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NORTHWEST NATURAL GAS COMPANY (NW NATURAL)

APPLICATION TO AMEND

THE SITE CERTIFICATES FOR

MIST UNDERGROUND NATURAL GAS STORAGE

AND THE

SOUTH MIST FEEDER PIPELINE

SUBMITTED TO THE
OREGON ENERGY FACILITY SITING COUNCIL
SEPTEMBER 15, 1998

TABLE OF CONTENTS

		Page
I.	AFFIDAVIT OF AUTHENTICITY	1
II.	INTRODUCTION	2
	A. Existing Site Certificates and Facilities.	2
	1. Underground Gas Storage.	2
	a. Nature of the Facility.	2
	b. Site Selection.	3
	c. Site Background.	4
	2. South Mist Feeder Pipeline.	5
	B. This Project.	6
	C. Council Jurisdiction.	7
	1. Gas Storage Facility.	7
	2. South Mist Feeder.	8
	D. Amendment Process.	8
III.	APPLICANT INFORMATION	10
IV.	PROJECT DESCRIPTION	11
	A. Gas Storage Facility.	11
	1. Miller Station Improvements.	11
	2. Reservoir Development Phase.	12
	3. Gathering System Additions.	12
	B. South Mist Feeder.	13
	C. Route Description.	13
V.	DIVISION 22 STANDARDS	15
	A. Organizational, Managerial and Technical Expertise (OAR 345-022-0010).	15
	1. NWN's Underground Storage and Pipeline Experience	15
	2. Technical Expertise Available to NWN.	16
	3. Past Performance.	17
	4. Conclusion.	17
	B. Structural (OAR 345-022-0020).	18
	1. Regional Geology.	19
	2. Seismic Characterization.	20
	C. Soil Protection (OAR 345-022-0022).	21
	1. Soil Types.	22
	2. Miller Station; Effect on Soils.	22
	3. South Mist Feeder Pipeline Alignment; Effect on Soils	22
	4. Reichhold Pool Wellsites and Gathering Lines; Effect on Soils.	23

TABLE OF CONTENTS

Page

D. Land Use (OAR 345-22-030). 24
1. Introduction. 24
2. Compliance with Applicable Substantive Criteria of Land Use Regulations 25
a. Columbia County: Applicable Substantive Land Use Regulations. 26
b. Washington County: Applicable Substantive Land Use Regulations 48
E. Protected Areas (OAR 345-022-0040) 78
F. Financial Assurance (OAR 345-022-0050). 80
G. Fish and Wildlife Habitat (OAR 345-022-0060). 81
1. Habitat Types; Habitat Categories. 82
2. Potentially Affected Fish and Wildlife Species. 90
3. Potential Impacts: Compliance with Goals and Standards. 91
H. Threatened & Endangered Species (OAR 345-022-0070). 99
1. Listed Species. 100
2. Species Proposed for Listing. 101
3. Federal Species of Concern. 102
4. Oregon Natural Heritage Program Status Species. 102
I. Scenic/Aesthetic (OAR 345-022-0080). 102
1. Baseline Description of Visual Features of Project Area 103
2. Points from Which Existing Project Is Visible. 103
3. Significant Scenic and Aesthetic Values Near the Project Area. . . 104
4. Proposed Project's Impact on Scenic Resources. 106
5. Construction. 106
J. Historic, Cultural and Archeological Resources (OAR 345-022-0090) . . . 107
K. Recreation (OAR 345-022-0100). 111
1. Existing Recreational Facilities. 112
2. Proposed Recreational Facilities. 113
3. Fishing. 113
4. Hunting. 113
L. Socioeconomic Impacts (OAR 345-022-0110). 114
1. Sewers and Sewage Treatment. 115
2. Water. 115
3. Storm Water Drainage. 115
4. Solid Waste Management. 115
5. Housing. 116
6. Traffic Safety. 116

TABLE OF CONTENTS

Page

7. Police Protection. . . . 118
8. Fire Protection. . . . 118
9. Health Care. . . . 119
10. Schools. . . . 119

M. Waste Minimization (OAR 345-022-0120). . . . 120
1. Introduction. . . . 120
2. Minimization of Solid Waste. . . . 120
3. Minimization of Wastewater. . . . 121
4. Minimization of Water Use. . . . 121
5. Impact on Surrounding Areas. . . . 121

N. Retirement (OAR 345-022-0130). . . . 121
1. Gas Processing Facility. . . . 122
2. Gathering Lines. . . . 122
3. Injection/Withdrawal Wells. . . . 123
4. Cost of Restoration. . . . 123
5. Retirement of Addition to South Mist Feeder of Parallel 24-Inch Pipeline 124
6. Financial Mechanism. . . . 124

VI. DIVISION 23 STANDARDS 125
A. Applicability of Need for Facility Standard. . . . 125
B. Demonstration of Compliance for South Mist Feeder. . . . 125

VII. DIVISION 24 STANDARDS 126
A. Public Health and Safety Standards for Surface Facilities Related to Underground Gas Storage Reservoirs (OAR 345-024-0030) 126
B. Public Health and Safety Standards for Pipelines (OAR 345-024-0060) . . 129

VIII. OTHER STATE STANDARDS 132

IX. NOTICE LIST 133

X. CONSTRUCTION SCHEDULE 134

I. AFFIDAVIT OF AUTHENTICITY

I, Carla L. Kelley being sworn, state that:

I am Deputy General Counsel of Northwest Natural Gas Company dba NW Natural and am authorized to act on behalf of NW Natural.

NW Natural is submitting this Application to Amend its Site Certificates for the Mist Underground Natural Gas Storage and South Mist Feeder Pipeline.

To my best knowledge and belief, the information in this Site Certificate Application is true and accurate.

Dated: September 15, 1998.

NORTHWEST NATURAL GAS COMPANY

By: Carla L. Kelley

Carla L. Kelley
Deputy General Counsel for
Northwest Natural Gas Company

State of Oregon)
)
County of Multnomah)

On this 15 day of September, 1998, before me, the undersigned, a notary public in and for said state, personally appeared Carla L. Kelley, known or identified to me to be an authorized representative of Northwest Natural Gas Company dba NW Natural, that executed this Affidavit of Authenticity ("Affidavit") or the person who executed this Affidavit on behalf of NW Natural, and acknowledged to me that NW Natural executed the same.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal on the day and year in this certificate first above written.

OFFICIAL SEAL
DELORES J. THRASHER
NOTARY PUBLIC-OREGON
COMMISSION NO. 304504
MY COMMISSION EXPIRES OCT. 8, 2001

Delores J. Thrasher
Notary Public for the State of Oregon
Residing at: Portland, Oregon
My Commission expires: 10-8-01

II. INTRODUCTION

By this Application, Northwest Natural ("NWN") proposes to amend both the site certificate for its underground natural gas storage facility at Mist, Oregon and its site certificate for the South Mist Feeder Pipeline. NWN intends to increase the capacity of the Mist storage facility by 45 MMcfd. It also proposes to expand the capacity of the South Mist Feeder by constructing a 24-inch pipeline parallel to the existing 16-inch pipeline.

A. Existing Site Certificates and Facilities.

1. Underground Gas Storage.

a. Nature of the Facility.

NWN is a gas utility that delivers energy to more than 450,000 customers. Although energy needs change significantly on a daily, monthly and seasonal basis due to changes in space-heating requirements, harvest processing, annual production cycles and other factors, in Oregon gas usage is generally lowest during summer months and peaks during December, January and February. Underground gas storage provides the most efficient means of balancing relatively constant pipeline gas supplies with widely fluctuating seasonal, daily and hourly market requirements. Gas is injected into storage during off-peak periods when market requirements are less than supply availability, and is withdrawn from storage when market demand exceeds available supplies from other sources. Storage reservoirs usually are replenished from April through September and are drawn down between October and March.

Underground reservoir storage requires suitable underground geological conditions in a specific geographic area. These conditions occur in depleted oil or gas pools like the pools in the Calvin Creek storage area.

An underground storage reservoir, reduced to simplest terms, is little more than a gas production reservoir retrofitted to inject gas back into the ground and withdraw it on a cyclical basis. Some gas always remains in the reservoir to maintain operating pressure. This gas is referred to as "cushion gas." Between one-third and one-half of the original gas in place in each reservoir (including some that could never be produced) is used as cushion gas. The remainder of the reservoir's capacity is used to inject and withdraw gas relatively rapidly to meet market needs. This gas is referred to as "working gas."

The principal differences between a natural gas production field and an underground storage reservoir are operational. The gas wells in a production field are designed to produce gas at flow rates that permit the efficient drainage of the reservoir over time. The Oregon Department of Geology and Mineral Industries ("DOGAMI") regulates the spacing of gas wells. Generally, no more than one well per quarter section (160 acres) is allowed. Closer well spacing could result in higher development costs with negligible increase in

overall gas production. Competing wells could also cause the premature demise of a reservoir, leaving behind gas that is uneconomical to produce.

A different operating concept applies to a storage reservoir. Instead of producing the major portion of the underground gas by careful management of field pressures and auxiliary compression over a period of years, the goal changes to that of an annual fill-and-empty cycle. Because the design withdrawal rate for the existing storage facility at Mist is 145 MMcfd (significantly greater than the original production capacity), a more closely spaced pattern of higher capacity wells has been used for storage operations. Compressors allow the storage pressure to be restored during a six-month injection period and provide for sustained high delivery rates during withdrawal as the reservoir pressure depletes.

b. Site Selection.

Underground storage facilities can only be developed in rare locations where the underground geological conditions are right. The Mist gas field (the "Mist Field") is such a place.

Millions of years ago, the present gas-producing sands in the Mist Field were laid down by a large river delta advancing into the ocean (analogous to the modern Mississippi River delta). The delta subsided and water depths increased, resulting in mud being deposited over the sand. Compaction from the weight of the material consolidated the sand and muds into sandstone and mudstone. Decomposition of the organic remains in the rock formed natural gas. Large amounts of natural gas migrated into the sandstone and accumulated in areas where the gas could be trapped and displace the water from between the sand grains, forming a "bubble." Further vertical gas migration is prevented by the compressed layers of clay that form the seal (caprock) over the sand. The ongoing compression of Oregon against the Pacific Ocean floor created the folds and faults in the sandstone that form the compartments that trap the gas and prevent lateral migration. The fact that gas remains in these reservoirs at high pressure (up to 1,000 pounds per square inch) after millions of years demonstrates the stable nature of these reservoirs. No man-made structures have been so thoroughly tested.

Gas storage facilities have been constructed in similar sandstones in Washington, but no native gas was present. That made exploration and development of the structures much more risky and expensive. It was necessary to pump salty water out of the sandstone and to inject gas produced in other states and transported to the site. There was no guarantee that the injected gas would stay put or that it would be recoverable. The gas reservoirs in the Mist Field are the only producing gas reservoirs discovered to date in Oregon and Washington, and thus they are the only "pretested" storage reservoirs, a rare and valuable resource.

c. Site Background.

By the late 1970s, NWN had anticipated its need for natural gas storage capacity in the Portland metropolitan area. NWN believed the area around Mist, in rural Columbia County, Oregon, might be one of the few areas in the state containing sandstones of reservoir quality that could be used to store natural gas. These sandstone zones, surrounded by impermeable rock, are referred to as underground "reservoirs," although they are not large caverns. The small spaces between sand grains add up to 30 percent of the volume of the rock and can be filled with compressed natural gas. NWN recognized that the Mist area would be an excellent location for storage facilities to serve the region.

Reichhold Energy Company and Diamond Shamrock Exploration Company were exploring the Mist area with the hope that underground reservoirs containing commercial gas deposits would be discovered. NWN formed a subsidiary, Oregon Natural Gas Development Corporation ("ONG"), to participate with those two companies in exploring the Mist area by drilling exploration wells to depths of several thousand feet below the surface. From NWN's perspective, simply finding a good underground reservoir, even without commercial gas deposits, would have been satisfactory. The discovery of natural gas at Mist was a bonus.

The Mist Field was discovered in April 1979. Natural gas production was established in December of that year when the first volumes of natural gas were transported to a connection with the NWN pipeline system about nine miles away, near Clatskanie. Subsequently, producing wells from the commercial discoveries in the Mist Field were connected by buried gathering lines to the natural gas processing equipment located at Miller Station. At Miller Station, the produced natural gas was collected, measured, treated and odorized before its transmission to NWN pipelines. Since 1979, more than $100 million worth of natural gas has been produced from numerous separate gas reservoirs in the Mist Field.

Through the 1980s and into the 1990s, gas exploration and production in the Mist Field was carried on by ONG and a variety of industry participants including Reichhold Energy Company, Diamond Shamrock Exploration Company, ARCO Oil & Gas Company, Nahama & Weagant Energy Company and Enerfin Resources NW-LP ("Enerfin"). Gathering pipelines connecting individual production wells to Miller Station were constructed and operated by ONG until December 1995 and by Enerfin thereafter. During these same time periods, ONG and Enerfin also operated the production wells under contract with the wells' various owners.

By the early 1980s, ONG had produced most of the economically recoverable natural gas in the Bruer and Flora pools, two of the first production reservoirs at Mist. In anticipation of that occurrence, in 1981, ONG applied for the permits necessary to convert the Bruer and Flora pools into an underground natural gas storage facility.

In September 1981, based on an application from ONG, the Energy Facility Siting Council ("EFSC" or the "Council") approved a site certificate for an underground natural gas storage facility at the Mist Field in Columbia County (the "Storage Certificate"). (Exhibit 1.) The Storage Certificate authorized ONG to construct and operate "two naturally existing underground gas reservoirs (the Flora and Bruer pools) * * *; Miller Station with attendant equipment (including, but not limited to, compressors), gathering lines, access roads, existing natural gas wells, monitoring wells and proposed injection/withdrawal wells" (collectively known as the "Mist Site"). (Exhibit 1 at 2, 3.) The Mist Site is located in rural Columbia County in parts of Sections 2, 3, 4, 10 and 11 of Township 6 North, Range 5 West, Willamette Meridian.

In 1990, ONG assigned the Storage Certificate to its parent, NWN. (Exhibit 2.) The Council approved three amendments to the Storage Certificate, in 1987, 1988 and 1990. The amendments modified several terms of the Storage Certificate and authorized the construction and replacement of wells. (Exhibits 3-5.)

In 1997, the Council approved Amendment No. 4. (Exhibit 6.) That amendment approved an expansion of the Mist Site that increased the combined total Mist storage peak-day delivery capability from 100 MMcfd to 145 MMcfd. The expansion included: (1) improvements to the Miller Station gas-processing facility, including the replacement of two older 550-horsepower compressor units with a more efficient unit; (2) total available compression of 6,650 brake horsepower ("BHP"); (3) construction of a building for the new compressor and updates to related equipment; (4) natural gas storage in one additional naturally occurring underground pool, Al's Pool, in the Calvin Creek storage area; (5) up to four new sites for injection/withdrawal wells, including one to four wells at each site; (6) approximately one mile of buried 8-inch and 6-inch gathering pipeline; and (7) approximately two and one-half miles of buried twin 16-inch transmission pipeline. NWN's Application for Amendment No. 4 described the Project as "Phase I of an expansion that may include four additional phases over a 10-year period." (Application to Amend Site Certificate for Mist Underground Natural Gas Storage Facility, Mar. 20, 1997 ("Phase II Application"), at 6.)[1]

On March 13, 1998, the Council approved Amendment No. 5, which replaced the amendment provisions in the Storage Certificate with a requirement that future site certificate amendments be governed by the Council's amendment rules. (Exhibit 7.)

2. South Mist Feeder Pipeline.

As noted above, the underground gas storage facility at Mist allows NWN to purchase gas from suppliers when gas is relatively inexpensive (spring and summer), store it, and then

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[1] For the reasons discussed in Subsection II.B. below, the Project approved in Amendment No. 4 will hereafter be referred to as "Phase II."

deliver the gas to NWN's customers when they need it most, typically October through March. Most of NWN's customers are in the Portland metropolitan area. An integral part of the storage and supply system is therefore a pipeline to transport the gas from the storage facility at Mist to the Portland area.

The existing South Mist Feeder pipeline was proposed by NWN in the late 1980s to transport gas from the Mist storage facility, which then included only the Flora and Bruer pools, to the Portland market.

In February 1989, based on an application from NWN, the Council approved a site certificate for "the construction and operation of a 16-inch-diameter natural gas pipeline known as the South Mist Feeder Pipeline and related and supporting facilities between Miller Station, near Mist, Oregon, and West Union Road, west of Portland, Oregon." (Pipeline Certificate, Section I.A.) (Exhibit 8.) The Pipeline Site Certificate approved construction of a 49-mile pipeline within a "440-yard pipeline corridor." (Pipeline Certificate, Sections II.A., IV.D.(3).)

On March 13, 1998, the Council approved Amendment No. 1, which replaced the amendment provisions in the Pipeline Site Certificate with a requirement that future site certificate amendments be governed by the Council's amendment rules. (Exhibit 9.)

The South Mist Feeder is located in rural Columbia and Washington Counties. The pipeline currently has the capacity to transport approximately 120 MMcfd.

