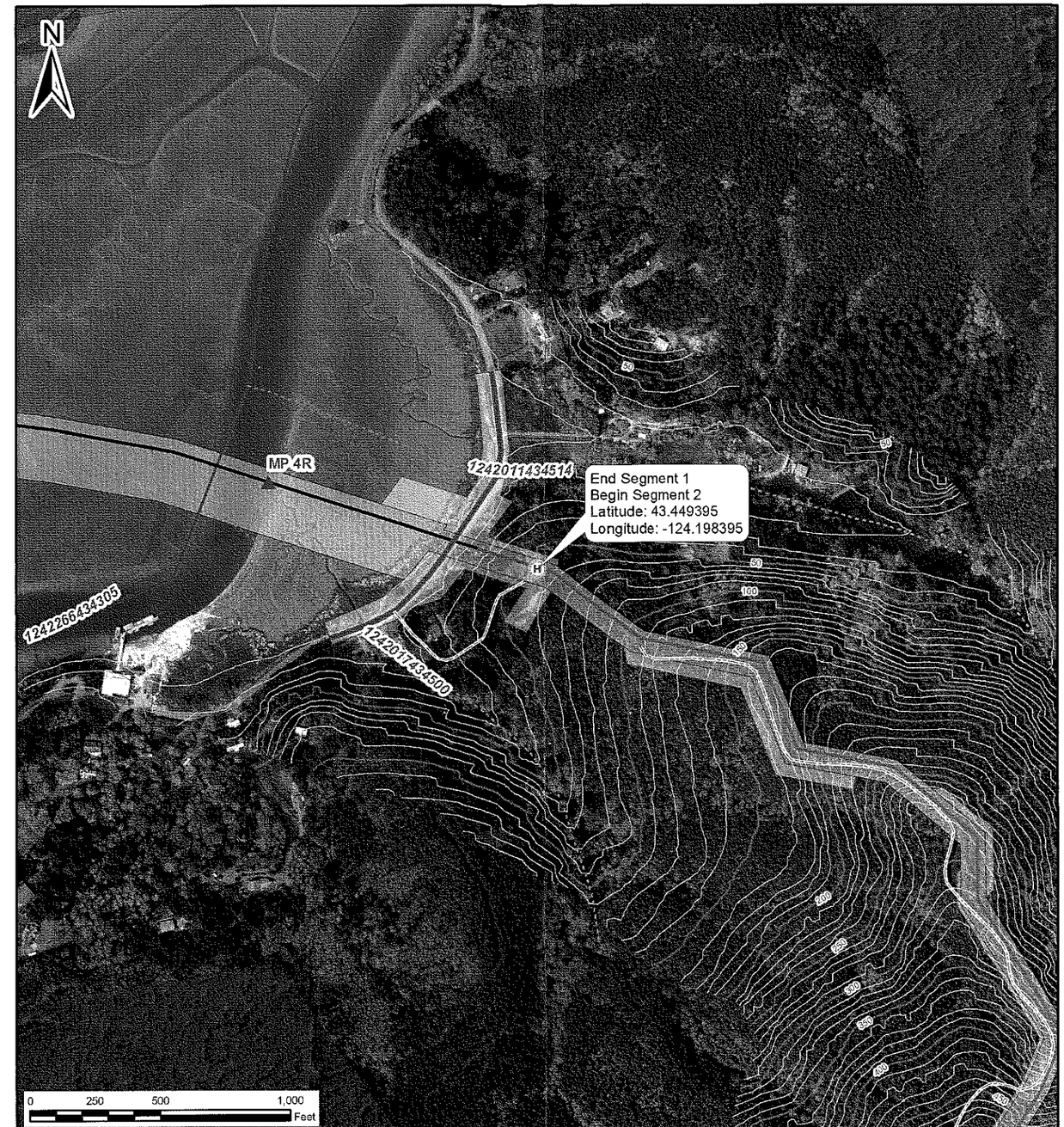

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36" PACIFIC CONNECTOR GAS PIPELINE
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S-36, T-24-S, R-13-W
COOS COUNTY, OREGON

Pacific Connector GAS PIPELINE

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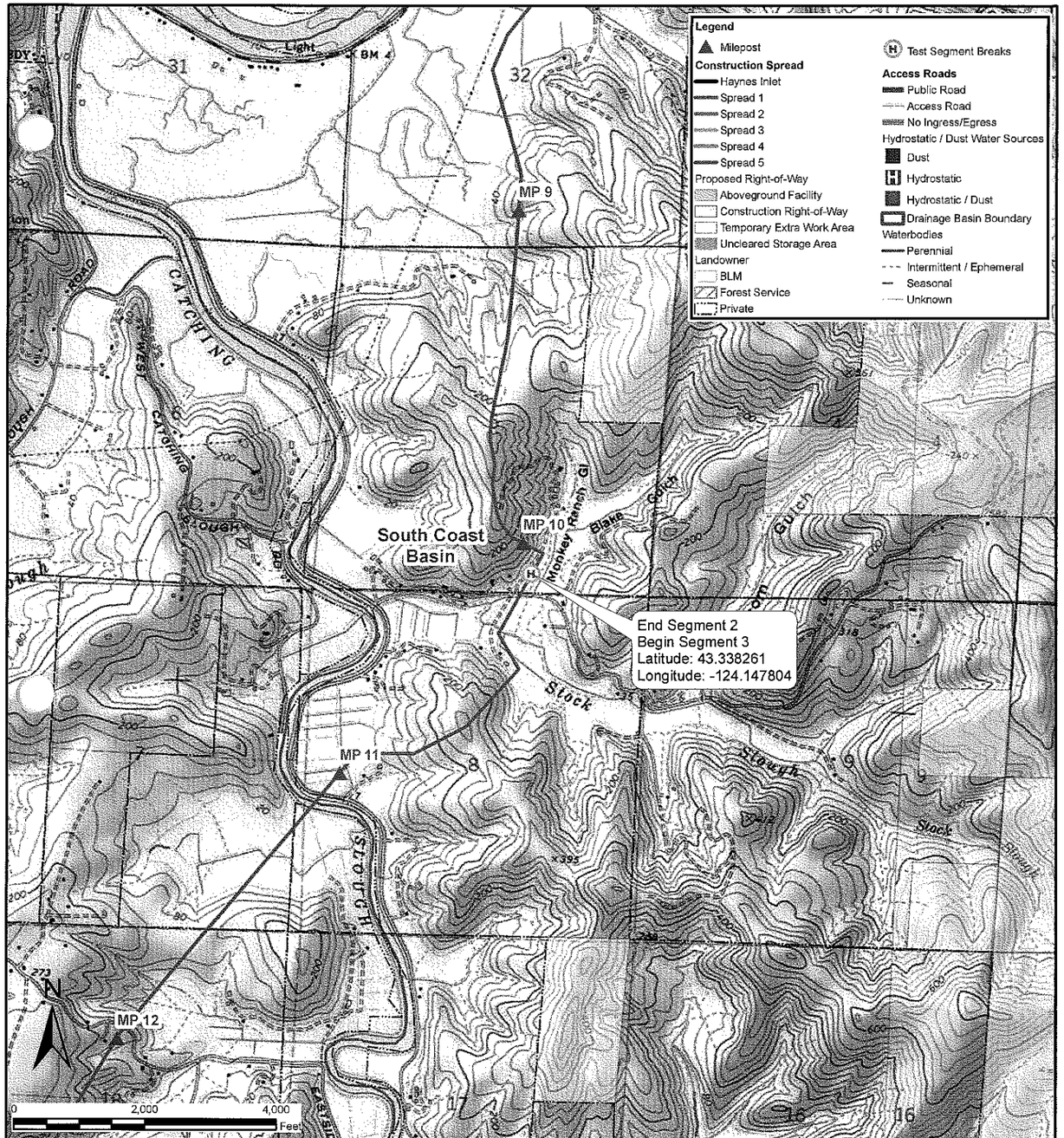

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36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENTS 2 END / 3 BEGIN
S-5, T-26-S, R-12-W
COOS COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

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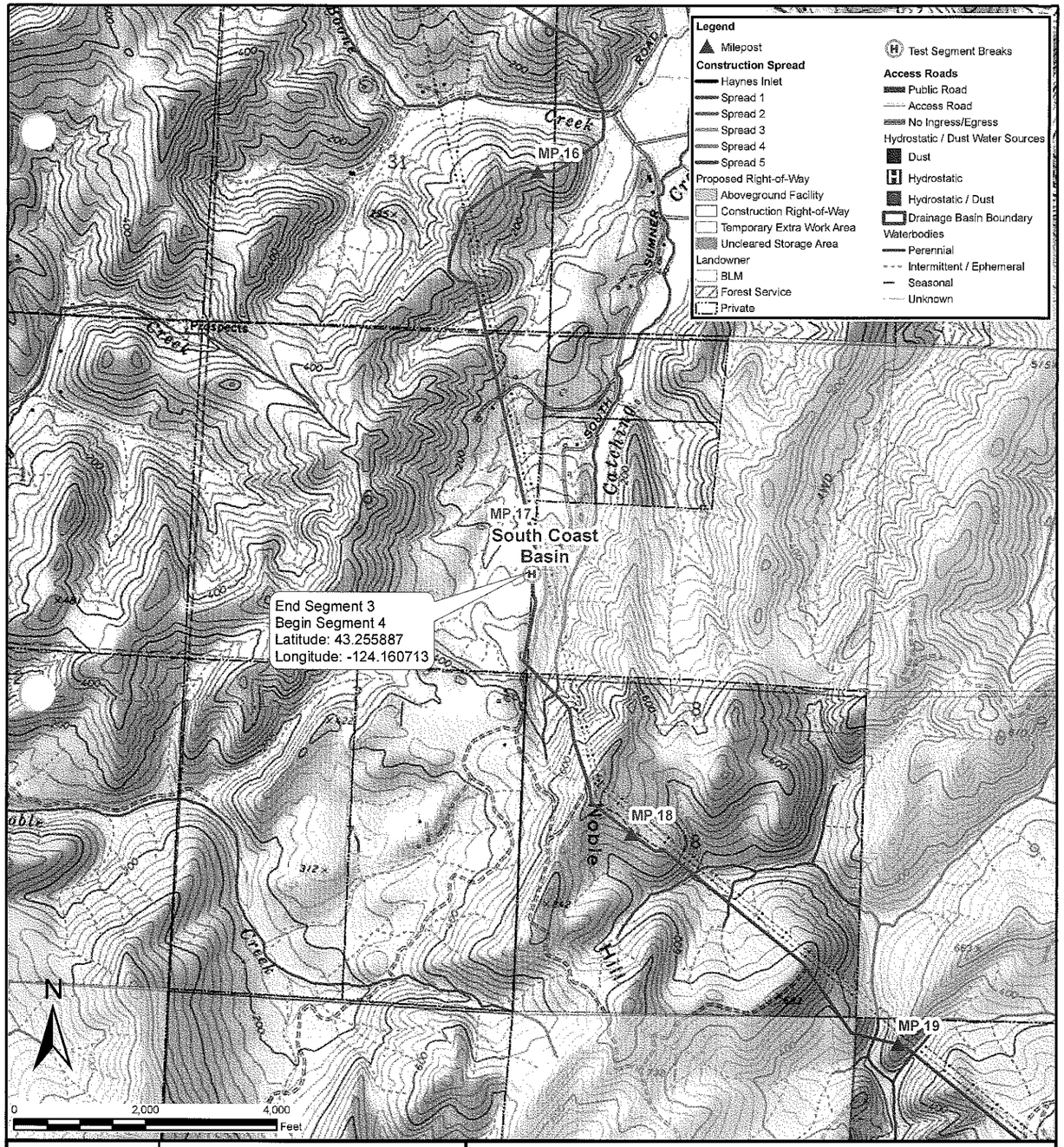

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S-5 & 6, T-27-S, R-12-W
COOS COUNTY, OREGON

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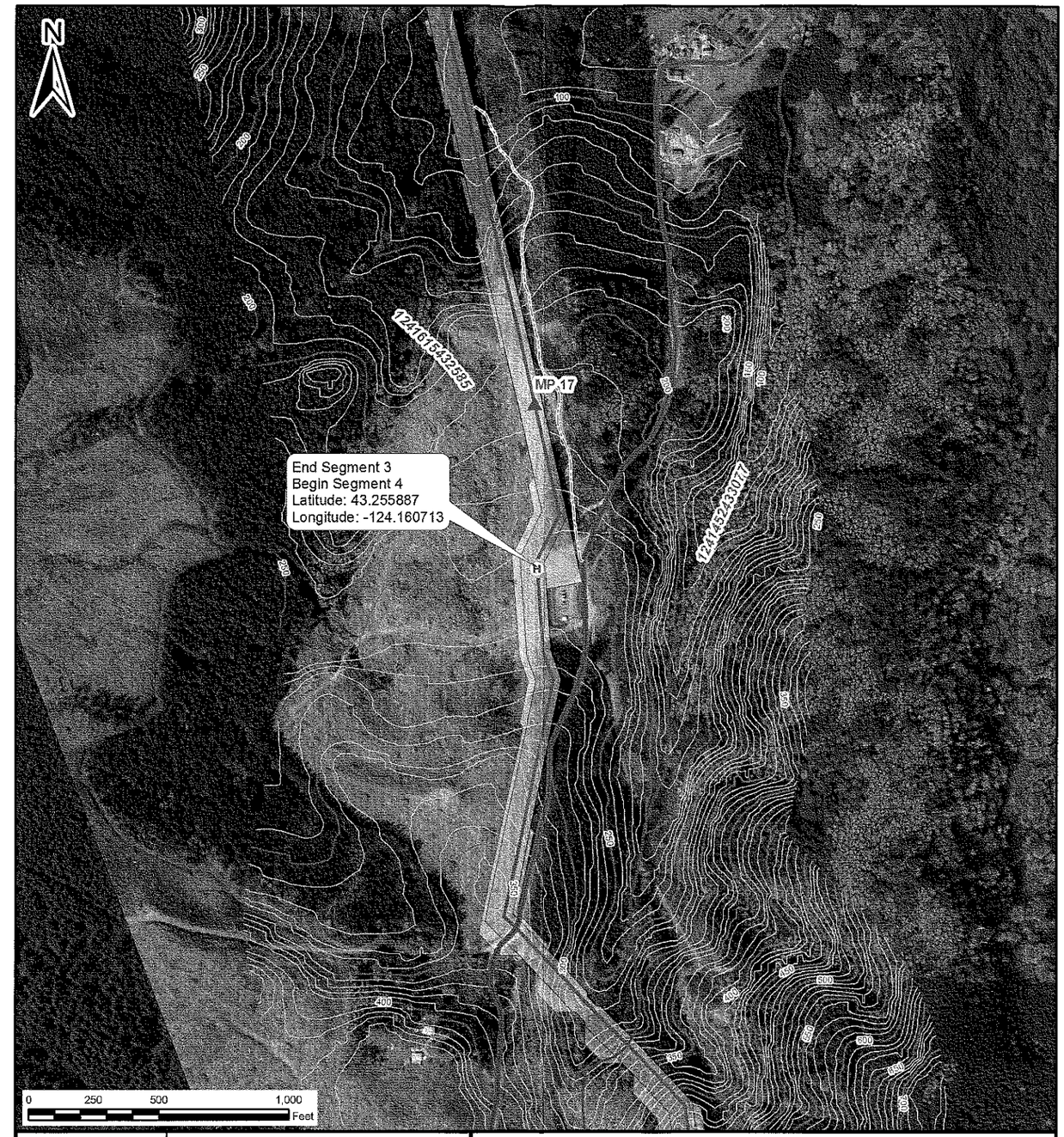

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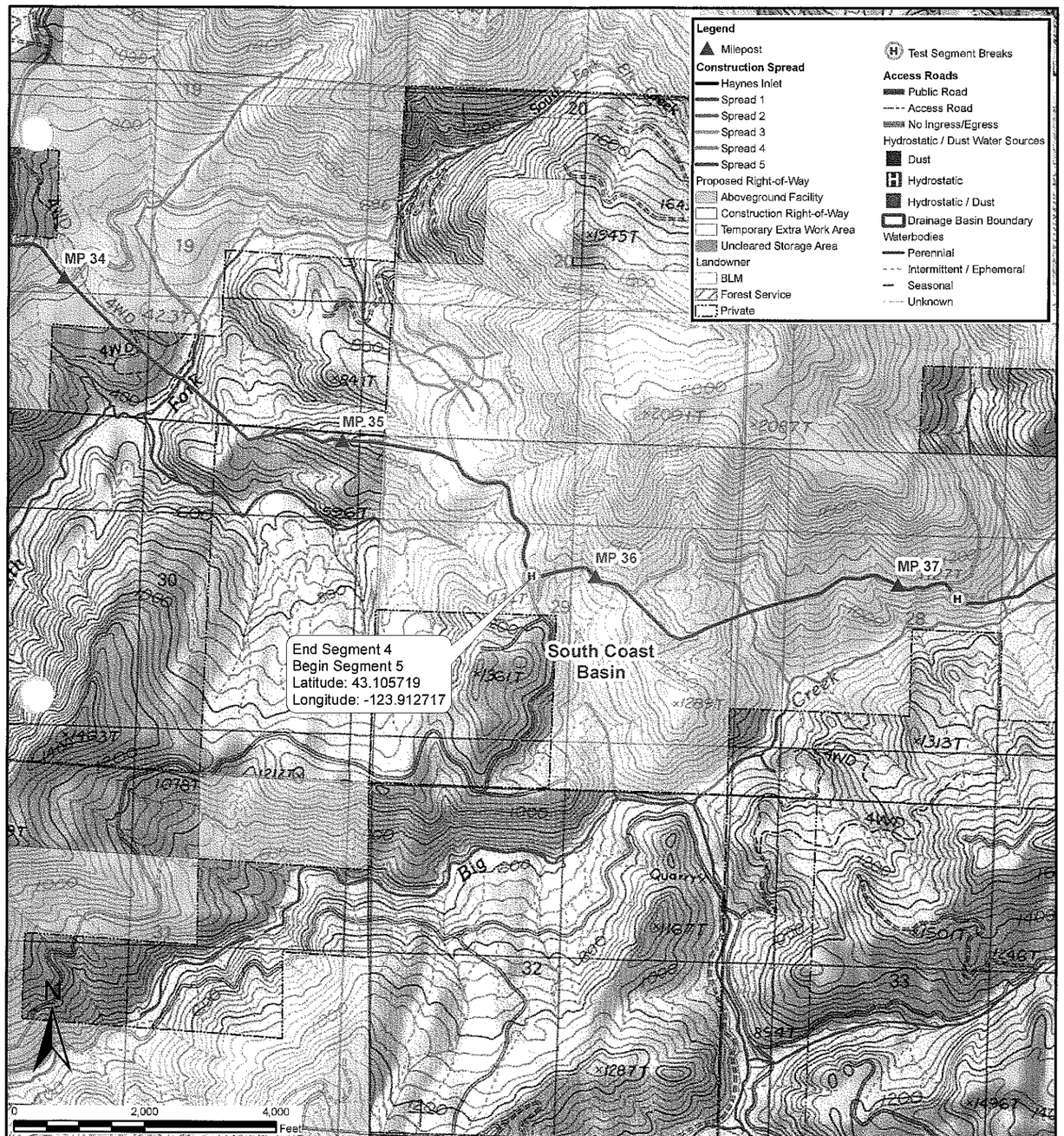

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36" PACIFIC CONNECTOR GAS PIPELINE
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S-29, T-28-S, R-10-W
COOS COUNTY, OREGON

Pacific Connector GAS PIPELINE

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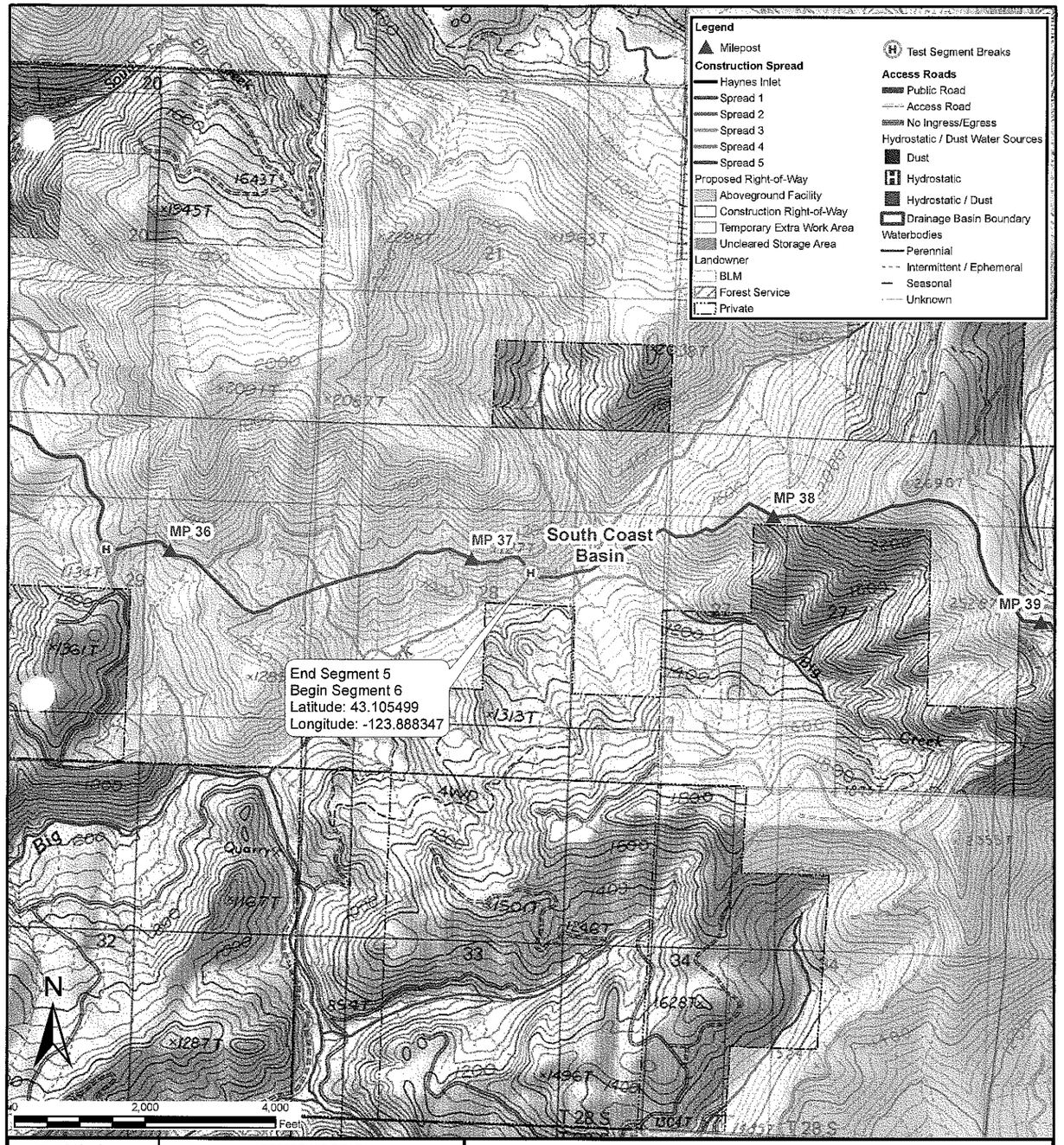

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S-28, T-28-S, R-10-W
COOS COUNTY, OREGON

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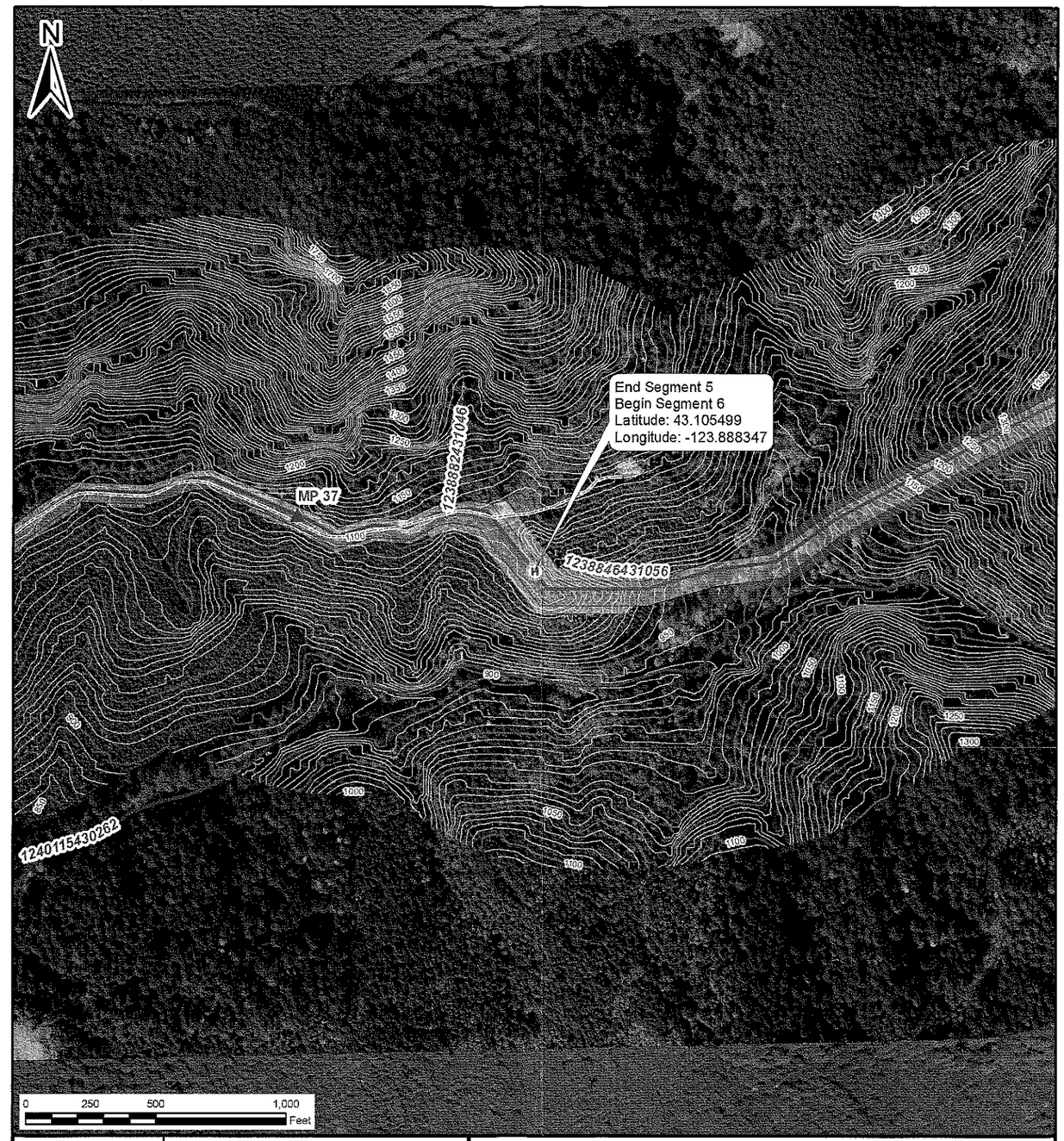

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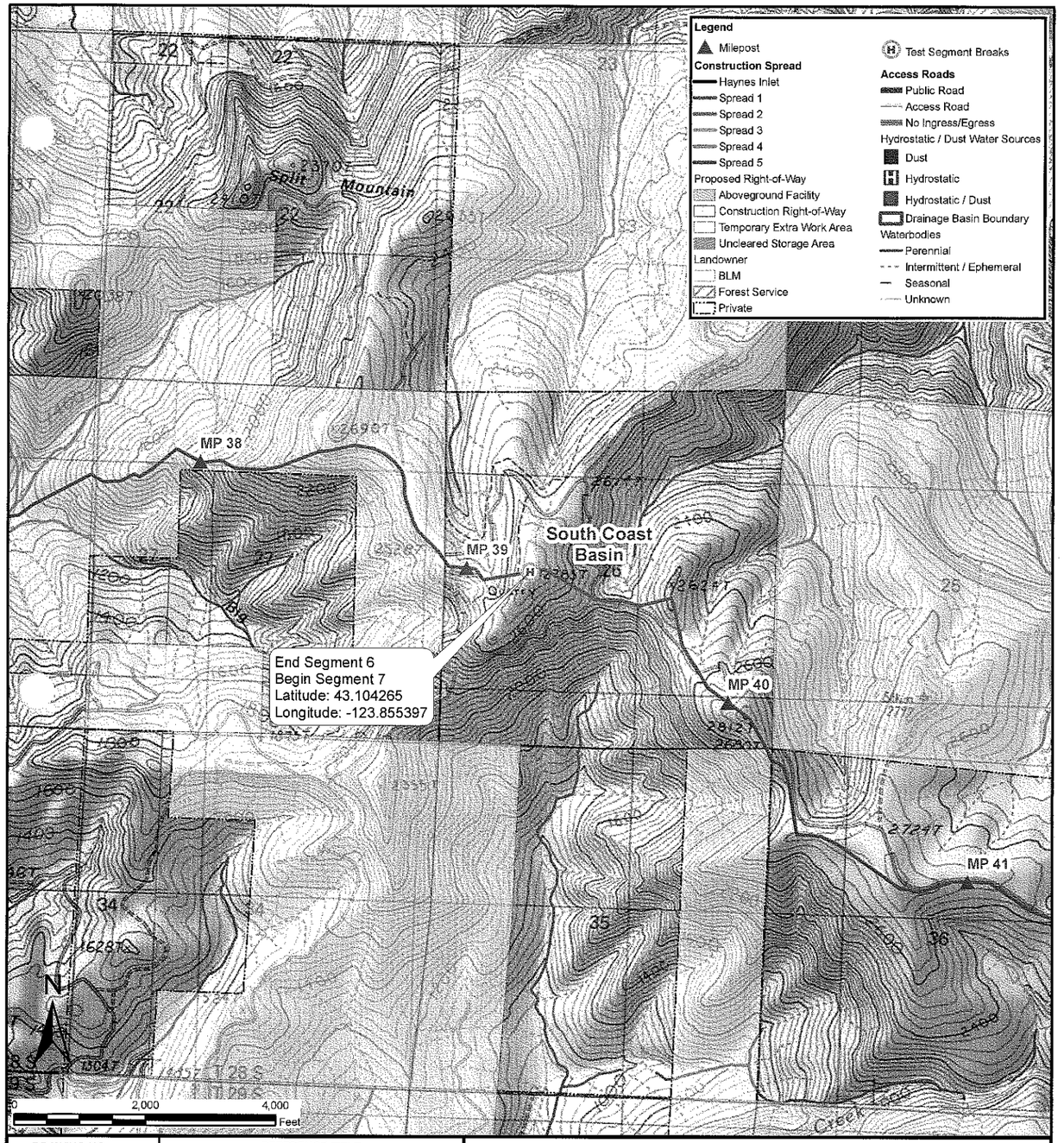
36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENTS 5 END / 6 BEGIN
S-28, T-28-S, R-10-W
COOS COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: Sept - 2015	ISSUED FOR BID:	SCALE: 1 : 500
CHK BY:	DATE:	ISSUED FOR CONST:	
APPR. BY:	DATE:	DRAWING NUMBER: Test Segments 5 / 6	SHEET 2 OF 2

Path: Q:\PCGP_2012\ArcMap\DEQ\Test Segments 5 and 6.mxd



DRAWING NO.	REFERENCE TITLE

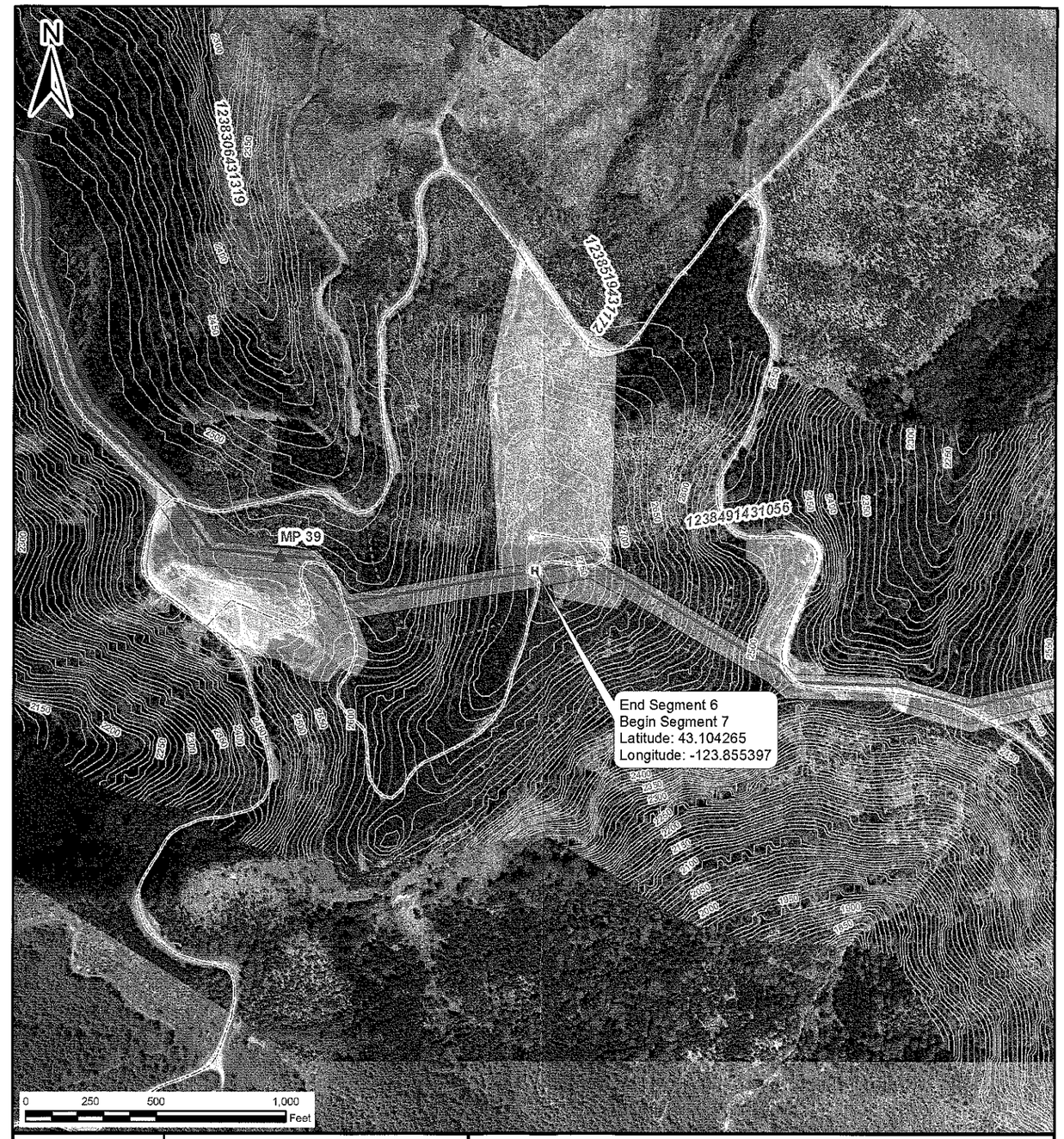
PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENTS 6 END / 7 BEGIN
S-26, T-28-S, R-10-W
COOS COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: Sept - 2015	ISSUED FOR BID:	SCALE: 1 : 2000
CHK BY:	DATE:	ISSUED FOR CONST:	
APPR. BY:	DATE:	DRAWING NUMBER: Test Segments 6 / 7	SHEET 1 OF 2