B. This Project.

By this Application, NWN proposes to increase the capacity of both the Mist storage facility and the South Mist Feeder. This Project is Phase III of NWN's storage development effort at Mist and will be referred to in this Application as either "the Project" or "Phase III."[2]

The gas storage portion of the Project will include: (1) upgrades to the dehydration and metering systems at Miller Station; (2) natural gas storage in one additional naturally occurring underground pool, the Reichhold Pool, within the existing site boundary; (3) up to four new sites for injection/withdrawal wells, including one to four wells at each site; (4) approximately 6,500 feet of buried gathering pipeline no greater than 12 inches in

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[2] Each stage of storage development at Mist has been given a phase number. Phase I was the original project involving the Bruer and Flora pools that started operation in 1989. Phase II was permitted in 1997 and involved an expansion of Miller Station and the addition of one reservoir, Al's Pool, in the Calvin Creek storage area. Phase II is scheduled to be fully operational in November 1998. This Project is Phase III; it may be followed by future projects with successively increasing phase numbers.

diameter; and (5) the removal of the 6,650 compressor horsepower limitation currently in place for the Miller Station facility. This will allow Miller Station to operate at rates of up to 190 MMcfd without any restriction on the use of the three existing compressor units, which have a total rating of 8,200 BHP.

The pipeline portion of the Project will expand the capacity of the South Mist Feeder, which connects the Mist storage facility to NWN's Portland gas distribution system, through the construction of approximately 38 miles of new 24-inch pipe from Mist to North Plains. Except for minor deviations that total less than five miles, the expanded pipeline will be entirely within the corridor approved in the Pipeline Certificate and will parallel the existing pipeline. The proposed expansion will increase the capacity of the South Mist Feeder by 180 MMcfd, for a total pipeline capacity of 300 MMcfd.

The Project is described in greater detail in Section IV.

C. Council Jurisdiction.

1. Gas Storage Facility.

When EFSC approved the Storage Certificate in 1981, its jurisdiction included both the surface and underground components of the facility. In 1993, the siting law was amended to include within the Council's jurisdiction only the

> "surface facility related to an underground gas storage reservoir that, at design injection or withdrawal rates, will receive or deliver more than 50 million cubic feet of natural or synthetic gas per day, and require more than 4,000 horsepower of natural gas compression to operate * * *." ORS 469.300(9)(a)(H).

The underground storage reservoir as well as the injection, withdrawal and monitoring wells and the individual wellhead equipment remain under DOGAMI's pervasive authority over the wells and other subsurface components.[3] ORS 469.300(9)(a)(H)(i)-(ii); see 1993 Or Laws, ch 544, § 3.

The surface facilities at the Mist Site are now subject to Council jurisdiction because they have the capacity to receive or deliver more than 50 million cubic feet per day and in its

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[3] State law grants DOGAMI broad authority "[t]o regulate the underground storage of natural gas and the drilling and operation of any wells required therefor." ORS 520.095(16). DOGAMI has exercised this authority through its adoption of comprehensive rules governing underground storage facilities. OAR ch 632, div 10. See, e.g., OAR 632-10-196 (gas injection of oil and gas properties).

current configuration the facility utilizes up to 6,650 horsepower of compression to achieve permitted throughput rates.

Standing alone, the gas-storage portion of the Project would not be an "energy facility" subject to EFSC jurisdiction because it will have the capacity to receive or deliver only 45 million cubic feet of natural gas per day and will require a maximum of 1,550 incremental horsepower of compression to operate. The aggregate length of the gathering lines is 6,500 feet, less than the five-mile minimum length for jurisdictional pipelines. ORS 469.300(9)(a)(E)(ii). The Council's jurisdiction over the gas storage portion of the Project is therefore based on the Project's expansion of an existing jurisdictional facility. ORS 469.320(1); OAR 345-021-0000(1).

2. South Mist Feeder.

A natural gas pipeline is an "energy facility" subject to EFSC jurisdiction if it is "[a]t least 16 inches in diameter, and five or more miles in length." ORS 469.300(9)(a)(E)(ii). The existing South Mist Feeder is an "energy facility" because it is 16 inches in diameter and approximately 49 miles in length. As noted above, the Pipeline Certificate permitted construction of the South Mist Feeder within a 440-yard corridor. (See Pipeline Certificate, Sections II.A., IV.D.3.)[4]

The siting statute authorizes EFSC to approve expansion of an energy facility within the facility's existing "site" through an amendment process. ORS 469.320(5)(b). The "site" of the existing South Mist Feeder is the 440-yard corridor referenced in the Pipeline Certificate.

Several segments of the pipeline expansion will need to be located outside the existing South Mist Feeder site due to safety considerations and physical constraints within the site. In the aggregate, these segments total only 4.366 miles, less than the five miles needed to trigger EFSC's original pipeline jurisdiction. (Exhibit 10.) These segments therefore must be added to the existing facility through the site certificate amendment process.

D. Amendment Process.

The Council rules that govern site certificate amendments are set forth in OAR chapter 345, division 27. OAR 345-027-0011 states that these rules apply only to "facilities for which a site certificate is executed on or after November 30, 1994." The Storage

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[4] Section II.A describes the pipeline route and concludes, "The pipeline will be constructed within the 440 yard corridor along the route shown in Appendix I." Section IV.D(3) states: "The pipeline shall be constructed within the 440 yard pipeline corridor that extends 220 yards on either side of [the] center line of the pipeline route as shown in Appendix I."

Certificate was executed in 1981 and the Pipeline Certificate was executed in 1989. Accordingly, when NWN began working on the site certificate amendments proposed in this Application, the division 27 amendment rules did not apply. Instead, the site certificates contained their own amendment provisions.

Earlier this year, NWN compared the amendment provisions in the site certificates with the division 27 amendment rules and discussed the alternative amendment processes with Council staff. Based on these analyses, NWN concluded that it was desirable to have a single process for all site certificate amendments to the extent possible. Accordingly, on February 27, 1998, NWN asked the Council to amend each site certificate by replacing the amendment provisions in the site certificate with requirements that future site certificate amendments be governed by the "duly adopted rules of the Energy Facility Siting Council for the amendment of site certificates." On March 13, 1998, the Council approved the requested amendments. (Exhibits 7, 9.) Accordingly, this amendment proceeding is governed by the site certificate amendment rules in OAR chapter 345, division 27.

III. APPLICANT INFORMATION

Name and Address:

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IV. PROJECT DESCRIPTION

A. Gas Storage Facility.

The Project will develop new underground gas storage capacity and expand the existing Miller Station facility so that an additional 45 MMcfd of storage gas can be delivered into the Portland load center on a design day. This expansion will increase the combined total Mist storage peak-day delivery capability to 190 MMcfd from the current maximum capability of 145 MMcfd. This expansion will require the development of a new storage reservoir, the Reichhold Pool, with high-capacity injection/withdrawal wells, the installation of a new high-capacity gathering pipeline to connect the Reichhold Pool injection/withdrawal wells to the existing gathering system and the upgrading of processing and compression capacity at Miller Station.

1. Miller Station Improvements.

The total gas throughput of Miller Station will be increased to accommodate the expanded storage capacity. The increased throughput will require minor improvements to Miller Station's compressor capacity, metering, dehydration and auxiliary systems. The existing compressor capacity consists of one ISO-rated 5,500-BHP gas-turbine-driven compressor and two 1,350-BHP reciprocating compressors. The gas-turbine-driven compressor was installed in 1998 with low-emission burners and controls to minimize NOx emissions. The two reciprocating compressors have newer engines that utilize clean-burn technology, which also minimizes NOx emissions.

The ISO rating of 5,500 BHP for the gas-turbine-driven compressor is a "nameplate rating" based on a standard set of operating conditions and is different from horsepower generated during actual operating conditions. The actual horsepower that the engine is capable of generating is related very specifically to atmospheric pressure and ambient air conditions such as relative humidity and temperature. A table showing the relationship of ambient air temperature and horsepower is provided. (Exhibit 11.) At ISO standard operating conditions the rating is 5,035 BHP. However, if the ambient air temperature is 40°F, then the expected output is 5,230 BHP. The critical period of operation of the Mist storage facility is during winter withdrawal when ambient air conditions are generally cold and the capability of the engine to generate horsepower is at its greatest. For purposes of this Application, the ISO rating of 5,500 BHP has been used.

Amendment No. 4 to the Storage Certificate (Exhibit 6) restricted the total compression horsepower available for use at the Mist facility to 6,650 BHP. This Application requests the removal of this horsepower limitation so that all of the installed compressor units can be operated at their full rated horsepower, totaling 8,200 BHP.

The capacity of Miller Station will be expanded by 45 MMcfd to handle the full design capacity of this Project in addition to the capacity of the existing Bruer, Flora and

Al's reservoirs. The current gas-dehydration system and gas-flow meters at Miller Station are not capable of this increased throughput. Accordingly, the dehydration system will require the addition of one new glycol contact tower with an overhead scrubber and the associated gas and glycol piping. The station metering will require the installation of new higher capacity meters. Both of these modifications will be done so that future expansions of the station can be made readily up to the ultimate station capacity of approximately 300 MMcfd if future storage projects prove to be viable.

2. Reservoir Development Phase.

The Calvin Creek storage area is located two and one-half miles south of NWN's Miller Station compressor plant near Mist, Oregon. (Exhibit 12.) The Calvin Creek storage area has multiple reservoirs located within its boundaries, some of which are potentially suitable for storage development. During Phase II, the expansion the Council approved in 1997, Al's Pool was developed for storage and is expected to be fully operational in November 1998. This Project (Phase III) includes the development of the Reichhold Pool if current testing confirms its suitability for storage operation.

The selection of the Reichhold Pool is based on the results of a three-dimensional seismic survey acquired for the entire Calvin Creek storage area before the Phase II expansion approved in 1997. Based on this data and other geologic and reservoir engineering data, the Reichhold Pool was selected for development in this Project. Test injection into the Reichhold Pool will be underway shortly, and the pressure response of the pool is being monitored.

The reservoir will be developed using vertical and high-angle directional wells. Four locations from which to drill the injection/withdrawal wells have been selected and evaluated for geotechnical suitability. The integration of three-dimensional seismic data, reservoir engineering data and a drilling engineering evaluation will determine which of the locations will actually be used. It may be possible to drill all wells from a single location. It is anticipated that at least two wells will be needed to achieve the injection/withdrawal flow rates required for the Project. Two or three observation/monitoring wells will also be drilled. These wells will be used to observe water movement within the reservoir and to verify that no stored gas is migrating from the Reichhold Pool to other pools in the area.

3. Gathering System Additions.

The gathering system will consist of a single 12-inch pipeline from the southern terminus of the twin 16-inch gathering pipelines (the Calvin Creek gathering header) to the location of the Reichhold Pool. At that point, the 12-inch pipeline will connect with six-inch or eight-inch gathering lines from each of the individual wellheads in the area. (Exhibit 13.)

The total gathering line alignment will travel under approximately 6,500 feet of private logging roads and reforested timberlands. The gathering line route involves one

landowner. The construction right-of-way will not exceed 80 feet in width. NWN will maintain a permanent right-of-way approximately 40 feet wide in the area above the pipeline for maintenance and safety.

To avoid areas where slope stability is a concern, NWN conducted a geotechnical review of a preliminary route. (Exhibit 14.) No geotechnical hazards along the proposed route were identified. NWN has conducted a cultural and environmental review in accordance with existing regulations to ensure that there will be no adverse effect on any cultural or environmental resources. (Exhibit 15.) NWN will also work closely with all relevant permitting agencies during construction to satisfy all permitting requirements.

B. South Mist Feeder.

The expansion of the South Mist Feeder consists of approximately 38 miles of 24-inch-diameter steel pipe of 0.375-inch wall thickness designed to satisfy the requirements of 49 CFR part 192 (1997). The expansion will run parallel to the existing South Mist Feeder pipeline, which is 16 inches in diameter. The expansion will include block valves, pig traps and regulator stations. NWN also conducted geotechnical, cultural and environmental studies along the pipeline expansion route to ensure the protection of resources and the avoidance of hazard areas. (Exhibits 19, 22.) The location of the pipeline and the related facilities are shown in Exhibits 10 and 16.

Again, there will be a construction right-of-way no more than 80 feet wide (the "construction right-of-way"). NWN also will maintain a permanent right-of-way directly above the pipeline for maintenance and safety (the "maintenance right-of-way"). The maintenance right-of-way will be restored to its preconstruction condition except in forested areas, where it must be kept free of trees and other large vegetation. Where the expansion pipeline deviates from the existing pipeline corridor (4.366 miles), the maintenance right-of-way will be approximately 40 feet wide. For most of the pipeline route, where the new pipe will be placed next to the existing pipeline, the maintenance right-of-way for the existing pipeline will simply be widened by 10 feet, for a total maintenance right-of-way width of 50 feet.

C. Route Description.

The route for the South Mist Feeder pipeline begins in Columbia County at Miller Station, in Section 11, Township 6 North, Range 5 West, Willamette Meridian, near the community of Mist, and traverses southerly on private lands to Mist and State Highway 47, thence southerly on private land easements and the public right-of-way of State Highway 47 for about 12 miles to the vicinity of Pittsburgh, thence southerly on easements adjacent to private logging roads for about nine miles to an intersection with Bacona Road near the Washington County line, thence southerly on easements and along Bacona Road for about eight miles to Meacham Corner, thence southerly on private easements adjacent to Dairy Creek and the public rights-of-way to Dairy Creek Road and Mountaindale Road for about

nine miles to just north of North Plains and State Highway 26 in Section 35, Township 2 North, Range 3 West, Willamette Meridian. (Exhibit 16.)

V. DIVISION 22 STANDARDS

A. Organizational, Managerial and Technical Expertise (OAR 345-022-0010).

Under this standard, the Council determines whether the applicant has the organizational, managerial and technical expertise to construct and operate the facility. To conclude that the applicant has the necessary expertise, the Council must determine that the applicant has

> "a reasonable probability of successful construction and operation of the facility considering the experience of the applicant, the availability of technical expertise to the applicant, and, if the applicant has constructed or operated other facilities, the past performance of the applicant, including but not limited to the number and severity of regulatory citations, in constructing or operating a facility, type of equipment, or process similar to the proposed facility." OAR 345-022-0010(1).

1. NWN's Underground Storage and Pipeline Experience.

NWN is a 140-year-old company whose core business is the local distribution of natural gas. Around 1980, NWN began developing the natural gas fields in the Mist area for the reinjection and storage of natural gas. Since 1988, NWN has operated its underground natural gas storage operation at Mist under the Storage Certificate, one of the two site certificates that is now in the amendment process. NWN also has a site certificate authorizing it to build and operate the South Mist Feeder pipeline, which brings natural gas to and from the storage facility.

The storage facility allows NWN to store natural gas that it purchases from the interstate pipeline and to withdraw that gas when it is needed for particularly cold weather and peaking requirements. Company personnel who have been managing the existing storage operation will continue to operate the expanded facility. These individuals include the operators who run Miller Station and the geologists and engineers who were formerly employed by an NWN subsidiary, ONG. The subsidiary is now merged into NWN and its employees work directly for NWN. Many of the individuals now working for NWN who are involved in the design and construction of the Project facilities have been with the underground storage project at Mist since its inception, as described below.

The expansion of the South Mist Feeder pipeline, designed to "twin" the existing South Mist Feeder, will be directed by the same NWN personnel who have been managing the existing South Mist Feeder pipeline. Several of these individuals were involved in the original construction in 1989. NWN owns and operates natural gas pipelines throughout its service territory in western Oregon and southern Washington.

2. Technical Expertise Available to NWN.

NWN has assembled an experienced team of professional, technical and administrative personnel to manage all phases of the Project. Following is a brief description of several key members of the Project team.

Charlie Stinson, Gas Storage Department Manager. Charlie is an Oregon-registered petroleum engineer who has been continually involved in the Mist development since discovery of the Mist gas fields in 1979. His specific experiences at Mist include management of the Bruer/Flora storage reservoir development, supervision of the installation and operation of the gas-production gathering system and management of various gas-development ventures. Mr. Stinson was responsible for the recently completed addition of the Calvin reservoirs and expansion of Miller Station, which were approved by EFSC as Amendment No. 4 to the Storage Certificate.

Ron Gullberg, Phase III Project Manager. Ron is a civil engineer registered in Oregon and Wyoming. He has more than 20 years of experience in natural gas control, storage and distribution system construction at NWN. He is responsible for the day-to-day management of the Project. Ron took over the construction management of the expansion approved by Amendment No. 4 in 1997.

Warren Harris, Pipeline Design & Installation. Warren is a mechanical engineer with more than 28 years of experience in the design and construction of gas pipeline systems in the Pacific Northwest. Warren was a key member of NWN's original South Mist Feeder project, which installed the existing pipeline in 1989. He is responsible for the expansion of the South Mist Feeder in this Application.

Jack Meyer, Reservoir Development. Jack is an Oregon-registered geologist with more than 20 years of geological and geophysical mapping and interpretation experience. Jack has worked on the Mist project for both exploration purposes and underground storage development at the Bruer and Flora pools continuously for the past 16 years.

Nick Potts, Storage Operations. Nick has a degree in mechanical engineering technology and has worked for NWN for the past 16 years in design and operations. For the past 12 years Nick has been the Superintendent of Storage, which includes the current Mist storage operations.