Path: Q:\PCGP_2012\ArcMap\DEQ\Test Segments 6 and 7.mxd



DRAWING NO.	REFERENCE TITLE

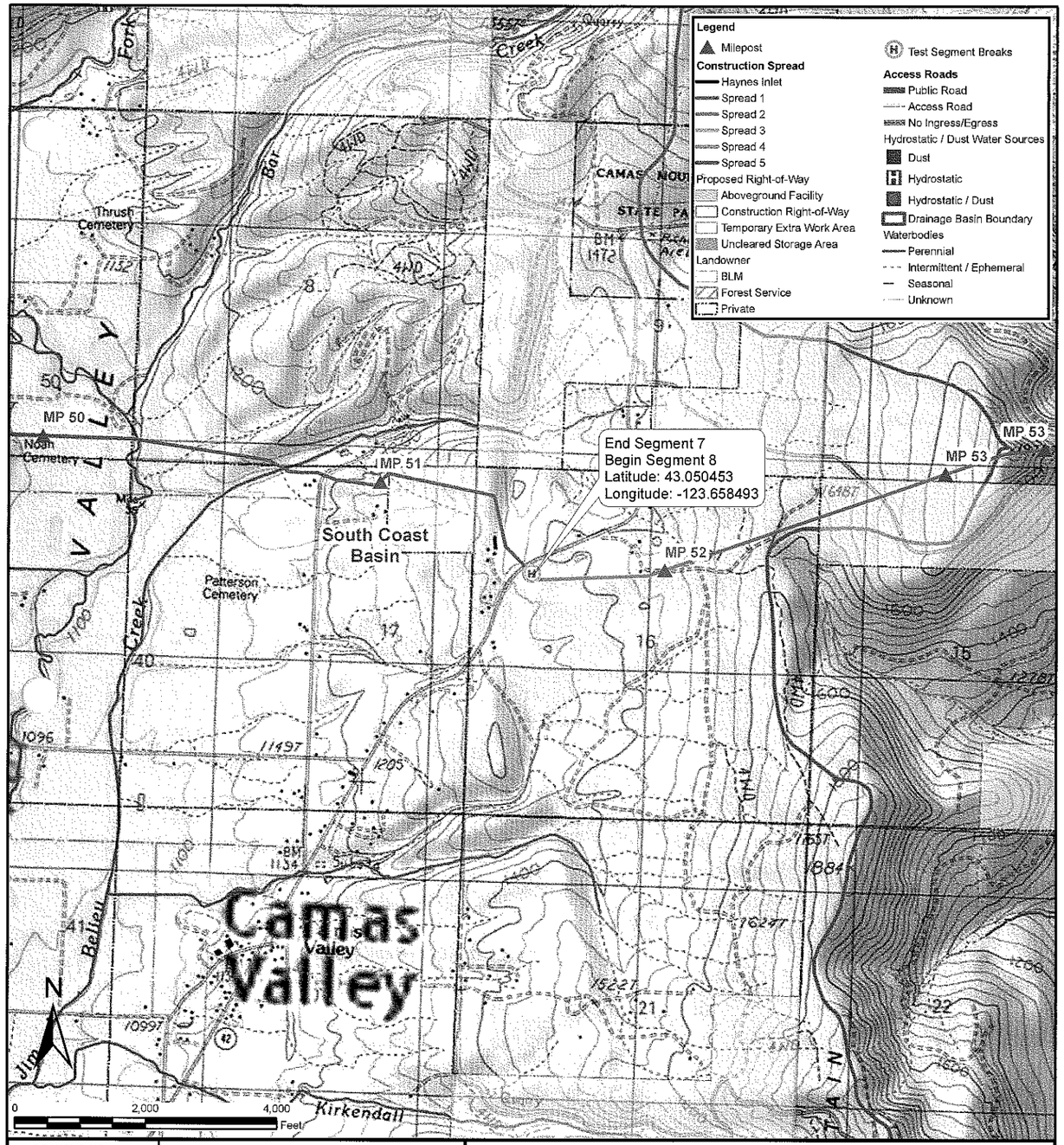
PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENTS 6 END / 7 BEGIN
S-26, T-28-S, R-10-W
COOS COUNTY, OREGON

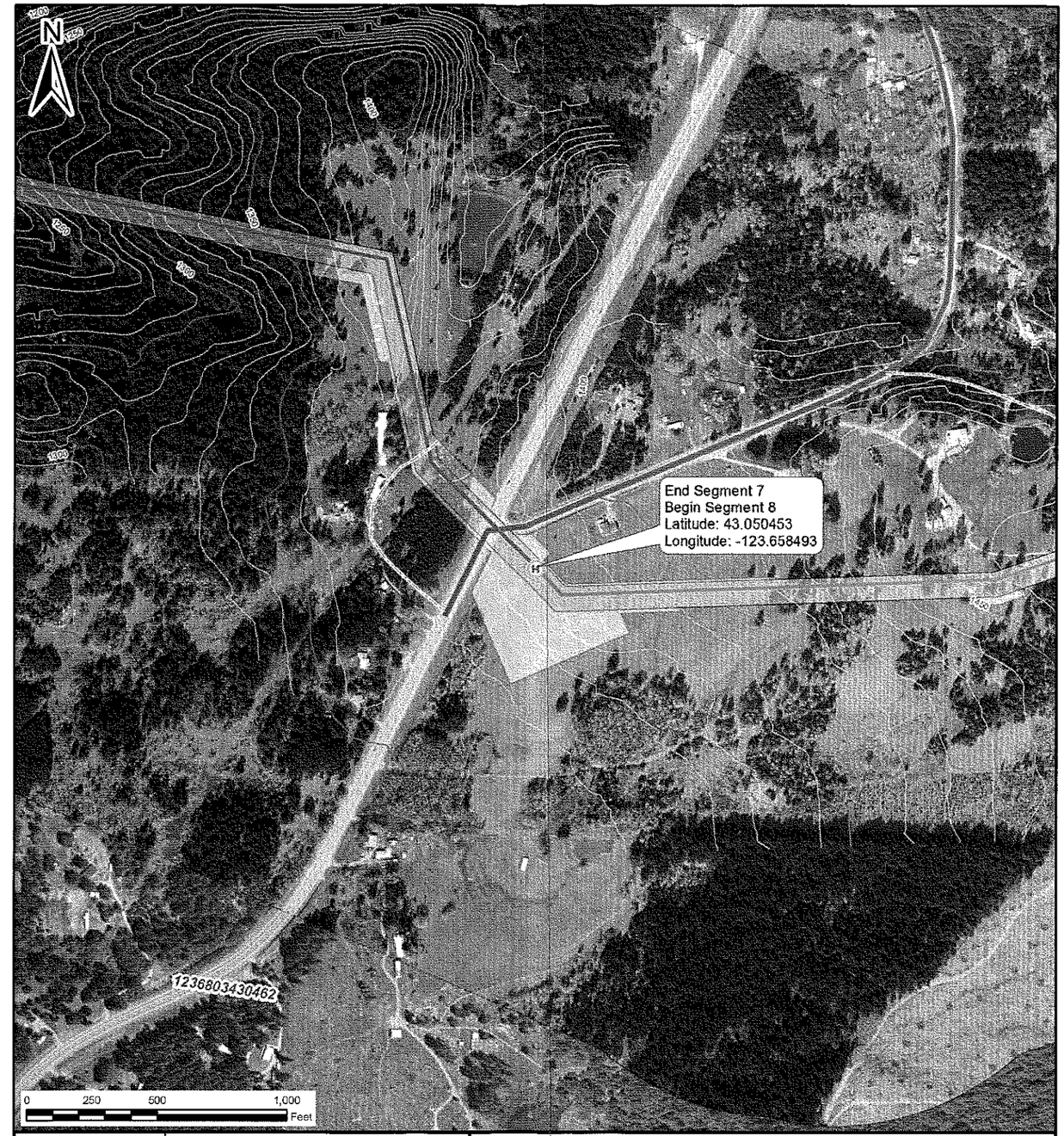
Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: Sept - 2015	ISSUED FOR BID:	SCALE: 1 : 500
CHK BY:	DATE:	ISSUED FOR CONST:	
APPR. BY:	DATE:	DRAWING NUMBER: Test Segments 6 / 7	SHEET 2 OF 2

Path: Q:\PCGP_2012\ArcMap\DEQ\Test Segments 6 and 7.mxd





DRAWING NO.	REFERENCE TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENTS 7 END / 8 BEGIN
S-16, T-29-S, R-8-W
DOUGLAS COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: Sept - 2015	ISSUED FOR BID:	SCALE: 1 : 2000
CHK BY:	DATE:	ISSUED FOR CONST:	
APPR. BY:	DATE:	DRAWING NUMBER: Test Segments 7 / 8	SHEET 1 OF 2
		Path: Q:\PCGP_2012\ArcMap\DEQ\Test Segments 7 and 8.mxd	

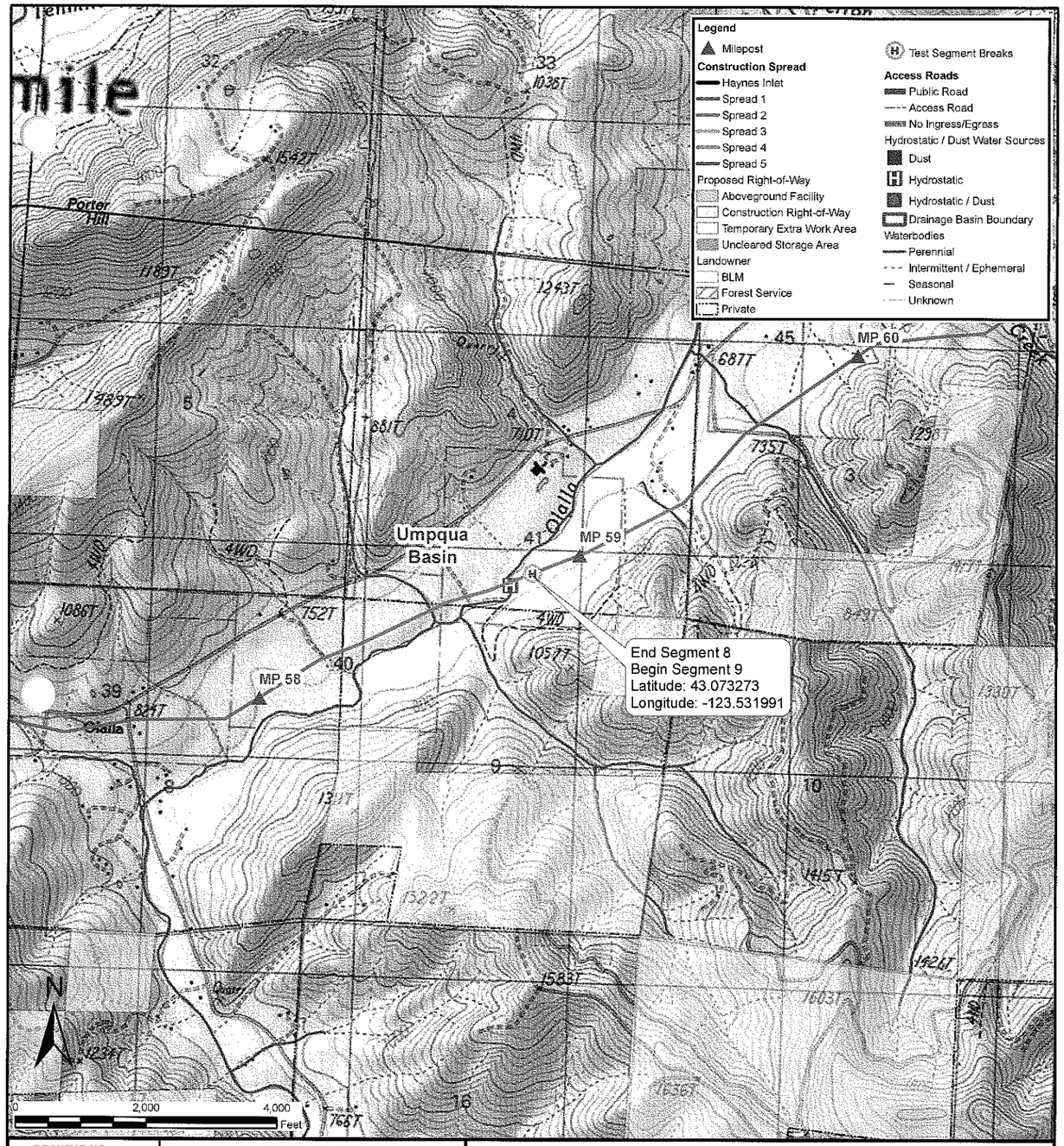
DRAWING NO.	REFERENCE TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENTS 7 END / 8 BEGIN
S-16, T-29-S, R-8-W
DOUGLAS COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: Sept - 2015	ISSUED FOR BID:	SCALE: 1 : 500
CHK BY:	DATE:	ISSUED FOR CONST:	
APPR. BY:	DATE:	DRAWING NUMBER: Test Segments 7 / 8	SHEET 2 OF 2
		Path: Q:\PCGP_2012\ArcMap\DEQ\Test Segments 7 and 8.mxd	



DRAWING NO.	REFERENCE TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENTS 8 END / 9 BEGIN
S-4, T-29-S, R-7-W
DOUGLAS COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: Sept - 2015	ISSUED FOR BID:	SCALE: 1 : 2000
CHK BY:	DATE:	ISSUED FOR CONST:	
APPR. BY:	DATE:	DRAWING NUMBER: Test Segments 8 / 9	SHEET 1 OF 2

Path: Q:\PCGP_2012\ArcMap\DEQ\Test Segments 8 and 9.mxd

DRAWING NO.	REFERENCE TITLE

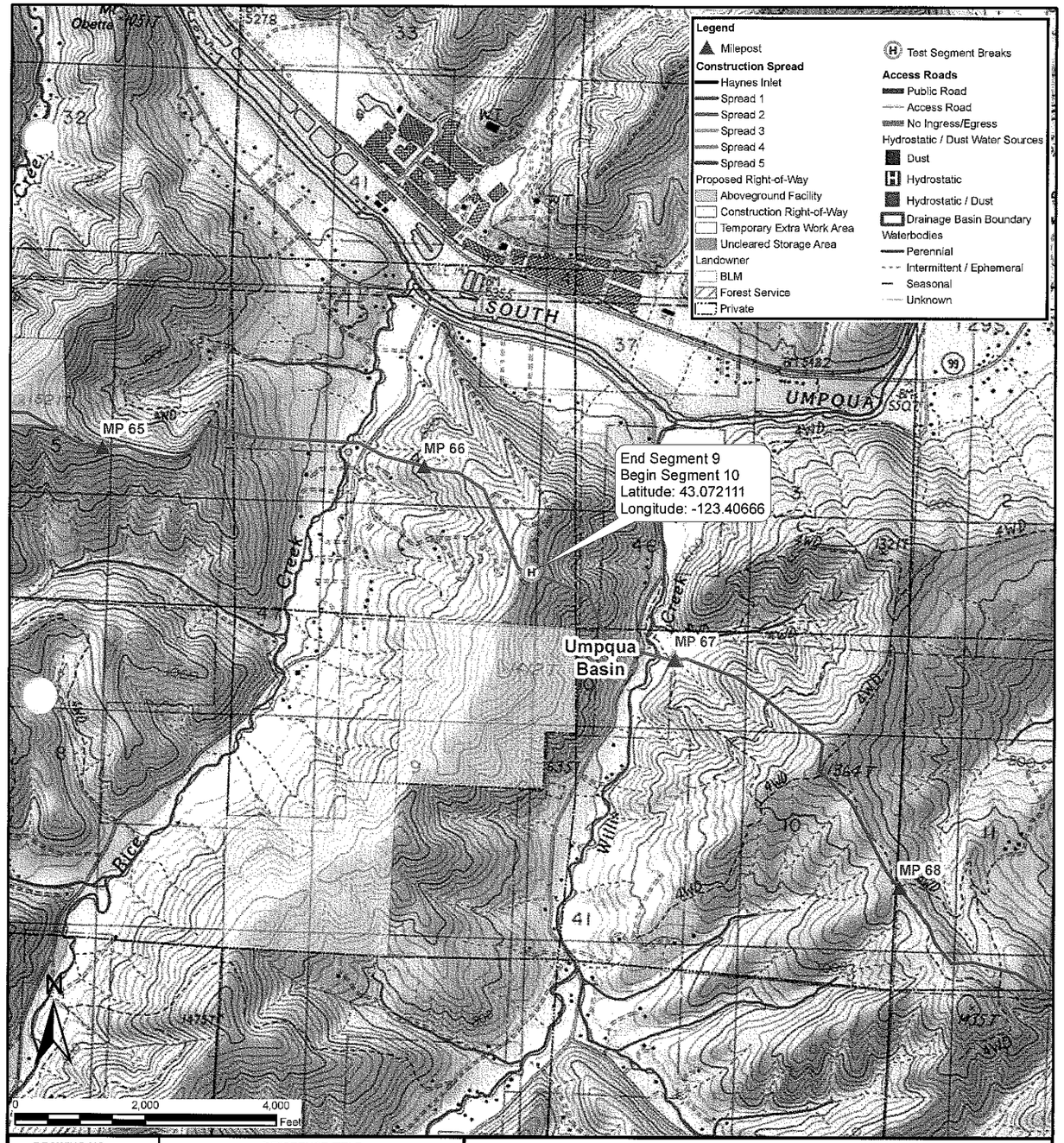
PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENTS 8 END / 9 BEGIN
S-4, T-29-S, R-7-W
DOUGLAS COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: Sept - 2015	ISSUED FOR BID:	SCALE: 1 : 500
CHK BY:	DATE:	ISSUED FOR CONST:	
APPR. BY:	DATE:	DRAWING NUMBER: Test Segments 8 / 9	SHEET 2 OF 2

Path: Q:\PCGP_2012\ArcMap\DEQ\Test Segments 8 and 9.mxd



DRAWING NO.	REFERENCE TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENTS 9 END / 10 BEGIN
S-4, T-29-S, R-6-W
DOUGLAS COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: Sept - 2015	ISSUED FOR BID:	SCALE: 1 : 2000
CHK BY:	DATE:	ISSUED FOR CONST:	
APPR. BY:	DATE:	DRAWING NUMBER: Test Segments 9 / 10	SHEET 1 OF 2

Path: G:\PCGP_2012\ArcMap\DEQ\Test Segments 9 and 10.mxd

DRAWING NO.	REFERENCE TITLE

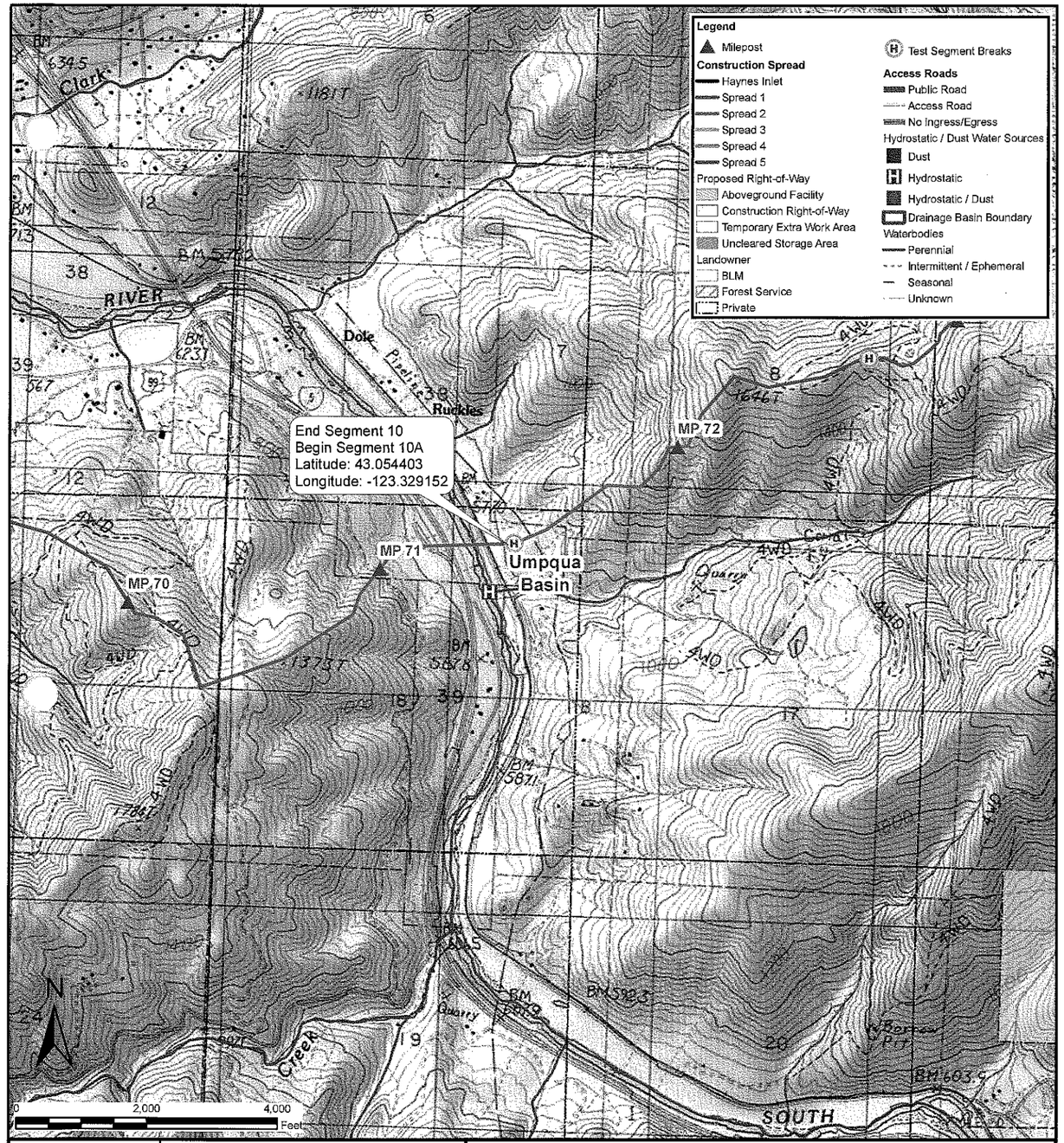
PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENTS 9 END / 10 BEGIN
S-4, T-29-S, R-6-W
DOUGLAS COUNTY, OREGON

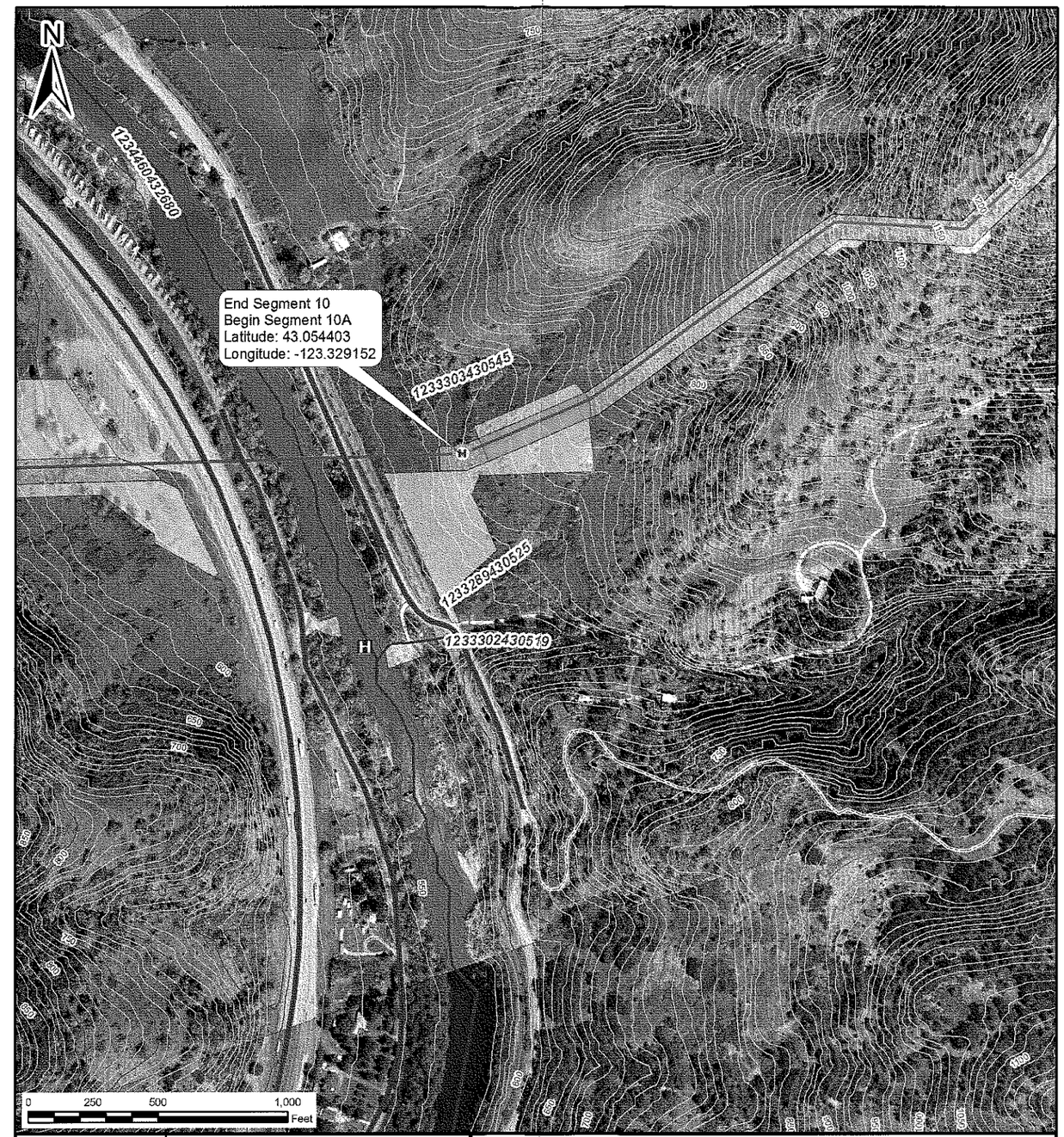
Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: Sept - 2015	ISSUED FOR BID:	SCALE: 1 : 500
CHK BY:	DATE:	ISSUED FOR CONST:	
APPR. BY:	DATE:	DRAWING NUMBER: Test Segments 9 / 10	SHEET 2 OF 2

Path: G:\PCGP_2012\ArcMap\DEQ\Test Segments 9 and 10.mxd





DRAWING NO.	REFERENCE TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENTS 10 END / 10A BEGIN
S-18, T-29-S, R-5-W
DOUGLAS COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: Sept - 2015	ISSUED FOR BID:	SCALE: 1 : 2000
CHK BY:	DATE:	ISSUED FOR CONST:	
APPR. BY:	DATE:	DRAWING NUMBER: Test Segments 10 / 10A	SHEET 1 OF 2

Path: Q:\PCGP_2012\ArcMap\DEQ\Test Segments 10 and 10A.mxd

DRAWING NO.	REFERENCE TITLE

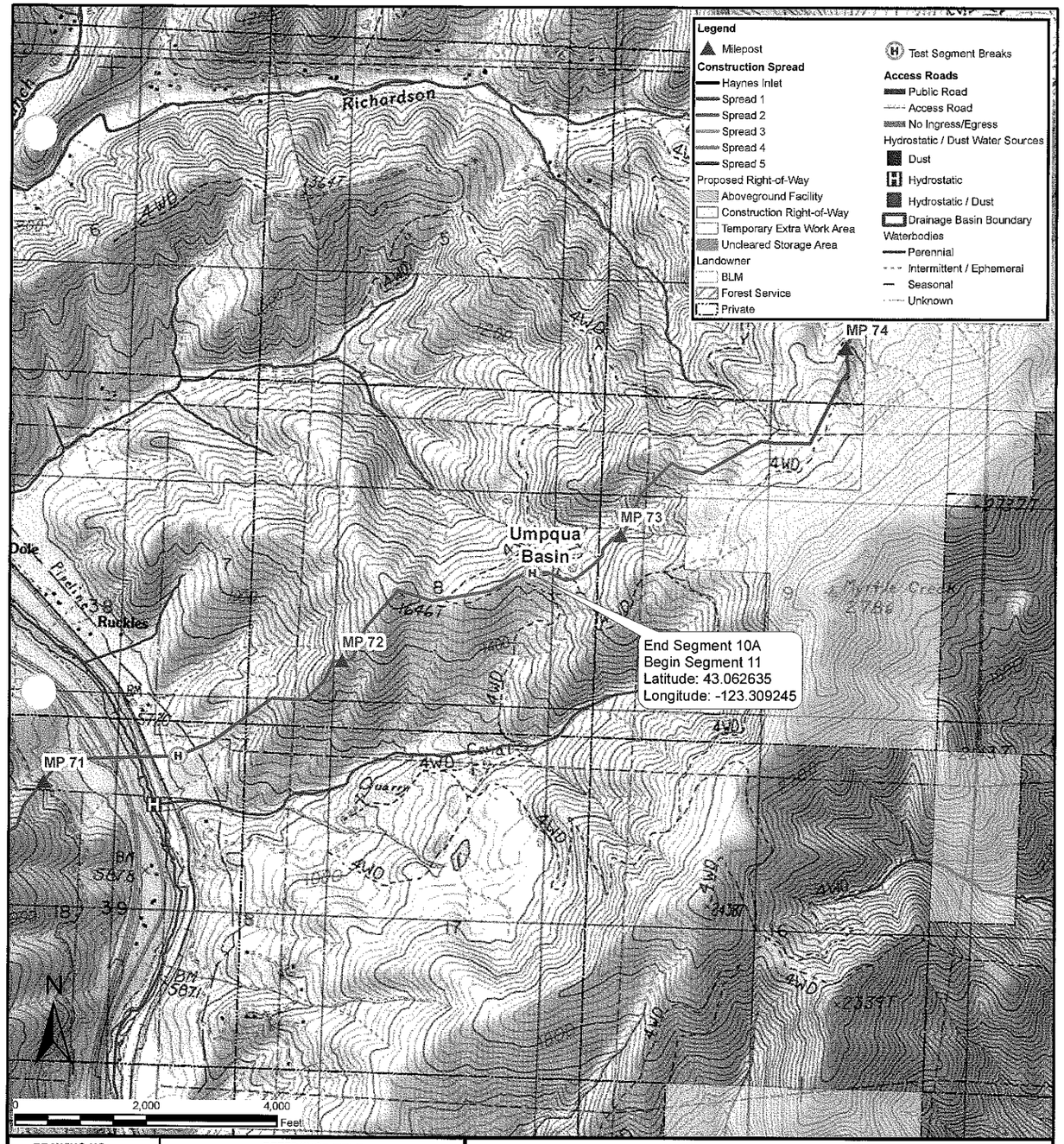
PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENTS 10 END / 10A BEGIN
S-18, T-29-S, R-5-W
DOUGLAS COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: Sept - 2015	ISSUED FOR BID:	SCALE: 1 : 500
CHK BY:	DATE:	ISSUED FOR CONST:	
APPR. BY:	DATE:	DRAWING NUMBER: Test Segments 10 / 10A	SHEET 2 OF 2

Path: Q:\PCGP_2012\ArcMap\DEQ\Test Segments 10 and 10A.mxd



DRAWING NO.	REFERENCE TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENTS 10A END / 11 BEGIN
S-8, T-29-S, R-5-W
DOUGLAS COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: Sept - 2015	ISSUED FOR BID:	SCALE: 1 : 2000
CHK BY:	DATE:	ISSUED FOR CONST:	
APPR. BY:	DATE:	DRAWING NUMBER: Test Segments 10A / 11	SHEET 1 OF 2