Todd Thomas, Field Development. Todd has a degree in geology and has operated for the past 15 years as a drilling superintendent and field operations engineer. Todd was a member of the reservoir development teams for both the Bruer/Flora project and the Phase II project. He has supervised the drilling of all the storage wells in the Mist Field.

Lemmie Rockford, Rockford Corporation. Lemmie is a pipeline construction expert who has supervised numerous major pipeline projects in the West and Northwest, including

the original South Mist Feeder installation and the gathering lines constructed pursuant to Amendment No. 4 at Mist. He will consult to NWN on pipeline design and construction issues.

NWN has contracted with State Pipe and Supply, Inc. to supply pipe manufactured by SeAH Steel, a Korean company. The pipeline will be designed by NWN's in-house pipeline engineers. NWN has selected the Rockford Corp. to install the South Mist Feeder loop.

3. Past Performance.

The existing storage facility at Mist has been in operation since 1988. During that time, the facility has had an exemplary safety record, operating without a single safety citation from OSHA and only one lost-time accident, which occurred in 1997. NWN has not received a single regulatory citation from DOGAMI in connection with its underground storage operations.

In 1996, the Oregon Public Utilities Commission (the "PUC") conducted an on-site inspection of the existing storage facility and reviewed the Operations and Maintenance Procedures for the plant. The PUC found no probable violations. (Exhibit 17.)

Finally, the South Mist Feeder has been in operation since 1989, again without a single OSHA citation, lost-time accident or citation from the PUC, which administers the federal pipeline safety regulations.[5] On August 21, 1998, the PUC's Chief of Pipeline Safety issued a letter in support of this Application. (Exhibit 18.) The letter states in part:

> "It has been the experience of this office that NWN closely adheres to the pipeline safety regulations, and any discrepancies noted during PUC investigations have been dealt with in a competent and cooperative manner. The design and construction activities are of critical importance because once the pipeline is buried, opportunities to physically inspect the pipeline are rare. The practices followed by NWN in these two areas are considered to be excellent, which provides a high level of confidence in public safety and increased service life of the pipeline."

4. Conclusion.

In its Order approving Amendment No. 4 (p. 8), the Council stated:

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[5] In January 1998, the pipeline exceeded federal pressure standards for a four-hour period. NWN reported the occurrence to the PUC, but the PUC did not issue a citation.

"NNG's prior experience constructing and operating the Mist Storage Facility, and the fact that the proposed expansion would involve identical activities, provide reasonable assurance that NNG can successfully construct, operate and retire the facility."

Based on NWN's experience with its existing underground storage facility and the South Mist Feeder pipeline, the expertise of key personnel and its past performance with the existing storage and pipeline facilities, NWN has again demonstrated that it has a reasonable probability of successful construction and operation of the Project and has the requisite organizational, managerial and technical expertise.

B. Structural (OAR 345-022-0020).

Under the structural standard, the Council determines whether

"(1) The applicant, through appropriate site-specific study, has adequately characterized the site in terms of seismic zone and expected ground response during the maximum credible seismic events; and

"(2) The facility can be designed, engineered, and constructed adequately to avoid potential dangers to human safety presented by seismic hazards affecting the site, as defined in ORS 455.447(1)(d) and including amplification, that are expected to result from all reasonably probable seismic events." OAR 345-022-0020.

The standard has two components, a site characterization requirement and a design and construction requirement. NWN engaged GeoEngineers, Inc. to prepare geotechnical investigations of the portions of the Project site that include the Reichhold Pool wells and gathering lines and the expansion of the South Mist Feeder. The geotechnical investigation of the South Mist Feeder is attached as Exhibit 19; the geotechnical investigation of the Reichhold Pool area is attached as Exhibit 14.

With respect to the minor improvements to the Miller Station facility, NWN refers to the corresponding report prepared by Dames & Moore and attached as Exhibit 10 to the Phase II Application (1997). The addition of one new gas-dehydration tower and replacement of various meters does not require major new buildings or other major site alteration. The improvements to Miller Station that will occur as a part of this Project in no way change Dames & Moore's predicted ground response at Miller Station during the maximum credible seismic events or change Dames & Moore's conclusion that the Miller Station facilities, if designed to meet Uniform Building Code ("UBC") Seismic Zone 3 requirements, can be constructed to avoid danger to human safety.

We discuss below the regional geologic setting and seismic characterization of the Project. References to Exhibit 19 point to more detailed information in the GeoEngineers, Inc. report supporting this discussion.

1. Regional Geology.

The Mist Field is located in the northern portion of the Coast Range physiographic province. Most rock layers in the area formed between 50 million and 30 million years ago. A chain of volcanic islands, perhaps not unlike today's Hawaiian Islands, was carried eastward on the Pacific Ocean floor and collided with the westward moving edge of North America about 50 million years ago. That collision process continues today at a rate of 9 to 12 millimeters per year. As the more dense ocean floor is driven beneath the western edge of North America, stresses accumulate. Earthquakes occur when these stresses are released. The zone of collision between the Pacific Ocean floor and North America, running from British Columbia to northern California, is referred to as the Cascadia Subduction Zone. "Subduction" is the geologic term for the descent of the ocean floor beneath the continent. The chain of islands, being too thick to pass smoothly beneath North America, became part of Oregon's Coast Range. (Exhibit 19 § 3.1.)

As the island chain approached the continent, sediments collected in the gap between the two, varying from sand to mud and including substantial amounts of volcanic ash. The sediments derived from the erosion of the North American continent and were carried to the sea by rivers. As the sediments grew thicker, the compressive forces of their own weight transformed them into the rock layers recognizable in the Mist Field today. The basalt (black) lava flows of the volcanic island chain and oceanic crust underlie the area at a depth of several thousand feet. Above that basement, in the Mist Field area, are three layers of clean sandstone, the shallowest of which is known locally as the Clark and Wilson Sandstone and contains the producing gas reservoirs and storage reservoirs in the Mist Field. This sandstone is overlain by up to 1,000 feet of mudstone of approximately the same age. The sandstone and mudstone are referred to together as the Cowlitz Formation.

Above the Cowlitz Formation are several layers of mudstone and siltstone, including up to 1,600 feet of mudstone and siltstone known as the Keasey Formation. The Keasey Formation is composed mainly of volcanic ash from the ancient Cascade Range. Above the Keasey Formation are additional thick sandstones and mudstones of the Pittsburgh Bluff Formation, formed approximately 30 million years ago. These are capped by relatively thin layers of the same Columbia River Basalt group that is well exposed in the Columbia River Gorge, which erupted between 17 million and 5 million years ago. Above the basalt are more recent clay and silt soils, reaching a depth in excess of 50 feet at Miller Station.

The volcanic and sedimentary assemblage of the Coast Range of northern Oregon has experienced at least two major crustal events related to the collision of North America with the Pacific Ocean floor. The first event occurred about 35 million years ago and created the faults that have trapped natural gas in the Clark and Wilson Sandstone in the Mist Field.

The second event started 5 million to 10 million years ago and continues to the present. This event is responsible for the arching up of the Coast Range. The stability of the Mist Field is confirmed by the fact that despite active crustal movement extending back several million years from the present, the gas has not escaped. Though the uplift of the Coast Range continues at a rate of one inch every 36 years at Astoria, the rate of uplift at the Mist Field is slower. Diagrams showing the Cascadia Subduction Zone and the slippage of the Pacific Ocean crust beneath North America are found at Exhibit 19, Figures G-6 and G-7.

Erosion has carved steep valleys in the sedimentary and volcanic layers of the Coast Range, creating alluvial soils in river valleys. The strength of the eroded rock layers varies according to composition, as might be expected, with basalt lava layers being more resistant to erosion and slumping while mudstones and recent alluvium are less competent. Landslides can occur in the less competent rocks and soils. A geologic map showing which of the geologic formations are exposed at the surface along the pipeline route is included at Exhibit 19, Figure G-3. A series of maps showing the location of dormant and active landslides along the pipeline route is included at Exhibit 19, Figure G-2. A series of maps showing landslides in the area of the wellsites and gathering lines to be built at the Reichhold Pool is included at Exhibit 19, Figure G-2.

2. Seismic Characterization.

Since 1993, all of western Oregon has been classified, for UBC purposes, as being in Seismic Zone 3. The UBC provides design criteria for buildings in this zone based on the ground acceleration and likely amplification of shaking that may occur during an earthquake.

Three general sources of earthquakes are recognized in the Project area. First, there is geologic evidence that over the past 4,000 years as many as eight earthquakes with magnitudes in excess of 8 may have occurred, with the most recent being more than 300 years ago. These "interplate" earthquakes are centered off the Oregon coast, where the Pacific Ocean floor and North American "plates" of the earth's crust grind together. See Exhibit 19, Figure G-7 for a diagram showing the source of such interplate earthquakes. For design evaluation purposes, a quake of magnitude 8.5 originating 15 miles beneath the earth's surface at a distance of 45 miles from the Project site is considered the maximum credible event.

The second source of earthquakes is farther inland, beneath the Willamette Valley and beneath the Cascade Range. There, the descending slab of Pacific Ocean floor begins to break within the earth's upper mantle, releasing stresses within the slab (an "intraplate" earthquake). A quake of magnitude 7 originating 30 miles beneath the earth's surface at a distance of six miles from the Project site is considered the maximum credible event from that source. See Exhibit 19, Figure G-7 for a diagram showing the source of such intraplate earthquakes.

Finally, occasional movement along faults in the rocks of the Coast Range may occur (a "crustal" earthquake), though historical activity is sparse. A quake of magnitude 6 originating six miles beneath the earth's surface at a distance of four miles from the Project site is considered the maximum credible event from this source. (Exhibit 19 § 7.1.) There have been several small earthquakes within 50 miles of the Project site since the mid-1800s. A table of 17 events in the magnitude 4-5 range is included in Exhibit 19 § 6.1 (Table G-4). A map showing the location of such earthquakes is at Exhibit 19, Figure G-4.

GeoEngineers, Inc. has calculated the peak ground accelerations and the expected amplification of vibrations that would occur throughout the South Mist Feeder corridor and at the location of the Reichhold Pool facilities during the maximum credible event from each of these three earthquake sources. (Exhibit 19 § 7.1 and Exhibit 14 § 7.1, respectively.) All calculated effects were less than the seismic loadings for UBC Seismic Zone 3. Accordingly, conventional UBC design methods are appropriate for design of the South Mist Feeder expansion, the Reichhold Pool facilities and the gathering lines. Welded steel pipelines like those to be installed at Reichhold Pool and within the South Mist Feeder corridor have not been damaged by earthquake shaking of this magnitude during earthquakes in California. (Exhibit 19 § 7.1.) Note that in making these calculations, GeoEngineers, Inc. used the maximum credible seismic event, rather than a lesser "reasonably probable" seismic event, and the resultant ground accelerations were within design criteria for UBC Seismic Zone 3. Therefore, the facilities designed to the specifications of UBC Seismic Zone 3 are expected to withstand any reasonably probable seismic event.

Earthquake shaking motions can be amplified or dampened by specific ground conditions. Some wet sandy soil types can become liquefied during earthquakes causing them to flow. Finally, earthquakes can produce ruptures at the surface of the earth. The South Mist Feeder corridor and the Reichhold Pool area have been evaluated for potential amplification, mass movement, differential soil compaction and settlement, buoyancy and lateral spread, liquefaction and rupture. GeoEngineers concludes that there is a low probability that any of these factors would result in damage to the Project facilities. (Exhibits 19, 14, §§ 7.2-7.7.)

In summary, the South Mist Feeder pipeline alignment and the locations for Reichhold Pool wellheads and gathering lines have been evaluated for seismic hazards including shaking, amplification, landsliding, soil liquefaction and surface rupture. The wellheads, the gathering lines and the expansion of the South Mist Feeder pipeline can be designed and built with very low risk of any damage from seismic hazards and, therefore, with very low risk of any danger to human safety.

C. Soil Protection (OAR 345-022-0022).

Under this standard, the Council determines whether the design, construction and operation of the facility, taking mitigation into account, is likely to result in a significant adverse impact to soils.

For the Miller Station portions of the Project, NWN relies upon the Dames & Moore study of the major soil types in the Miller Station area, which is attached as Exhibit 12 to the Phase II Application, which the Council approved in 1997. A topographic map showing the elevations of Miller Station is included in this application at Exhibit 19, Figure G-2a. For the South Mist Feeder alignment and the Reichhold Pool area, NWN relies on the GeoEngineers studies attached to this application as Exhibits 19 and 14, respectively.

1. Soil Types.

Thirty-five soil types will be subject to Project construction activities. GeoEngineers has provided a soil map for each area, attached as Exhibits 14-A and 14-B. Descriptions of each soil type are within the text of the Exhibits.

2. Miller Station; Effect on Soils.

Miller Station is an existing industrial site, already dedicated to gas storage activities. As with the project approved in Amendment No. 4 to the Storage Certificate, NWN has elected to add new dehydration and compression capacity to Miller Station in this Project, rather than to create a second facility near the Reichhold Pool. There will be very little earthwork at Miller Station for the new dehydration facilities and no significant increased loading of soils in the area. No significant cutting or trenching is expected. The planned equipment locations are already covered with crushed rock. Therefore, there will be no significant new adverse impact on soils at the Miller Station site.

3. South Mist Feeder Pipeline Alignment; Effect on Soils.

The construction of the pipeline will result in temporary disturbance to a variety of soil types and plant communities. In the elevations above the river valleys, timber and brush must be removed for pipeline construction. However, the pipeline corridor is of limited width and after pipeline burial, plant growth will be established to prevent erosion. Native soils will be used for backfill. Where necessary, the pipeline will be surrounded by bedding sand. The presence of the pipeline will likely be more protective of the soils than other land uses in the area (timber harvesting, pasturing and hay harvesting) since less intensive surface use will be made of the pipeline corridor in the future. The paragraphs that follow discuss the effect of the pipeline on soil compaction, erosion and landsliding.

GeoEngineers reviewed soils and rock units underlying the pipeline alignment and found that rock units are not susceptible to consolidation under the loads that will be associated with pipeline construction. Embankment fills are not planned and the buried pipeline will not significantly change the existing stresses in the alluvial soils along the route. Therefore, soil compaction and settlement along the pipeline alignment should be minimal. (Exhibit 19 § 5.1.)

Erosion of soils along the South Mist Feeder pipeline alignment is not expected to increase as a result of Project construction. Portions of the pipeline will be along roads, where existing pavement and crushed rock surfaces prevent erosion. Overland portions of the alignment will be revegetated following pipeline construction, to minimize erosion. GeoEngineers recognized that groundwater and rainfall might find a preferential path through pipeline backfill materials. They suggest, and NWN will implement, construction measures to avoid erosion from this source. (Exhibit 19 §§ 5.2, 5.3.)

The South Mist Feeder pipeline alignment has been changed following investigation of the slopes in the area to avoid, where feasible, slopes already affected by landsliding. GeoEngineers provided maps showing the existing areas affected by landsliding along the alignment. (Exhibit 19, Figures G-2a through G-2h.) Affected areas have been classified as either active or dormant landslides. (Exhibit 19, Table G-3.) Where possible, affected areas have been avoided by realignment. Where affected slopes could not feasibly be avoided, GeoEngineers suggests that NWN employ strain gauges, inclinometers and surface surveys at various points to monitor ground movement and allow for mitigation of any stresses on the pipeline. GeoEngineers concludes that the ground provides adequate support for the pipeline along the entire alignment. (Exhibit 19 §§ 5.4.2, 5.4.3.) The net effect of the pipeline alignment on area soils will be minimal.

4. Reichhold Pool Wellsites and Gathering Lines; Effect on Soils.

Up to four graded wellsites for injection and withdrawal facilities are planned, each approximately 200 feet square and capable of supporting several wells. The proposed wellsite locations are shown at Exhibit 14, Figure 1. Each wellsite will be connected by a 6-inch or 8-inch pipeline to the proposed 12-inch pipeline that connects the Reichhold Pool area to the existing gathering systems. Approximately 6,500 feet of gathering line will be constructed with major segments along existing gravel roads and some overland segments. The following paragraphs discuss the effects of the gathering lines on area soils.[6]

Construction of the wellsites and gathering pipelines will result in temporary disturbance to a variety of soil types described in Exhibit 14, Figure 8. The graded wellsites will be made level by cut and fill, will affect less than four total acres and will be designed to minimize erosion during storage operations. The gathering pipeline corridor is of limited width and after pipeline burial, plant growth will be reestablished to prevent erosion. Native soils will be used for backfill. When necessary, the pipeline will be surrounded by bedding sand. The presence of the pipeline will likely be more protective of the soils than other land uses in the areas outside the road right-of-way (timber harvesting) since less intensive surface

[6] Under ORS 469.300(9)(a)(H)(i)-(ii), only DOGAMI has jurisdiction over the wellsites. The location of the wellsites is discussed here only for the purpose of giving a complete description of the Project.

use will be made of the pipeline corridor in the future. The paragraphs that follow discuss the effect of the pipeline on soil compaction, erosion and landsliding.

GeoEngineers reviewed soils and rock units underlying the pipeline alignment. The rock units and soils are not susceptible to consolidation under the loads that will be associated with the gathering pipeline. Soil compaction and settlement along the pipeline alignment should be minimal. (Exhibit 14 §§ 4.3, 5.1).