Path: Q:\PCGP_2012\ArcMap\DEQ\Test Segments 10A and 11.mxd

DRAWING NO.	REFERENCE TITLE

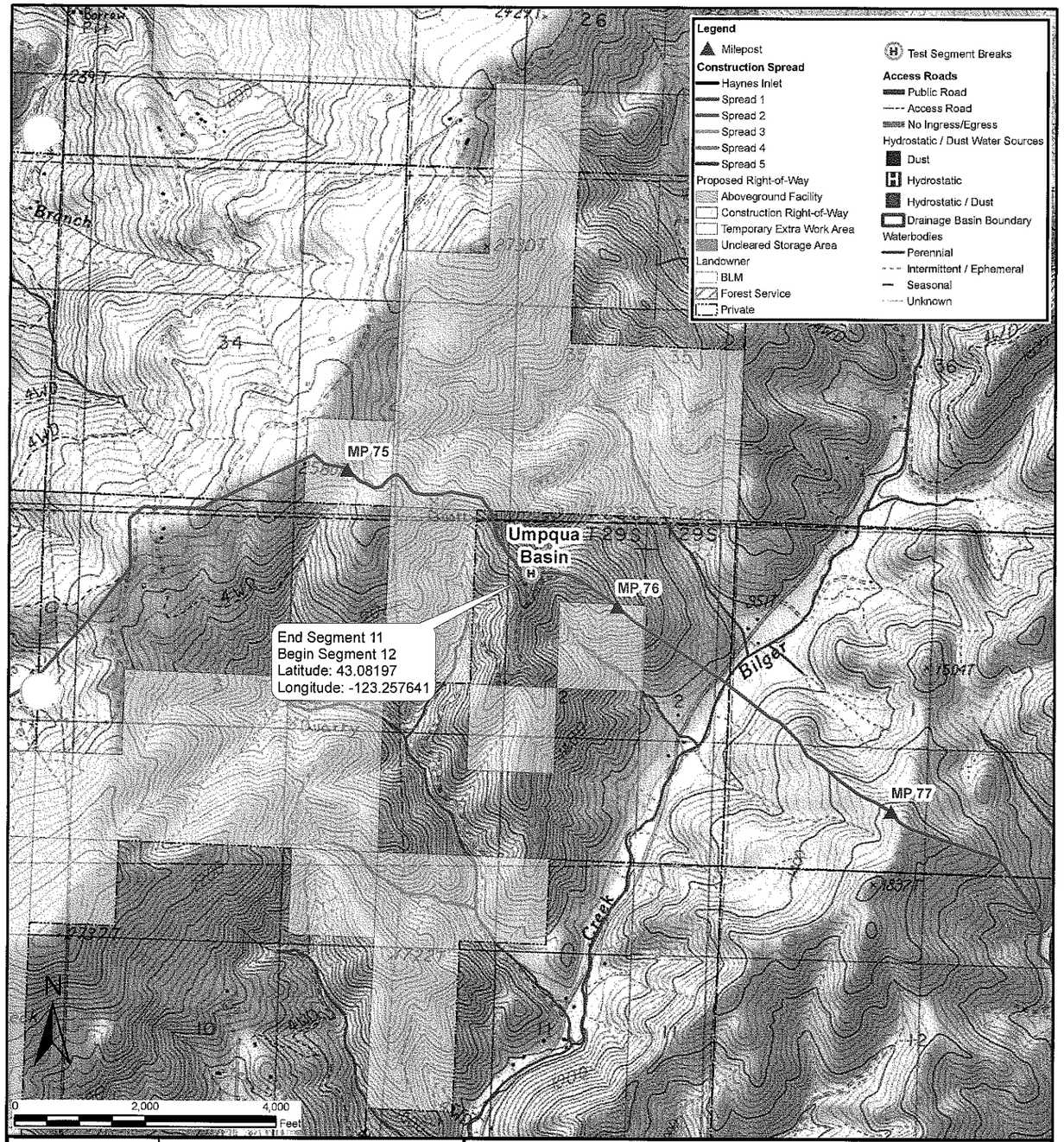
PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENTS 10A END / 11 BEGIN
S-8, T-29-S, R-5-W
DOUGLAS COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: Sept - 2015	ISSUED FOR BID:	SCALE: 1 : 500
CHK BY:	DATE:	ISSUED FOR CONST:	
APPR. BY:	DATE:	DRAWING NUMBER: Test Segments 10A / 11	SHEET 2 OF 2

Path: Q:\PCGP_2012\ArcMap\DEQ\Test Segments 10A and 11.mxd



DRAWING NO.	REFERENCE TITLE

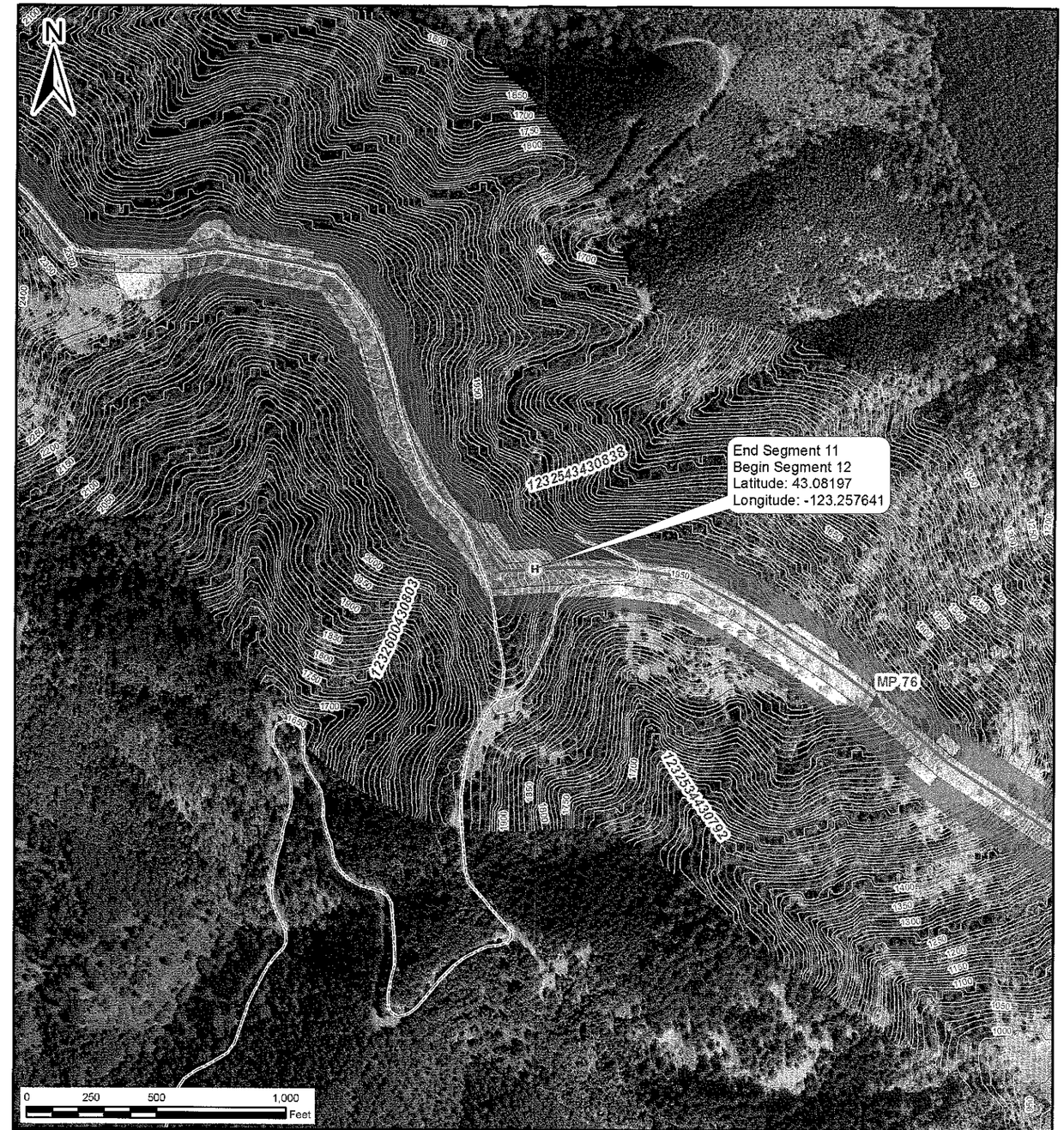
PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENTS 11 END / 12 BEGIN
S-2, T-29-S, R-5-W
DOUGLAS COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: Sept - 2015	ISSUED FOR BID:	SCALE: 1 : 2000
CHK BY:	DATE:	ISSUED FOR CONST:	
APPR. BY:	DATE:	DRAWING NUMBER: Test Segments 11 / 12	SHEET 1 OF 2

Path: Q:\PCGP_2012\ArcMap\DEQ\Test Segments 11 and 12.mxd



DRAWING NO.	REFERENCE TITLE

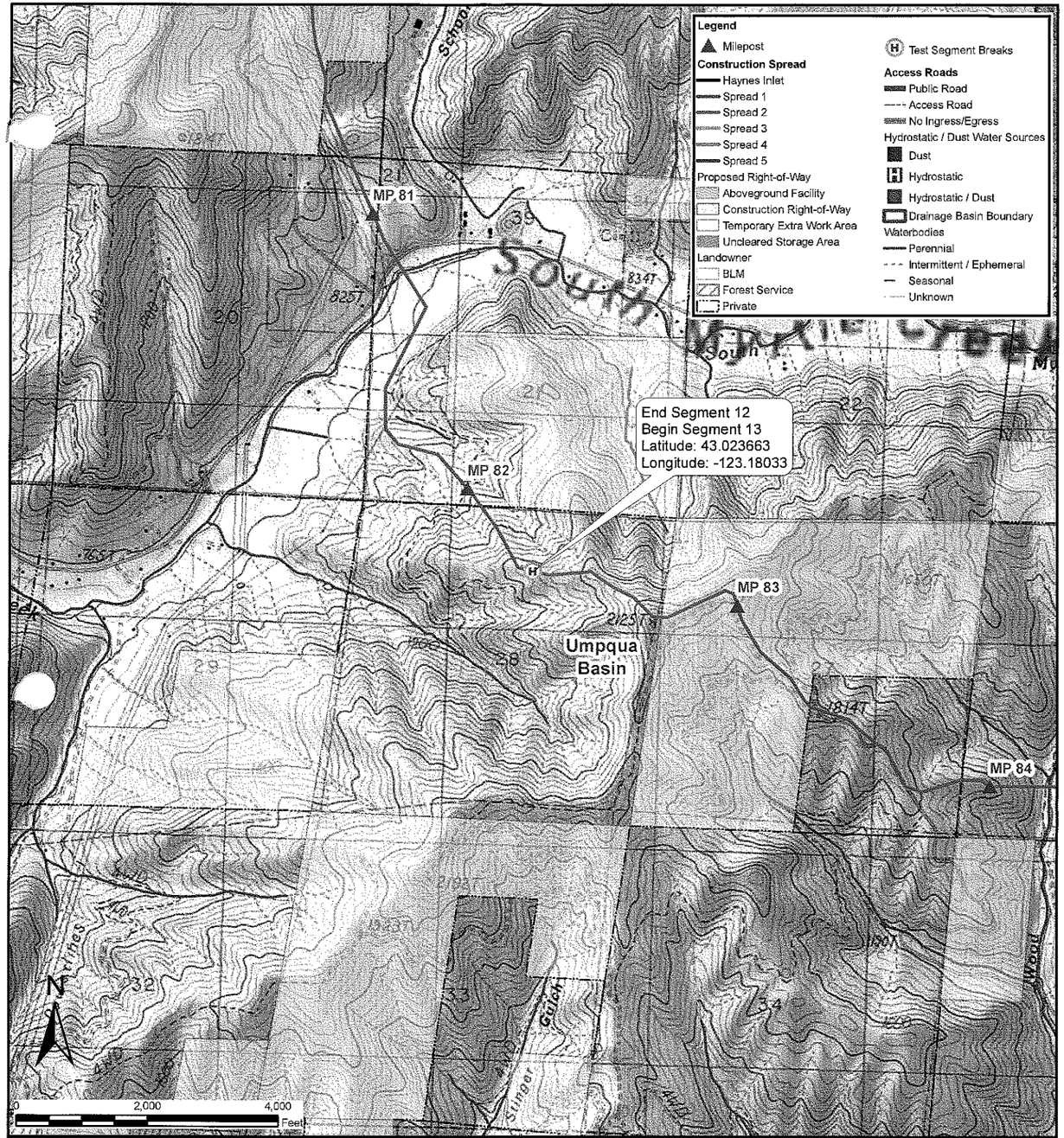
PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENTS 11 END / 12 BEGIN
S-2, T-29-S, R-5-W
DOUGLAS COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: Sept - 2015	ISSUED FOR BID:	SCALE: 1 : 500
CHK BY:	DATE:	ISSUED FOR CONST:	
APPR. BY:	DATE:	DRAWING NUMBER: Test Segments 11 / 12	SHEET 2 OF 2

Path: Q:\PCGP_2012\ArcMap\DEQ\Test Segments 11 and 12.mxd



DRAWING NO.	REFERENCE TITLE

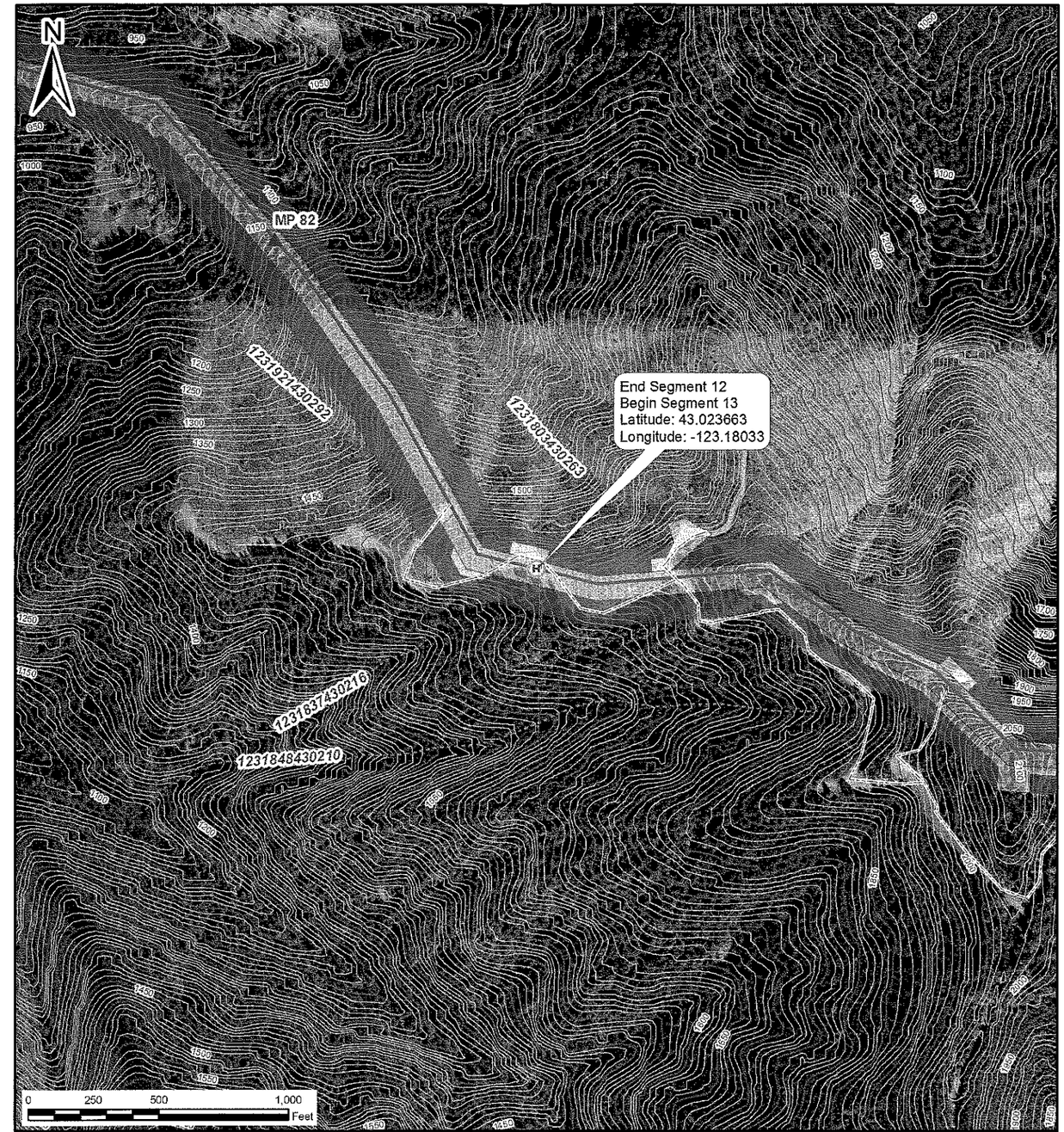
PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENTS 12 END / 13 BEGIN
S-28, T-29-S, R-4-W
DOUGLAS COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: Sept - 2015	ISSUED FOR BID:	SCALE: 1 : 2000
CHK BY:	DATE:	ISSUED FOR CONST:	
APPR. BY:	DATE:	DRAWING NUMBER: Test Segments 12 / 13	SHEET 1 OF 2

Path: Q:\PCGP_2012\ArcMap\DEQ\Test Segments 12 and 13.mxd



DRAWING NO.	REFERENCE TITLE

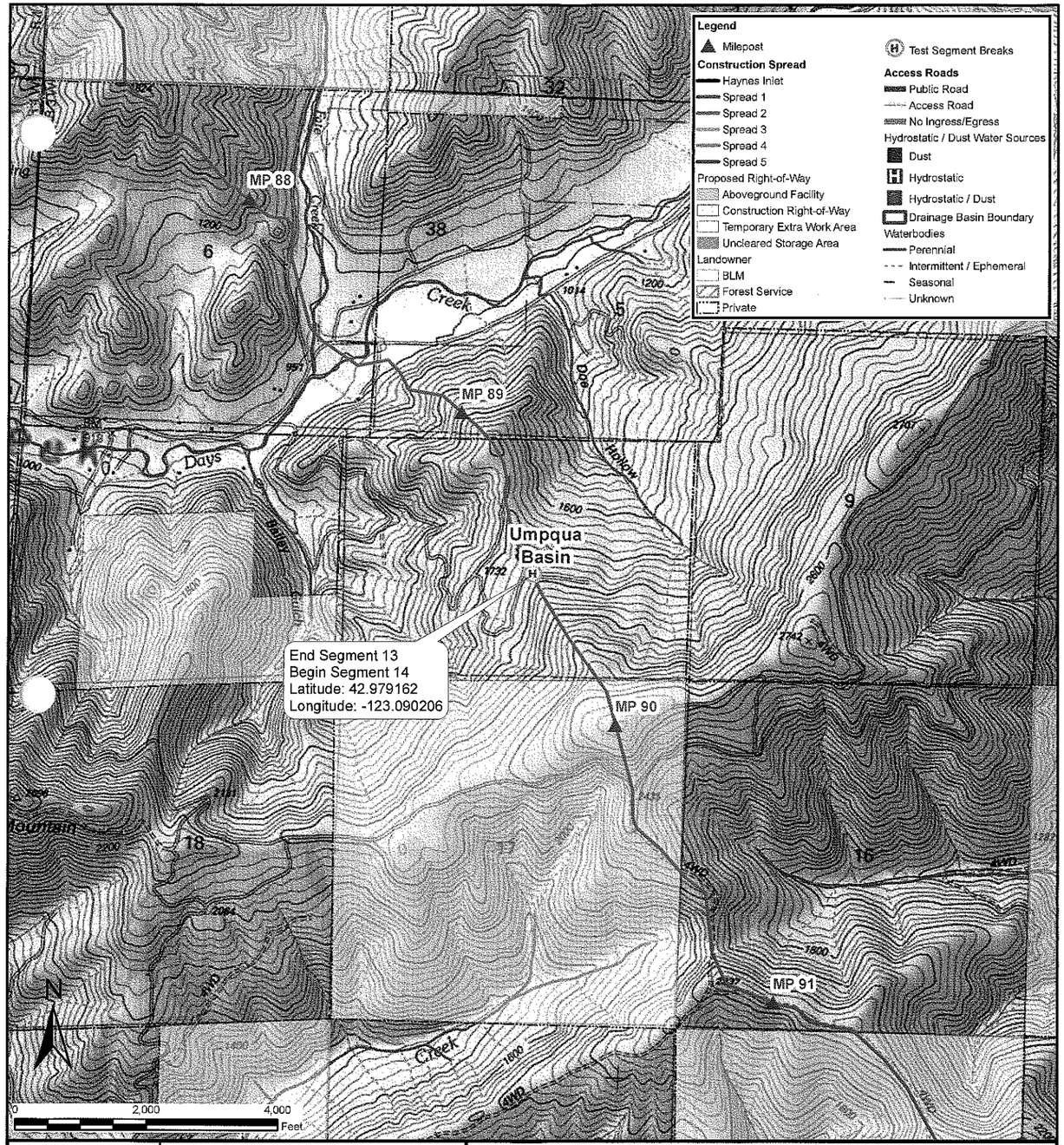
PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENTS 12 END / 13 BEGIN
S-28, T-29-S, R-4-W
DOUGLAS COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: Sept - 2015	ISSUED FOR BID:	SCALE: 1 : 500
CHK BY:	DATE:	ISSUED FOR CONST:	
APPR. BY:	DATE:	DRAWING NUMBER: Test Segments 12 / 13	SHEET 2 OF 2

Path: Q:\PCGP_2012\ArcMap\DEQ\Test Segments 12 and 13.mxd



DRAWING NO.	REFERENCE TITLE

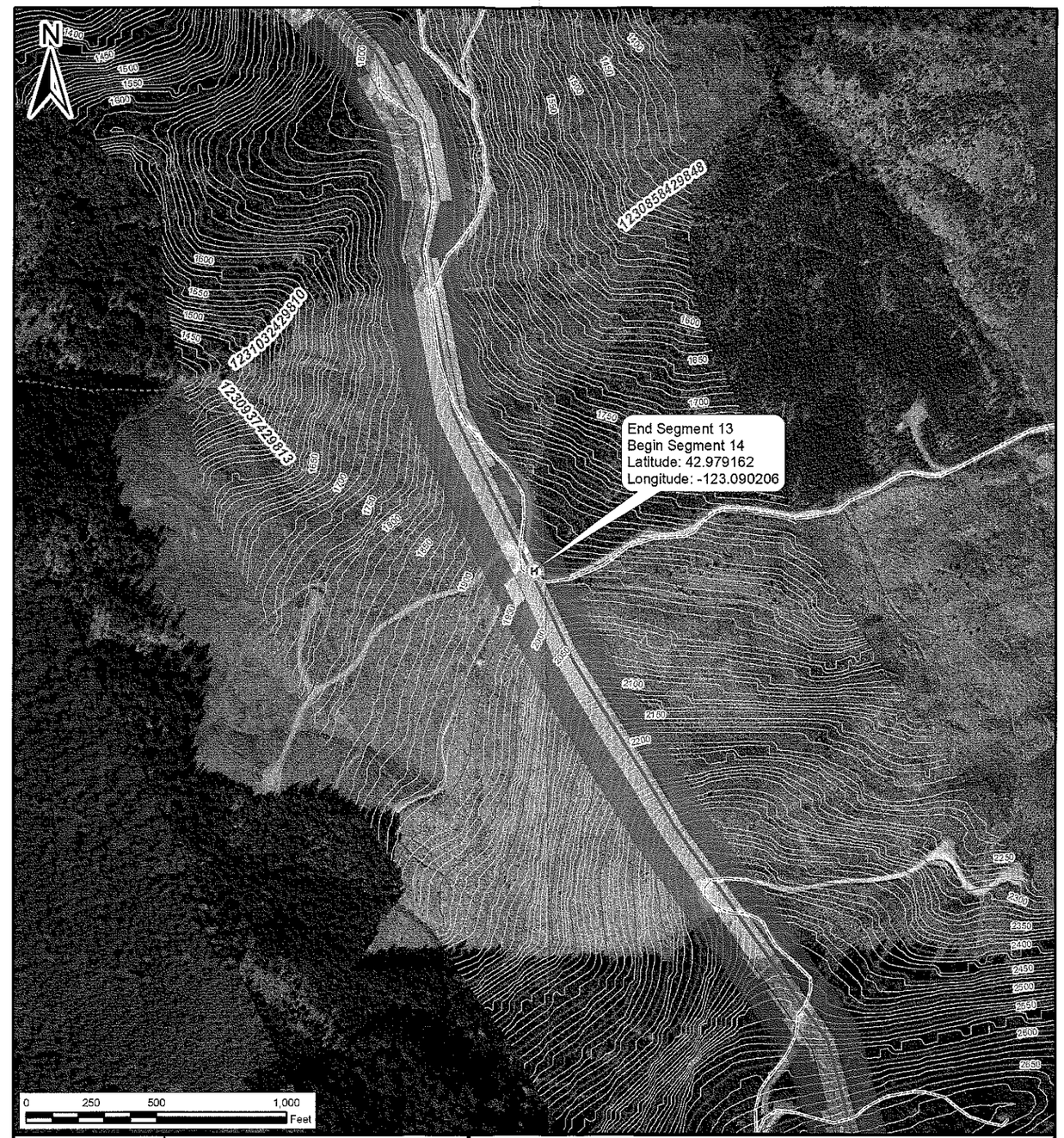
PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENTS 13 END / 14 BEGIN
S-8, T-30-S, R-3-W
DOUGLAS COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: Sept - 2015	ISSUED FOR BID:	SCALE: 1 : 2000
CHK BY:	DATE:	ISSUED FOR CONST:	
APPR. BY:	DATE:	DRAWING NUMBER: Test Segments 13 / 14	SHEET 1 OF 2

Path: Q:\PCGP_2012\ArcMap\DEQ\Test Segments 13 and 14.mxd



DRAWING NO.	REFERENCE TITLE

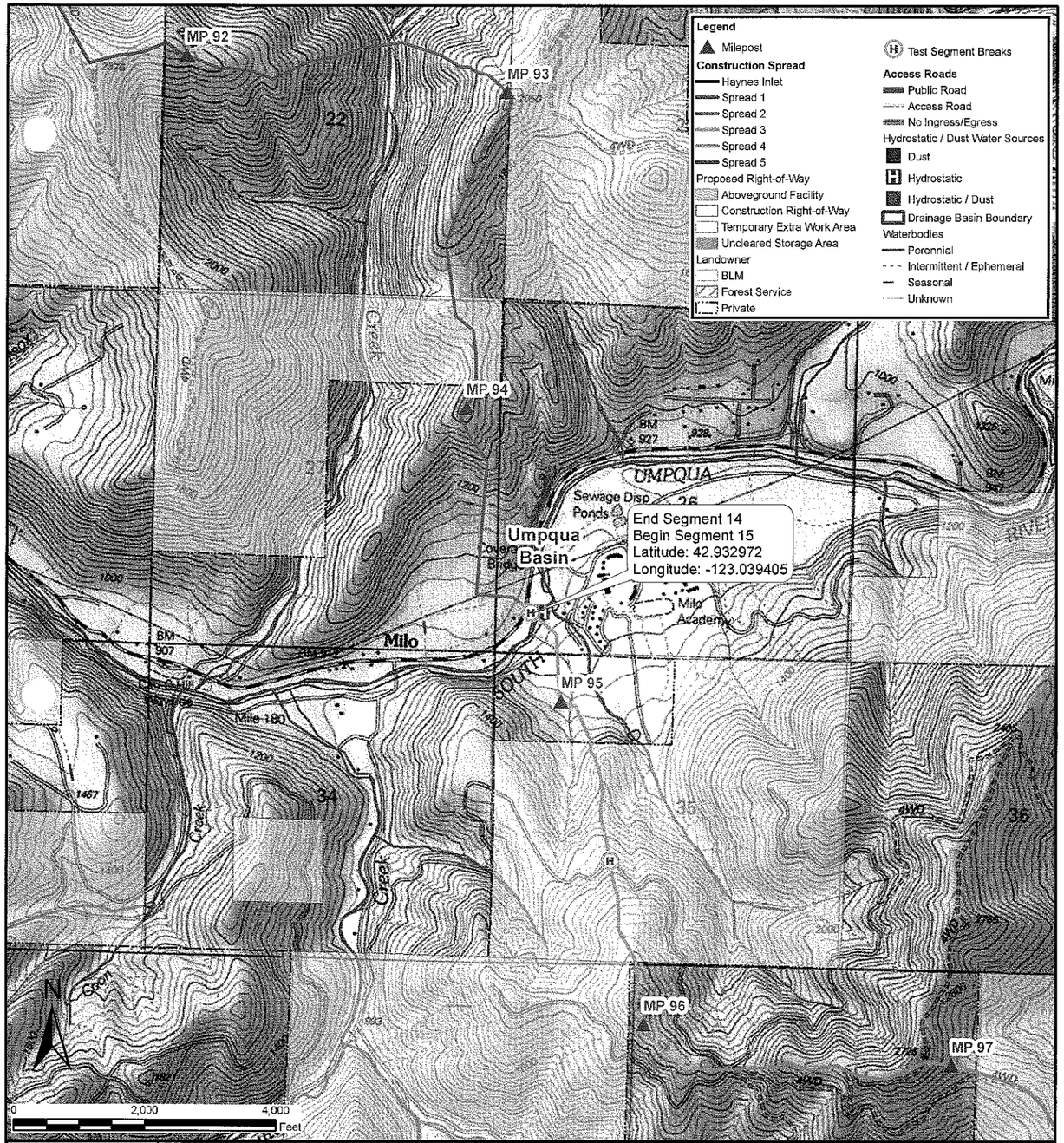
PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENTS 13 END / 14 BEGIN
S-8, T-30-S, R-3-W
DOUGLAS COUNTY, OREGON

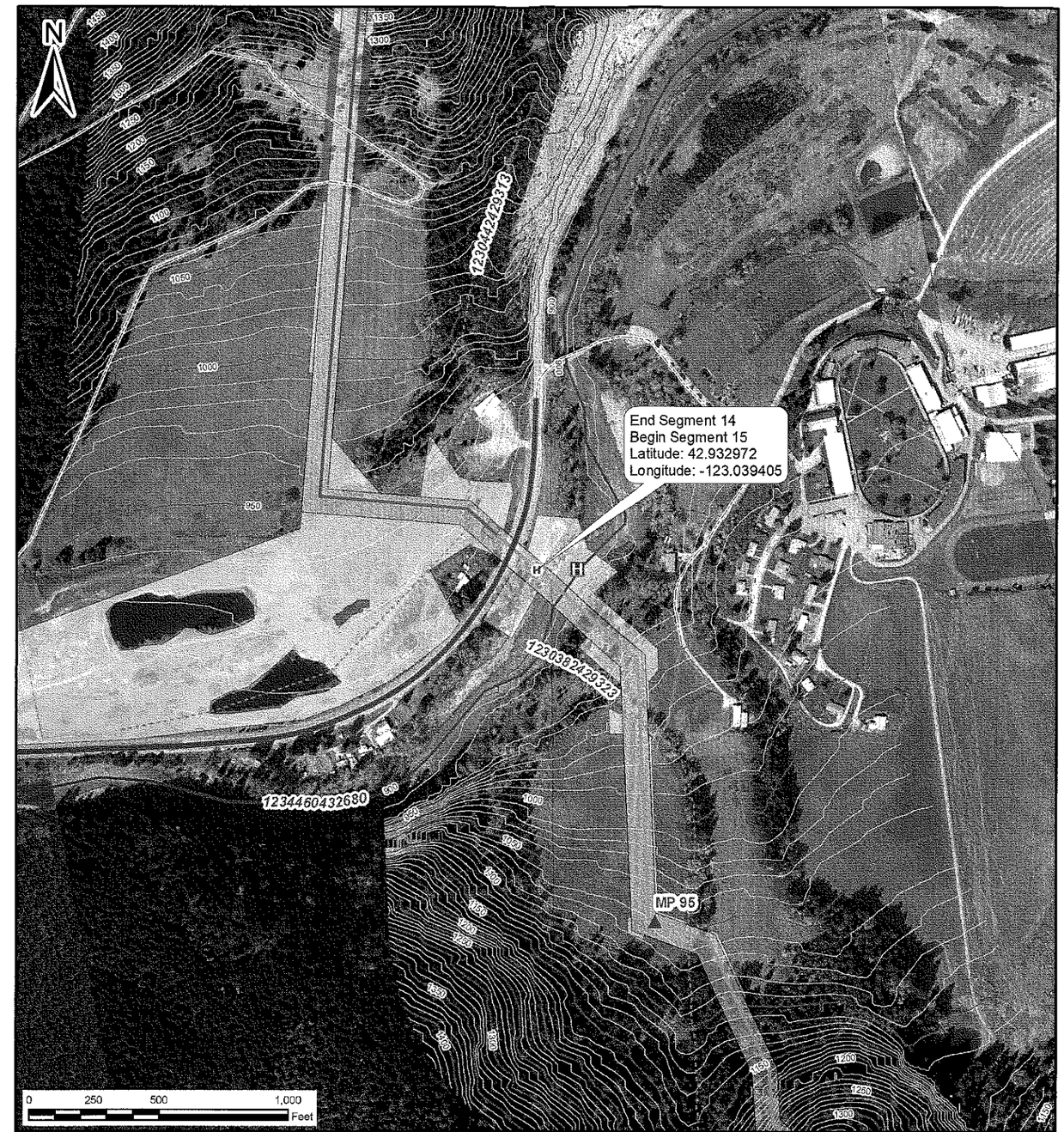
Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: Sept - 2015	ISSUED FOR BID:	SCALE: 1 : 500
CHK BY:	DATE:	ISSUED FOR CONST:	
APPR. BY:	DATE:	DRAWING NUMBER: Test Segments 13 / 14	SHEET 2 OF 2

Path: Q:\PCGP_2012\ArcMap\DEQ\Test Segments 13 and 14.mxd





DRAWING NO.	REFERENCE TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENTS 14 END / 15 BEGIN
S-26, T-30-S, R-3-W
DOUGLAS COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: Sept - 2015	ISSUED FOR BID:	SCALE: 1 : 2000
CHK BY:	DATE:	ISSUED FOR CONST:	
APPR. BY:	DATE:	DRAWING NUMBER: Test Segments 14 / 15	SHEET 1 OF 2