Erosion of soils along the gathering pipeline alignment is not expected to be significant as a result of Project construction. Portions of the gathering pipeline will be along roads, where existing crushed-rock surfaces prevent erosion. Overland portions of the alignment will be revegetated following pipeline construction, to minimize erosion. GeoEngineers recognized that groundwater and rainfall might find a preferential path through pipeline backfill materials. They suggest construction measures to avoid erosion from this source. (Exhibit 14 §§ 5.2, 5.3.)

The gathering line alignment has been adjusted following investigation of the slopes in the area, to avoid slopes already affected by landsliding. A map showing the existing areas affected by landsliding in the area is provided at Exhibit 14, Figure G-2. All affected areas have been avoided. In the context of the substantial impacts on area soils related to timber harvesting and agricultural activities in the same area, the effect of the proposed gathering line construction will be minimal.

D. Land Use (OAR 345-22-030).

1. Introduction.

NWN has elected to address the Council's land use standard by obtaining a land use determination from the Council pursuant to ORS 469.504(1)(b). OAR 345-021-0010(1)(i)(B)(i) states that an application must identify the "applicable substantive [land use] criteria" of the local governments affected by a proposed facility and describe how the facility complies with those criteria and any Land Conservation and Development Commission (the "LCDC") rules, goals or land use statutes directly applicable to the facility under ORS 197.646(3).[7]

If an applicant cannot demonstrate compliance with one or more of the "applicable substantive criteria," the applicant must describe how the proposed facility complies with the Statewide Planning Goals adopted by the LCDC (the "Goals"). An applicant may demonstrate compliance with the Council's land use standard by showing compliance with a

[7] NWN is not aware of any statutes, rules or goals that apply directly to the Project pursuant to ORS 197.646(3).

combination of the Goals and applicable substantive criteria from the affected local governments.

The information in this section of the Application, and relevant information elsewhere in the Application, demonstrates that the Project meets the Council's land use standards.

The Project is described in detail in Section IV, above. The changes to Miller Station, new natural gas storage in the Reichhold Pool, the new gathering lines at the Reichhold Pool and the first 24 miles of the South Mist Feeder pipeline expansion will all occur in Columbia County. The remaining 14 miles of the South Mist Feeder pipeline route are in Washington County. The pipeline route is located entirely within these two jurisdictions.

The proposed pipeline passes through several land use zones in both Columbia County and Washington County, where it is either a use permitted outright or a conditional use. The pipeline satisfies the conditional use criteria by utilizing existing rights-of-way where possible and allowing existing land uses to continue. In three of the zones in Columbia County, pipelines are not listed as either permitted or conditional uses. For these zones, this section of the Application demonstrates how the Project complies with the Goals.

2. Compliance with Applicable Substantive Criteria of Land Use Regulations.

This section identifies the substantive land use regulations and comprehensive plan requirements applicable to the Project, beginning with Columbia County and followed by Washington County. This section discusses each of the zoning districts within which the Project is located, describes how the Project is treated in each district (as a use permitted outright, as a conditional use or as a use requiring Goal findings) and addresses the applicable substantive criteria.[8]

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[8] Oregon law makes the comprehensive plan the primary planning document. Implementing ordinances such as zoning ordinances must be consistent with the comprehensive plan. Baker v. City of Milwaukie, 271 Or 500, 533 P2d 772 (1975). Where a conflict exists between the comprehensive plan and the zoning ordinance, the comprehensive plan will control. To NWN's knowledge, there are no areas subject to conflict between the county comprehensive plans and the county zoning ordinances. Thus, this section of the Application demonstrates compliance with the applicable zoning regulations of Columbia County and Washington County but does not engage in any direct discussion of the respective county comprehensive plans unless specifically referred to in the applicable zoning regulations.

a. Columbia County: Applicable Substantive Land Use Regulations.

The proposed Project is located on six separate land use districts in Columbia County: Primary Forest (P-76), Primary Agriculture (PA-38), Forest Agriculture (FA-19), Existing Commercial (E.C.), Rural Center (RC) and Rural Residential (RR-5). Most of the lands crossed by the Project are located in the forest and farm zones. The E.C., RC and RR-5 areas are located in and near the towns of Mist, where the pipeline travels through town under the center of the highway, and Vernonia, where the pipeline travels across several rural residential parcels and one commercial parcel east of town.

The Project is permissible as a conditional use in the P-76, PA-38 and FA-19 zones. Therefore the Project's compliance with the applicable substantive criteria from the county's land use ordinance and comprehensive plan is demonstrated below in Subsections (1) (general criteria), (2) (P-76 criteria), (3) (PA-38 criteria) and (4) (FA-19 criteria).

The county's zoning provisions relating to the E.C., RC and RR-5 zones do not contain any provisions authorizing natural gas pipelines, utility facilities or any similar uses. Therefore, this Application demonstrates compliance with the applicable Goals in Subsection (5) below.

Compliance with the county's riparian area protection ordinance, which applies to land in all zones, is demonstrated in Subsection (6).

(1) General Criteria Applicable to All Conditional Uses.

The Project is a conditional use in the P-76, PA-38 and FA-19 zoning districts. In each case, the general conditional use criteria found in Columbia County Zoning Ordinance ("CCZO") §§ 1503.5(A)-(G) and 1503.6 apply. These criteria are addressed below.

(a) CCZO § 1503.5(A):

> "The Commission may grant a Conditional Use Permit after conducting a public hearing, provided the applicant provides evidence substantiating that all the requirements of this ordinance relative to the proposed use are satisfied and demonstrates the proposed use also satisfies the following criteria:
>
> "A. The use is listed as a Conditional Use in the zone which is currently applied to the site[.]"

Response: The Project is listed as a conditional use in the P-76 district. CCZO § 503.2 lists "mining and processing of * * * subsurface resources" as a conditional use and § 503.6 lists "[u]tility facilities." Just last year, the county found that the applicant's natural

gas storage activities at Mist, including pipelines, constitute listed conditional uses under these provisions. (Exhibit 20-D.) CCZO §§ 503.2 and 503.6 implement OAR 660-006-0025(3)(m) (production of gas and single-well compressors may be allowed outright on forest lands), OAR 660-006-0025(4)(f) (processing of gas, multiple-well compressors and storage may be permitted on forest lands subject to review standards) and OAR 660-006-0025(4)(p) (new gas distribution lines with rights-of-way of 50 feet or less may be permitted on forest lands subject to review standards).[9]

The Project is listed as a conditional use in the PA-38 district. CCZO § 303.2 lists "[o]perations conducted for the * * * exploration, mining, and processing of aggregate and other mineral resources or other subsurface resources" as a conditional use,[10] and § 303.8 lists "[f]acilities necessary for public utility service." The county has previously found that the applicant's natural gas storage activities at Mist Field including pipelines, constitute listed conditional uses under these provisions. (Exhibits 20-D.)

The Project is "necessary for public utility service" for the following reasons. NWN is the sole provider of natural gas to residential and commercial end users in its territories located in the Willamette Valley, Clark County, Washington, and various parts of the Oregon Coast and Columbia Gorge. NWN also sells and transports natural gas to industrial customers in its service territory. According to NWN's most recent Integrated Resource Plan, which was approved by the PUC in 1996, firm residential customers are anticipated to grow systemwide at 3.5 percent per year between 1995 and 2014 while the firm commercial class is expected to grow at 2.3 percent per year over this period. The firm industrial class is expected to grow at about 1 percent per year. (OPUC Order 96-219, Aug. 13, 1996 (the "Order"). (Exhibit 24.)) Much of the growth is centered in the Portland metropolitan area, including Washington and Clackamas Counties as well as Multnomah County.

The Order notes, "In the next two years, the company will initiate looping of the South Mist Feeder * * *." (Order at 3.) The pipeline portion of the Project constitutes the referenced "looping" of the South Mist Feeder by placing a parallel pipe along the length of the existing pipeline. This looping, coupled with increases in NWN's ability to store gas at Mist in Columbia County, has been determined to be the most cost-effective way to meet the increased demand. By virtue of the Order approving the Integrated Resource Plan, the regulatory agency responsible for utility service, PUC, has determined the need for increased storage capacity and additional pipeline. (Exhibit 21.)

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[9] The proposed South Mist Feeder pipeline will have a permanent right-of-way of 50 feet or less and thus falls under OAR 660-006-0025(4)(p).

[10] ORS 215.283(1)(g) authorizes in EFU zones the exploration for and production of oil and gas as defined by ORS 520.005. ORS 520.005(14) includes "underground reservoirs," meaning "subsurface * * * formation[s] suitable for the injection and storage of natural gas therein and the withdrawal of natural gas therefrom * * *."

Nearly all of the land in Columbia County between the Mist Field and its border with Washington County to the south is zoned either for agricultural or forestry use. Indeed, given the need (and desirability) of placing the pipeline (a) parallel to the existing pipeline[11] and (b) under public right-of-way as much as possible, it is not possible to construct the pipeline without crossing some of the county's agricultural land. This is because the agricultural land is concentrated in the Nehalem River Valley along State Highway 47. The proposed pipeline therefore must be sited in an agricultural zone to provide the public utility service contemplated by the Project.[12]

The use is listed as a conditional use in the FA-19 district. CCZO § 404.2 lists "mining and processing of mineral and subsurface resources" as a conditional use, and WCC § 404.7 lists "facilities necessary for public utility service." These provisions are essentially identical to those in the PA-38 zone discussed above, and therefore the foregoing discussion of state statutory and administrative law applies equally to the FA-19 zone.

(b) CCZO § 1503.5(B):

> "The use meets the specific criteria established in the underlying zone[.]"

Response: The specific criteria applicable in the P-76, PA-38 and FA-19 zones are addressed in Subsections (2), (3) and (4), below.

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[11] When NWN sited the existing South Mist Feeder in the late 1980s, it chose its route to minimize impacts on the County's resource lands and negotiated the route with individual landowners on a parcel-by-parcel basis. By placing the proposed pipeline parallel to the existing pipeline and by confining the new pipeline to the existing pipeline corridor, NWN has also minimized the impacts of the new pipeline on the County's agricultural land.

[12] For those portions of the pipeline in the EFU District that fall within the right-of-way of a public road, the pipeline is "permitted outright" pursuant to ORS 215.213(1)(n), which allows "the placement of utility facilities * * * in the subsurface of public roads and highways along the public right of way" in any area zoned EFU. Accordingly, NWN believes that the portions of the pipeline in the public right-of-way need not, from a strictly legal standpoint, demonstrate compliance with County land use criteria. Similarly, for those segments of the pipeline that are in the EFU District but outside the right-of-way of public roads, NWN believes the pipeline is governed solely by ORS 215.213(1)(d), which allows "[u]tility facilities necessary for public service" in any area zoned EFU. NWN believes that the only legally applicable criterion is whether the pipeline is "necessary for public service." While NWN reserves its right to assert these positions in the future if necessary, NWN nevertheless intends in this Application to demonstrate full compliance with the criteria in the county codes.

(c) CCZO § 1503.5(C):

> "The characteristics of the site are suitable for the proposed use considering size, shape, location, topography, existence of improvements, and natural features[.]"

Response: NWN's choice of a site for the proposed gas storage reservoir was dictated by the presence of a unique underground formation suitable for natural gas storage and not found elsewhere in the state: the Calvin Creek reservoirs. The County previously has found this to be a suitable site for storage operations. (Exhibit 20-D.) The pipeline in turn is necessary to provide the benefits of the storage facility to NWN's customers throughout western Oregon. Based on site studies performed by Dames & Moore and GeoEngineers (Exhibits 14-A, 19, 22), NWN has selected a pipeline route designed to minimize intrusion on natural features such as wetlands, hazard areas such as unstable slopes, and natural resources such as timber. For instance, the new pipeline will be immediately adjacent to the existing pipeline for the majority of its length.

(d) CCZO § 1503.5(D):

> "The site and proposed development is timely, considering the adequacy of transportation systems, public facilities, and services existing or planned for the area affected by the use[.]"

Response: This Project will not require new public facilities or services--in fact, it will provide them by creating a new source of natural gas storage. The Project facilities do not rely on public water or sewer and are accessed by privately maintained roads. The Mist-Birkenfeld Rural Fire District provides fire-fighting services for the applicant's Mist Field operations, and the applicant provides financial and other support for the district. The applicant has discussed the Project with the district and the district has found that it can provide an adequate level of coverage for the new operations. (Exhibit 23-A.)

(e) CCZO § 1503.5(E):

> "The proposed use will not alter the character of the surrounding area in a manner which substantially limits, impairs, or precludes the use of surrounding properties for the primary uses listed in the underlying district[.]"

Response: The P-76 zoning district allows a number of primary uses, most importantly the propagation or harvesting of forest products. CCZO §§ 502.1, .10. The PA-38 zoning district allows a number of primary uses, most importantly farm use as defined by ORS 215.203. The FA-19 zone allows both farm and forest uses as primary uses.

The proposed use will not impair or preclude the use of surrounding properties for these primary uses because it will not affect other property owners' abilities to use their properties. The existing South Mist Feeder and Mist Field storage operations are carried out without conflicts with on-site or nearby timber and farm owners. Timber and farm owner letters of support are attached as Exhibits 24 and 25. The expanded South Mist Feeder pipeline will be buried primarily within the existing right-of-way and at a depth that does not interfere with agricultural or forestry practices. The new gathering lines will have the same negligible impacts on surrounding forestry operations as the existing gathering lines. The pipelines will not have any "off-site" impacts on agriculture or the propagation or harvesting of forest products.

(f) CCZO § 1503.5(F):

"The proposal satisfies the goals and policies of the Comprehensive Plan which apply to the proposed use[.]"

Response: The following Columbia County Comprehensive Plan (the "Plan") goals and policies are applicable to this Application.

i) Forest Lands Goal:

"To conserve forest lands for forest uses."

Response: Most of the proposed Project will be located underneath the ground and therefore will have minimal impact on forest lands. The applicant has sought to minimize the forest impacts of its above-ground activities. The pipeline right-of-way will remove only about 60 acres of timberland in Columbia County from commercial production. One of the largest timber owners in the area, Longview Fibre Company ("Longview Fibre"), has submitted a letter stating that "the exploration, production and underground storage of natural gas has proven to be a very compatible land use with our forest management operations" and that they "have no objection to the current proposed expansion." (Exhibit 20-D.)

In its earlier consideration of the Mist storage project, the county concluded, "This project will have a minimal impact on the forest resource * * * while providing a valuable energy storage site." (Exhibit 20-D.) A similar conclusion applies to the present proposal.

Finally, the proposed pipeline is allowed by LCDC's rules for forest lands. These rules allow new gas distribution lines on forest lands, so long as the right-of-way for the line is 50 feet or less. The right-of-way for the proposed pipeline will not exceed 50 feet.

ii) Forest Lands Policy 1:

"It shall be the policy of Columbia County to conserve forest lands for forest uses * * *."

Response: See Response to previous criterion.

iii) Energy Sources Goal:

> "To protect deposits of energy materials in the County and prevent injury to surrounding lands and residents."

Response: The energy sources section of the Plan includes in its inventory the natural gas wells in the Mist area. The county has determined that a natural gas well can cause potential conflicts with primary forest uses and has elected to rely on administrative rules established by DOGAMI to minimize such conflicts. The findings section states:

> "The County will conserve forest lands for forest uses and allow operations conducted for the exploration, mining and processing of subsurface resources as a conditional use. The County will rely on DOGAMI to ensure future protection of resources and surrounding lands." (Plan at 224.)

This Goal is satisfied because the operation is regulated subject to the conditional use criteria in CCZO and through permits required by DOGAMI, not through the Council's site certificate process. See ORS 469.300(9).

iv) "Agricultural" Goal:

> "To preserve agricultural land for agricultural uses."

Response: The applicant's proposal is consistent with this Goal because the Project will take agricultural land out of service only during the very short construction phase of the Project. The only portion of the Project crossing PA-38 and FA-19 land will be pipeline buried four feet underground, primarily in the right-of-way for the existing pipeline and, in any case, below the level at which farm implements operate. A letter of support from Gutmann Nurseries, attached as Exhibit 25, shows that even lands directly in the pipeline right-of-way can continue to be used for agricultural use once the pipeline is in place.

v) Agricultural Policy 4:

> "Protect agricultural lands from non-farming encroachments.

Response: This Application will not result in any nonfarming encroachment onto agricultural lands because it will not involve surface facilities on such lands.

vi) Agricultural Policy 5:

"Encourage agricultural activities on designated agricultural lands."

Response: This use will not interfere with agricultural activities on agricultural lands. During pipeline trenching and construction, operations will be coordinated with farm owners, damage will be minimized and, if damage occurs, the property owner will be compensated in accordance with written agreements entered into with the applicant. Construction will be temporary and will not discourage agricultural activities.

vii) Agricultural Policy 11:

"Prevent land uses that interfere with or impair agricultural management from occurring on designated agricultural lands, excepting those specified in ORS 215.213[6] 2 and 3."

Response: This section actually refers to ORS 215.283(2) and (3) because the county did not adopt marginal land provisions under ORS 197.247 before 1993. ORS 215.213(1). The proposed uses are allowed by ORS 215.283(2).

viii) Agricultural Policy 15:

"Permit non-farm/non-forest uses only when not in conflict with agricultural or forestry activities."