Path: Q:\PCGP_2012\ArcMap\DEQ\Test Segments 14 and 15.mxd

DRAWING NO.	REFERENCE TITLE

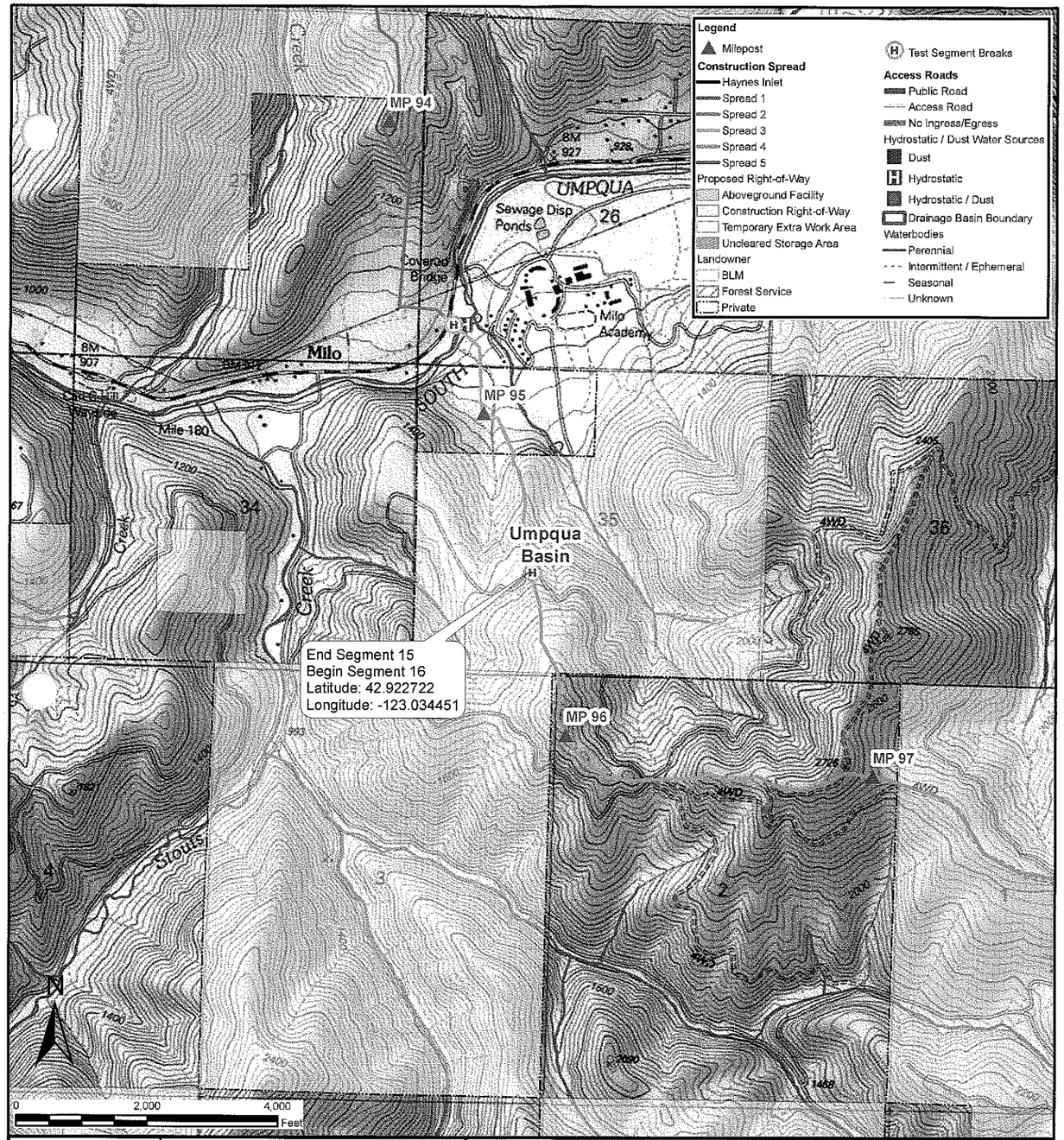
PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENTS 14 END / 15 BEGIN
S-26, T-30-S, R-3-W
DOUGLAS COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: Sept - 2015	ISSUED FOR BID:	SCALE: 1 : 500
CHK BY:	DATE:	ISSUED FOR CONST:	
APPR. BY:	DATE:	DRAWING NUMBER: Test Segments 14 / 15	SHEET 2 OF 2

Path: Q:\PCGP_2012\ArcMap\DEQ\Test Segments 14 and 15.mxd



DRAWING NO.	REFERENCE TITLE

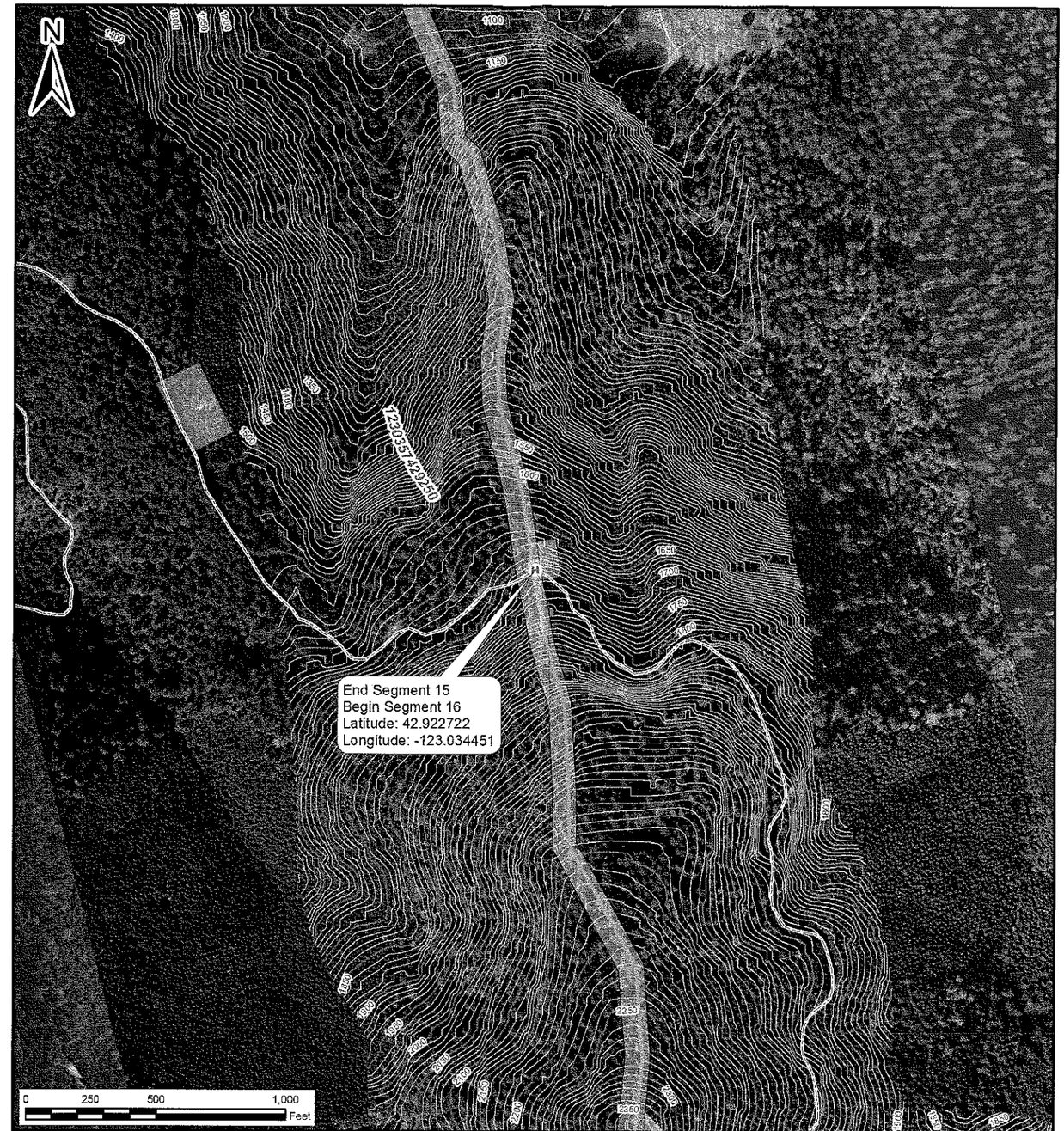
PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENTS 15 END / 16 BEGIN
S-35, T-30-S, R-3-W
DOUGLAS COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: Sept - 2015	ISSUED FOR BID:	SCALE: 1 : 2000
CHK BY:	DATE:	ISSUED FOR CONST:	
APPR. BY:	DATE:	DRAWING NUMBER: Test Segments 15 / 16	SHEET 1 OF 2

Path: Q:\PCGP_2012\ArcMap\DEQ\Test Segments 15 and 16.mxd



DRAWING NO.	REFERENCE TITLE

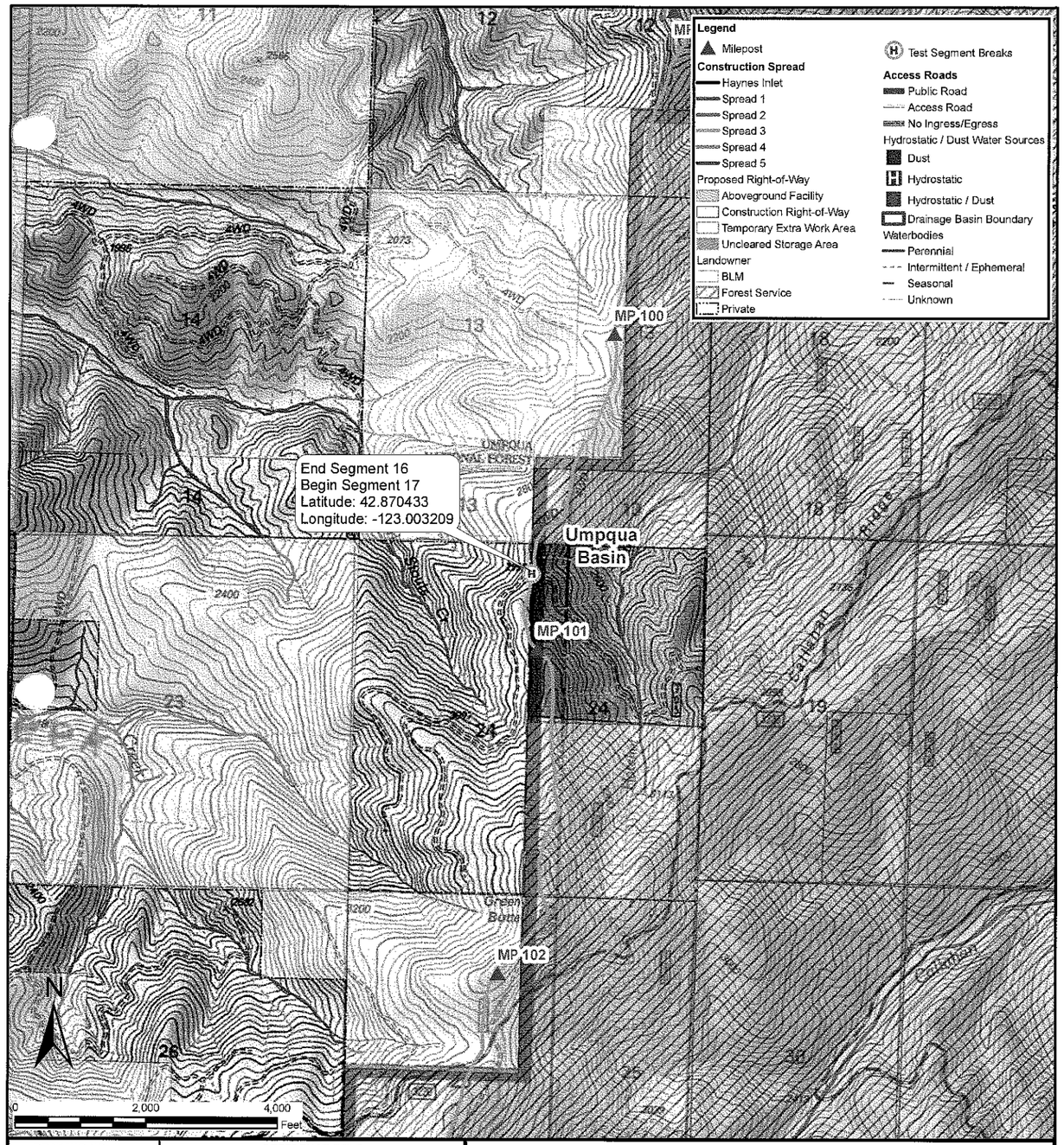
PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENTS 15 END / 16 BEGIN
S-35, T-30-S, R-3-W
DOUGLAS COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: Sept - 2015	ISSUED FOR BID:	SCALE: 1 : 500
CHK BY:	DATE:	ISSUED FOR CONST:	
APPR. BY:	DATE:	DRAWING NUMBER: Test Segments 15 / 16	SHEET 2 OF 2

Path: Q:\PCGP_2012\ArcMap\DEQ\Test Segments 15 and 16.mxd



DRAWING NO.	REFERENCE TITLE

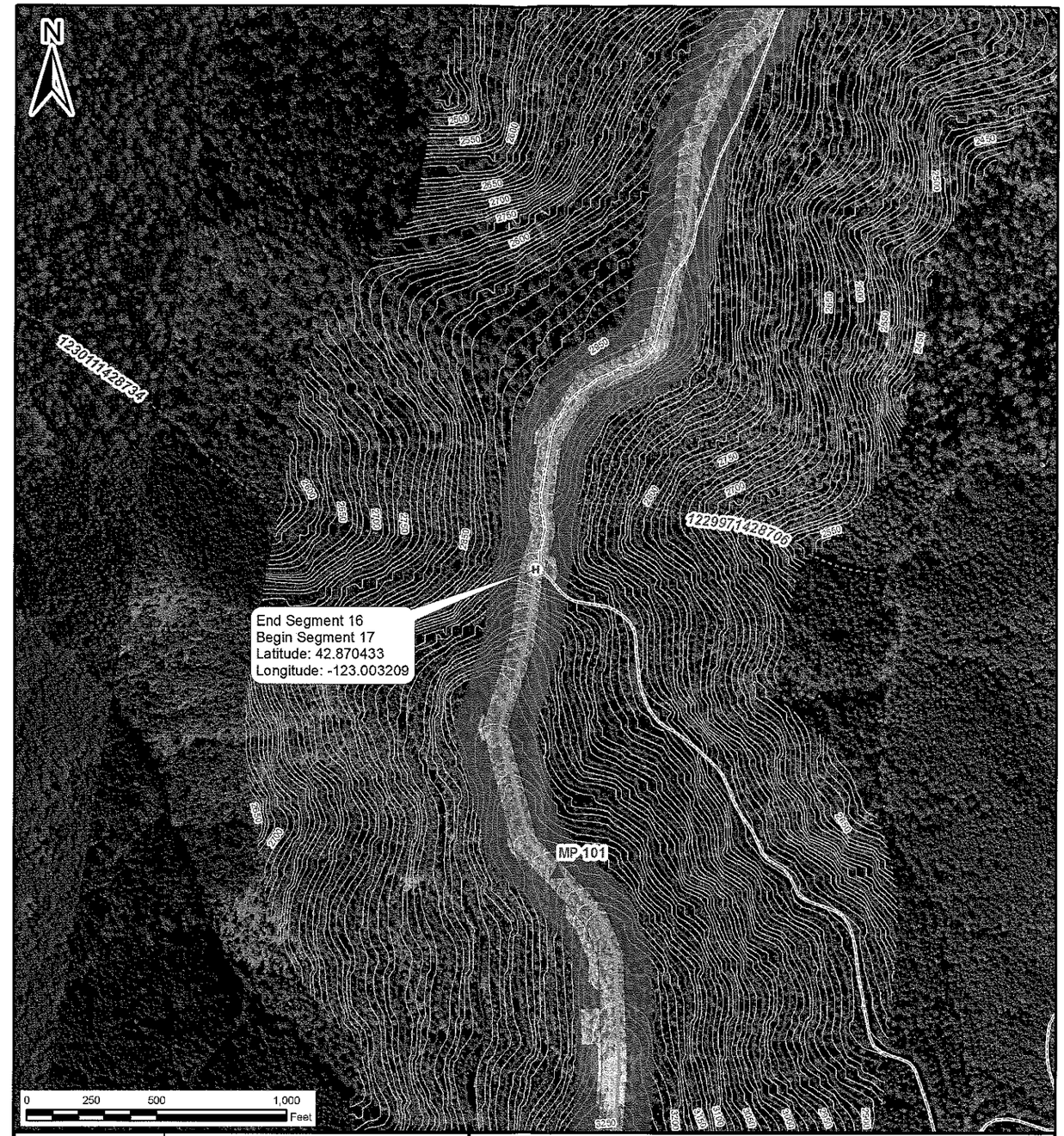
PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENTS 16 END / 17 BEGIN
S-24, T-31-S, R-3-W
DOUGLAS COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: Sept - 2015	ISSUED FOR BID:	SCALE: 1 : 2000
CHK BY:	DATE:	ISSUED FOR CONST:	
APPR. BY:	DATE:	DRAWING NUMBER: Test Segments 16 / 17	SHEET 1 OF 2

Path: Q:\PCGP_2012\ArcMap\DEQ\Test Segments 16 and 17.mxd



DRAWING NO.	REFERENCE TITLE

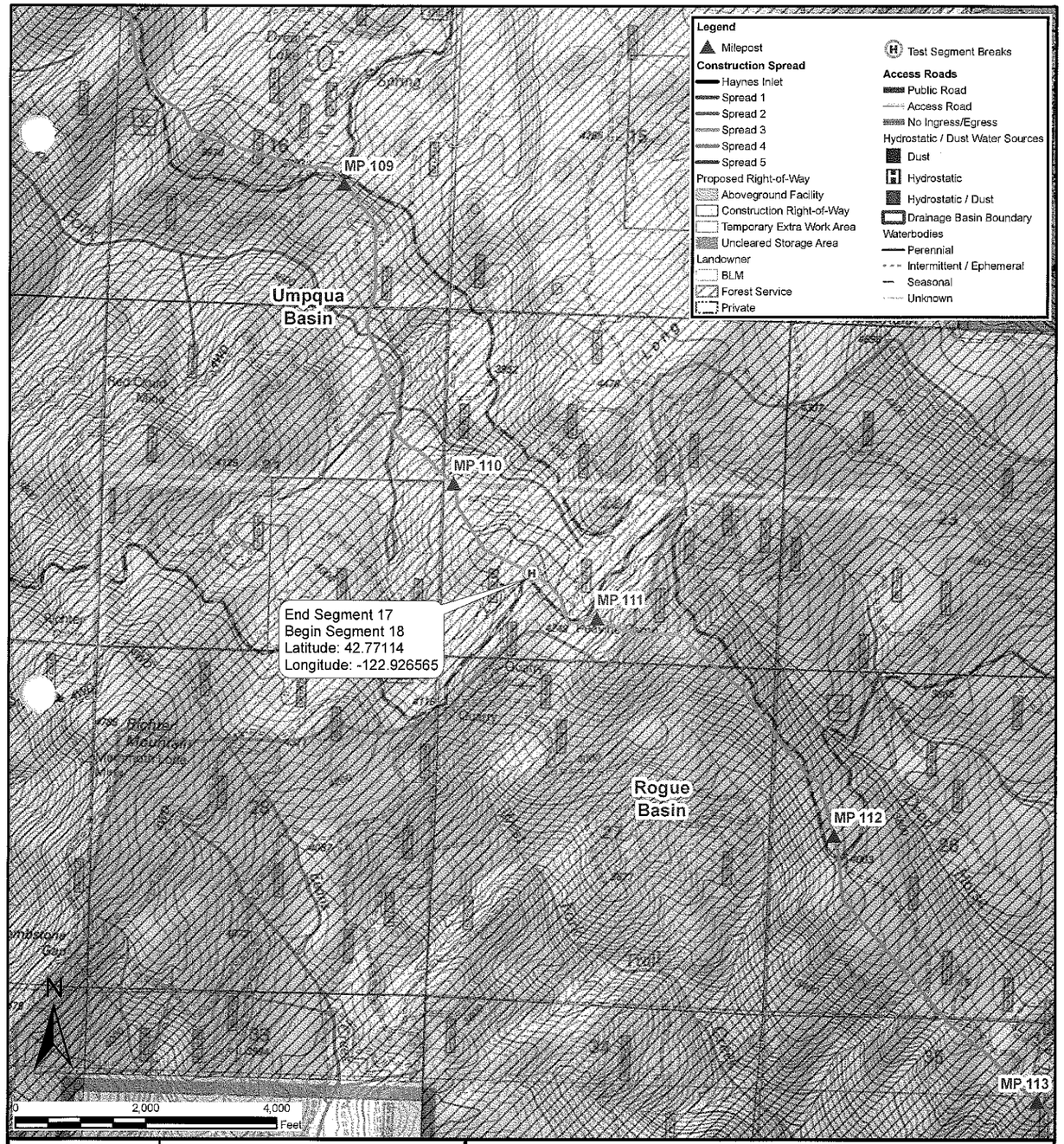
PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENTS 16 END / 17 BEGIN
S-24, T-31-S, R-3-W
DOUGLAS COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: Sept - 2015	ISSUED FOR BID:	SCALE: 1 : 500
CHK BY:	DATE:	ISSUED FOR CONST:	
APPR. BY:	DATE:	DRAWING NUMBER: Test Segments 16 / 17	SHEET 2 OF 2

Path: Q:\PCGP_2012\ArcMap\DEQ\Test Segments 16 and 17.mxd



DRAWING NO.	REFERENCE TITLE

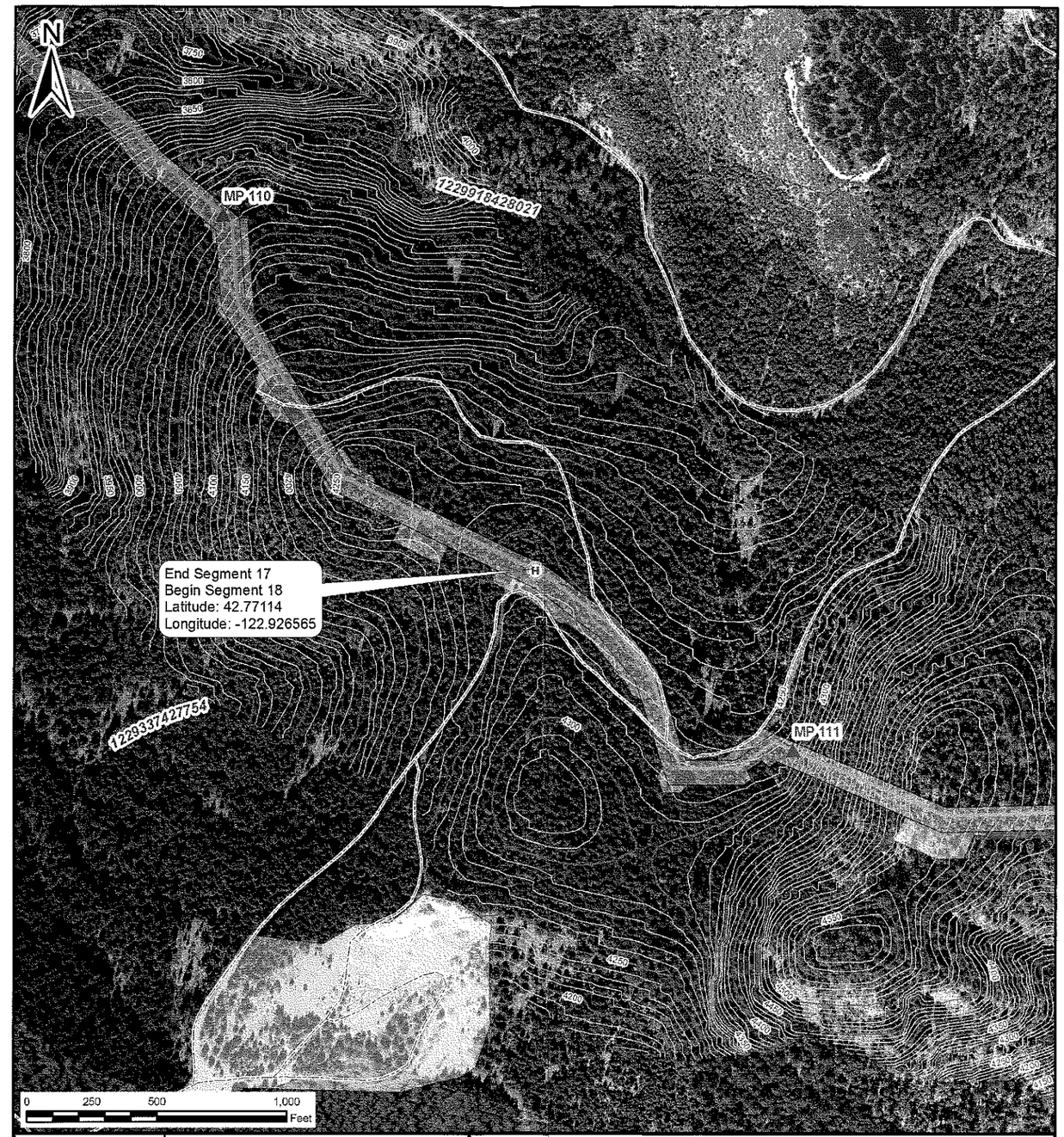
PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENTS 17 END / 18 BEGIN
S-22, T-32-S, R-2-W
JACKSON COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: Sept - 2015	ISSUED FOR BID:	SCALE: 1 : 2000
CHK BY:	DATE:	ISSUED FOR CONST:	
APPR. BY:	DATE:	DRAWING NUMBER: Test Segments 17 / 18	SHEET 1 OF 2

Path: Q:\PCGP_2012\ArcMap\DEQ\Test Segments 17 and 18.mxd



DRAWING NO.	REFERENCE TITLE

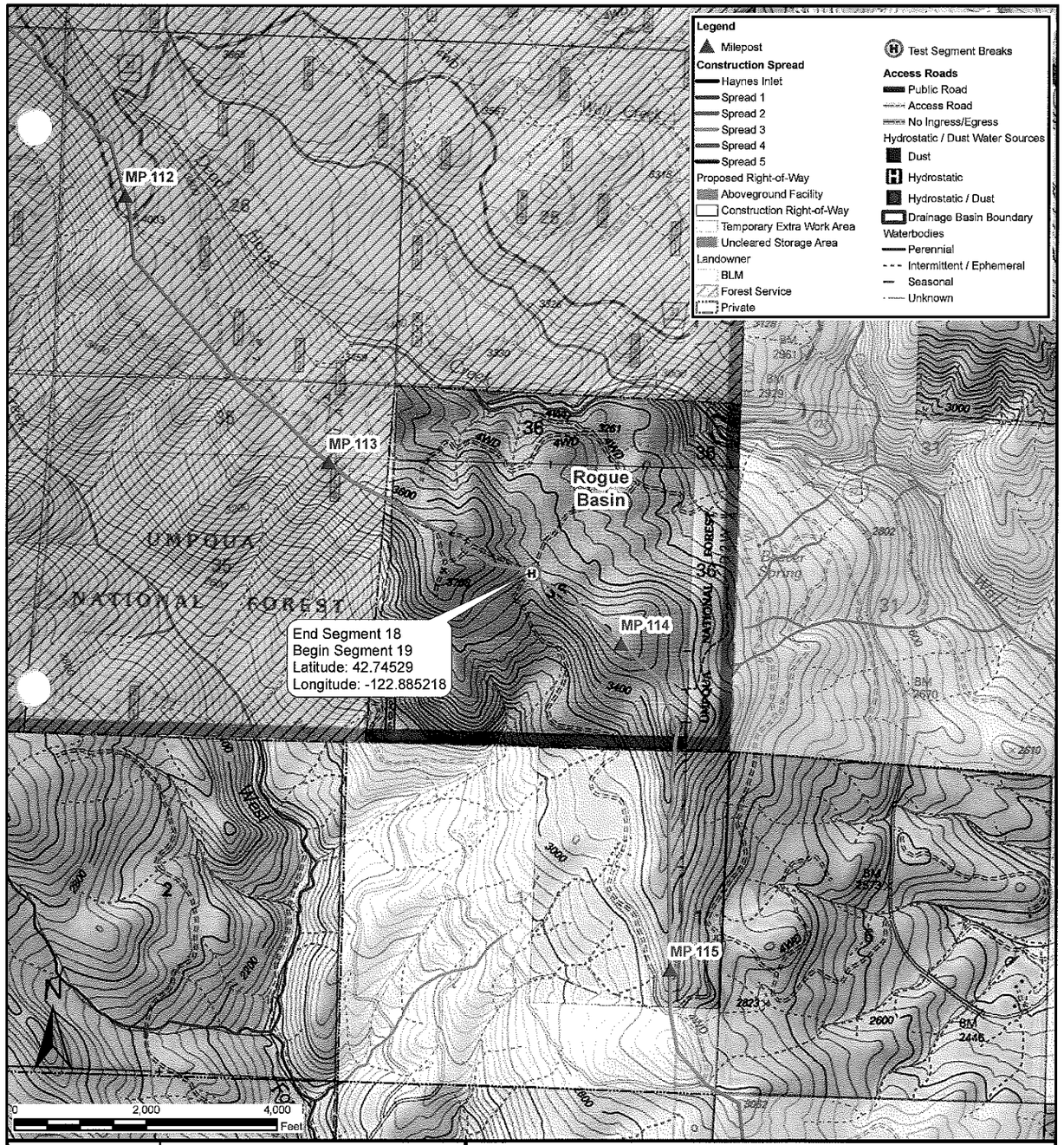
PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENTS 17 END / 18 BEGIN
S-22, T-32-S, R-2-W
JACKSON COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: Sept - 2015	ISSUED FOR BID:	SCALE: 1 : 500
CHK BY:	DATE:	ISSUED FOR CONST:	
APPR. BY:	DATE:	DRAWING NUMBER: Test Segments 17 / 18	SHEET 2 OF 2

Path: Q:\PCGP_2012\ArcMap\DEQ\Test Segments 17 and 18.mxd



DRAWING NO.	REFERENCE TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENTS 18 END / 19 BEGIN
S-36, T-32-S, R-2-W
JACKSON COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: Sept - 2015	ISSUED FOR BID:	SCALE: 1 : 2000
CHK BY:	DATE:	ISSUED FOR CONST:	
APPR. BY:	DATE:	DRAWING NUMBER: Test Segments 18 / 19	SHEET 1 OF 2

Path: Q:\PCGP_2012\ArcMap\DEQ\Test Segments 18 and 19.mxd

DRAWING NO.	REFERENCE TITLE

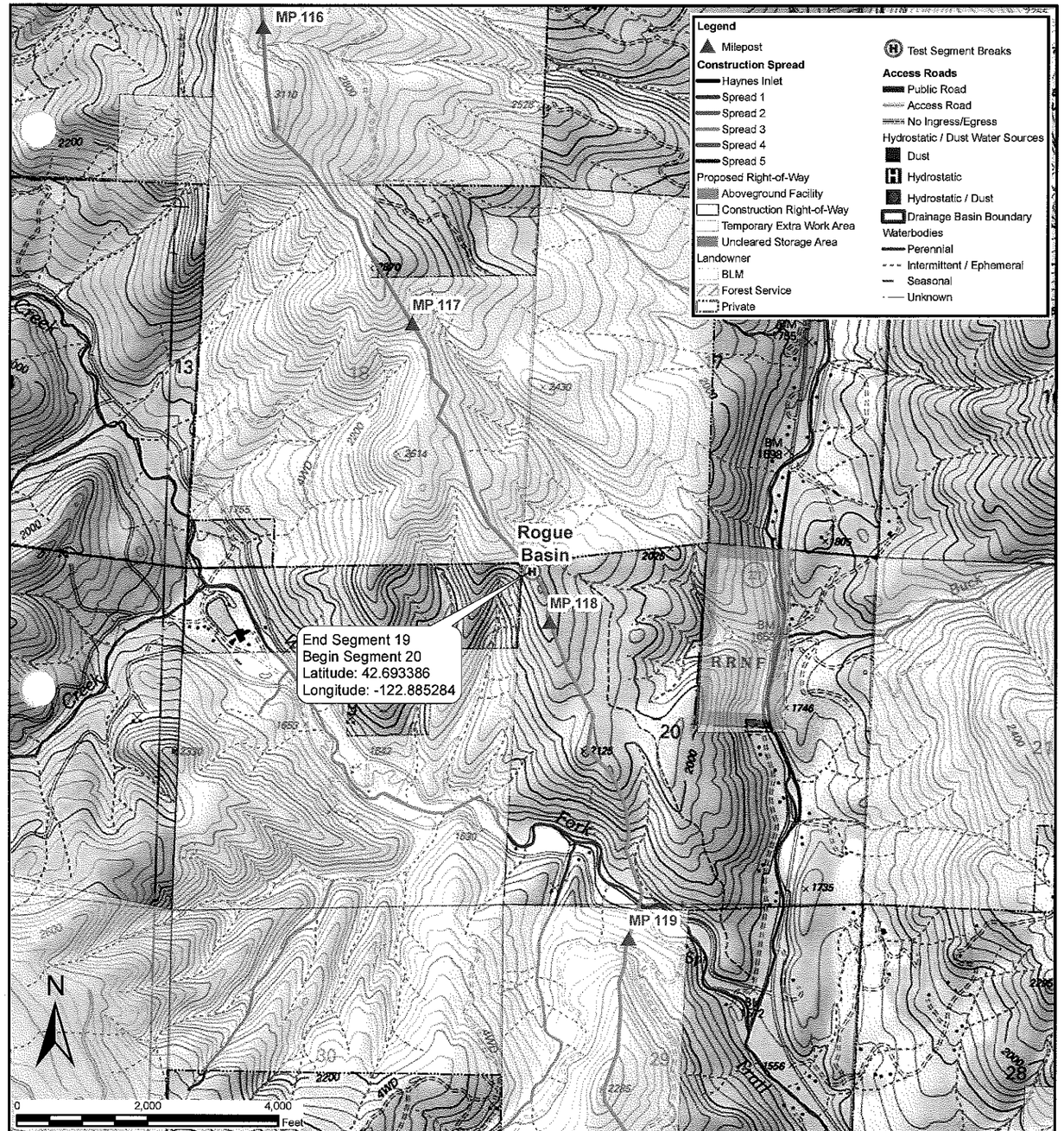
PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENTS 18 END / 19 BEGIN
S-36, T-32-S, R-2-W
JACKSON COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: Sept - 2015	ISSUED FOR BID:	SCALE: 1 : 500
CHK BY:	DATE:	ISSUED FOR CONST:	
APPR. BY:	DATE:	DRAWING NUMBER: Test Segments 18 / 19	SHEET 2 OF 2