Response: This nonfarm/nonforestry use will not be in conflict with agricultural or forestry activity. The use will not require the removal of lands from agricultural activities on a permanent basis. Use of forest and right-of-way has been minimized by following existing roads where feasible. Letters of support have been submitted by affected farm and forest owners. (Exhibits 24, 25.) In addition, the use is allowed by LCDC Goal 4 (Forest Lands) and by the state statutes that govern the use of agricultural lands, as described above.

ix) Agricultural Policy 17:

"Allow non-farm uses in accordance with ORS 215.283."

Response: ORS 215.283(1)(g) and (2)(b)(B) authorize this use. The county has implemented ORS 215.283 by establishing the use as a conditional use in the PA-38 and FA-19 zoning districts.

x) Air, Land and Water Resources Goal:

"To maintain and improve land resources and the quality of the air and water of the County."

Response: The county attains this Goal by relying on state and federal agencies to require compliance with environmental laws. (See Policies 1, 2.) The applicant will meet this Goal by securing all required state and federal permits, and this can be made a condition of land use approval.

(g) CCZO § 1503.5(G):

"The proposal will not create any hazardous conditions."

Response: In siting the present Project, the applicant has considered a number of safety issues, including soil stability, seismic issues, landslide potential and fire safety. The Project has been designed to avoid or minimize the risk of all hazards, and project facilities incorporate numerous safety features.

The Project will be monitored from Miller Station,[13] which NWN has operated since 1987 with only one lost-time accident and which was recently found by the PUC to be in compliance with applicable federal safety regulations. In addition, since 1988 NWN has operated a similar underground storage project at the nearby Bruer/Flora storage area without creating any hazardous conditions and without any accidents. Further, NWN has operated the existing South Mist Feeder pipeline since 1989 without any fire incident or indeed any incident requiring action by local fire districts. In connection with this Application, NWN has obtained letters from five fire districts that serve the pipeline corridor in both Columbia and Washington Counties. (Exhibits 23-A-23-E.) None have expressed any reservations about the proposed pipeline expansion.

Finally, the PUC has written in support of this Application stating, among other things, that NWN's design and construction practices "are considered to be excellent, which provides a high level of confidence in public safety and increased service life of the pipeline." (Exhibit 18.)

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[13] NWN will conduct continuous monitoring of the pipeline from both its Miller Station and Portland gas control centers. Supervisors and trained emergency response crews are on call at all times to respond to emergency situations. (Exhibit 35.)

(h) CCZO § 1503.6:

"Design Review: The Commission may require the Conditional Use be subject to a site design review by the Design Review Board or Planning Commission."

Response: Site design review is required. The applicant has submitted with this Application all information required by CCZO § 1550. (Exhibits 10, 12, 13, 14-14-B, 15, 16, 19, 22, 31, 33.)

The county's design review ordinance does not contain any objective criteria. In the county's past approvals of NWN's storage and pipeline facilities in the county, the site design review provision has been used by the county as a means of providing NWN with any additional suggestions the county may have concerning the design and placement of project facilities. The primary facilities to be constructed are the I/W wells (which are outside the scope of this Application), the gathering pipelines and the South Mist Feeder looping pipeline. The locations for these structures were selected based on a careful site analysis performed by GeoEngineers. GeoEngineers identified potential hazard areas, such as slopes, slide areas and unstable soils, and then helped NWN to avoid such areas in siting its pipelines and wells. NWN also sited the South Mist Feeder expansion parallel to existing road rights-of-way wherever possible. The applicant minimized impacts on timber and on wetlands and other natural features. Finally, the Project will have virtually no visual impacts. The I/W wells are located exclusively in forested areas. The changes to Miller Station will all occur within existing structures within the fenced facilities. The rest of the Project is underground pipeline.

(2) PF-76 Zoning District Approval Criteria.

A conditional use in the PF-76 district is subject to the criteria contained in CCZO §§ 504.1-.3.

(a) CCZO § 504.1:

"All Conditional Uses Permitted in the PF-76 Zone Shall Meet the Following Requirements:

"* * * The use is consistent with forest and farm uses and with the intent and purposes set forth in the Oregon Forest Practices Act."

Response: The proposed use is consistent with forest and farm uses and will not unduly interfere with or detract from those uses. Most of the proposed Project will be located underground, and any disturbance of timberlands and timber management activities has been minimized. One of the largest timber owners in the area, Longview Fibre, has

submitted a letter explaining that gas storage operations are "very compatible" with timber management and stating that Longview Fibre has "no objection to the current proposed expansion." (Exhibit 24.)

The South Mist Feeder Looping Project will not unduly interfere with forest uses. Most of the pipeline will be placed in the existing pipeline corridor. Divergence from the existing corridor has been minimized and will proceed only under written agreements with forest owners.

The Oregon Forest Practices Act is contained in ORS 527.610-.730. The policy statement in ORS 527.630(1) provides as follows:

> "Forests make a viable contribution to Oregon by providing jobs, products, tax base and other social and economic benefits, by helping to maintain forest tree species, soil, air and water resources and by providing a habitat for wildlife and aquatic life. Therefore, it is declared to be the public policy of the State of Oregon to encourage economically efficient forest practices that assure the continuous growing and harvesting of forest tree species and the maintenance of forestland for such purposes as the leading use on privately owned land, consistent with sound management of soil, air, water, fish and wildlife resources and scenic resources within visually sensitive corridors as provided in ORS 527.755 that assures the continuous benefits of those resources for future generations of Oregonians."

The Forest Practices Act policy is to maintain forest lands principally for the purpose of forest management. The policy does not preclude uses that do not interfere with this principal objective. The proposed Project does not interfere with this objective because it will not prevent the forest lands in the area from being used principally for forest management. The wellsites and pipeline routes have been designed to minimize the impact on existing timberland. The construction and operation of the Project will be coordinated with forestry operations in the area, and the largest timber owner has submitted a letter of support.

(b) CCZO § 504.2:

> "The use will not significantly increase the cost, nor interfere with accepted forest management practices or farm uses on adjacent or nearby lands devoted to forest or farm use."

Response: Many of the statements in the previous response apply here as well. The impact of this Project on nearby forestry and farm operations will be minimal. The Project will occur subject to lease and easement agreements requiring the applicant to conduct its activities with due regard for farm and forest practices. As most of the Project, including the pipelines, will be underground, impacts on nearby properties will be minimal. There will be no interference with farmlands in Columbia County because the only part of the Project traversing farmlands is the 24-inch pipeline, which will be buried four feet beneath the ground and will follow the existing corridor for most of its course. No surface structures will be constructed on farmlands. The letters from Longview Fibre and Gutmann Nurseries demonstrate that the existing pipeline has not had an adverse impact on farm and forestry operations, or increased the cost of those operations. (Exhibits 24, 25.) The proposed pipeline will have similarly insignificant impacts.

(c) CCZO § 504.3:

> "The use will be limited to a site no larger than necessary to accommodate the activity and, as such will not materially alter the stability of the overall land use pattern of the area or substantially limit or impair the permitted uses of surrounding properties. If necessary, measures will be taken to minimize potential negative effects on adjacent forest lands."

Response: The portion of the Project area located at the Mist Field has been determined to be the minimum area necessary to cover the Calvin Creek underground storage formation and the remaining portion of the Project area is the minimum necessary to cover pipeline routes. Wellsites and pipeline routes have been located to minimize the impact on timberlands. The pipeline construction and permanent rights-of-way are the minimum width necessary to safely accomplish their functions. The wellsites and buried pipelines will not have any negative effects on adjacent timberlands.

The applicant's previous storage operations at the Calvin Creek and Bruer/Flora storage areas, approved by the county in 1981 and 1997, demonstrate that in constructing such projects the applicant can and does take steps to minimize impacts on forest land. (Exhibits 20-C, 20-D.)

(d) CCZO § 504.4:

> "The use does not constitute an unnecessary fire hazard, and provides for fire safety measures in planning, design, construction, and operation."

Response: The use will not result in an increased potential for fire in the PF-76 zoning district. The applicant has operated the Calvin Creek and Bruer/Flora underground

natural gas storage reservoirs since 1988 without causing any fires or other hazards. The wellhead and pipeline facilities have numerous safety features, including relief valves and automatic shutdown systems. In addition, the facilities are monitored from the "nerve center" at Miller Station by the applicant's trained personnel. Miller Station has been operated since 1987 (17,800 person-hours) with only a single lost-time accident. (Id.) It was inspected by the OPUC in 1996 and was found to be in compliance with the pipeline safety regulations of the U.S. Department of Transportation (49 CFR part 192). (Exhibit 17.)

(e) CCZO § 504.5:

> "Public utilities are to develop or utilize rights-of-way that have the least adverse impact on forest resources. Existing rights-of-way are to be utilized wherever possible."

Response: NWN is a public utility. The proposed pipelines have been sited where feasible within existing rights-of-way. Approximately 88 percent of the 24-inch pipeline will be built within the corridor approved for the existing pipeline. Most of the places where the pipeline deviates from the existing corridor will be through lowlands along Highway 47 near the Nehalem River and along existing logging roads in the Pebble Creek reroute and that will have minimal impact on forest resources.

(f) CCZO § 504.6:

> "Development within major and peripheral big game ranges shall be sited to minimize the impact on big game habitat. To minimize the impact, structures shall: be located near existing roads; be as close as possible to existing structures on adjoining lots; and be clustered where several structures are proposed."

Response: This area is within a major big game habitat area. (Exhibit 27.) The county has already found that the applicant's storage operations in the Mist Field area will not unduly impact big game habitat. (Exhibits 20-C, 20-D.) The applicant does not propose any above-ground "structures," as the term is used in CCZO § 504.6, other than wellhead facilities, which are outside the scope of this Application, and equipment within the existing fenced Miller Station site. The pipeline routes have been sited to minimize the cutting of mature timber, which can serve as cover for big game. In sum, the area of disturbed big game habitat will be minimized as required by the rule.

(3) PA-38 Zoning District Approval Criteria.

CCZO § 306 requires that the County Agricultural Extension Office and the Soil and Water Conservation Service be notified of any conditional use application in the PA-38 zone, and be given 10 days in which to comment.

Section 304.6 requires that no structure be constructed within 30 feet of a property line. The applicant does not propose to build any structure within 30 feet of any property line in the PA-38 zone. The setback requirement for "structures" does not apply to subsurface equipment like pipelines.

Section 304.7 contains maximum height limits for structures. These will not be exceeded by any structure proposed by the applicant.

(4) FA-19 Zoning District Approval Criteria.

A conditional use in the FA-19 district is subject to the criteria contained in CCZO §§ 405.1-.6.

(a) CCZO § 405.1:

> "The use will not significantly increase the cost, nor interfere with accepted forest management practices or farm uses on adjacent or nearby lands devoted to forest or farm use."

Response: The impact of this Project on nearby forestry and farm operations will be minimal. The Project will occur subject to lease and easement agreements requiring the applicant to conduct its activities with due regard for farm and forest practices. Most of the Project, including the pipelines, will be underground, so impacts on nearby properties will be minimal. There will be little interference with farmlands because the only part of the Project traversing farmlands is the 24-inch pipeline, which will be buried four feet beneath the ground. No surface structures will be constructed on farmlands. See also discussion under CCZO § 504.1, above.

(b) CCZO § 405.2:

> "The use will be limited to a site no larger than necessary to accommodate the activity and, as such will not materially alter the stability of the overall land use pattern of the area or substantially limit or impair the permitted uses of surrounding properties. If necessary, measures will be taken to minimize potential negative effects on adjacent forest lands."

Response: The Project area subject to this conditional use application has been determined to be the minimum area necessary to cover the Calvin Creek underground storage formation and the pipeline routes. Wellsites and pipeline routes have been located to minimize the impact on timberlands. The pipeline construction and permanent rights-of-way are the minimum width necessary to safely accomplish their functions. The wellsites and buried pipelines will not have any negative effects on adjacent timberlands.

The applicant's previous storage operations at the Calvin Creek and Bruer/Flora storage areas, approved by the county in 1981 and 1997, demonstrate that in constructing such projects the applicant can and does take steps to minimize impacts on forest land. (Exhibits 20-C, 20-D.)

(c) CCZO § 405.3:

> "The use does not constitute an unnecessary fire hazard, and provides for fire safety measures in planning, design, construction, and operation."

Response: The use will not result in an increased potential for fire in the PF-76 zoning district. The applicant has operated its Mist storage facility since 1988 without causing any fires or other fire-related hazards. The wellhead and pipeline facilities have numerous safety features, including relief valves and automatic shutdown systems. In addition, the facilities are monitored from the "nerve center" at Miller Station by the applicant's trained personnel. Miller Station has been operated since 1987 (17,800 person-hours) with only a single lost-time accident. (Id.) It was inspected by OPUC in 1996 and was found to be in compliance with the pipeline safety regulations of the U.S. Department of Transportation (49 CFR part 192). (Exhibit 17.) The pipeline safety staff of OPUC has recently expressed "a high level of confidence" in the safety of the proposed operation. (Exhibit 18.) Local fire districts are similarly confident of the fire safety of the Project. (Exhibits 23-A-23-E.)

(d) CCZO § 405.4:

> "Public utilities are to develop or utilize rights-of-way that have the least adverse impact on forest resources. Existing rights-of-way are to be utilized wherever possible."

Response: NWN is a public utility. The proposed pipelines have been sited where feasible within existing rights-of-way. Approximately 88 percent of the 24-inch pipeline will be built within the corridor approved for the existing pipeline. Most of the places where the pipeline deviates from the existing corridor will be through lowlands along Highway 47 near the Nehalem River and along existing logging roads in the Pebble Creek reroute and that will have minimal impact on forest resources.

(e) CCZO § 405.5:

"Road standards shall be limited to the minimum width necessary for management and safety."

Response: No roads are proposed in the FA-19 zone as a part of this Application. The pipeline rights-of-way have been designed to be as narrow has possible, given access and safety requirements, and the existing pipeline corridor has been used wherever feasible.

(5) Compliance with Statewide Planning Goals.

Under ORS 469.504(1)(b)(B), a proposed facility must demonstrate compliance with the Statewide Planning Goals if it does not comply with one or more substantive criteria in the local code. One of the basic criteria in any land use ordinance is that the use be listed as an allowed or conditional use in the zones where it will be located. The Project is not listed as either an allowed or conditional use in the E.C., RC or RR-5 zones. Therefore, under ORS 469.504(a)(b)(B), NWN demonstrates below that the Project complies with each applicable Goal.

(a) Goal 1, Citizen Involvement:

"To develop a citizen involvement program that insures the opportunity for citizens to be involved in all phases of the planning process."

Response: This Goal governs public participation in the land use process. NWN does not propose any changes to the public participation requirements of either local or state law. The Council's site certificate amendment rules provide sufficient notice and comment periods to satisfy Goal 1 as it applies to the applicant's proposal.

(b) Goal 2, Land Use Planning:

"To establish a land use planning process and policy framework as a basis for all decision and actions related to use of land and to assure an adequate factual base for such decisions and actions."

Response: This Goal governs the land use planning process. Goal 2 is not applicable to the Project because the applicant is proceeding under a specific, statutorily created land use option, ORS 469.504(1)(b)(B).

(c) Goal 3, Agricultural Lands:

"To preserve and maintain agricultural lands."

Response: This Goal is designed for the protection of agricultural lands. NWN is seeking a Council determination of Goal compliance not for such lands, but rather for those portions of the Project that cross lands zoned commercial, rural commercial and rural residential. For any agricultural lands crossed by the Project (i.e., PA-38 and FA-19 lands), the applicant has demonstrated compliance with Columbia County comprehensive plan and zoning ordinance provisions implementing Goal 3.

(d) Goal 4, Forest Lands:

> "To conserve forest lands by maintaining the forest land base and to protect the state's forest economy by making possible economically efficient forest practices that assure the continuous growing and harvesting of forest tree species as the leading use on forest land consistent with sound management of soil, air, water, and fish and wildlife resources and to provide for recreational opportunities and agriculture."

Response: This Goal is designed for the protection of forest lands. NWN is seeking a determination of Goal compliance not for such lands, but rather for those portions of the Project that cross lands zoned commercial, rural commercial and rural residential. For any forest lands crossed by the Project (i.e., PF-76 and FA-19), the applicant has demonstrated compliance with Columbia County comprehensive plan and zoning ordinance provisions implementing Goal 4.

(e) Goal 5, Open Spaces, Scenic, Historic and Natural Resources:

> "To conserve open space and protect natural and scenic resources."

Response: The portions of the Project subject to this Goal compliance request are those crossing the E.C., RR-5 and RC zones. Columbia County has already decided to dedicate these lands to residential and commercial development rather than open space, scenic or natural resource use. In addition, there are no county-identified open spaces, historic areas or natural resources in the vicinity of those portions of the Project crossing the E.C., RR-5 and RC zones. A portion of the Project in these zones will be located beneath State Highway 47, which in this area is a state-designated scenic highway. However, the South Mist Feeder expansion will be buried underground in these areas and thus will have no impact on the scenic value of the highway. The fact that the Project will have no scenic or aesthetic impacts is discussed in more detail in Section V.I. of this Application.

(f) Goal 6, Air, Water and Land Resources:

"To maintain and improve the quality of the air, water and land resources of the state."

Response: This Goal is primarily concerned with waste and process discharges to the land, water and air of the state. The portions of the applicant's Project crossing the E.C., RR-5 and RC zones will consist of buried pipeline and will not involve any such discharges. More broadly, these portions of the Project will not degrade any air, water or land resources. In addition, the Goal requires that land use approval should require compliance with state environmental quality statutes and regulations. The applicant has acquired or will acquire all necessary permits for the proposed Project.

(g) Goal 7, Areas Subject to Natural Disasters and Hazards:

"To protect life and property from natural disasters and hazards."

Response: This Goal is intended to ensure that developments which could be damaged by natural disasters with the potential for resultant injury to persons or property are approved only where appropriate safeguards are in place. The portions of the applicant's proposed pipeline crossing the E.C., RC and RR-5 zones are not located in any county-identified natural hazard areas. In addition, the applicant has surveyed the proposed pipeline corridor and has discovered no such hazard areas within any of the EC, RC or RR-5 zone areas. Finally, NWN has proposed adequate safeguards for those portions of the pipeline crossing hazard areas. See Section V.B., above.

(h) Goal 8, Recreational Needs:

"To satisfy the recreational needs of the citizens of the state and visitors and, where appropriate, to provide for the siting of necessary recreational facilities including destination resorts."

Response: The applicant's proposal does not involve the siting of a recreational facility. The discussion in Section V.K. of this Application, below, demonstrates that the Project, including those portions crossing E.C., RR-5 and RC land, will not have an adverse impact on any recreational facilities in the county.

(i) Goal 9, Economic Development:

"To provide adequate opportunities throughout the state for a variety of economic activities vital to the health, welfare, and prosperity of Oregon's citizens.

Response: This Goal provides certain guidelines for local governments to follow to stimulate orderly economic growth. In particular, the planning guidelines in the Goal emphasize the use of "geographically appropriate" sites for major facilities and also the expansion and increased productivity of existing facilities. NWN's proposal meets these Goals because it involves the expansion of the existing underground gas storage operations at Mist Field. Those operations are geographically appropriate in that they are sited where they must be: at a geological formation unique in the state. The applicant's proposal will result in the orderly and effective economic development of one of Columbia County's important natural resources. In addition, the Project will ensure that NWN will be able to provide reliable gas service to its commercial and industrial customers in the Portland area, thereby providing a service necessary for NWN's customers to maintain their economic productivity.

(j) Goal 10, Housing:

"To provide for the housing needs of citizens of the state.

Response: This Goal is intended to assist local governments in developing plans to provide adequate housing. In particular, the Goal requires local governments to inventory their buildable lands and to decide which lands must be used for residential development to meet projected housing needs. The proposed pipeline will cross certain lands that have been designated "rural residential" by Columbia County. In these cases, the applicant will secure pipeline easements from residential property owners. The applicant's proposal will not prevent residential development on these lands and will not result in any land being removed from the county's inventory of buildable land. The Project will not interfere with the county's ability to provide needed housing for its citizens.

(k) Goal 11, Public Facilities and Services:

"To plan and develop a timely, orderly and efficient arrangement of public facilities and services to serve as a framework for urban and rural development."

Response: This Goal requires local governments to coordinate their land use planning with an analysis of the availability of public facilities and services such as water, sewer and roads. The applicant's proposal will not require any new public facilities or services from the county. The Project will not require public water or sewer facilities. Impacts on public roads will be minimal and are fully described in Section V.L., below.

Finally, the applicant's proposal will not interfere with the county's ability to provide public services to its citizens.

(l) Goal 12, Transportation:

> "To provide and encourage a safe, convenient and economic transportation system."

Response: This Goal governs local government decisions regarding transportation facilities. The Project will not require the construction of any new roads or other transportation facilities, nor will it create any long-term conflicts with such facilities in the county. Construction of the Project will involve certain short-term impacts on several roads and highways in the county, as described in Section V.L., below. However, such short-term impacts are not addressed by Goal 12 or its implementing rules.

(m) Goal 13, Energy Conservation:

> "To conserve energy."

Response: This Goal requires local governments to maximize energy conservation. In particular, the Goal emphasizes the efficient siting of land uses and also the multiple use of land when possible. The location of the applicant's proposal is not alterable because the location is based on the unique geology of the Mist Field. In addition, the applicant's proposal provides for an efficient means of using forest, farm, residential and commercial land for a second purpose without creating conflicts with the primary uses and utilizes the existing pipeline corridor for most of the route.

(n) Goal 14, Urbanization:

> "To provide for an orderly and efficient transition from rural to urban land use."

Response: This Goal governs the transition from rural to urban land use in areas outside of established urban growth boundaries. The applicant's proposal does not involve any developments that will alter the existing character of the rural residential and rural commercial areas it crosses. Therefore the Project will not have any impacts addressed under Goal 14.

(o) Goals 15 through 19.

Response: These Goals are not applicable to the applicant's proposal because the proposal is not located in any of the geographical areas covered by these Goals.

(6) CCZO 1170: Riparian Area Protection.

CCZO § 1170 provides for the protection of the riparian areas adjacent to rivers, streams and lakes in the county. In particular, the ordinance protects riparian vegetation for 50 feet from the ordinary high water line of a "Class I" river or stream. The ordinance protects a smaller, 25-foot zone for all other rivers and streams.

The locations of all river and stream crossings (or places where the Project otherwise enters the protected riparian zone), along with the appropriate riparian buffer areas, are shown on Exhibit 22-A.

The proposed 24-inch pipeline crosses the Nehalem River two times, the East Fork Nehalem River two times and Elk Creek, a major tributary, one time. These crossings do not disturb any riparian areas within the 50-foot zone protected by CCZO § 1170 because the pipeline will be installed underneath the river by directional drilling with entrance and egress points several hundred feet from either river bank.

The 24-inch pipeline also will cross a number of smaller creeks and streams. Each crossing will be carried out pursuant to a set of mitigation measures designed to protect the habitat value of the particular stream being crossed. The crossings, their individual habitat categories and the proposed mitigation measures are detailed in Section V.G., below and in Exhibit 22.

CCZO § 1170.2 provides two paths for riparian area compliance (either Subsections A and B or Subsection C):

> "No structure other than a fence or sign shall be located within the areas listed in (.1) above. A lesser setback may only be allowed if:
>
> "A. The Department of Fish and Wildlife is consulted by the Department [of Planning] at least 10 days prior to issuing a permit for a structure; and
>
> "B. The riparian vegetation does not actually extend all the way into the riparian area to the location of the proposed structure and the riparian vegetation has not been removed in violation of the below riparian vegetation maintenance standards; or
>
> "C. An application for a variance to the above setback standard has been approved pursuant to Article 1504 of the Zoning Ordinance with findings of compliance to the

comprehensive plan policies for the protection of streams, lakes, wetlands, and riparian vegetation."

In essence, the first path (the "Exemption Path") exempts proposed development that will not actually impact riparian vegetation and where notice is given to the Oregon Department of Fish and Wildlife ("ODFW"). The second path (the "Variance Path") requires a variance.

Each of the proposed stream crossings will involve some impact to vegetation within the riparian buffer area. The type and amount of vegetation involved is detailed in Exhibit 22. NWN therefore will follow the Variance Path for all stream crossings.

The crossings meet the criteria for a variance under CCZO § 1504, as follows:

(a) CCZO § 1504.1:

> "Major Variances: The Planning Commission may permit and authorize a variance from the requirements of this ordinance when unusual circumstances cause undue hardship in the application of it. The granting of such a variance shall be in the public interest."

Response: A variance may be granted when "unusual circumstances cause undue hardship." The unusual circumstance posed by NWN's Project is that the Project is a linear facility crossing over 20 miles in the county. There is no possible, much less practicable, way to route the proposed pipeline so as to avoid crossing riparian areas. Since CCZO § 1170 prohibits all structures in riparian areas, applying it would cause undue hardship by making the entire Project impossible. This would cause hardship to all of NWN's customers in the Portland metropolitan area, by depriving them of reliable, low cost natural gas service during the winter months.

Because the Project is being proposed by a public utility and is part of an Integrated Resource Plan acknowledged by the OPUC, granting a variance would be in the public interest. As Exhibit 21 demonstrates, impacts to riparian vegetation can be minimized by using a variety of mitigation practices appropriate to the circumstances of each crossing.

(b) CCZO § 1504.1(A)(1):

> "The granting of the variance will not be detrimental to the public safety, health, or welfare, or injurious to other property[.]"

Response: Due to the mitigation measures recommended in Exhibit 22, NWN's proposed work in riparian areas can be accomplished with minimal impacts on riparian vegetation. Therefore, granting the variance will not be detrimental to public safety, health

or welfare. Indeed, denial of the variance will be detrimental to public health and welfare by depriving NWN's customers of reliable, low cost gas service in the winter. Granting the variance will not affect, or be injurious to, other property.

(c) CCZO § 1504.1(A)(2):

> "The conditions upon which the request for a variance is based are unique to the property for which the variance is sought and are not applicable generally to other property."

Response: The particular properties identified by NWN as appropriate for the pipeline stream crossings have been chosen as a result of careful analysis in an attempt to avoid steep slopes, soil and slide hazards and a host of other features. The properties are unique in that they are among the few that are useful as part of a safe, practicable pipeline route from Mist to North Plains and largely within the existing South Mist Feeder corridor. This condition is not generally applicable to other property in the county. Indeed, major linear facilities like the proposed pipeline are uncommon and not likely to occur generally on other property. In sum, granting a variance in this case will not undermine the general applicability of the riparian protections in CCZO § 1170.

(d) CCZO § 1504.1(A)(3):

> "Approval of the application will allow the property to be used only for purposes authorized by the Zoning Ordinance[.]"

Response: Approval of the variance will allow NWN to proceed with its proposed Project. As demonstrated in other sections of this narrative, the Project is authorized by the CCZO as a conditional use and meets all applicable criteria for conditional uses.

(e) CCZO § 1504.1(A)(4):

> "Strict compliance with the Zoning Ordinance would create an unnecessary hardship[.]"

Response: Strict compliance with CCZO § 1170 would make it impossible to construct linear facilities like the proposed pipeline--despite the fact that such facilities usually provide important public services. Such a hardship is not necessary in this case to protect riparian areas and water quality. By implementing the mitigation measures NWN has developed, the Project can be constructed with minimum adverse impact to riparian areas. Once constructed, the Project will be buried, the area will be revegetated and the pipeline will not cause further interference with the riparian area.

(f) CCZO § 1504.1(A)(5):

> "The granting of the variance will not adversely affect the realization of the Comprehensive Plan nor violate any other provision of the Zoning Ordinance."

Response: The variance would not violate any other provision of the zoning ordinance. Compliance with applicable provisions of CCZO is shown elsewhere in this narrative.

The applicable comprehensive plan policies are those relating to streams, lakes, wetlands and riparian vegetation.[14] These policies provide for the protection of streams and riparian areas. Buried pipelines and linear utility facilities are not among the various uses identified as potentially conflicting with stream and riparian area protection. In addition, the stream and riparian protection policies expressly recognize the need to provide some flexibility for "water dependent uses." Water Resources Goal, Policy 9. NWN's proposed pipeline is "water dependent" in the sense that it would be impossible to site it without crossing streams and riparian areas. NWN will minimize the impacts of these crossings, however, by implementing the mitigation measures it has developed. In sum, granting the variance and allowing the project to proceed will not conflict with the county's comprehensive plan.

Summary. The proposed stream crossings can be accomplished with minimal and temporary impacts to riparian vegetation and will provide a substantial public benefit. All of the criteria for a variance to the requirements of CCZO § 1170 will be met by the proposed Project as conditioned by the mitigation measures developed by NWN.

b. Washington County: Applicable Substantive Land Use Regulations.

This section describes how the Project complies with the applicable substantive criteria in Washington County's land use regulations.[15]

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[14] CCZO § 1170 also requires compliance with these policies in connection with any variance request.

[15] The Rural/Natural Resource Element of the Washington County Comprehensive Plan (the "WCCP") explains:

> "All decisions relating to the use and development [of land] are required by law to comply with the Comprehensive Plan. The goals and policies in this plan are required and will

(continued...)

The proposed South Mist Feeder pipeline expansion crosses three separate land use districts in Washington County, including (1) Exclusive Farm Use ("EFU"), (2) Agriculture and Forest-20 ("AF-20") and (3) Exclusive Forest and Conservation ("EFC"). Only a small portion of the planned pipeline crosses the AF-20 district, while the rest of the pipeline is split nearly equally between the EFU and EFC districts.

The proposed pipeline also crosses or runs parallel to several areas that contain "significant natural resources," including (1) wildlife habitat (sensitive habitats identified by ODFW and forested areas coincidental with water areas and wetlands), (2) water areas and wetlands (100-year floodplain, drainage hazard areas and ponds, except those already developed), (3) water areas and wetlands and fish and wildlife habitat (water areas and wetlands that are also fish and wildlife habitat), and (4) historic and cultural resources (includes historic resources as described in the Washington County Cultural Resources Inventory ("WCCRI")).

The following discussion first reviews the generally applicable standards and then the permitting requirements for each applicable land use district and overlay zone.

(1) Generally Applicable Standards.

(a) WCC § 416-1.

Washington County Code ("WCC") § 416-1 contains general provisions for utility design. The only provision potentially applicable to NWN's proposed pipeline is WCC § 416-1.4, which states:

> "The location, design, installation and maintenance of all utility lines and facilities shall be carried out with minimum, feasible disturbance of soil and site."

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[15](...continued)

> be carried out by the County. Those goals and policies which relate to the development of land will be implemented in the development code and no person requesting a development permit or filing an application to divide a lot or parcel of land shall be required to address, consider, or implement any goal, policy or strategy contained in this Rural Natural Plan Element unless required by the Development Code." WCCP at i.

As noted in footnote 8 above, given the lack of any conflict between the WCCP and the Washington County Code, this Exhibit does not engage in any direct discussion of the WCCP unless specifically referenced in the Washington County Code.

Response: WCC § 416-1 is targeted at utility facilities installed to serve a particular development. See, e.g., WCC § 416-1.1. NWN's gas pipeline does not supply service to a particular development, and, therefore, WCC § 416-1.4 does not apply to NWN's proposed pipeline. However, even if the provision applies here, the pipeline will meet this standard because it will be placed in the existing pipeline corridor whenever possible, in locations based on negotiations with individual landowners to minimize impacts on their property and in road rights-of-way.

(b) WCC § 430-105.

WCC § 430-105 contains the special use standards specific to public utilities and is cross-referenced in several of the district-specific permitting requirements (discussed below). For purposes of WCC § 430-105, a "public utility" includes:

> "Any corporation, including municipal or semi-municipal corporation, service district, company, individual, or association that owns or operates any plant or equipment * * * for the transportation of water, gas, or petroleum products by pipeline * * *."

Response: NWN fits within this definition of "public utility." However, WCC § 430-105.6(A) exempts "[u]nderground pipes and conduits" from the requirements of WCC § 430-105, "except where such Pipes or conduits would introduce an urban service outside the Urban Growth Boundary." The proposed pipeline expansion will not include any individual service lines or other "hookups" to either existing or new development sites outside the Urban Growth Boundary (the "UGB").[16] NWN's pipeline will not "introduce" any service outside the UGB in Washington County. Accordingly, the requirements of WCC § 430-105 do not apply.

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[16] One other generally applicable provision that is potentially relevant here is Washington County Code ("WCC") § 201-2, which lists exclusions from the requirement of obtaining a Development Permit. WCC § 201-2.12 excludes certain excavations and fills from the requirement of obtaining a Development Permit, and Subsections (C) and (K) include within the scope of this exception certain "[e]xcavations for wells, tunnels or utilities" and "[u]nderground pipes and conduits." While NWN is not pursuing a Development Permit from Washington County and intends to comply fully with all zone-specific requirements that might otherwise apply, NWN reserves its right to assert WCC § 201-2 in applicable situations in the future if necessary.

(2) Washington County Permitting Requirements for Pipeline in the EFU District.

WCC allows utility facilities to be sited in the EFU district. The specific requirements are as follows:

(a) WCC § 340-4.

"Uses Permitted Through a Type II Procedure

"The uses listed in Section 340-4.1 are permitted subject to the specific standards for the use set forth below and in applicable Special Use Sections of Section 430, as well as the general standards for the District, the Development Standards of Article IV and all other applicable standards of the Code. Approval may be further conditioned by the Review Authority pursuant to Section 207-6. Unless the use is specifically exempted, the Review Authority shall make specific findings with respect to the standards in Section 340-4.2."

Response: NWN's pipeline meets the requirements of WCC § 430 (see discussion of special use standards contained in WCC § 430-105 above), the general standards for the EFU district, the development standards of Article IV[17] and all other applicable standards of WCC. Moreover, WCC § 202-2.2(C) provides that "[i]n the exclusive farm use districts, (the EFU and AF-20 Districts), development or uses specifically allowed by ORS 215.213 may be determined by the Director to be allowed." ORS 215.213(1)(d) and (n) specifically allow the use being proposed here.[18]

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[17] The Article IV Development Standards that may be applicable in the EFU zone for this Project include WCC § 410 (Slopes and Grading), WCC § 412 (Drainage), WCC § 416 (Utilities), WCC § 421 (Flood Plain and Drainage Hazard Area Development), WCC § 422 (Significant Natural Resources) and WCC § 430-105 (Public Utility). See the discussion of compliance with WCC § 416 and WCC § 430-105, above; each of the other potentially applicable Article IV Development Standards are discussed in further depth below.