Path: Q:\PCGP_2012\ArcMap\DEQ\Test Segments 18 and 19.mxd



DRAWING NO.	REFERENCE TITLE

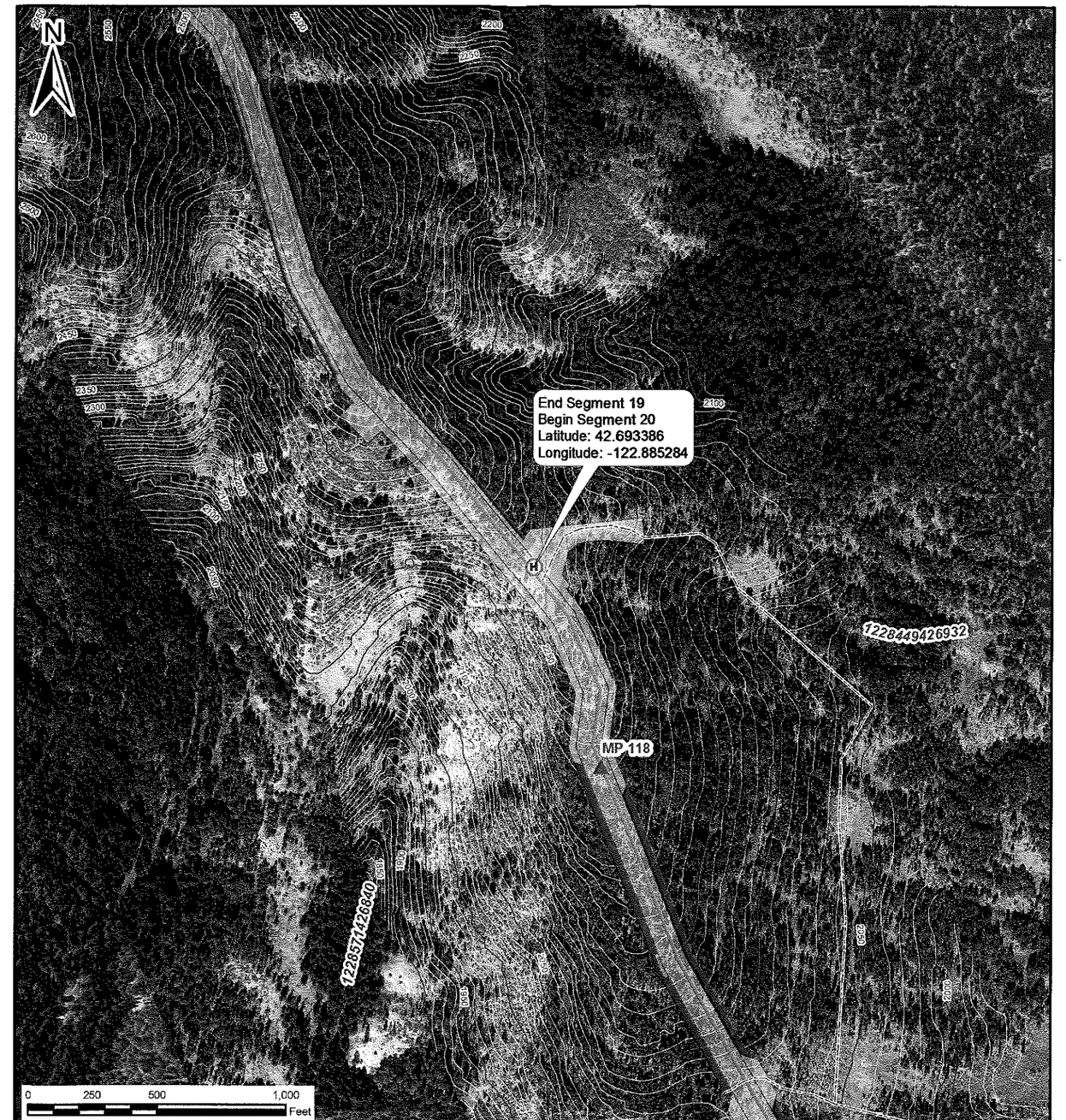
PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENTS 19 END / 20 BEGIN
S-20, T-33-S, R-1-W
JACKSON COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: Sept - 2015	ISSUED FOR BID:	SCALE: 1 : 2000
CHK BY:	DATE:	ISSUED FOR CONST:	
APPR. BY:	DATE:	DRAWING NUMBER: Test Segments 19 / 20	SHEET 1 OF 2

Path: Q:\PCGP_2012\ArcMap\DEQ\Test Segments 19 and 20.mxd



DRAWING NO.	REFERENCE TITLE

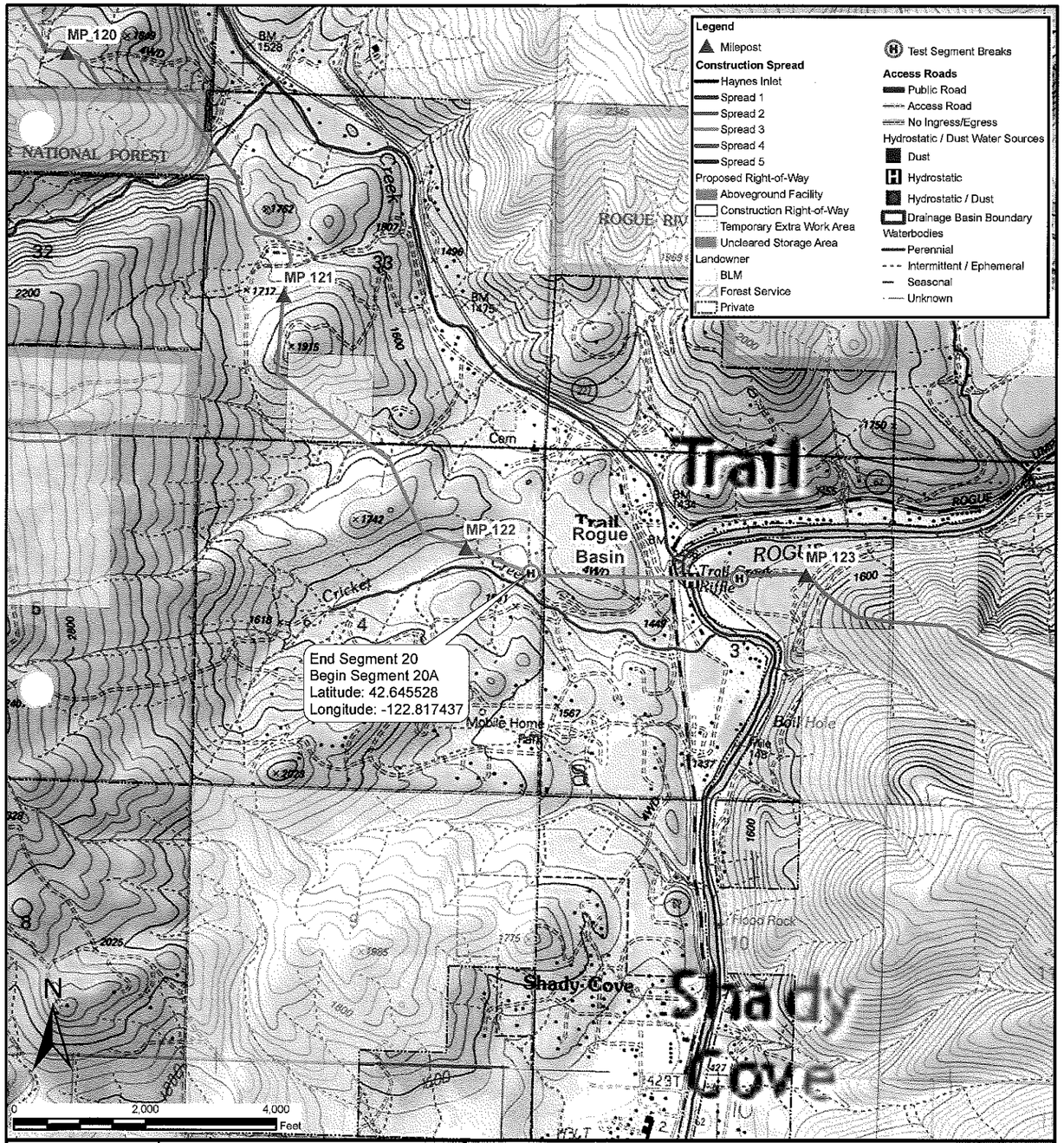
PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENTS 19 END / 20 BEGIN
S-20, T-33-S, R-1-W
JACKSON COUNTY, OREGON

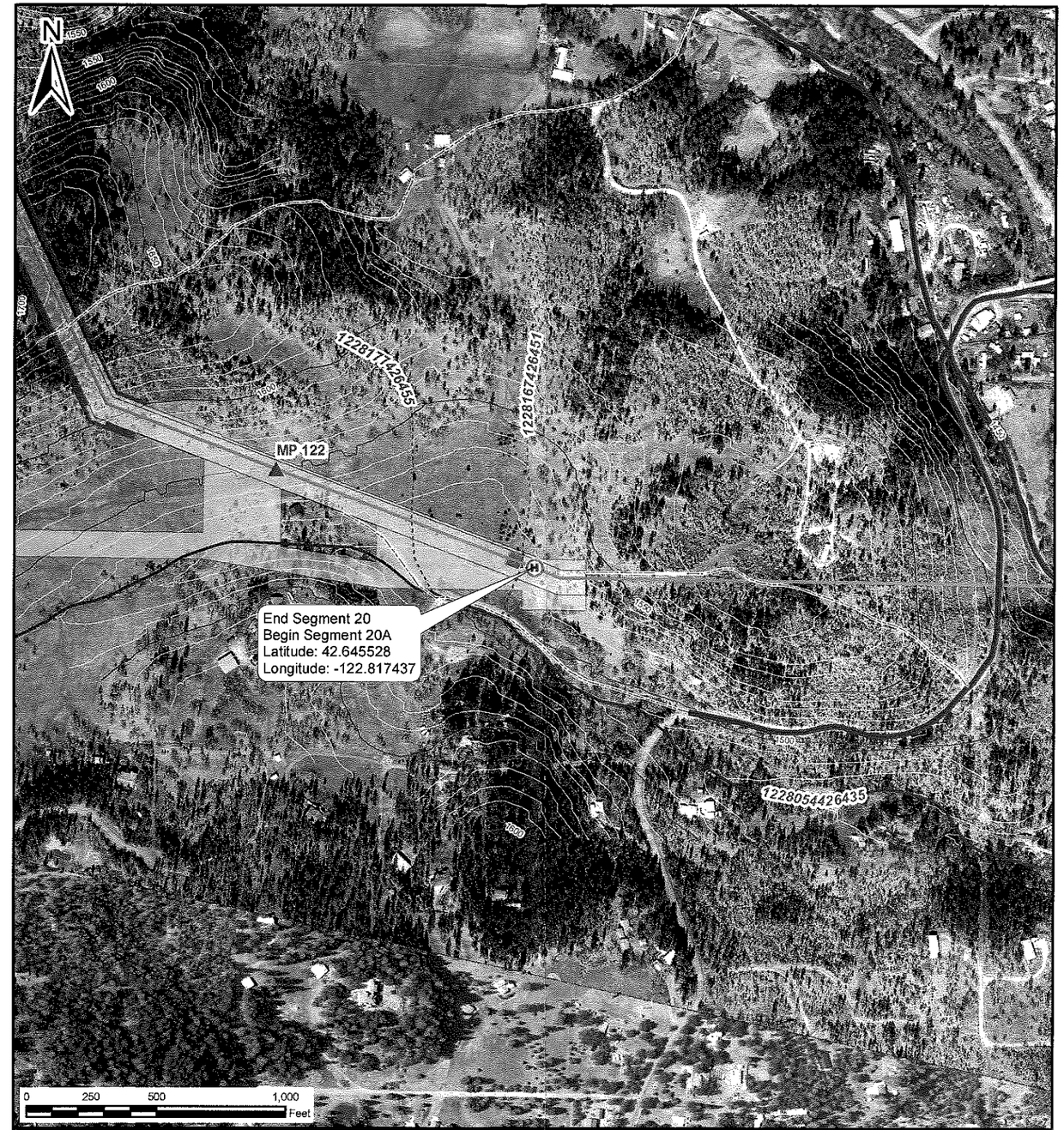
Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: Sept - 2015	ISSUED FOR BID:	SCALE: 1 : 500
CHK BY:	DATE:	ISSUED FOR CONST:	
APPR. BY:	DATE:	DRAWING NUMBER: Test Segments 19 / 20	SHEET 2 OF 2

Path: Q:\PCGP_2012\ArcMap\DEQ\Test Segments 19 and 20.mxd





DRAWING NO.	REFERENCE TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENTS 20 END / 20A BEGIN
S-4, T-34-S, R-1-W
JACKSON COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: Sept - 2015	ISSUED FOR BID:	SCALE: 1 : 2000
CHK BY:	DATE:	ISSUED FOR CONST:	
APPR. BY:	DATE:	DRAWING NUMBER: Test Segments 20 / 20A	SHEET 1 OF 2

Path: Q:\PCGP_2012\ArcMap\DEQ\Test Segments 20 and 20A.mxd

DRAWING NO.	REFERENCE TITLE

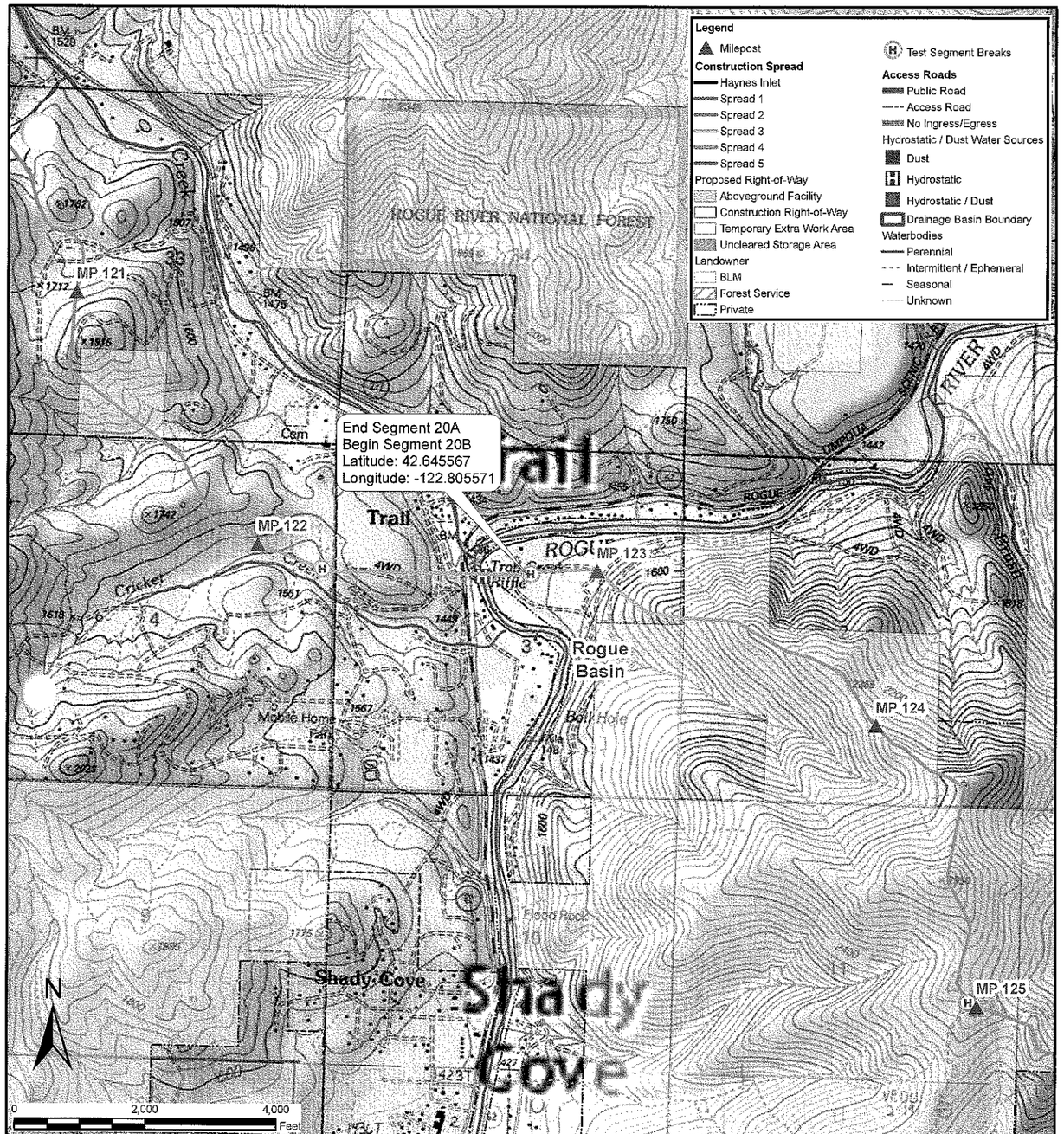
PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENTS 20 END / 20A BEGIN
S-4, T-34-S, R-1-W
JACKSON COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: Sept - 2015	ISSUED FOR BID:	SCALE: 1 : 500
CHK BY:	DATE:	ISSUED FOR CONST:	
APPR. BY:	DATE:	DRAWING NUMBER: Test Segments 20 / 20A	SHEET 2 OF 2

Path: Q:\PCGP_2012\ArcMap\DEQ\Test Segments 20 and 20A.mxd



DRAWING NO.	REFERENCE TITLE

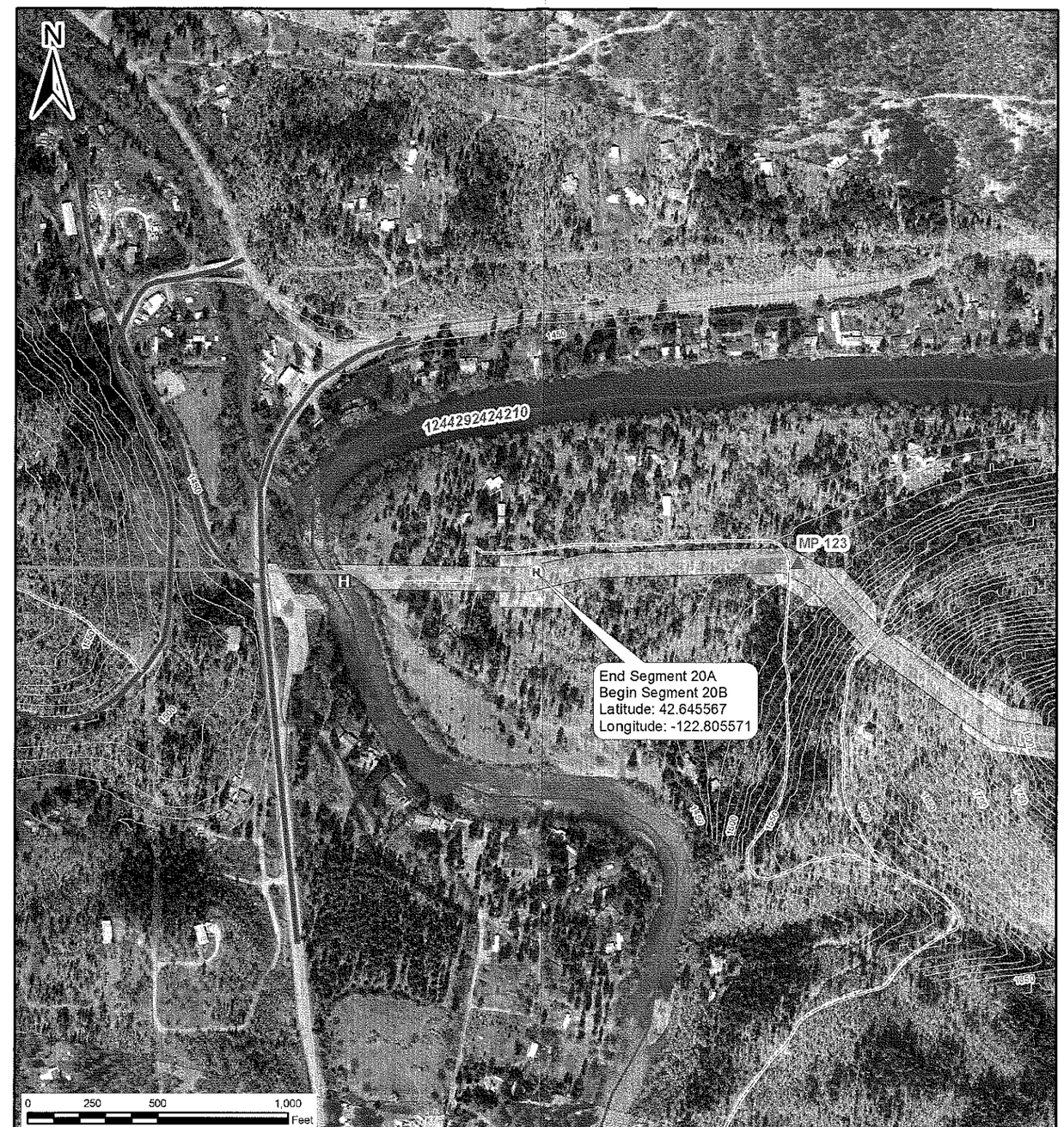
PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENTS 20A END / 20B BEGIN
S-3, T-34-S, R-1-W
JACKSON COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: Sept - 2015	ISSUED FOR BID:	SCALE: 1 : 2000
CHK BY:	DATE:	ISSUED FOR CONST:	
APPR. BY:	DATE:	DRAWING NUMBER: Test Segments 20A / 20B	SHEET 1 OF 2

Path: Q:\PCGP_2012\ArcMap\DEQ\Test Segments 20A and 20B.mxd



DRAWING NO.	REFERENCE TITLE

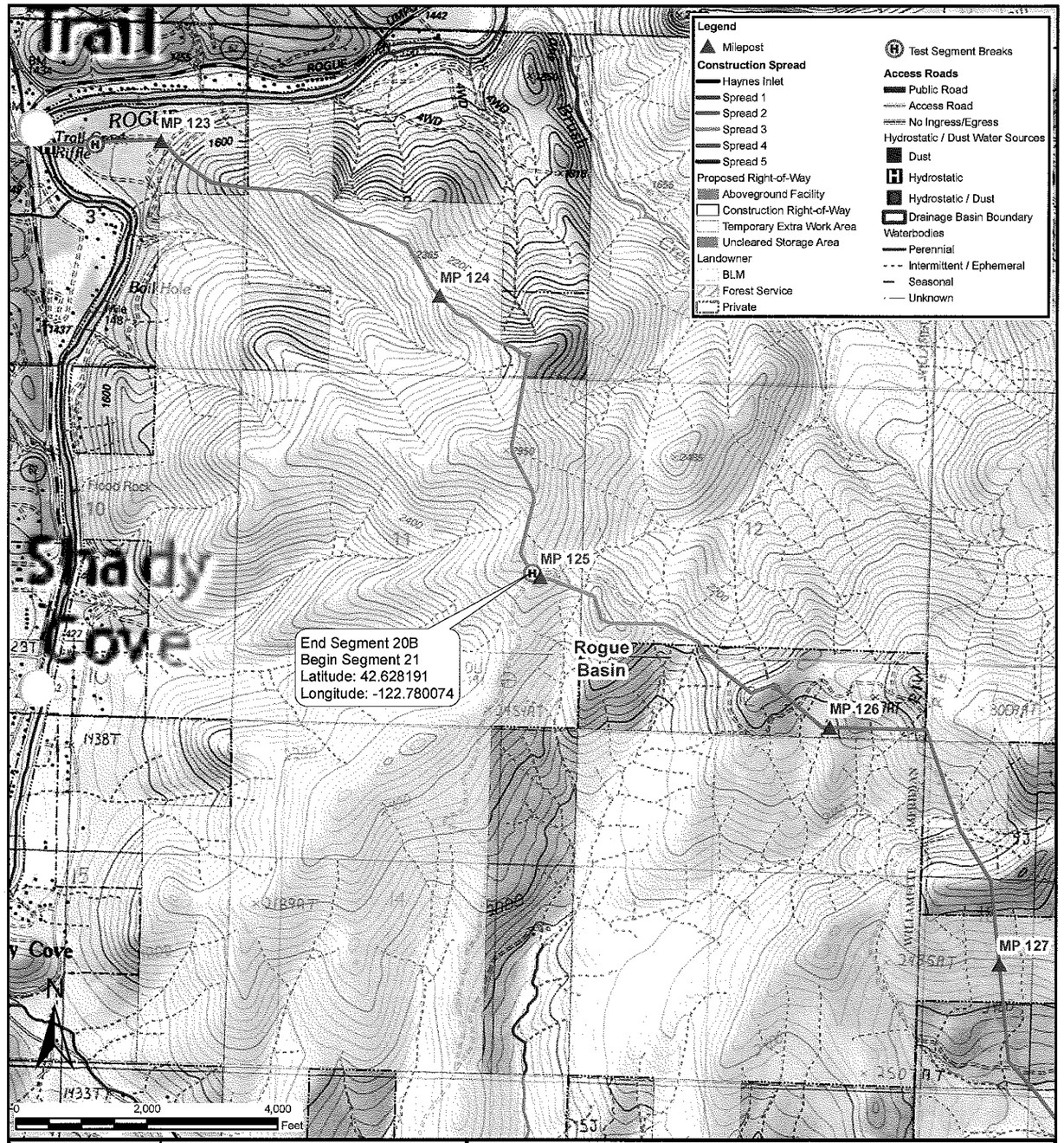
PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENTS 20A END / 20B BEGIN
S-3, T-34-S, R-1-W
JACKSON COUNTY, OREGON

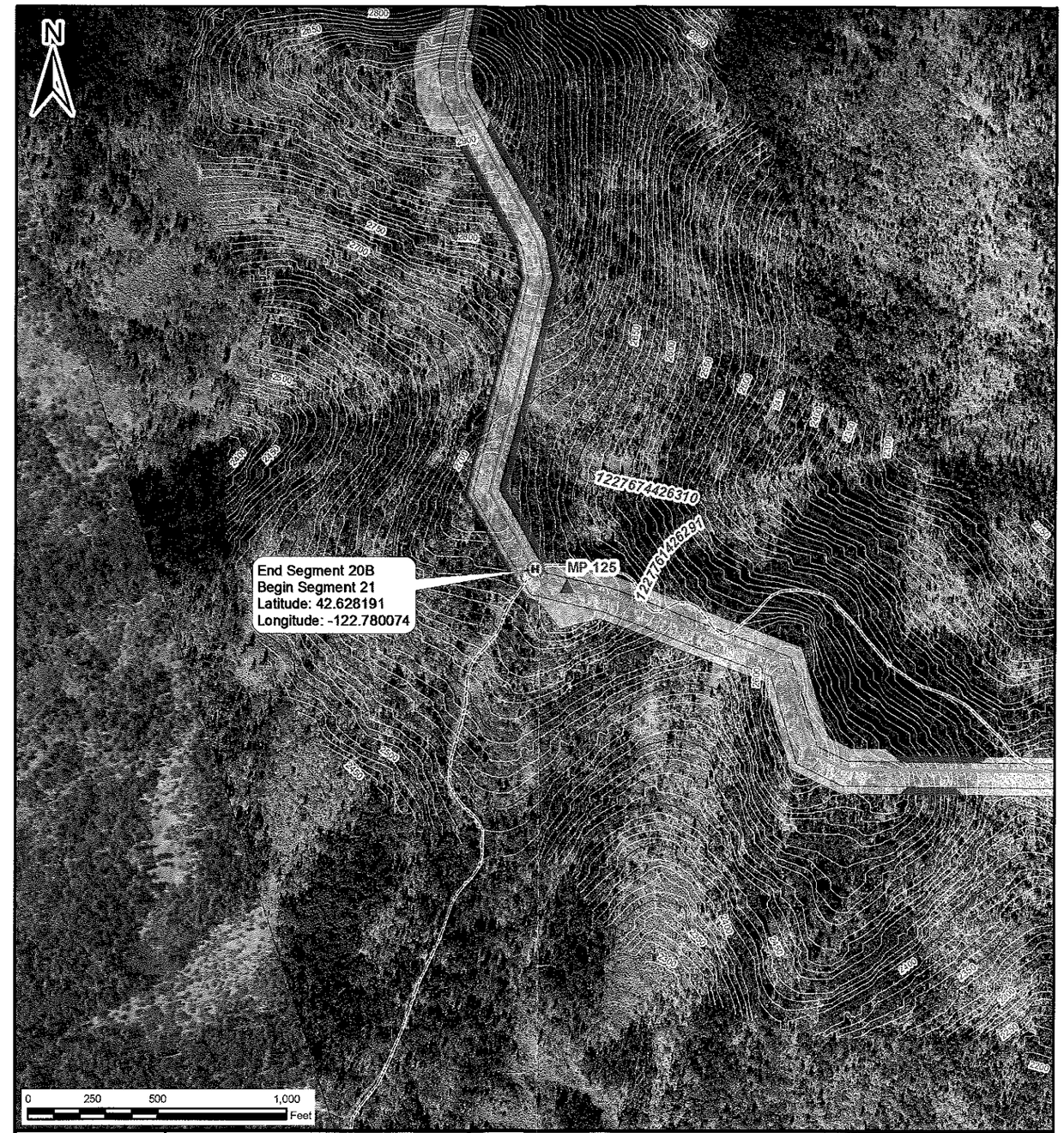
Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: Sept - 2015	ISSUED FOR BID:	SCALE: 1 : 500
CHK BY:	DATE:	ISSUED FOR CONST:	
APPR. BY:	DATE:	DRAWING NUMBER: Test Segments 20A / 20B	SHEET 2 OF 2

Path: Q:\PCGP_2012\ArcMap\DEQ\Test Segments 20A and 20B.mxd





DRAWING NO.	REFERENCE TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENTS 20B END / 21 BEGIN
S-11, T-34-S, R-1-W
JACKSON COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: Sept - 2015	ISSUED FOR BID:	SCALE: 1 : 2000
CHK BY:	DATE:	ISSUED FOR CONST:	
APPR. BY:	DATE:	DRAWING NUMBER: Test Segments 20B / 21	SHEET 1 OF 2

Path: Q:\PCGP_2012\ArcMap\DEQ\Test Segments 20B and 21.mxd

DRAWING NO.	REFERENCE TITLE

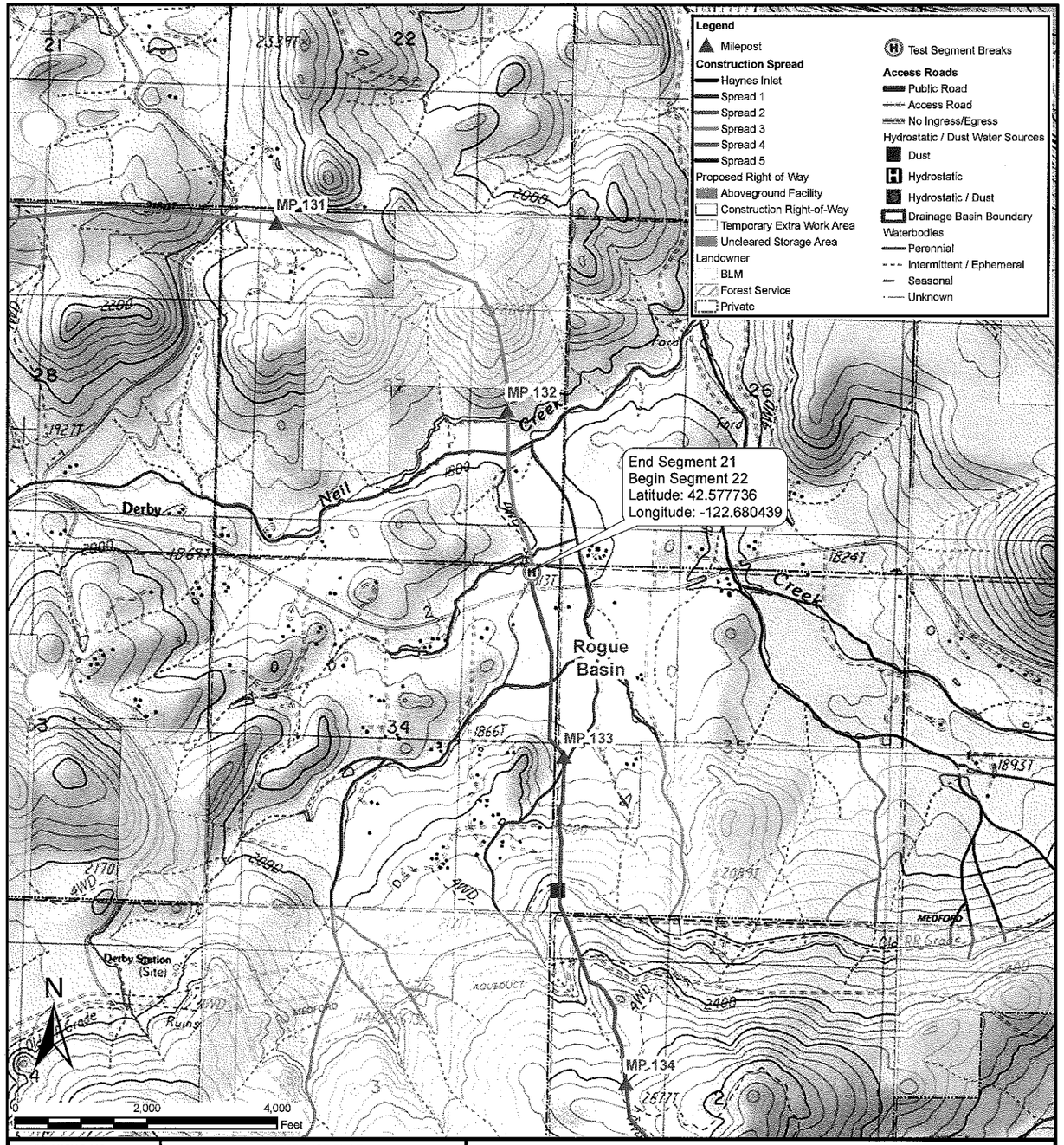
PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENTS 20B END / 21 BEGIN
S-11, T-34-S, R-1-W
JACKSON COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: Sept - 2015	ISSUED FOR BID:	SCALE: 1 : 500
CHK BY:	DATE:	ISSUED FOR CONST:	
APPR. BY:	DATE:	DRAWING NUMBER: Test Segments 20B / 21	SHEET 2 OF 2

Path: Q:\PCGP_2012\ArcMap\DEQ\Test Segments 20B and 21.mxd



DRAWING NO.	REFERENCE TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENTS 21 END / 22 BEGIN
S-34, T-34-S, R-1-E
JACKSON COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: Sept - 2015	ISSUED FOR BID:	SCALE: 1 : 2000
CHK BY:	DATE:	ISSUED FOR CONST:	
APPR. BY:	DATE:	DRAWING NUMBER: Test Segments 21 / 22	SHEET 1 OF 2