[18] For those portions of the pipeline in the EFU district that fall within the right-of-way of a public road, the pipeline is "permitted outright" pursuant to ORS 215.213(1)(n), which allows "the placement of utility facilities * * * in the subsurface of public roads and highways along the public right of way" in any area zoned EFU. Accordingly, NWN believes that the portions of the pipeline in the public right-of-way need not, from a strictly legal standpoint, demonstrate compliance with county land use criteria.

(continued...)

(b) WCC § 340-4.1.

WCC § 340-4.1 lists permitted uses within the EFU district and includes:

> "Y. Utility facilities necessary for public service (except those uses listed in (1), (2), and (3) below). A facility is necessary if it must be situated in an agricultural zone in order for the service to be provided.[19] For required standards, see Sections 430-105.3 through 430-105.7. These facilities are exempt from 340-4.2.
>
> "(1) Commercial facilities for the purpose of generating power for public use by sale;
>
> "(2) Transmission towers over 200 feet in height; and
>
> "(3) Receiving and transmitting antennas and communication towers that are subject to 430-109."

Response: NWN is the sole provider of natural gas to residential and commercial end users in its territories located in the Willamette Valley; Clark County, Washington; and various parts of the Oregon Coast and Columbia Gorge. NWN also sells and transports natural gas to industrial customers in its service territory. According to NWN's most recent Integrated Resource Plan, which was approved by OPUC in 1996, firm residential customers are anticipated to grow systemwide by 3.5 percent per year between 1995 and 2014 while the firm commercial class is expected to grow by 2.3 percent per year over this period. The firm industrial class is expected to grow by about 1 percent per year. (OPUC Order 96-219, Aug. 13, 1996 (the "Order"). (Exhibit 21.)) Much of the growth is centered in the Portland

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[18](...continued)
Similarly, for those segments of the pipeline that are in the EFU district but outside the right-of-way of public roads, NWN believes the pipeline is governed solely by ORS 215.213(1)(d), which allows "[u]tility facilities necessary for public service" in any area zoned EFU. NWN believes that the only legally applicable criterion is whether the pipeline is "necessary for public service." While NWN reserves its right to assert these positions in the future if necessary, NWN nevertheless intends in this Application to demonstrate full compliance with the criteria in WCC.

[19] WCC interpretation of the phrase "necessary for public service" is identical to that set forth in the LCDC's rule promulgated pursuant to ORS 215.213(1)(d). OAR 660-033-0130(16) ("A facility is necessary if it must be situated in an agricultural zone in order for the service to be provided."). By demonstrating compliance with WCC § 340-4.1 the Project complies with the LCDC rule as well.

metropolitan area, including Washington and Clackamas Counties, as well as Multnomah County.

The Order notes: "In the next two years, the company will initiate looping of the South Mist Feeder * * *." (Order at 3) The pipeline portion of the Project constitutes the referenced "looping" of the South Mist Feeder, by placing a parallel pipe along the length of the existing pipeline. This looping, coupled with increases in NWN's ability to store gas at Mist in Columbia County, has been determined to be the most cost-effective way to meet the increased demand. By virtue of the Order approving the Integrated Resource Plan, the regulatory agency responsible for utility service, OPUC, has determined the need for increased storage capacity and additional pipeline. (Exhibit 21.)

In addition to the general systemwide necessity for the Project to meet projected utility need, Washington County residents and businesses in particular, because of their location close to the source of the storage gas and main delivery artery, are likely to experience an increase in the reliability of NWN's gas delivery system created by looping the South Mist Feeder and adding storage ability.

Nearly all of the land in Washington County between its border with Columbia County and the Portland metropolitan area is zoned either for agricultural or forestry use. (Exhibit 28.) Indeed, it is impossible to get from Columbia County to the metropolitan area without passing through the county's agricultural zones. The proposed pipeline therefore "must be situated in an agricultural zone" for gas service to be provided to the metropolitan area.

When NWN sited the existing South Mist Feeder in the late 1980s, it chose its route to minimize impacts on the county's resource lands and negotiated the route with individual landowners on a parcel-by-parcel basis. By placing the proposed pipeline parallel to the existing pipeline and by confining the new pipeline to the existing pipeline corridor, NWN has also minimized the impacts of the new pipeline on the county's agricultural land.

(c) WCC 340-4.2.

"Required Findings:

"The proposed use will not:

"A. Force a significant change in accepted farm or forest practices on surrounding lands devoted to farm or forest use; or

"B. Significantly increase the cost of accepted farm or forest practices on surrounding lands devoted to farm or forest use.

"An applicant may demonstrate that these standards for approval will be satisfied through the imposition of conditions. Any conditions so imposed shall be clear and objective."

Response: Because the proposed pipeline is a "[u]tility facilit[y] necessary for public service," WCC § 340-4.1(Y) (quoted above), exempts it from this standard. Nevertheless, NWN's experience with the existing South Mist Feeder pipeline demonstrates that the proposed pipeline expansion will satisfy this standard.

A significant portion of the existing South Mist Feeder is located on land owned by Longview Fibre, which conducts forestry operations on 70,000 acres of forest land in both Columbia and Washington Counties. Longview Fibre recently wrote that after construction, "the existing pipeline has had a minimal impact on our [forestry] operations." Its letter commends NWN for its "good record of facility maintenance and resource protection" and states that Longview Fibre has "no objection to the current proposed expansion of a new line crossing our lands." (Exhibit 24.)

Similarly, the existing pipeline crosses land on Dairy Creek Road that is owned and in agricultural use by Gutmann Nurseries. Mr. Bob Gutmann recently stated that the existing pipeline has "had little impact" on his agricultural operation, which has the pipeline easement area in a "conventional grain/clover rotation." (Exhibit 25.) Mr. Gutmann recalls that the construction phase went well and states that Gutmann Nurseries has been "quite pleased" with its relationship with NWN over the past nine years. (Id.)

NWN will follow the same construction practices for the proposed pipeline expansion that it used in 1989. The expanded pipeline will have no more impact than the existing pipeline has had on farm and forest operations on adjacent lands. Accordingly, the proposed pipeline will not force a significant change in accepted farm or forest practices on surrounding lands devoted to farm or forest use, and will not significantly increase the cost of accepted farm or forest practices on surrounding lands devoted to farm or forest use.

(3) Washington County Permitting Requirements for Pipelines in the AF-20 District.

Specifically, WCC § 344 governs AF-20 uses; compliance with this section is discussed below.

(a) WCC 344-4.

"Uses Permitted Through a Type II Procedure:

"The uses listed in Section 344-4.1 are permitted subject to the specific standards for the use set forth below

and in applicable Special Use Sections of Section 430, as well as the general standards for the District, the Development Standards of Article IV and all other applicable standards of the Code. Approval may be further conditioned by the Review Authority pursuant to Section 207-6. Unless the use is specifically exempted, the Review Authority shall make specific findings with respect to the standards in Section 344-4.2."

Response: NWN's pipeline meets the requirements of WCC § 430 (see discussion of special use standards contained in WCC § 430-105 above), the general standards for the AF-20 district, the development standards of Article IV[20] and all other applicable standards of WCC. Moreover, WCC § 202-2.2(C) provides that "[i]n the exclusive farm use districts, (the EFU and AF-20 Districts), development or uses specifically allowed by ORS 215.213 may be determined by the Director to be allowed." ORS 215.213(1)(d) and (n) specifically allow the proposed pipeline use.[21]

(b) WCC § 344-4.1.

WCC § 344-4.1 lists permitted uses within the AF-20 district and includes:

"Y. Utility facilities necessary for public service (except those uses listed in (1), (2), and (3) below). A facility is necessary if it must be situated in an agricultural zone in order for the service to be provided. For required standards, see Sections 430-105.3 through 430-105.7. These facilities are exempt from 344-4.2.

"(1) Commercial facilities for the purpose of generating power for public use by sale;

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[20] The Article IV Development Standards that may be applicable in the AF-20 zone for this Project include WCC § 410 (Slopes and Grading), WCC § 412 (Drainage), WCC § 416 (Utilities), WCC § 421 (Flood Plain and Drainage Hazard Area Development), WCC § 422 (Significant Natural Resources), and WCC § 430-105 (Public Utility). For the discussion of compliance with WCC § 416 and WCC § 430-105, see Subsection D.2.b.(1), above; each of the other potentially applicable Article IV Development Standards are discussed in further depth below.

[21] While NWN reserves the arguments set forth in footnote 18, this Application nonetheless demonstrates compliance with the requirements of Washington County's AF-20 zone.

"(2) Transmission towers over 200 feet in height; and

"(3) Receiving and transmitting antennas and communication towers that are subject to 430-109."

Response: As noted above, NWN is the sole provider of natural gas to residential and commercial end users in its territories located in the Willamette Valley; Clark County, Washington; and various parts of the Oregon Coast and Columbia Gorge. NWN also sells and transports natural gas to industrial customers in its service territory. According to NWN's most recent Integrated Resource Plan, which was approved by the OPUC in 1996, firm residential customers are anticipated to grow systemwide by 3.5 percent per year between 1995 and 2014 while the firm commercial class is expected to grow by 2.3 percent per year over this period. The firm industrial class is expected to grow by about 1 percent per year. (OPUC Order 96-219, Aug. 13, 1996 (the "Order"). (Exhibit 21.)) Much of the growth is centered in the Portland metropolitan area, including Washington and Clackamas Counties, as well as Multnomah County.

The Order notes: "In the next two years, the company will initiate looping of the South Mist Feeder * * *." (Order at 3.) The pipeline portion of the Project constitutes the referenced "looping" of the South Mist Feeder, by placing a parallel pipe along the length of the existing pipeline. This looping, coupled with increases in NWN's ability to store gas at Mist in Columbia County, has been determined to be the most cost-effective way to meet the increased demand. By virtue of the Order approving the Integrated Resource Plan, the regulatory agency responsible for utility service, OPUC, has determined the need for increased storage capacity and additional pipeline. (Exhibit 21.)

In addition to the general systemwide necessity for the Project to meet projected utility need, Washington County residents and businesses in particular, because of their location close to the source of the storage gas and main delivery artery, are likely to experience an increase in reliability of NWN's gas delivery system created by looping the South Mist Feeder and adding storage ability.

Nearly all of the land in Washington County between its border with Columbia County and the Portland metropolitan area is zoned either for agricultural or forestry use. (Exhibit 28.) Indeed, it is impossible to get from Columbia County to the metropolitan area without passing through Washington County's agricultural zones. The proposed pipeline therefore "must be situated in an agricultural zone" for gas service to be provided to the metropolitan area.

When NWN sited the existing South Mist Feeder in the late 1980s, it chose its route to minimize impacts on the county's resource lands and negotiated the route with individual landowners on a parcel-by-parcel basis. By placing the proposed pipeline parallel to the

existing pipeline and by confining the new pipeline to the existing pipeline corridor, NWN has also minimized the impacts of the new pipeline on the county's agricultural land.

(c) WCC § 344-4.2.

"Required Findings:

"The proposed use will not:

"A. Force a significant change in accepted farm or forest practices on surrounding lands devoted to farm or forest use; or

"B. Significantly increase the cost of accepted farm or forest practices on surrounding lands devoted to farm or forest use. An applicant may demonstrate that these standards for approval will be satisfied through the imposition of conditions. Any conditions so imposed shall be clear and objective."

Response: Because the proposed pipeline is a "[u]tility facilit[y] necessary for public service," WCC § 344-4.1(Y) (quoted above), exempts the pipeline from this standard. Nevertheless, NWN's experience with the existing South Mist Feeder pipeline demonstrates that the proposed pipeline expansion will satisfy this standard.

Much of the existing South Mist Feeder is located on land owned by Longview Fibre, which conducts forestry operations on 70,000 acres of forest land in both Columbia and Washington Counties. Longview Fibre recently wrote that after construction, "the existing pipeline has had a minimal impact on our [forestry] operations." Its letter commends NWN for its "good record of facility maintenance and resource protection" and states that Longview Company Fibre has "no objection to the current proposed expansion of a new line crossing our lands." (Exhibit 24.)

Similarly, the existing pipeline crosses land on Dairy Creek Road that is owned and in agricultural use by Gutmann Nurseries. Mr. Gutmann recently stated that the existing pipeline has "had little impact" on his agricultural operation, which has the pipeline easement area in a grain/clover rotation. (Exhibit 25.) Mr. Gutmann recalls that the construction phase went well and states that Gutmann Nurseries has been "quite pleased" with its relationship with NWN over the past nine years. (Id.)

NWN will follow the same construction practices for the proposed pipeline expansion that it used in 1989. The expanded pipeline will have no more impact than the existing pipeline has had on farm and forest operations on adjacent lands. Accordingly, the proposed pipeline will not force a significant change in accepted farm or forest practices on

surrounding lands devoted to farm or forest use and will not significantly increase the cost of accepted farm or forest practices on surrounding lands devoted to farm or forest use.

(4) Washington County Permitting Requirements for Pipeline in the EFC District.

The WCC allows utility facilities to be sited in the EFC district. WCC § 342 governs uses in the EFC district, and the following discussion addresses the applicable requirements.

(a) WCC § 342-3.

"Uses Permitted Through a Type II Procedure

> "The uses listed in Section 342-3.1 are permitted subject to the specific standards for the use set forth below and in applicable Special Use Sections of Section 430, as well as the general standards for the District, the Development Standards of Article IV and all other applicable standards of the Code. Approval may be further conditioned by the Review Authority pursuant to Section 207-6. Unless the use is specifically exempted, the Review Authority shall make specific findings with respect to the standards in Section 342-3.2.
>
> "The uses listed below are subject to the applicable siting and fire safety criteria of Section 428."

Response: NWN's pipeline meets the requirements of WCC § 430 (see discussion of special use standards contained in WCC § 430-105 above), the general standards for the EFC district, the development standards of Article IV[22] and all other applicable standards of WCC. WCC § 428 addresses forest structure siting and fire safety standards; compliance with this section is discussed in Subsection D.2.b.10 below.

[22] The Article IV Development Standards that may be applicable in the EFC zone for this Project include WCC § 410 (Slopes and Grading), WCC § 412 (Drainage), WCC § 416 (Utilities), WCC § 421 (Flood Plain and Drainage Hazard Area Development), WCC § 422 (Significant Natural Resources), WCC § 428 (Forest Structure Siting and Fire Safety Standards) and WCC § 430-105 (Public Utility). For the discussion of compliance with WCC § 416 and WCC § 430-105, see Section III.B.1 above; each of the other potentially applicable Article IV Development Standards are discussed in further depth below.

(b) WCC § 342-3.1.

WCC § 342-3.1 lists permitted uses within the EFC district and includes:

> "M. New distribution lines (e.g., gas, oil, geothermal) with rights-of-way fifty (50) feet or less in width."

Response: NWN's proposed pipeline falls within the scope of WCC § 342-3.1 because it is a new gas distribution line with a permanent right-of-way that will be 50 feet wide or less.

(c) WCC § 342-3.2.

> The proposed use will not
>
> "A. Force a significant change in, or significantly increase the cost of, accepted farming or forest practices on agriculture or forest lands; and
>
> "B. Significantly increase fire hazard or significantly increase fire suppression costs, or significantly increase risks to fire suppression personnel." WCC § 342-32.

Response:

A. Farm and Forest Practices. As noted above, much of the existing South Mist Feeder is located on land owned by Longview Fibre, which has found the existing pipeline to have "minimal impact on our [forestry] operations" and has "no objection to the current proposed expansion of a new line crossing our lands." (Exhibit 24.)

Similarly, the existing pipeline crosses land on Dairy Creek Road that is owned and in agricultural use by Gutmann Nurseries. Mr. Gutmann recently stated that the existing pipeline has "had little impact" on his agricultural operation, and that Gutmann Nurseries has been "quite pleased" with its relationship with NWN over the past nine years. (Exhibit 25.)

NWN will follow the same construction practices for the proposed pipeline expansion that it used in 1989. The expanded pipeline will have no more impact than the existing pipeline has had on farm and forest operations on adjacent lands. Accordingly, the proposed pipeline will not force a significant change in accepted farm or forest practices on surrounding lands devoted to farm or forest use and will not significantly increase the cost of accepted farm or forest practices on surrounding lands devoted to farm or forest use.

B. Fire Hazard. NWN has operated the existing South Mist Feeder pipeline since 1989 without any fire, or other incident requiring action by local fire districts. In connection with this Application, NWN has obtained letters from five fire districts that serve the pipeline corridor in both Columbia and Washington Counties. (Exhibit 23.) None have expressed any reservations about the proposed pipeline expansion. The response of Washington County Fire District Two is typical in noting: "There have been no fire incidents with the existing South Mist Feeder in the nine years since its installation. For the reasons described above, we do not expect the expansion of the pipeline to increase fire hazard, fire suppression costs, or risks to fire suppression personnel to any significant degree." (Exhibit 23-B.)

In addition, NWN will conduct continuous monitoring of the pipeline from both its Miller Station and Portland gas control centers. Supervisors and trained emergency response crews are on call at all times to respond to emergency situations. (Exhibit 26.)