Path: Q:\PCGP_2012\ArcMap\DEQ\Test Segments 21 and 22.mxd

DRAWING NO.	REFERENCE TITLE

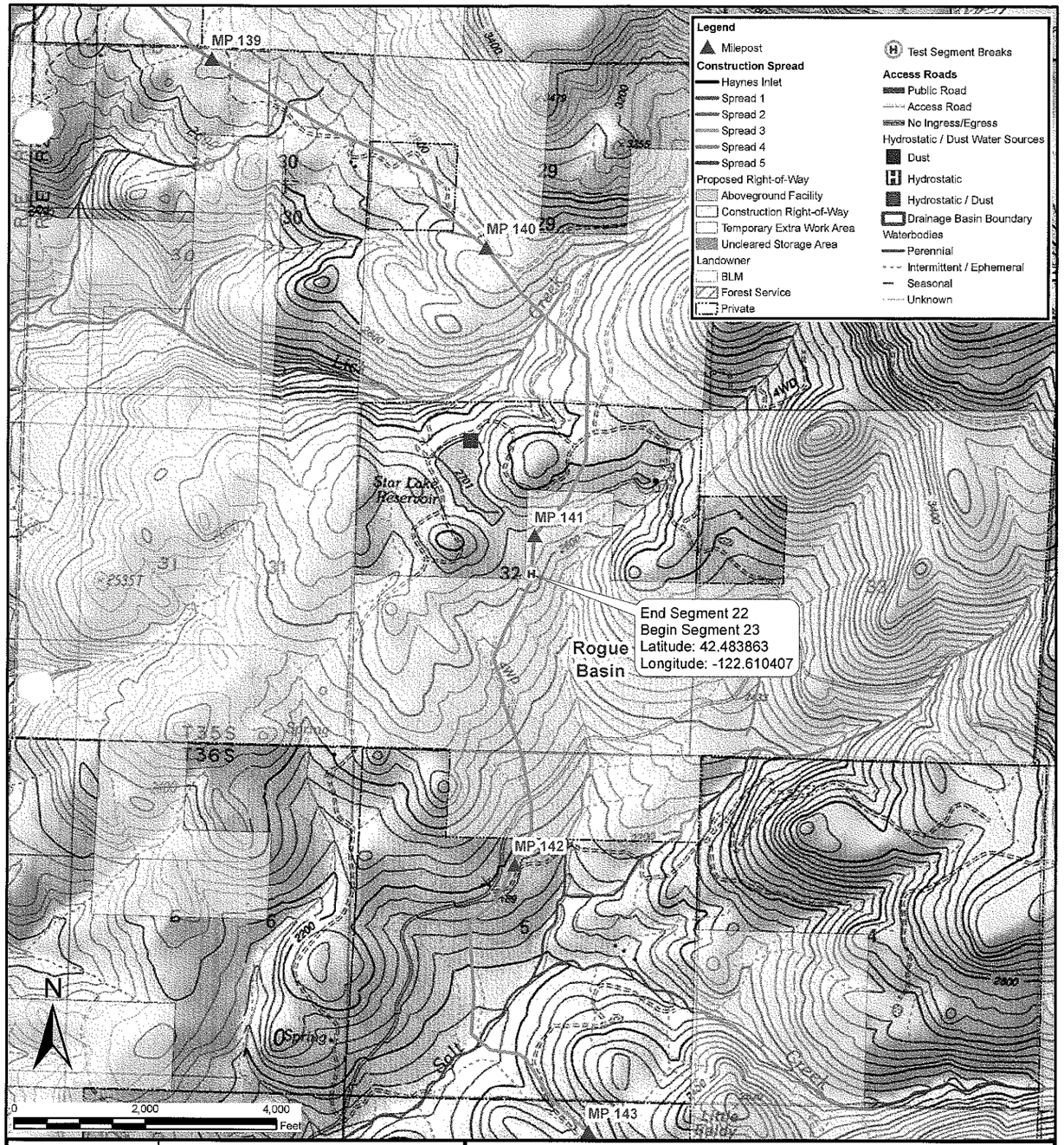
PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENTS 21 END / 22 BEGIN
S-34, T-34-S, R-1-E
JACKSON COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: Sept - 2015	ISSUED FOR BID:	SCALE: 1 : 500
CHK BY:	DATE:	ISSUED FOR CONST:	
APPR. BY:	DATE:	DRAWING NUMBER: Test Segments 21 / 22	SHEET 2 OF 2

Path: Q:\PCGP_2012\ArcMap\DEQ\Test Segments 21 and 22.mxd



DRAWING NO.	REFERENCE TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENTS 22 END / 23 BEGIN
S-32, T-35-S, R-2-E
JACKSON COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: Sept - 2015	ISSUED FOR BID:	SCALE: 1 : 2000
CHK BY:	DATE:	ISSUED FOR CONST:	
APPR. BY:	DATE:	DRAWING NUMBER: Test Segments 22 / 23	SHEET 1 OF 2

Path: Q:\PCGP_2012\ArcMap\DEQ\Test Segments 22 and 23.mxd

DRAWING NO.	REFERENCE TITLE

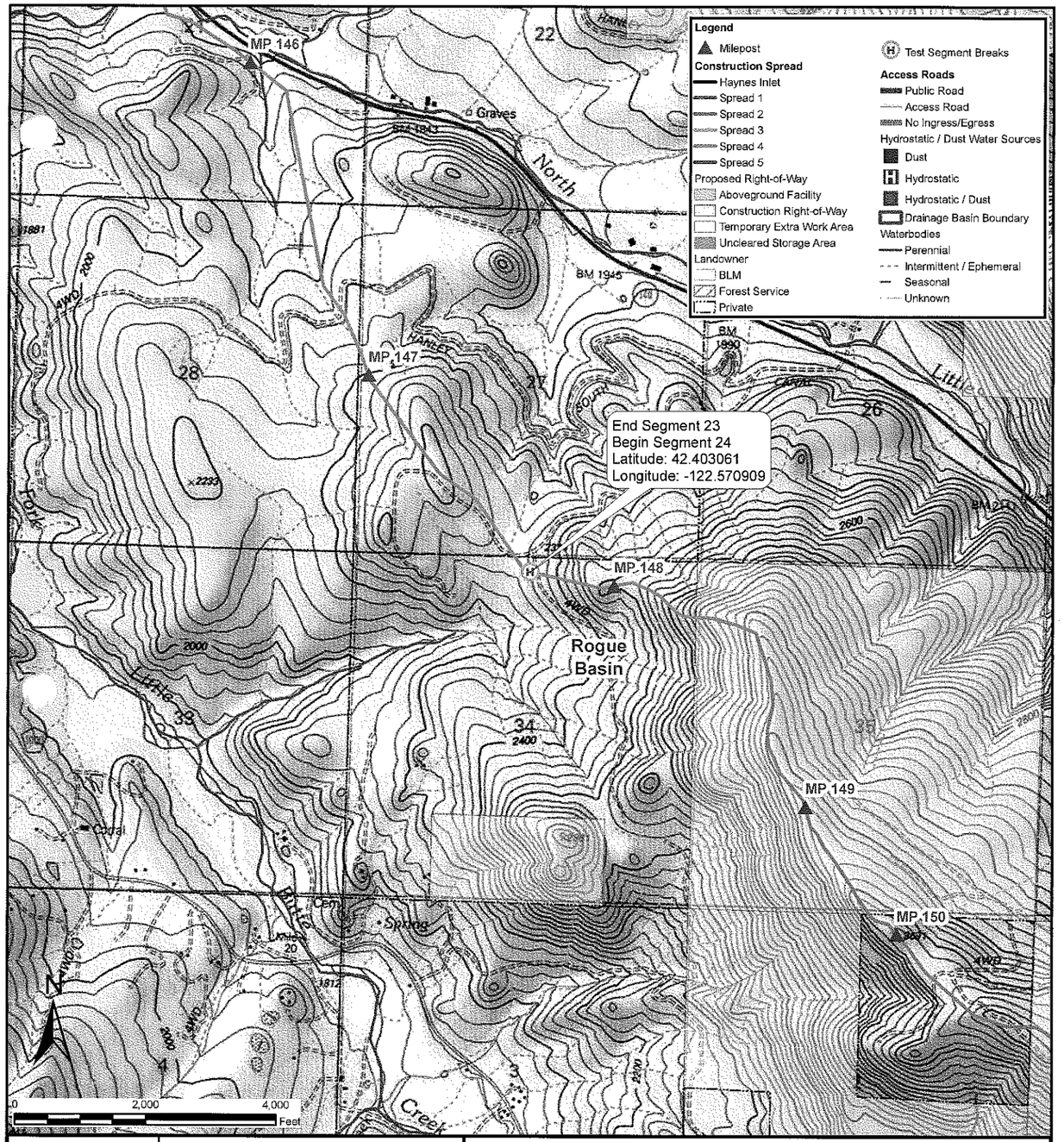
PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENTS 22 END / 23 BEGIN
S-32, T-35-S, R-2-E
JACKSON COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: Sept - 2015	ISSUED FOR BID:	SCALE: 1 : 500
CHK BY:	DATE:	ISSUED FOR CONST:	
APPR. BY:	DATE:	DRAWING NUMBER: Test Segments 22 / 23	SHEET 2 OF 2

Path: Q:\PCGP_2012\ArcMap\DEQ\Test Segments 22 and 23.mxd



DRAWING NO.	REFERENCE TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENTS 23 END / 24 BEGIN
S-34, T-36-S, R-2-E
JACKSON COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: Sept - 2015	ISSUED FOR BID:	SCALE: 1 : 2000
CHK BY:	DATE:	ISSUED FOR CONST:	
APPR. BY:	DATE:	DRAWING NUMBER: Test Segments 23 / 24	SHEET 1 OF 2

Path: Q:\PCGP_2012\ArcMap\DEQ\Test Segments 23 and 24.mxd

DRAWING NO.	REFERENCE TITLE

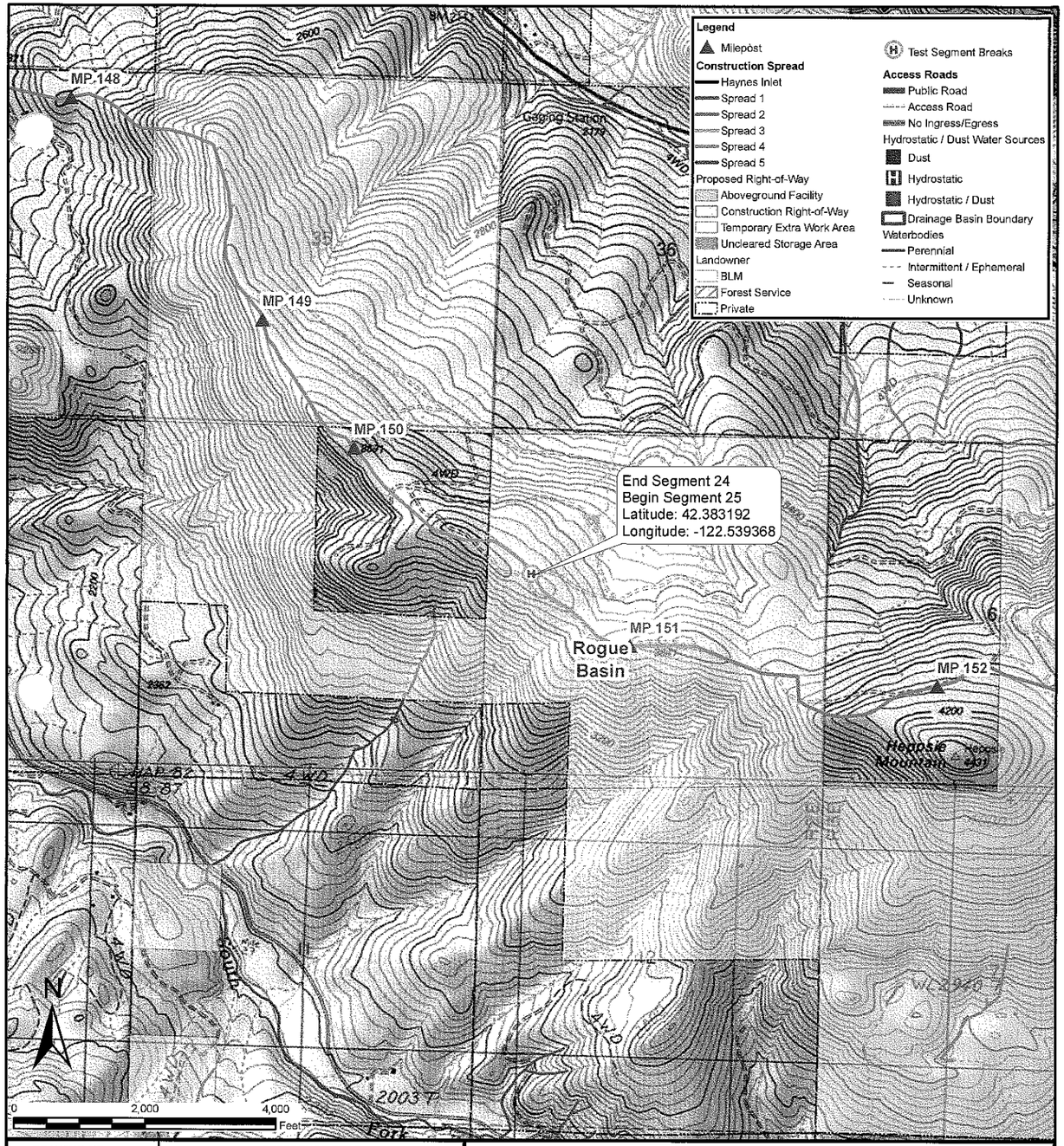
PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENTS 23 END / 24 BEGIN
S-34, T-36-S, R-2-E
JACKSON COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: Sept - 2015	ISSUED FOR BID:	SCALE: 1 : 500
CHK BY:	DATE:	ISSUED FOR CONST:	
APPR. BY:	DATE:	DRAWING NUMBER: Test Segments 23 / 24	SHEET 2 OF 2

Path: Q:\PCGP_2012\ArcMap\DEQ\Test Segments 23 and 24.mxd



DRAWING NO.	REFERENCE TITLE

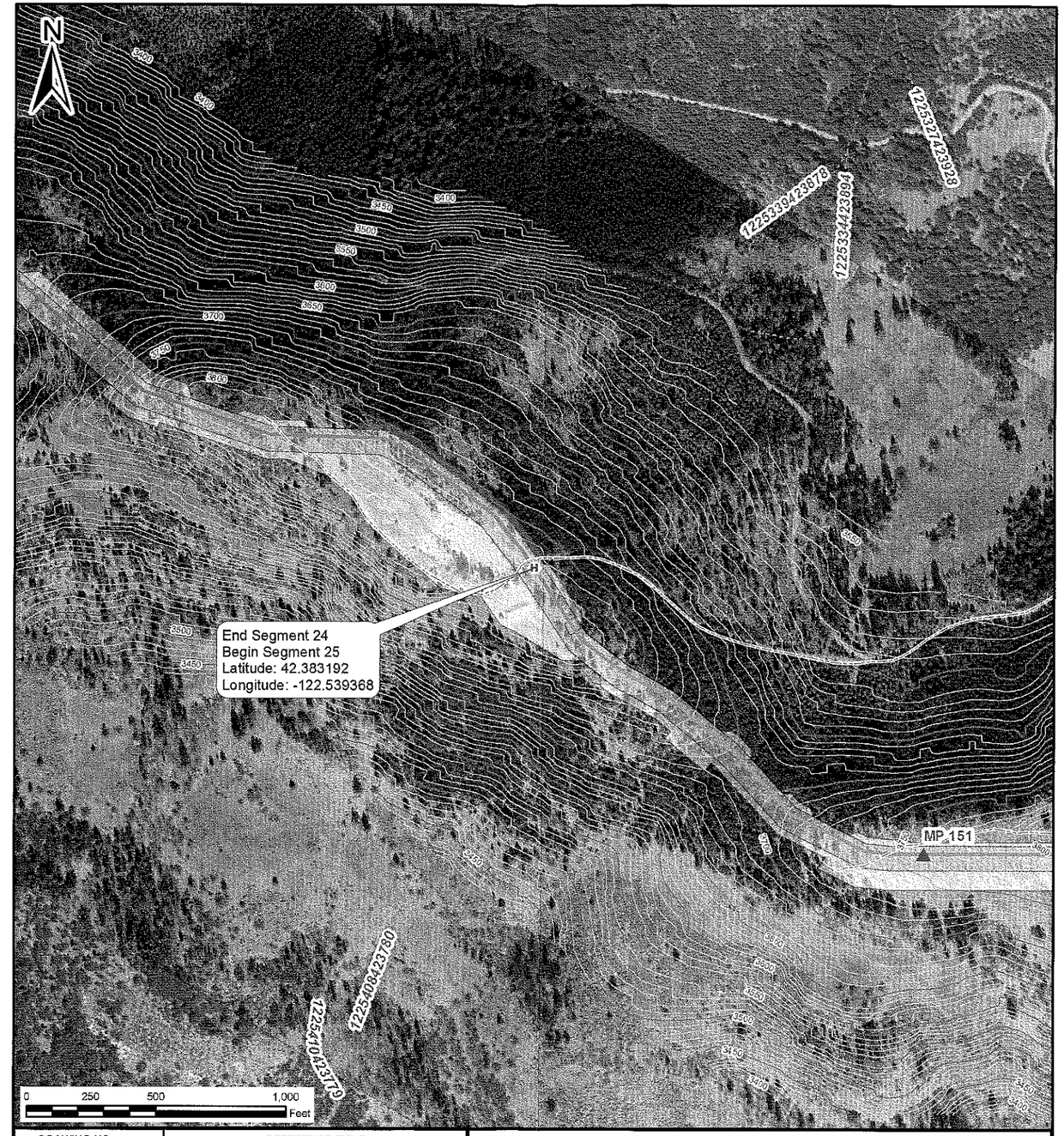
PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENTS 24 END / 25 BEGIN
S-1, T-37-S, R-2-E
JACKSON COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: Sept - 2015	ISSUED FOR BID:	SCALE: 1 : 2000
CHK BY:	DATE:	ISSUED FOR CONST:	
APPR. BY:	DATE:	DRAWING NUMBER: Test Segments 24 / 25	SHEET 1 OF 2

Path: Q:\PCGP_2012\ArcMap\DEQ\Test Segments 24 and 25.mxd



DRAWING NO.	REFERENCE TITLE

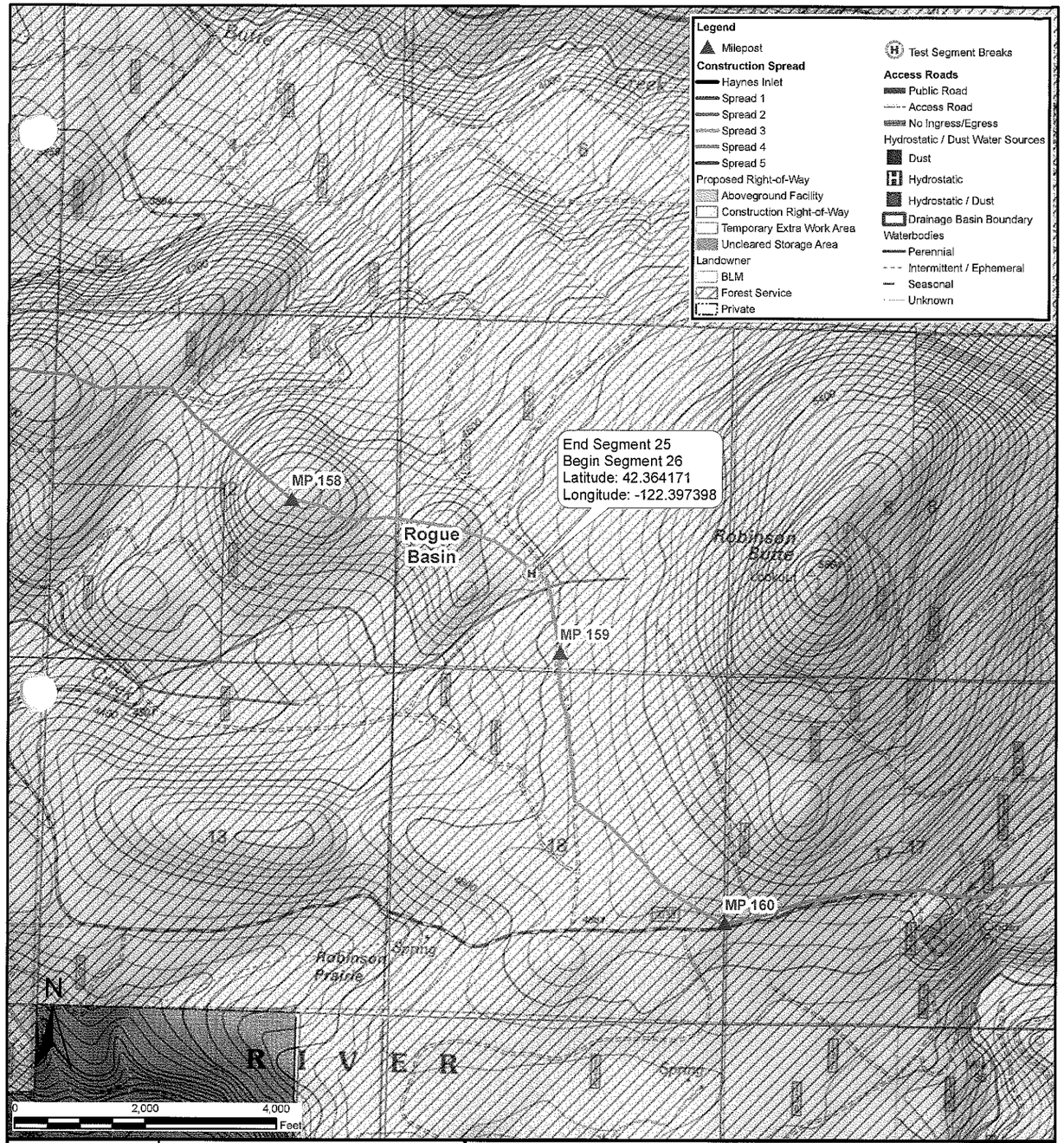
PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENTS 24 END / 25 BEGIN
S-1, T-37-S, R-2-E
JACKSON COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: Sept - 2015	ISSUED FOR BID:	SCALE: 1 : 500
CHK BY:	DATE:	ISSUED FOR CONST:	
APPR. BY:	DATE:	DRAWING NUMBER: Test Segments 24 / 25	SHEET 2 OF 2

Path: Q:\PCGP_2012\ArcMap\DEQ\Test Segments 24 and 25.mxd



DRAWING NO.	REFERENCE TITLE

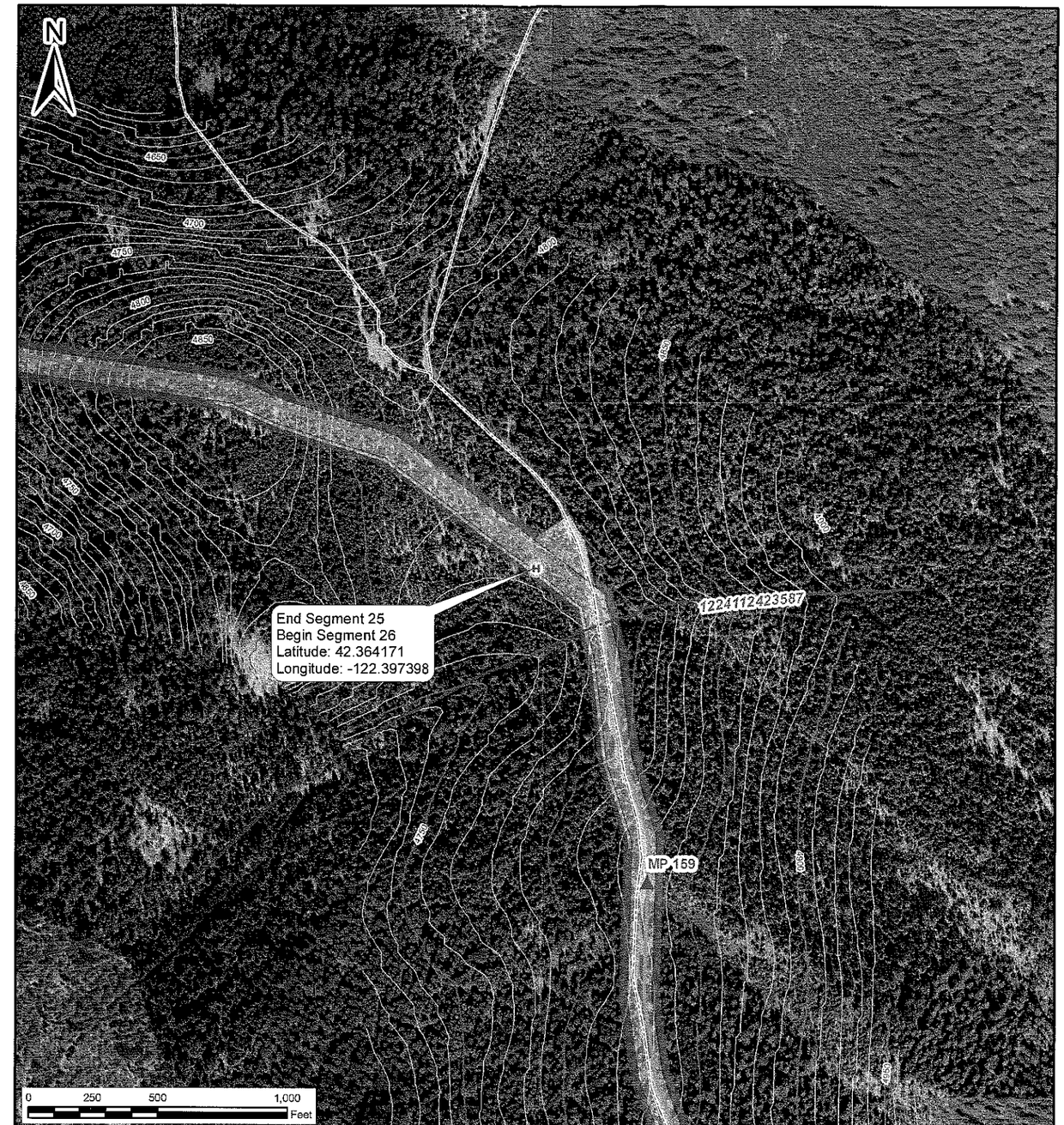
PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENTS 25 END / 26 BEGIN
S-7, T-37-S, R-4-E
JACKSON COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: Sept - 2015	ISSUED FOR BID:	SCALE: 1 : 2000
CHK BY:	DATE:	ISSUED FOR CONST:	
APPR. BY:	DATE:	DRAWING NUMBER: Test Segments 25 / 26	SHEET 1 OF 2

Path: Q:\PCGP_2012\ArcMap\DEQ\Test Segments 25 and 26.mxd



DRAWING NO.	REFERENCE TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENTS 25 END / 26 BEGIN
S-7, T-37-S, R-4-E
JACKSON COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: Sept - 2015	ISSUED FOR BID:	SCALE: 1 : 500
CHK BY:	DATE:	ISSUED FOR CONST:	
APPR. BY:	DATE:	DRAWING NUMBER: Test Segments 25 / 26	SHEET 2 OF 2

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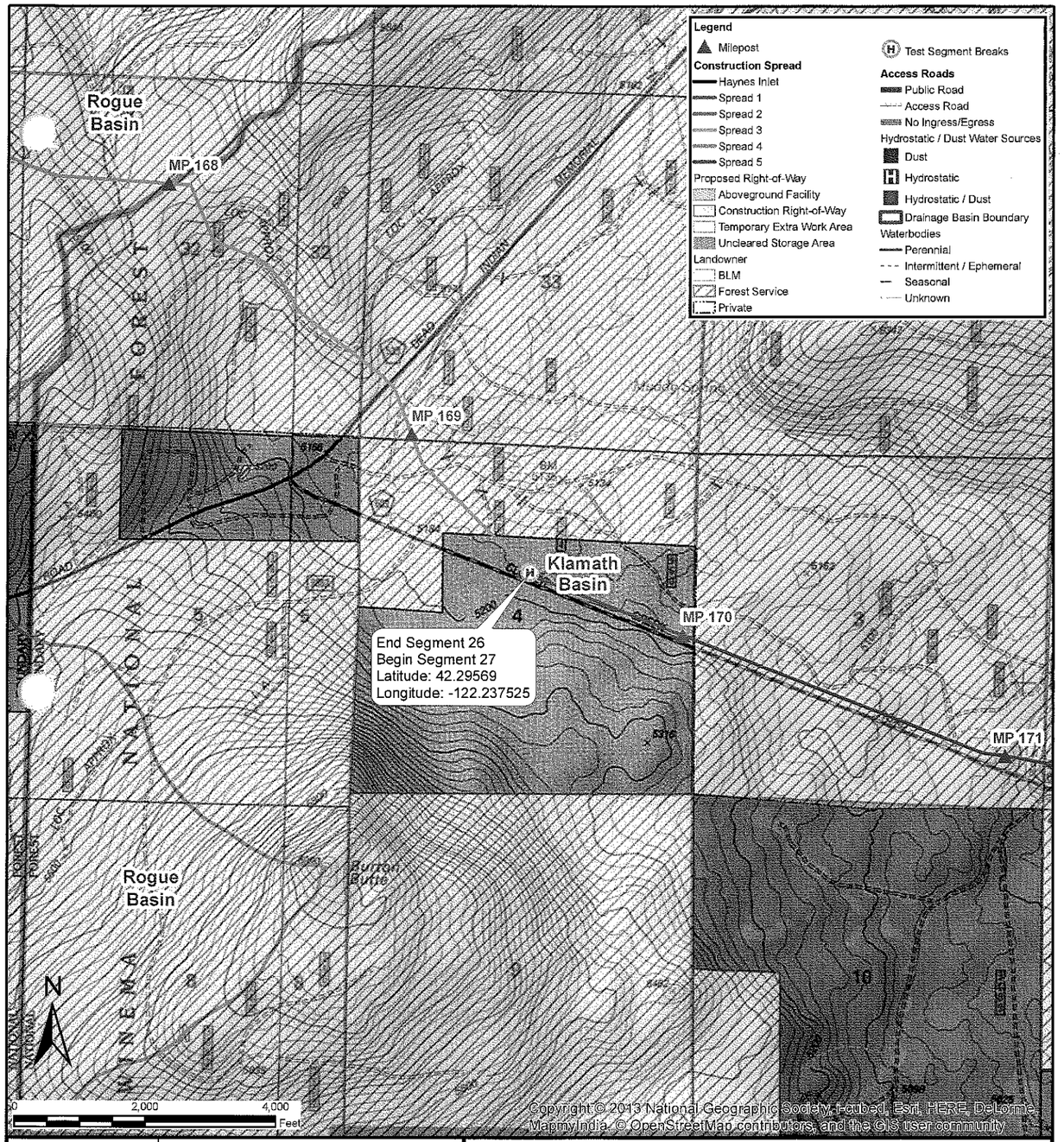

DRAWING NO.	REFERENCE TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENTS 26 END / 27 BEGIN
S-4, T-38-S, R-5-E
JACKSON COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: Sept - 2015	ISSUED FOR BID:	SCALE: 1 : 2000
CHK BY:	DATE:	ISSUED FOR CONST:	
APPR. BY:	DATE:	DRAWING NUMBER: Test Segments 26 / 27	SHEET 1 OF 2

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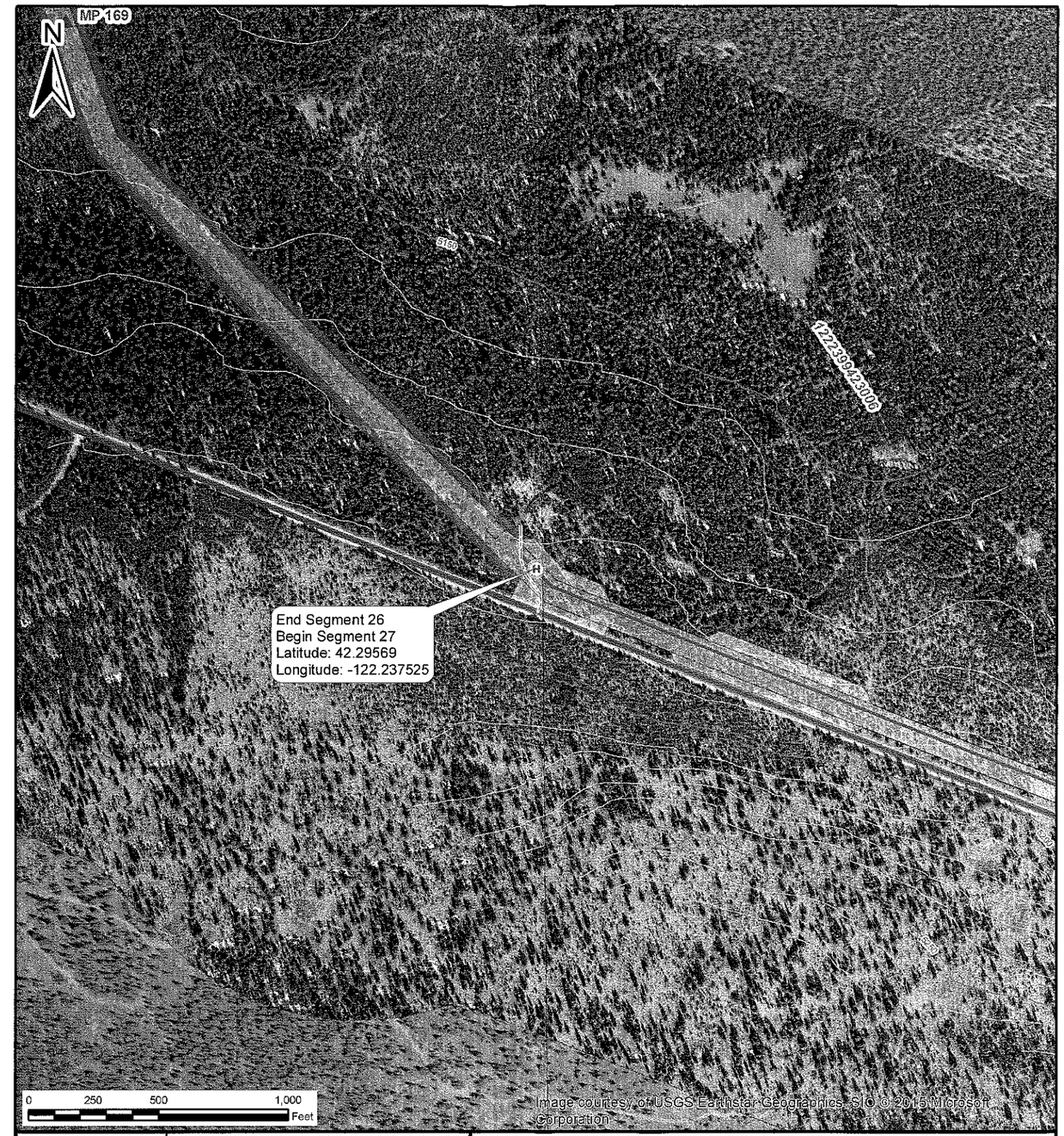

DRAWING NO.	REFERENCE TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENTS 26 END / 27 BEGIN
S-4, T-38-S, R-5-E
JACKSON COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: Sept - 2015	ISSUED FOR BID:	SCALE: 1 : 500
CHK BY:	DATE:	ISSUED FOR CONST:	
APPR. BY:	DATE:	DRAWING NUMBER: Test Segments 26 / 27	SHEET 2 OF 2

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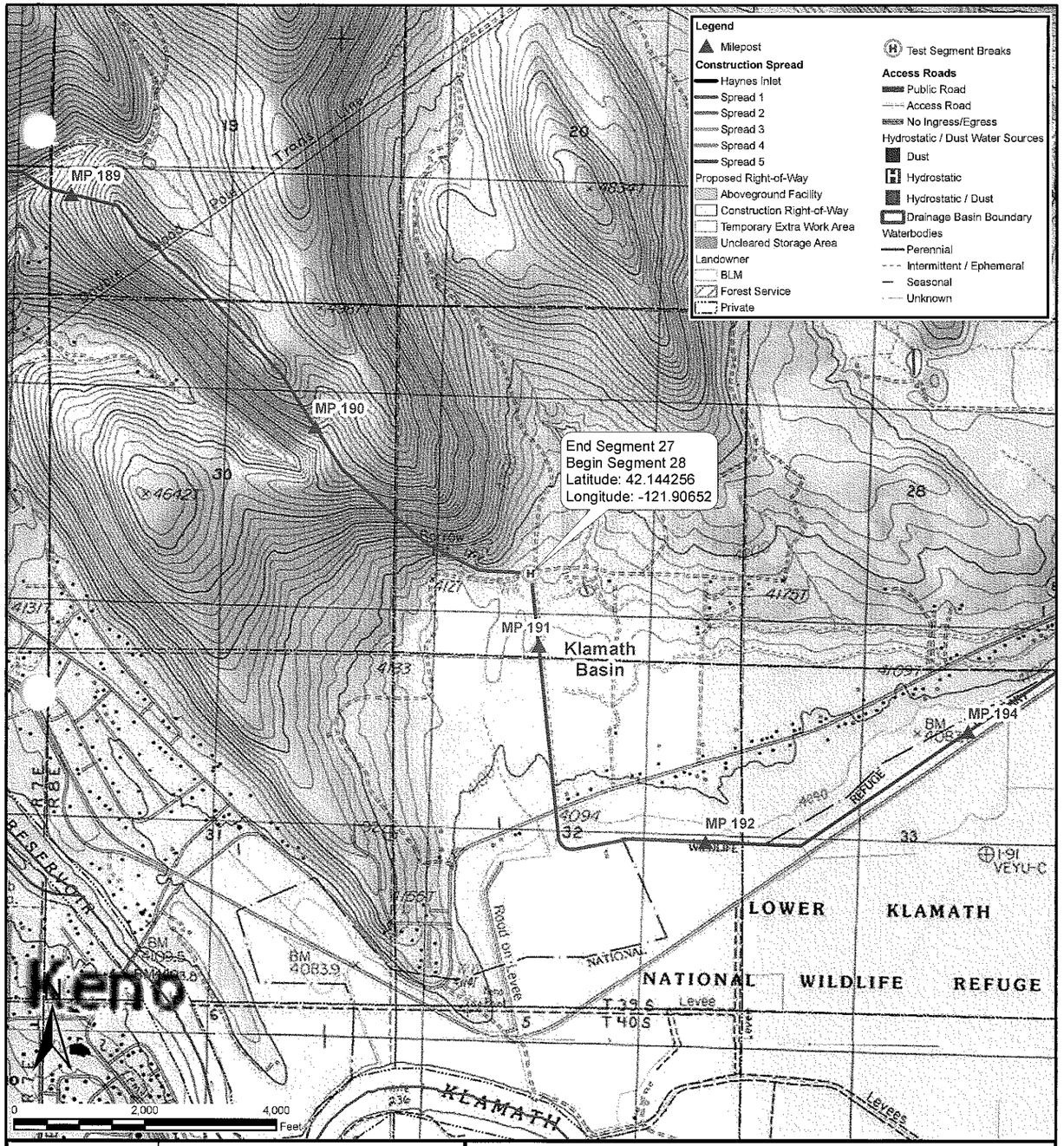

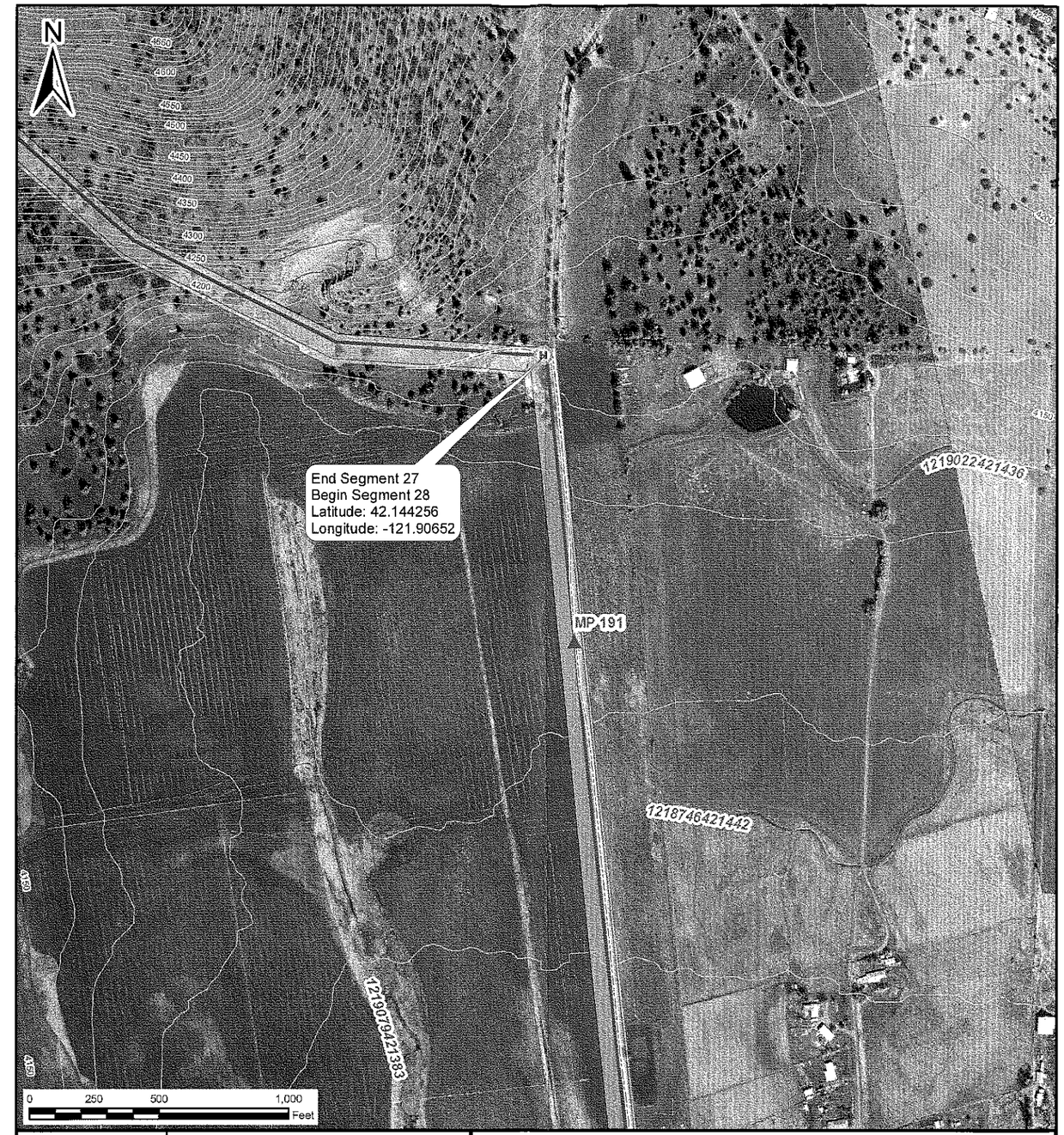

DRAWING NO.	REFERENCE TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENTS 27 END / 28 BEGIN
S-29, T-39-S, R-8-E
KLAMATH COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: Sept - 2015	ISSUED FOR BID:	SCALE: 1 : 2000
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APPR. BY:	DATE:	DRAWING NUMBER: Test Segments 27 / 28	SHEET 1 OF 2

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DRAWING NO.	REFERENCE TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENTS 27 END / 28 BEGIN
S-29, T-39-S, R-8-E
KLAMATH COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: Sept - 2015	ISSUED FOR BID:	SCALE: 1 : 500
CHK BY:	DATE:	ISSUED FOR CONST:	
APPR. BY:	DATE:	DRAWING NUMBER: Test Segments 27 / 28	SHEET 2 OF 2

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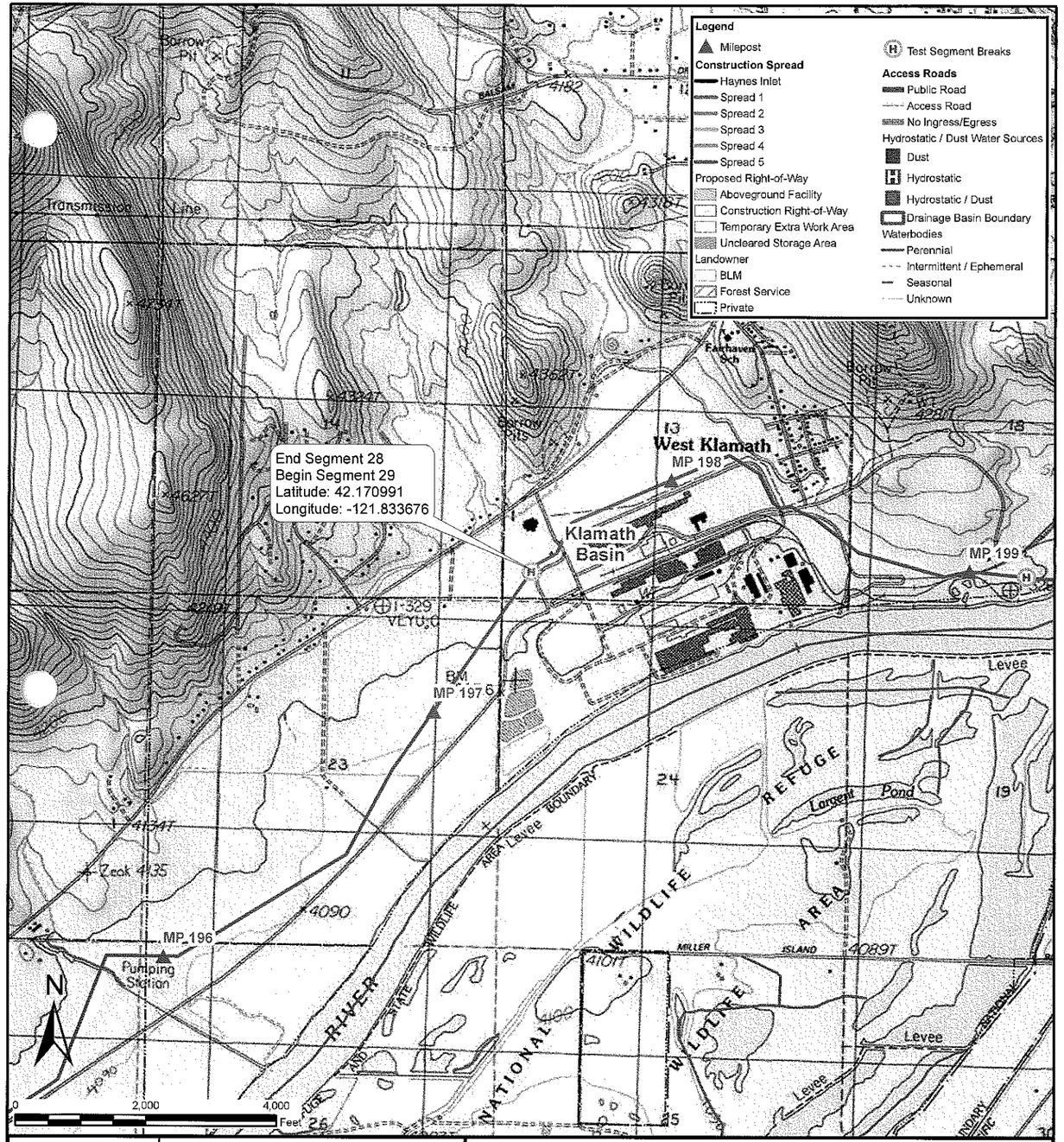

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PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENTS 28 END / 29 BEGIN
S-13, T-39-S, R-8-E
KLAMATH COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: Sept - 2015	ISSUED FOR BID:	SCALE: 1 : 2000
CHK BY:	DATE:	ISSUED FOR CONST:	
APPR. BY:	DATE:	DRAWING NUMBER: Test Segments 28 / 29	SHEET 1 OF 2

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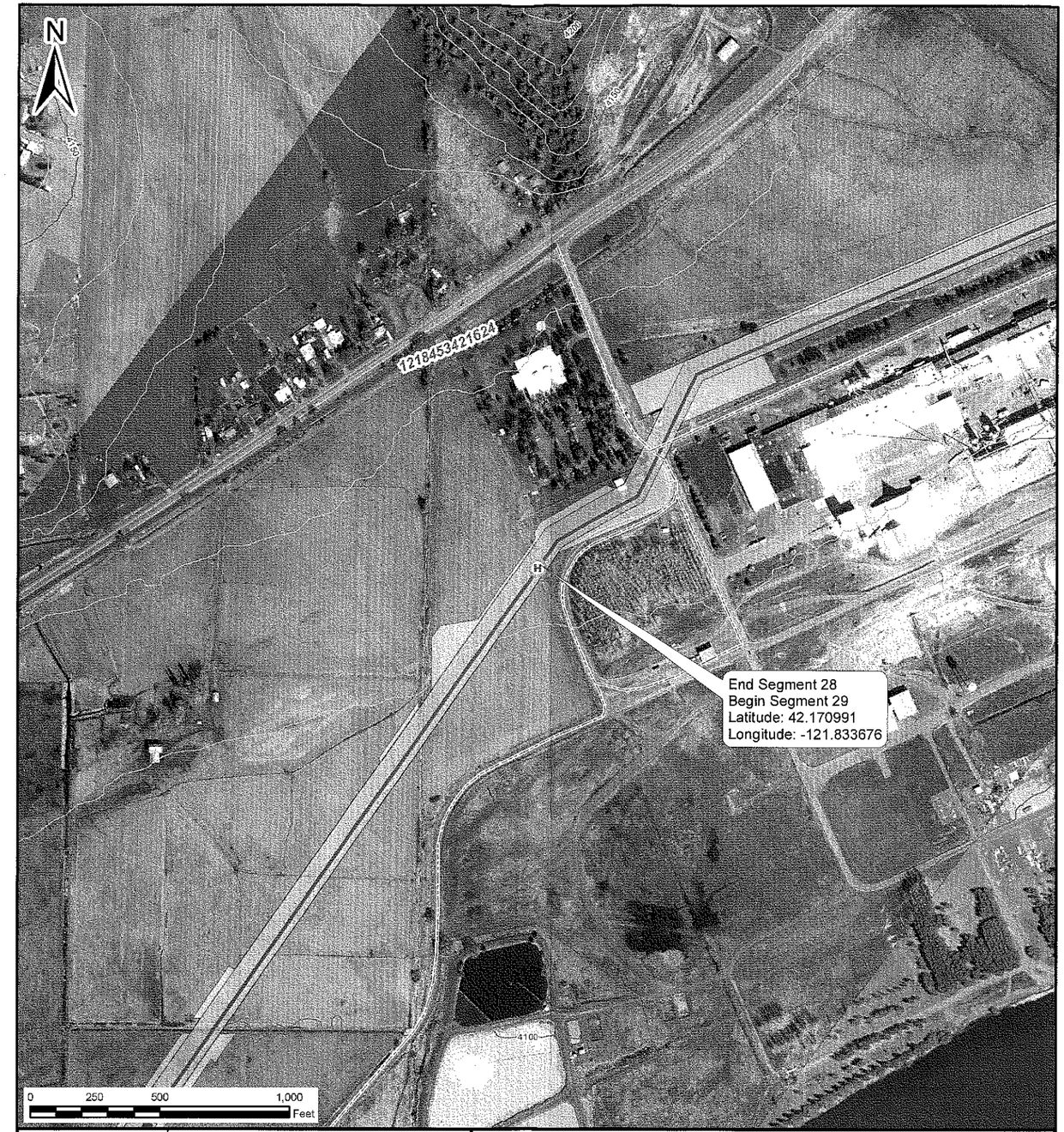

DRAWING NO.	REFERENCE TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
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36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENTS 28 END / 29 BEGIN
S-13, T-39-S, R-8-E
KLAMATH COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: Sept - 2015	ISSUED FOR BID:	SCALE: 1 : 500
CHK BY:	DATE:	ISSUED FOR CONST:	
APPR. BY:	DATE:	DRAWING NUMBER: Test Segments 28 / 29	SHEET 2 OF 2

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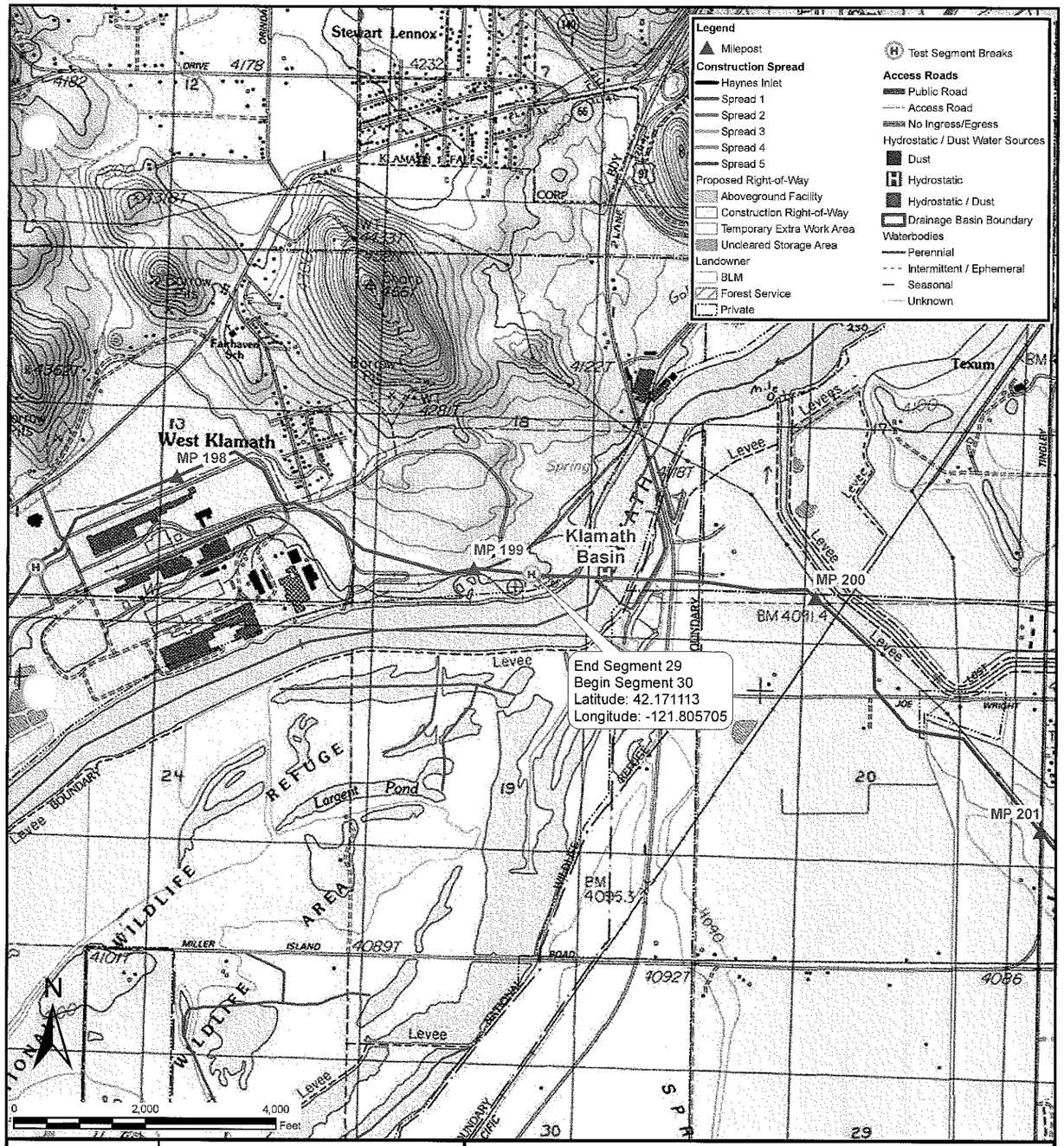

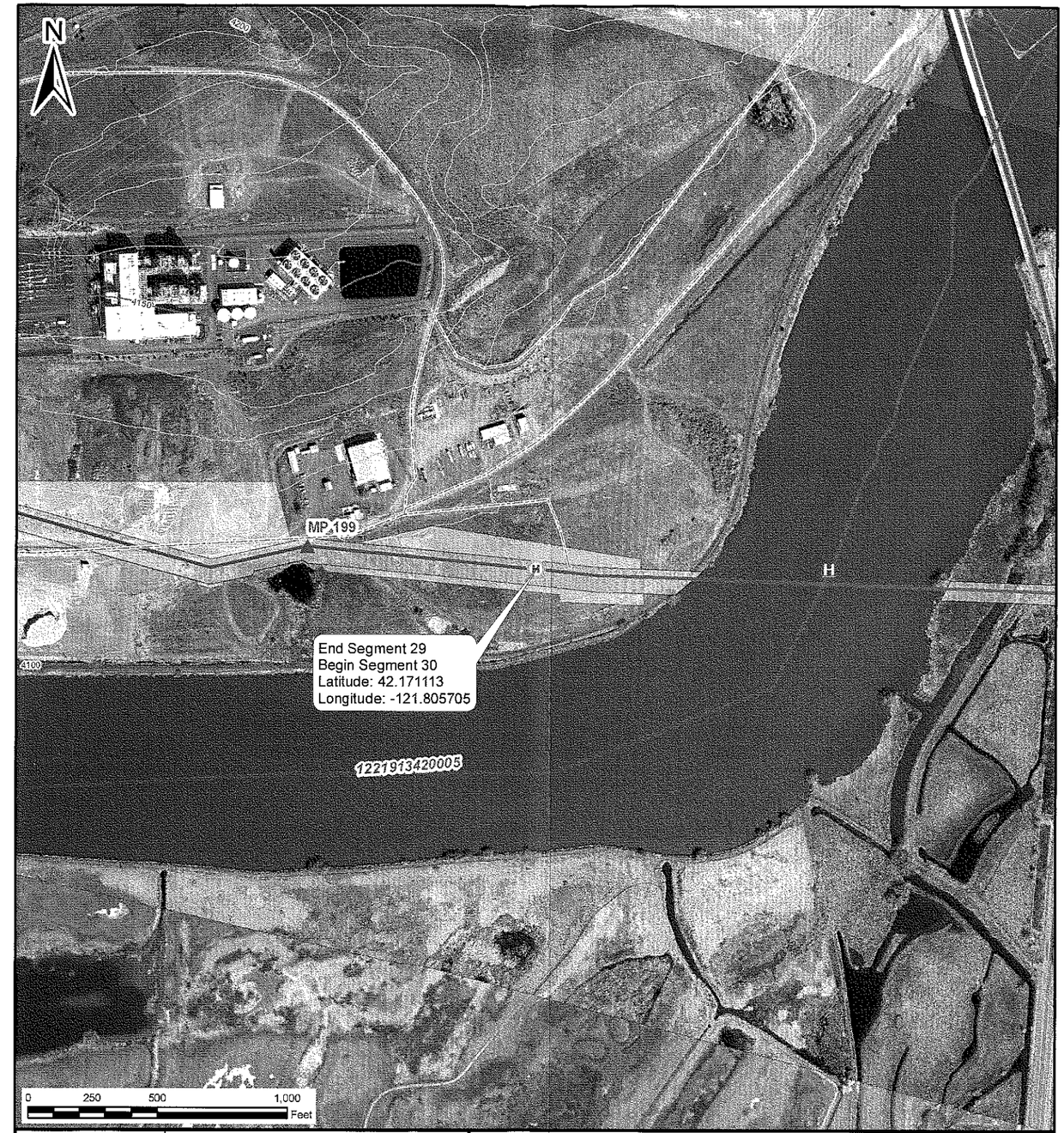

DRAWING NO.	REFERENCE TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENTS 29 END / 30 BEGIN
S-18, T-39-S, R-9-E
KLAMATH COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: Sept - 2015	ISSUED FOR BID:	SCALE: 1 : 2000
CHK BY:	DATE:	ISSUED FOR CONST:	
APPR. BY:	DATE:	DRAWING NUMBER: Test Segments 29 / 30	SHEET 1 OF 2

Path: Q:\PCGP_2012\ArcMap\DEQ\Test Segments 29 and 30.mxd

DRAWING NO.	REFERENCE TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENTS 29 END / 30 BEGIN
S-18, T-39-S, R-9-E
KLAMATH COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: Sept - 2015	ISSUED FOR BID:	SCALE: 1 : 500
CHK BY:	DATE:	ISSUED FOR CONST:	
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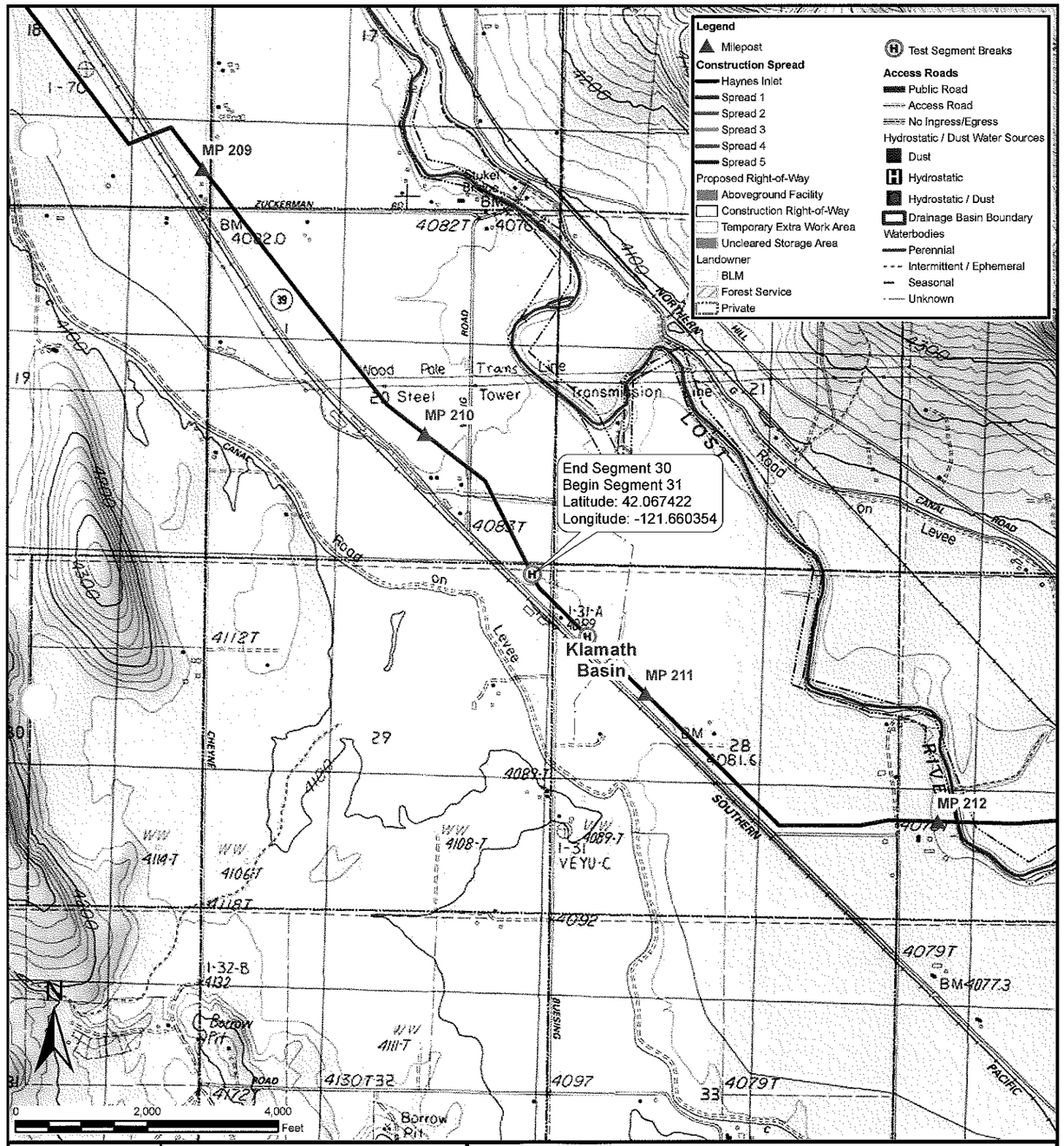

DRAWING NO.	REFERENCE TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENTS 30 END / 31 BEGIN
S-29, T-40-S, R-10-E
KLAMATH COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: Sept - 2015	ISSUED FOR BID:	SCALE: 1 : 2000
CHK BY:	DATE:	ISSUED FOR CONST:	
APPR. BY:	DATE:	DRAWING NUMBER: Test Segments 30 / 31	SHEET 1 OF 2

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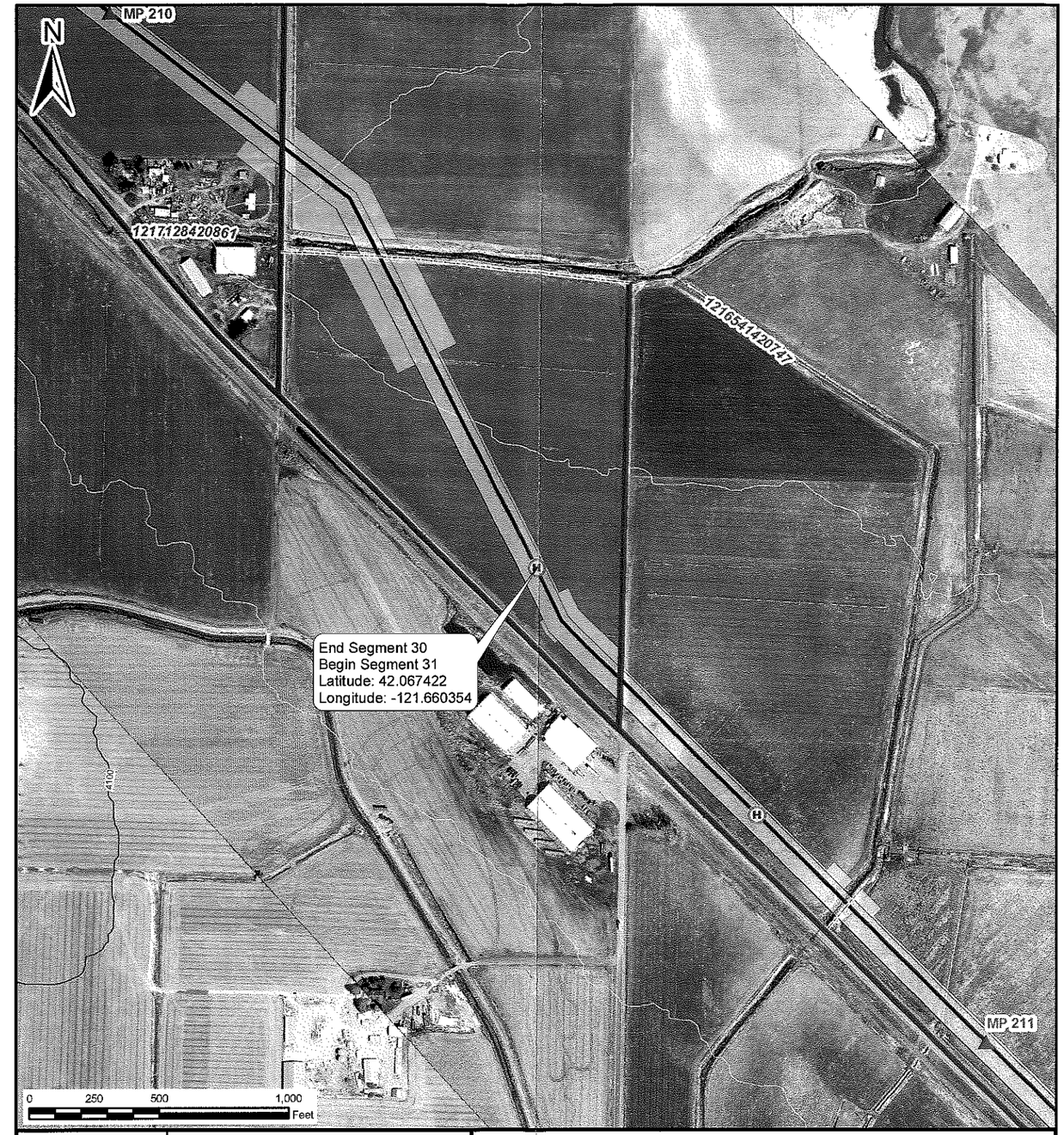

DRAWING NO.	REFERENCE TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENTS 30 END / 31 BEGIN
S-29, T-40-S, R-10-E
KLAMATH COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: Sept - 2015	ISSUED FOR BID:	SCALE: 1 : 500
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APPR. BY:	DATE:	DRAWING NUMBER: Test Segments 30 / 31	SHEET 2 OF 2

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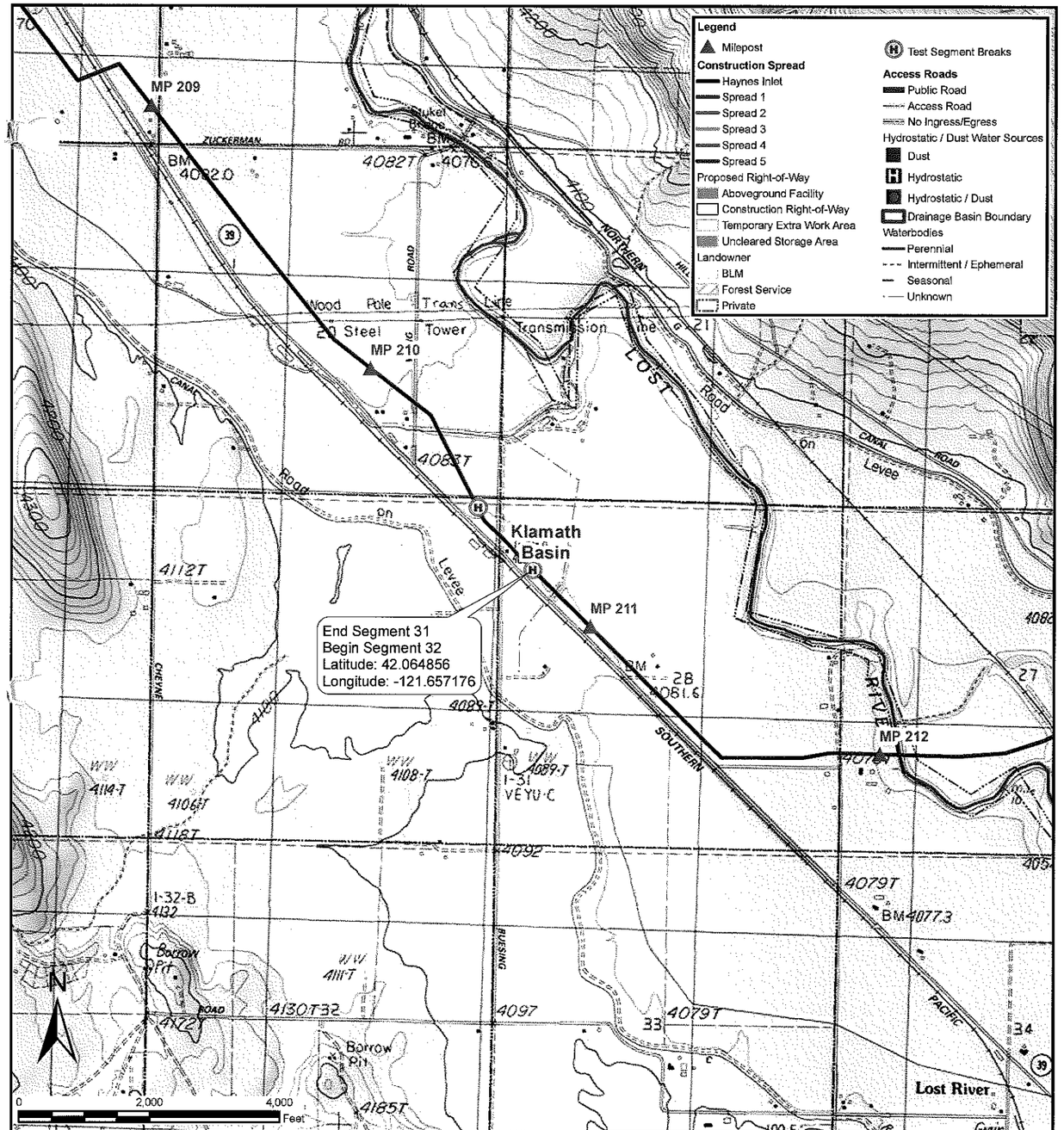

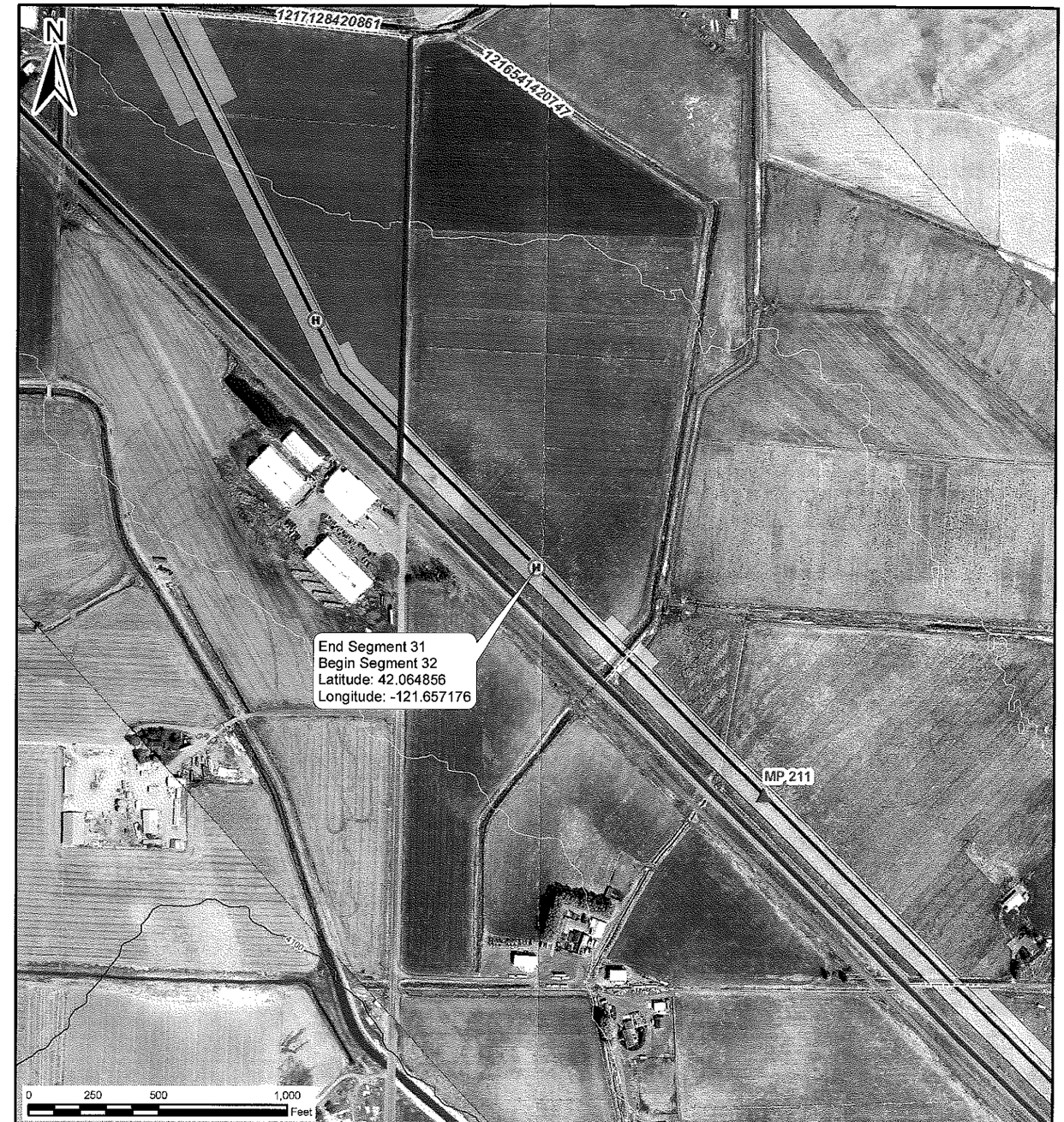

DRAWING NO.	REFERENCE TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENTS 31 END / 32 BEGIN
S-28, T-40-S, R-10-E
KLAMATH COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: Sept - 2015	ISSUED FOR BID:	SCALE: 1 : 2000
CHK BY:	DATE:	ISSUED FOR CONST:	
APPR. BY:	DATE:	DRAWING NUMBER: Test Segments 31 / 32	SHEET 1 OF 2

Path: Q:\PCGP_2012\ArcMap\DEQ\Test Segments 31 and 32.mxd

DRAWING NO.	REFERENCE TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENTS 31 END / 32 BEGIN
S-28, T-40-S, R-10-E
KLAMATH COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: Sept - 2015	ISSUED FOR BID:	SCALE: 1 : 500
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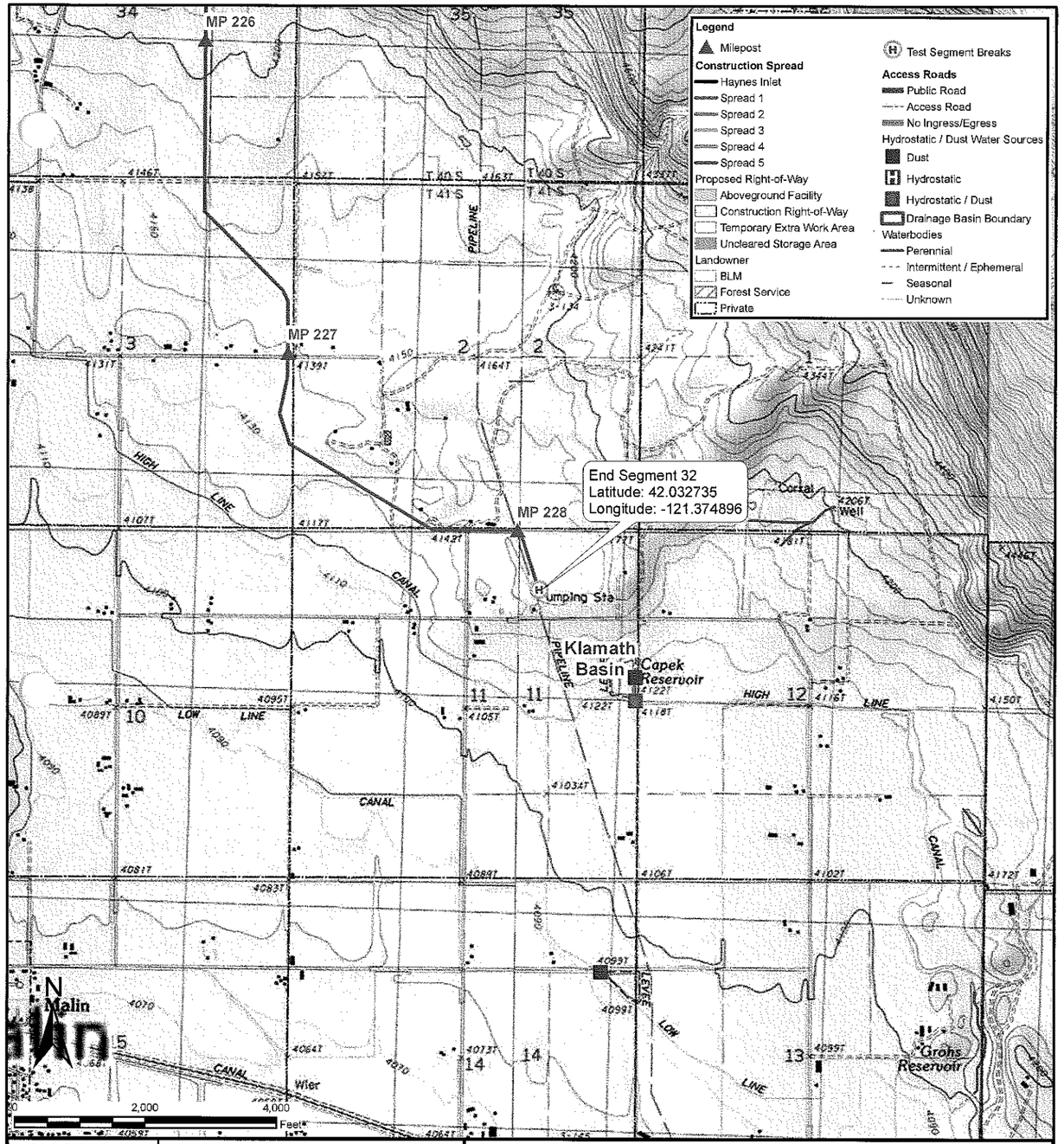

DRAWING NO.	REFERENCE TITLE

PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENTS 32 END
S-11, T-41-S, R-12-E
KLAMATH COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: Sept - 2015	ISSUED FOR BID:	SCALE: 1 : 2000
CHK BY:	DATE:	ISSUED FOR CONST:	
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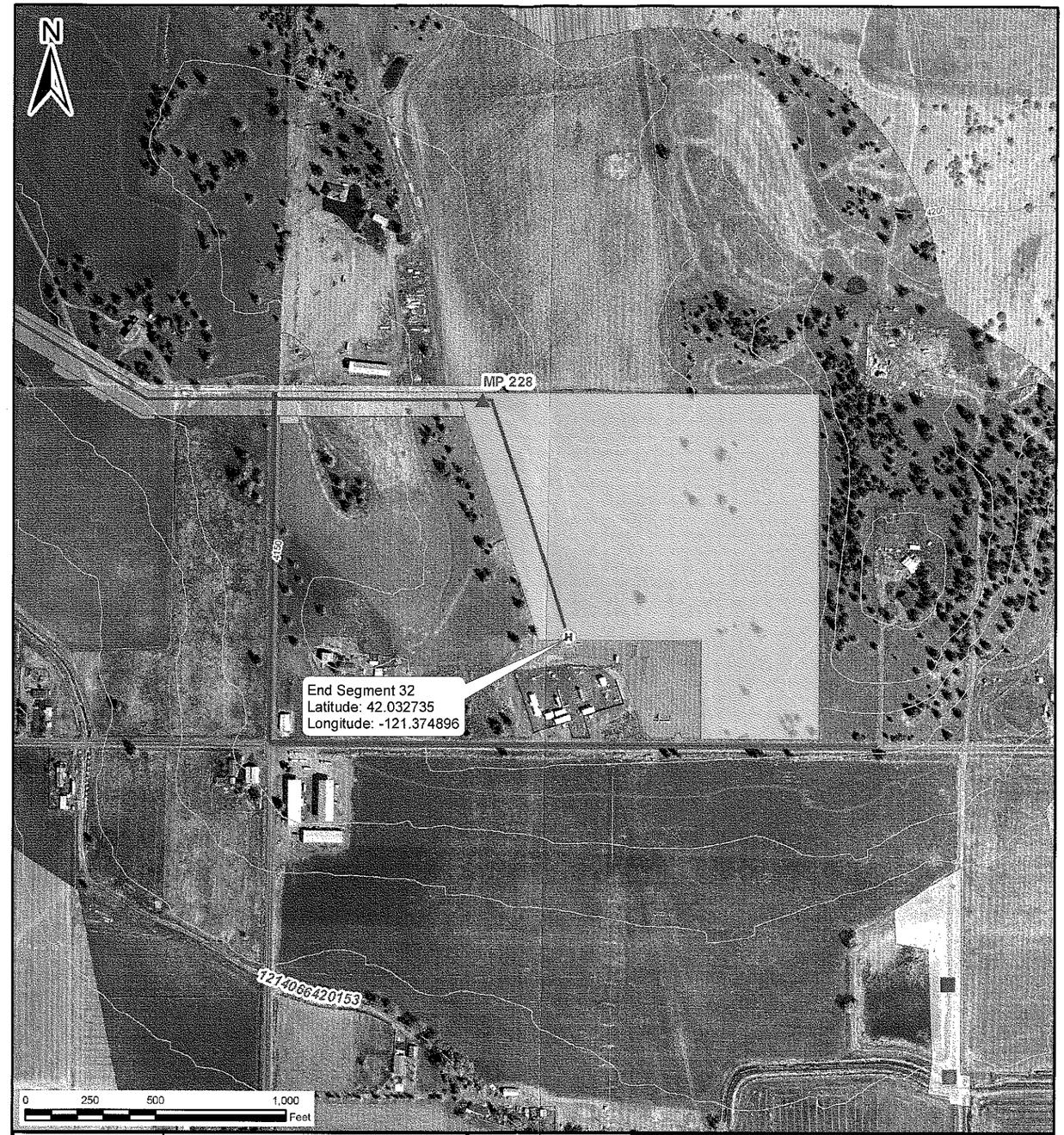

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PACIFIC CONNECTOR GAS PIPELINE PROJECT
PACIFIC CONNECTOR GAS PIPELINE, LP
36" PACIFIC CONNECTOR GAS PIPELINE
HYDROSTATIC TEST SEGMENTS 32 END
S-11, T-41-S, R-12-E
KLAMATH COUNTY, OREGON

Pacific Connector GAS PIPELINE

NO.	DATE	BY	REVISION NUMBER	W.O. NO.	CHK.	APP.

DWG. BY: EE	DATE: Sept - 2015	ISSUED FOR BID:	SCALE: 1 : 500
CHK BY:	DATE:	ISSUED FOR CONST:	
APPR. BY:	DATE:	DRAWING NUMBER: Test Segments 32	SHEET 2 OF 2

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Appendix B

Pacific Connector Gas Pipeline
Permit Table (Modified from EIS)

Major Permits, Approvals, and Consultations for the PCGP Project			
Agency	**Authority/Regulation/ Permit**	**Agency Action**	**Initiation of Consultations and Permit Status**
FEDERAL			
Federal Energy Regulatory Commission (FERC)	Sections 3 and 7 of the Natural Gas Act (NGA) [Title 15 United States Code [U.S.C.] 717] Section 311 of the Energy Policy Act of 2005 (EPAct) Title 18 Code of Federal Regulations (CFR) 153, 157, 375, and 385	Order Granting Section 3 Authorization and Issuing Certificate of Public Convenience and Necessity.	On June 6, 2013, Pacific Connector filed an application with the FERC under Section 7 of the NGA.
	Order No. 687 National Environmental Policy Act (NEPA) 42 U.S.C. 4321 et seq. 40 CFR 1500-1508 18 CFR 380.12	Produce Environmental Impact Statement (EIS).	FERC issued the FEIS in September 2015.
Advisory Council on Historic Preservation (ACHP)	Section 106 of the National Historic Preservation Act (NHPA) 16 U.S.C. 470 36 CFR 800	Opportunity to comment on the undertaking.	On August 30, 2011, the FERC submitted its Memorandum of Agreement (MOA) to the ACHP for original Pacific Connector project in Docket No. CP07-441-000. If the newly proposed Pacific Connector Project (Docket No. CP13-492-000) is authorized by the FERC, the MOA would be amended.
Federal Communication Commission	License for fixed microwave stations and service 47 U.S.C. 303 47 CFR 101	Review proposals for new or additions to existing communication towers.	Pending.
U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS)	Farmland Protection Policy Act 7 U.S.C. 4201-4209 7 CFR Part 658	Determine if the Project would result in the permanent conversion of prime farmland.	On August 30, 2012, the NRCS commented on the FERC's NOI. NRCS comments on impacts on prime farmland pending review of EIS.
USDA Forest Service (Forest Service)	Mineral Leasing Act (MLA) 30 U.S.C. 181 et seq. 43 CFR 2882	Concur with Right-of-Way (ROW) Grant.	On April 17, 2006, Pacific Connector submitted its initial SF 299 ROW Grant application. On February 25, 2013, Pacific Connector amended that application. Decision on ROW Grant pending until after issuance of FEIS.
	36 CFR 219.17	Amend Land and Resource Management Plans (LRMP).	On September 21, 2012, Forest Service and BLM issued a Supplemental NOI. Amendments pending review of EIS.
U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS)	Section 7 of the Endangered Species Act (ESA) 16 U.S.C. 1531 et seq. 50 CFR 222 50 CFR 224 50 CFR 402	Provide a biological opinion (BO) if the Project is likely to adversely affect federally listed threatened or endangered aquatic species or their habitat.	FERC submitted its biological assessment (BA) and essential fish habitat (EFH) assessment to the NMFS February 24, 2015.. The NMFS would issue its BO pending review of the FERC's BA and EFH Assessment.

Major Permits, Approvals, and Consultations for the PCGP Project			
Agency	**Authority/Regulation/ Permit**	**Agency Action**	**Initiation of Consultations and Permit Status**
	Marine Mammal Protection Act (MMPA) 16 U.S.C. 1361 et. seq. 50 CFR 82 50 CFR 216	Consult on protected marine mammals.	On October 8, 2014, Jordan Cove and Pacific Connector submitted their draft application for incidental harassment authorization to the NMFS. Review pending.
	Magnuson-Stevens Fishery Conservation and Management Act (MSA) 16 U.S.C. 1801-1884 50 CFR 600	Provide conservation recommendations if the Project would adversely impact EFH.	Pending review of the FERC's EFH Assessment.
U.S. Department of the Army, Corps of Engineers (COE)	Section 10 of the Rivers and Harbors Act (RHA) 33 U.S.C. 403 33 CFR 320 to 330	Process permit application for structures or work in or affecting navigable waters of the United States.	Pending.
	Section 404 of the Clean Water Act (CWA) 33 U.S.C. 1344 33 CFR 320 to 330	Process permit application for the placement of dredged or fill material into waters of the United States.	Pending.
DOE, Bonneville Power Administration (BPA)	Encroachment permit for electric transmission line crossings	Permit review.	Decision Pending.
U.S. Environmental Protection Agency (EPA)	Section 404 of the CWA 33 U.S.C. 1412 40 CFR 227, 228	Co-administers CWA 404 program with the COE. EPA retains veto authority for wetland permits issued by the COE.	On October 29, 2012, EPA commented on the FERC's NOI. Review pending issuance of COE permit.
	Section 309 of the Clean Air Act (CAA) 42 U.S.C. 7401 et seq. 40 CFR 1503.1(a)	Reviews and evaluates EIS for adequacy in meeting the procedural and public disclosure requirements of the NEPA.	Review of EIS pending.
U.S. Department of the Interior (USDOI), Bureau of Land Management (BLM)	Section 28 of Mineral Leasing Act of 1920 (MLA) 30 U.S.C. 181 43 CFR 2880	Issue ROW Grant for crossing federal lands.	On April 17, 2006, Pacific Connector submitted its initial SF 299 ROW Grant application. On February 25, 2013, Pacific Connector amended that application.
	Federal Land Policy and Management Act of 1976, as amended 43 CFR 1610	Resource Management Plan Amendments.	
USDOI Bureau of Reclamation	MLA 30 U.S.C. 181 et seq. 43 CFR 288.23(i)	Concur with issuance of the ROW Grant	On April 17, 2006, Pacific Connector submitted its initial SF 299 ROW Grant application. On February 25, 2013, Pacific Connector amended that application.
USDOI Fish and Wildlife Service (FWS)	Section 7 of the ESA 16 U.S.C. 153 et seq. 50 CFR 402.02	Provide a BO if the project is likely to adversely affect terrestrial federally-listed threatened and endangered species or their habitat.	On September 4, 2012, FWS commented on FERC's NOI. FERC submitted its BA to FWS February 24, 2015. FWS would issue its BO pending review of the FERC's BA.
	Fish and Wildlife Coordination Act (FWCA) 16 U.S.C. 661-667(d) 23 CFR Part 773	Provide comments to prevent loss of and damage to wildlife resources.	FWS generally addresses FWCA issues via comments on FERC NEPA and COE 404 permit processes.
	Migratory Bird Treaty Act (MBTA) 16 U.S.C. 703 Executive Order 13186	Consultation regarding compliance with the MBTA.	Pending review of this EIS and review of applicants' Migratory Bird Conservation Plan.

Major Permits, Approvals, and Consultations for the PCGP Project			
Agency	**Authority/Regulation/ Permit**	**Agency Action**	**Initiation of Consultations and Permit Status**
DOT, Federal Aviation Administration (FAA)	18 CFR Subchapter E Federal Aviation Regulations (FAR) Part 77 IAW FAA Order 7400.2G, 6-1-6	Aeronautical Study of Objects Affecting Navigable Airspace. Feasibility Study for Hazard Determination.	On May 8, 2007, the FAA issued an aeronautical study for the communication tower at the Jordan Cove Meter Station proposed under Docket No. CP07-444-000. Continuing consultations with FAA are pending.
U.S. Department of the Treasury, Bureau of Alcohol, Tobacco, and Firearms	Explosives User Permit 27 CFR 555	Issue permit to purchase, store, and use explosives during project construction.	Pending.
STATE – OREGON			
Oregon Department of Agriculture (ODA)	Oregon Endangered Species Act Oregon Senate Bill 533 and Oregon Revised Statute (ORS) 564	Consult on Oregon listed plant species, and ODA would review botanical survey reports covering non-federal public lands prior to ground-disturbing activities where state listed botanical species are likely to occur.	On July 24, 2006, ODA provided Pacific Connector with a list of state listed species. In September 2007 and November 2008 Pacific Connector submitted botanical survey reports to ODA. ODA's review of these botanical reports is pending.
Oregon Department of Environmental Quality (ODEQ)	Water Quality Certification Section 401 of the CWA ORS 468B OAR 340-48	Issue a license or permit to achieve compliance with state water quality standards.	Pacific Connector submitted water quality information to ODEQ concurrent with its JPA to the COE. Review pending.
	Section 402 of CWA ORS 468B OAR 340-45	Issue National Pollutant Discharge Elimination System (NPDES) permits for discharge of stormwater.	One year prior to construction, Pacific Connector intends to submit its NPDES permit applications to ODEQ.
	CAA – Title V 40 CFR 98 ORS 468A OAR 340-215, 216, 218, 222, & 228	Issue Title V Air Quality Operating permit. Issue Title V Acid Rain permit. Enforce Greenhouse Gas (GHG) Reporting Requirements.	Pacific Connector anticipates submitting an air quality permit application to ODEQ in second quarter 2015.
	Hazardous Waste Activity ORS 466 OAR 340-102	Review plans for storage and management of hazardous waste	Pending.
Oregon Department of Fish and Wildlife (ODFW)	Fish and Wildlife Coordination Act and the Oregon Endangered Species Act under ORS 496, 506, and 509 OAR 635	Consult on sensitive species and habitats that may be affected by the Project and, in general, regarding conservation of fish and wildlife resources.	Pacific Connector submitted its revised Wildlife Habitat Mitigation Plan to ODFW February 13, 2015.
	Fish Screening Criteria at Stream Crossings ORS 509-580 through 910 OAR 635-412-5 through 40	Review stream crossing plans for consistency with Oregon fish passage law and ODFW fish passage rules	Pacific Connector will resubmit its Fish Passage Waiver Application and Fish Passage Plan for Road and Stream Crossings in 2015.
	ORS 509-140, et al.	Consider issuance of in-water blasting permits.	Pacific Connector will resubmit its In-Water Blasting Permit Application in 2015.
Oregon Department of Forestry (ODF)	Easement on State lands Oregon Forest Practices Act OAR 629 ORS 477 ORS 527	Management of State Forest lands for Greatest Permanent Value, develops Forest Management Plans, stewardship under State's Land Management Classification System, monitors harvests of timber on private lands, and protects non-federal public and private lands from wildfires.	Pacific Connector anticipates submittal of final plans to ODF during the second quarter 2015.

Major Permits, Approvals, and Consultations for the PCGP Project			
Agency	**Authority/Regulation/ Permit**	**Agency Action**	**Initiation of Consultations and Permit Status**
Oregon Department of Geology and Mineral Industries (DOGAMI)	Building Code Section 1802.1 ORS 455-446 OAR 517	Review of structural designs in tsunami zones. Review of geotechnical investigations for geological hazards. Review of mining and reclamation activities.	Review and decision pending.
State Historic Preservation Office (SHPO)	Section 106 of the NHPA 36 CFR 800 ORS 338-920	Review cultural resources reports and comments on recommendations for National Register of Historic Places eligibility and project effects. Issue permits for excavation of archaeological sites on non-federal lands.	On June 3, 2011, the Oregon SHPO signed the FERC's MOA for the original Pacific Connector project in Docket No. CP07-441-000. If the FERC authorizes the newly proposed Pacific Connector Project (in Docket CP13-492-000) the MOA would be amended. SHPO review of future cultural resources investigations reports pending.
Oregon Department of Land Conservation and Development (ODLCD)	Coast Zone Management Act (CZMA) 15 CFR Part 930 ORS 196.435	Determine consistency with CZMA program policies.	On August 1, 2014, Jordan Cove and Pacific Connector submitted their applications for Certification of Consistency to the ODLCD. The six-month review period regarding federal consistency provisions of the CZMA began on August 1, 2014, was extended on January 15, 2015, and will end on July 14, 2015.
Oregon Department of State Lands (ODSL)	Submerged and Submersible Land Easement OAR 141-122	Grant submerged land easements.	On May 15, 2014, Pacific Connector submitted its easement Application. ODSL Review pending. In April 2015, ODSL determined the application to be incomplete until revised LUCS are submitted from Jackson and Klamath counties.
	Joint Removal-Fill Law ORS 196-795-990 OAR 141-85	Approve removal or fill of material in waters of the state.	On December 2, 2013, ODSL found Pacific Connector's application to be complete. In January 2015, ODSL determined the application to be incomplete until revised LUCS are submitted from Jackson and Klamath counties.
	Compensatory Wetland Mitigation Rules OAR 141-85-121	Review and approve wetland mitigation plans.	On July 15, 2013, Pacific Connector filed an application with ODSL. Decision Pending.
Oregon Department of Transportation (ODOT)	State Highway ROW ORS 374-305 OAR 734- 55	Permits to be issued from each DOT District Office to allow construction within State Highway ROW and use of State Highways for Project access.	Applications for ODOT road crossing permits would be submitted prior to and during construction on an as-needed basis.
Oregon Department of Water Resources (ODWR)	New Water Rights ORS 537 OAR 690-310	Issue permits to appropriate surface water and groundwater.	Pacific Connector submitted an application for a license to temporarily use surface waters for pipeline construction and testing. ODWR review pending.
	Temporary Water Use ORS 537 OAR 690-340	Issue limited licenses for temporary use of surface waters.	Pacific Connector anticipates submitting an application during the second quarter of 2015.

Major Permits, Approvals, and Consultations for the PCGP Project			
Agency	**Authority/Regulation/ Permit**	**Agency Action**	**Initiation of Consultations and Permit Status**
Oregon Public Utilities Commission (OPUC)	OAR 860-031	Authorize intrastate electric transmission lines. Inspect the natural gas facilities for safety.	Pending Pacific Connector's submittal of appropriate applications to OPUC. Pending operation of facilities.
LOCAL – COUNTIES			
Coos County	Coos County Zoning and Land Development Ordinance, Coos County Comprehensive Plan, and Coos Bay Estuary Management Plan (CBEMP) ORS 197.015(10)(b)(H)	Issue Conditional Use Permits. Zoning Changes and Verifications. Issue Land Use Compatibility Statement (LUCS) under Statewide Planning Goals.	On September 8, 2010, Coos County issued a Conditional Use Permit to Pacific Connector. On June 14, 2013, Coos County issued a LUCS to Pacific Connector.
Douglas County	Douglas County Comprehensive Plan and Douglas County Land Use and Development Ordinance ORS 197.015(10)(b)(H)	Issue Conditional Use Permits Issue LUCS	On December 11, 2009, Douglas County issued a Conditional Use Permit to Pacific Connector. On March 20, 2014, Douglas County Planning Commission approved a Major Amendment to its 2009 decision to allow the Pacific Connector pipeline to cross 7.3 miles within the Coastal Zone in Douglas County. That decision was affirmed by the Board of Commissioners for Douglas County on April 30, 2014. Douglas County then issued a revised LUCS on June 2, 2014 for the 7.3-mile portion of the pipeline within the Coastal Zone Management Area within Douglas County.
Jackson County	Jackson County Comprehensive Plan and Jackson County Land Development Ordinance ORS 197.015(10)(b)(H)	Issue Conditional Use Permits Issue LUCS	On June 18, 2013 Jackson County provided a LUCS for the Project. The LUCS indicated that the Project was not subject to the land development standards of the Jackson County Land Development Ordinance because it would be authorized by the FERC. Therefore, no conditional use permits would be necessary.
Klamath County	Klamath County Land Development Code ORS 197.015(10)(b)(H)	Issue Conditional Use Permits Issue LUCS	On August 21, 2012, Klamath County responded to the FERC NOI with a list of local permits that Pacific Connector should apply for. On June 10, 2013, Klamath County provided a LUCS for the Project. The LUCS indicated that if not authorized by FERC the Project would require county applications and review. Therefore, no conditional use permits would be necessary.
All Counties	Road Crossing Permits	Review permits to cross county roads.	To be submitted prior to construction.
	Grading Permits	Review permits for excavation and grading activities.	To be submitted prior to construction.
	Solid Waste Disposal	Review permits for disposal of solid waste generated by construction.	To be submitted prior to construction.

October 27, 2015

Pacific Connector GAS PIPELINE
W. Randall Miller, CEP
Project Environmental Manager
295 Chipeta Way
Salt Lake City, UT 84108
(801) 584-6702 Office
(801) 584-6753 Fax

Carrie Everett
Oregon Department of Environmental Quality
750 Front Street NE, #120
Salem, OR 97301

Re: Pacific Connector Gas Pipeline Project, Application for Water Pollution Control Facilities Individual Permit (WPCF-N)

Dear Ms. Everett:

I am submitting the enclosed application by Williams Pacific Connector Gas Operator, LLC on behalf of the Pacific Connector Gas Pipeline, LP ("Pacific Connector"). In addition a check for the permit application fees is included with this letter. Please let me know if you have any questions or concerns, my office telephone is (801) 584-6702 or you may contact me via e-mail at randy.miller@williams.com.

Sincerely,

W. Randall Miller, CEP
Project Environmental Manager

Attachment

cc w/o attachment: Mary Camarata, ODEQ
Tim McFetridge, ODEQ
Carolyn Last, Edge Environmental

PCGP/WPCF Permit/PCGP Letter to DEQ Submitting WPCF-N Application 10272015

RECEIVED
NOV 12 2015
WESTERN REGION/EUGENE
DEPT. ENVIRONMENTAL QUALITY

STATE OF OREGON
DEPARTMENT OF ENVIRONMENTAL QUALITY
Receipt

163049

State of Oregon Department of Environmental Quality

Issuing Office: WR-Eugene

Date: 11/13/15

Check/Payer Name: Northwest Pipeline GP

Address: PO Box 21218 Tulsa, OK

ZIP Code: 74121

Reason for Payment	Amount	Payment Type	Fees Received
On-Site Sewage Permit	$	Cash	$
On-Site Surcharge	$	Check # 2091131136	$13,011.00
NEW WPCF WQ Individual Permit	$13,011.00	Check #	$
	$	MO #	$
	$	Total	$13,011.00

Issued By: Cara Zumwalt

DEP# 32085