Finally, OPUC has written in support of this Application stating, among other things, that NWN's design and construction practices are "excellent" and provide "a high level of confidence in public safety." (Exhibit 18.)

(5) Washington County's Regulation of Significant Natural Resources.

WCC § 422 addresses significant natural resources and governs development or uses within such resources. The proposed pipeline crosses or runs parallel to three separate Significant Natural Resources categories: water areas and wetlands,[23] which include the 100-year floodplain;[24] wildlife habitat; and water areas and wetlands and fish and wildlife habitat.

According to the WCC § 422-1,

> "The intent and purpose of these standards is to permit limited and safe development in areas with significant natural resources, while providing for the identification, protection, enhancement and perpetuation of natural sites, features, objects and organisms with the County, here identified as important for their uniqueness, psychological or

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[23] "Wetlands" are defined as "[t]hose areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." WCC § 106-215.

[24] "Floodplain" is defined as "[t]he flood-hazard area adjoining a stream or drainageway feature that is subject to inundation by a regional flood including the floodway and floodway fringe." WCC § 106-83.

scientific value, fish and wildlife habitat, educational opportunities or ecological role."

The following discussion addresses the specific requirements in WCC § 422 applicable to the Project.

(a) WCC § 422-1.

"Development within riparian areas, Water Areas and Wetlands, or Water Areas and Wetlands and Fish and Wildlife Habitat shall comply with applicable state and federal regulatory guidelines."

Response: NWN's proposed pipeline complies with all applicable state and federal regulatory guidelines. The proposed pipeline will cross 61 wetland areas subject to the jurisdiction of the Oregon Division of State Lands (the "DSL"). Section VI.A. of this Application demonstrates compliance with the DSL's criteria for issuance of a removal/fill permit for the Project. Exhibit 22 of this Application describes the types of fish and wildlife habitat along the proposed pipeline route and classifies the habitat according to ODFW regulations. Section V.G. of this Application demonstrates the Project's compliance with the Council's Fish and Wildlife Habitat Standard, OAR 345-22-0060, and its consistency with ODFW's fish and wildlife habitat mitigation goals and standards. NWN will secure Army Corps of Engineers' approval of its Project activities in wetlands, probably under Nationwide Permit 12. Development of the proposed pipeline therefore will comply with applicable state and federal regulatory guidelines.

WCC § 422-3 contains the criteria for development in significant natural resource areas. The criteria applicable to this Project are addressed immediately below.

(b) WCC § 422-3.1.

"The required master plan and site analysis for a site which includes an identified natural resource shall:

"A. Identify the location of the natural resource(s), except in areas where a Goal 5 analysis has been completed and a program decision adopted pursuant to OAR 660, Division 23 (effective September 1, 1996);

"B. Describe the treatment or proposed alteration, if any. Any alteration proposed pursuant to Section 422-3.1B shall be consistent with the program decision for the subject natural resource.

"C. Apply the design elements of the applicable Community Plan; or the applicable implementing strategies of the Rural/Natural Resource Plan Element, Policy 10, Implementing Strategy E which states:

"'Implement the recommendations of the Oregon Department of Fish and Wildlife Habitat Protection Plan for Washington County to mitigate the effects of development in the Big Game Range within the EFU, EFC and AF-20 land use designations.'"

Response: Exhibit 29 shows the proposed pipeline in relation to the significant natural resources identified by the county. As discussed in detail in Section V.G. and Exhibit 22, the proposed pipeline will cross 61 stream and/or wetland areas, many of which fall in significant natural resource areas identified by the county. NWN will avoid all impacts to as many of these resources as possible by boring under the resource areas. Where directional drilling is not possible due to physical constraints, NWN will take a number of measures, described in Section V.G., to avoid impacts to the functional values of the resource areas.

Portions of the pipeline also fall within big game range designations in Washington County. (Exhibit 30.) Plan Policy 10, Implementing Strategy E, which applies to both fish and wildlife resources requires Washington County to implement the recommendations of ODFW's "Habitat Protection Plan." None of ODFW's recommendations to mitigate the effects of development on fish habitat in the range are directly applicable to the pipeline project. See Fish and Wildlife Habitat Protection Plan at 7-9 (Apr. 1977) (recommendations relate to rivers, streams and headwater areas and address residential development, "vulnerable" structures, obstructions to fish passage, new roads, etc.). However, it appears that the general goal of the recommendations is to maintain soil stability and riparian vegetation along streams and ensure compliance with fish habitat management policies established by state and federal agencies. As discussed in detail in Section V.G, NWN will take a number of measures to avoid impacts to fish resources, pursuant to the fish and wildlife habitat mitigation goals and standards of OAR 635-415-0030.

With regard to wildlife habitat, ODFW's Habitat Protection Plan provides recommendations for five wildlife categories, including big game, upland game, waterfowl, furbearers, and nongame wildlife. Again, none of ODFW's recommendations to mitigate the effects of development on wildlife habitat in the range are directly applicable to the pipeline project. See Fish and Wildlife Habitat Protection Plan at 19-20, 24, 26-27, 30, 32-33 (recommendations address density, new roads, off-road vehicle use, etc.). However, it appears that the general goal of the recommendations is to limit stress to the animals and avoid harassment during fawning and calving times, especially with respect to deer and elk. Much of the pipeline route in the big game range lies within conifer forest habitat. According to the Environmental Report attached as Exhibit 22, the conifer forest habitat

along the pipeline route provides no locations of special importance for deer fawning or elk calving. In particular, concentrations of sensitive fawning and calving activities are not expected to occur along roadsides or in the existing pipeline corridor, which the new pipeline will follow for most of its length. The location of the pipeline should therefore avoid significant harassment of big game during fawning and calving times in accordance with Rural/Natural Resource Plan Element, Policy 10, Implementing Strategy E. As discussed in detail in Section V.G, NWN will take a number of measures to avoid impacts to wildlife resources, pursuant to the fish and wildlife habitat mitigation goals and standards of OAR 635-415-0030.

(c) WCC § 422-3.3.

> "Development Within a Riparian Zone, Water Areas and Wetlands, and Water Areas and Wetlands and Fish and Wildlife Habitat:
>
> "A. No new or expanded alteration of the vegetation or terrain of the Riparian Zone (as defined in Section 106)[25] or a significant water area or wetland (as identified in the applicable Community Plan or the Rural/Natural Resource Plan Element) shall be allowed except for the following:
>
> "* * * * *
>
> "(3) Installation or construction of the following utilities: sewer and water lines, electric, communication and signal lines; and gas distribution and transmission lines.
>
> "* * * * *
>
> "B. Where development or alteration of the riparian zone is permitted under the above exceptions, the flood plain and drainage hazard development criteria shall be followed."

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[25] "Riparian zone" is defined as "[t]he area, adjacent to a water area, which is characterized by moisture-dependent vegetation, compared with vegetation on the surrounding upland, as determined by a qualified botanist or plant ecologist, or in no case less than a ground distance of twenty-five (25) feet on either side of the channel. Where, in its existing condition, a wetland or watercourse has no discernible channel which conveys surface water runoff, the riparian zone shall be measured from the center of the topographic trough, depression or canyon in which it is located." WCC § 106-185.

Response: This section allows NWN to alter the vegetation or terrain of a riparian zone, a significant water area or a wetland for the proposed pipeline. The floodplain and drainage hazard development criteria are addressed in Subsection D.2.b.(6) below.

(d) WCC § 422-3.6.

> "For any proposed use in a Significant Natural Resource Area, there shall be a finding that the proposed use will not seriously interfere with the preservation of fish and wildlife areas and habitat identified in the Washington County Comprehensive Plan, or how the interference can be mitigated. This section shall not apply in areas where a Goal 5 analysis has been completed and a program decision has been adopted that allows a 'conflicting use' to occur pursuant to OAR 660-23-040(5)(c) (effective September 1, 1996)."

Response: Exhibit 30 shows the proposed pipeline route in relation to the key fish and wildlife habitat areas identified by Washington County. Section V.G. of this Application demonstrates compliance with the Council's Fish and Wildlife Habitat Standard, OAR 345-022-0060, and consistency with ODFW's fish and wildlife habitat mitigation goals and standards. This information demonstrates that the Project will not seriously interfere with the preservation of fish and wildlife areas and habitat identified in the Washington County Comprehensive Plan (the "WCCP").

(e) WCC § 422-5.

> "Development within a riparian area, Water Areas and Wetlands, or Water Areas and Wetlands and Fish and Wildlife Habitat, shall obtain all required local, state and federal permits."

Response: As noted above, the proposed pipeline will cross 61 wetland areas subject to the jurisdiction of the DSL. Section VI.A. of this Application demonstrates compliance with the DSL's criteria for issuance of a removal/fill permit for the Project. Exhibit 22 describes the types of fish and wildlife habitat along the proposed pipeline route and classifies the habitat according to ODFW regulations. Section V.G. of this Application demonstrates the Project's compliance with the Council's Fish and Wildlife Habitat Standard, OAR 345-022-0060, and its consistency with ODFW's fish and wildlife habitat mitigation goals and standards. NWN will obtain Army Corps of Engineers' approval of Project activities in wetlands, probably under Nationwide Permit 12. NWN's proposed pipeline therefore will obtain all required local, state and federal permits applicable to development activity in wetlands, water areas and habitat.

6. Washington County's Regulation of Floodplain and Drainage Hazard Area Development.

WCC § 421 addresses floodplain and drainage hazard area development. The lands subject to the standard are specified in WCC § 421-1. The following discussion addresses the specific requirements in WCC § 421 applicable to NWN's proposed pipeline.

(a) WCC § 421-3.

"Submittal Requirements

"In addition to the requirements of Section 203-3[26], an application for a flood plain or drainage area alteration shall contain the following information for the area proposed to be disturbed which shall be prepared by a registered civil engineer. This information may be submitted with or be made part of a site plan or grading plan for the proposed development.

"421-3.1 Existing and proposed topography within the boundaries of the flood area using the following contour intervals:

"A. For slopes of five (5) percent or less, contour intervals not more than one (1) foot;

"B. For slopes greater than five (5) percent and up to and including ten (10) percent, contour intervals not more than two (2) feet; and

"C. For slopes greater than ten (10) percent, contour intervals not more than five (5) feet.

"421-3.2 For applications for Type II and III flood plain or drainage hazard area alterations, documentation which demonstrates compliance with the applicable review standards of Sections 421-7 through 421-14.

[26] WCC § 203-3 sets forth requirements for neighborhood meetings. The section does not apply to this Application.

"421-3.3 Erosion plan as required by Section 410-1.6B. or Section 426, whichever is applicable.[27]

"421-3.4 Drainage plan as required by Section 412."[28]

Response: Exhibit 19, Figures G-2a through G-2h, prepared by a registered civil engineer, shows the topography of the site. Compliance with the applicable review standards of WCC § 421-7 through 421-14 is discussed below.

(b) WCC 421-5.

"Uses and Activities Allowed Through a Type II Procedure

"Unless specifically prohibited in the applicable Community Plan, the Rural/Natural Resource Plan Element or Section 422, a development permit may be approved in a flood area through a Type II procedure for the following:

"* * * * *

"421-5.11 Construction or major improvement or alteration of underground pipes and conduits, including sewer, water and gas lines, transmission and distribution lines for geothermal resources, gas and oil, underground electrical, telephone and television transmission and distribution lines, including necessary accessory structures and drainage systems."

Response: NWN's proposed pipeline is not specifically prohibited in the applicable Community Plan, the Rural/Natural Resource Plan Element or WCC § 422, which governs significant natural resources (discussed above). This subsection therefore allows for the approval of NWN's proposed pipeline in a flood area.

WCC § 421-7 contains the development standards for all Type II and Type III Floodplain and Drainage Hazard Area uses and activities. The specific criteria contained in WCC § 421-7 that are applicable to this Project are addressed immediately below.

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[27] See discussion of erosion control requirements in Subsection D.2.b.(7) below.

[28] See discussion of drainage requirements in Subsection D.2.b.(8) below.

WCC § 421-7 provides:

> "The applicant for a proposed flood plain or drainage hazard area development shall demonstrate compliance with the following applicable standards[.]"
>
> (c) WCC § 421-7.1.
>
> "Development proposed to encroach into a regulatory floodway adopted and designated pursuant to FEMA regulations shall demonstrate through hydrologic and hydraulic analysis, performed in accordance with standard engineering practice by a registered civil engineer, that the cumulative effect of the proposal, when combined with all other existing and anticipated development within the basin based upon full development of the basin as envisioned in the applicable Community Plan or the Rural/Natural Resource Plan, will not result in any increase in flood levels within the community during the occurrence of the base (regional) flood discharge. Notwithstanding this provision, development that would result in such an increase may be approved if the County, at the sole expense of the applicant, first obtains FEMA approval in accordance with 44 CFR Ch. 1, Part 65 (October 1, 1990, edition, or its successor). No increase to the flood plain elevation shall be permitted unless the area in which the rise will occur contains no structures and the owner of such property signs a written acceptance of any increase in the flood plain elevation. These properties are not required to be part of the application for the proposed development."

Response: The proposed pipeline will be located within the Federal Emergency Management Act ("FEMA") 100-year regulatory floodway between stations 657+50 and 880+00 (see Exhibit 19, Figures G-2h, G-2g) for a total distance of approximately 22,250 feet. In this segment, excess soils generated by trench excavation and backfill will be hauled off of the pipeline alignment and disposed of in an approved area outside the floodway. Surface conditions will be restored to preconstruction slopes and grades and will be revegetated. Consequently, the installation of the pipeline will not change the volume, grading or vegetation of the floodway and therefore will not increase flood levels. From stations 880+00 to 1100+00 (see Exhibit 19, Figures G-2h, G-2g) the pipeline is located next to Dairy Creek Road near the eastern border of the 100-year floodway but not in it. (Exhibit 32.)

(d) WCC § 421-7.2.

"Development proposed on a flood plain site where the development does not encroach into an adopted FEMA regulatory floodway shall demonstrate through hydrologic and hydraulic analysis, performed in accordance with standard engineering practice by a registered civil engineer, that the cumulative effect of the proposal, when combined with all other existing and anticipated development within the basin based upon full development of the basin as envisioned in the applicable Community Plan or the Rural/Natural Resource Plan, will not increase the flood plain elevation more than one (1) foot at any point in the community. Notwithstanding this provision, an increase in excess of one (1) foot may be approved if the County, at the sole expense of the applicant, first obtains FEMA approval in accordance with 44 CFR Ch. 1, Part 65 (October 1, 1990, edition, or its successor). No increase in the flood plain elevation shall be permitted unless the area in which the rise will occur contains no structures and the owner of such property signs a written acceptance of any increase in the flood plain elevation."

Response: The pipeline will not be located in a floodplain that is not a FEMA regulatory floodway. (Exhibit 32.)

(e) WCC § 421-7.3.

"Development proposed on a drainage hazard area site shall demonstrate through hydrologic and hydraulic analysis, performed in accordance with standard engineering practice by a registered civil engineer, that the cumulative effect of the proposal, when combined with all other existing and anticipated development within the basin based upon full development of the basin as envisioned in the applicable Community Plan or the Rural/Natural Resource Plan, will not result in any increase to the drainage hazard area elevation at any point in the community. Notwithstanding this provision, an increase may be approved if the area in which the rise will occur contains no structures and the owner of such property signs a written acceptance of any increase in the drainage hazard area elevation."

Response: If the pipeline crosses a stream or drainage hazard area, it will be installed under the channel and the channel will be returned to its original condition. (Exhibit 32.)

(f) WCC § 421-7.4.

> "Encroachments into a floodway shall be designed so as to minimize the risk that the encroachment will catch substantial debris or otherwise significantly impede flood water flows. Designs may include, but are not limited to, adequate sizing of openings, secured break-away bridges, diverters or spacing of supports."

Response: The entire pipeline will be buried. There will be no above-ground structures that will catch debris or impede floodwater flow. (Exhibit 32.)

(g) WCC 421-7.5.

> "The proposal will not increase the existing velocity of flood flows so as to exceed the erosive velocity limits of soils in the flood area."

Response: The existing grades and dimensions of the floodway will not be changed. Therefore, flow velocities will not be increased. Trench excavations that have disturbed vegetation will be revegetated. Therefore, erosive velocities will not be exceeded due to absence of vegetation. (Exhibit 32.)

(h) WCC § 421-7.6.

> "All cut and fill shall be structurally sound and designed to minimize erosion. All fill below the flood surface elevation shall be accompanied by an equal amount of cut or storage within the boundary of the development site unless:
>
> "A. The proposed cut and fill is found to be in compliance with an adopted Drainage Master Plan; or
>
> "B. Off-site excavation will be utilized to balance a fill, provided:
>
> "(1) The off-site excavation area will be part of the application for the development proposing to place the fill;

"(2) The off-site excavation area will be located in the same drainage basin as the proposed fill area;

"(3) The off-site excavation area will be located within points of constriction on the drainage system, if any, and as close to the fill site as practicable. The applicant's registered civil engineer shall conduct a storage routing analysis to determine the location of the fill;

"(4) The off-site excavation area will be constructed as part of the development placing the fill;

"(5) Any use or future development of the excavated area shall comply with the standards of Section 421 and Section 422 if the area is designated as a Significant Natural Resource; and

"(6) Ownership of the excavated area shall be by one of the following mechanisms:

"(a) Dedication of the area to an appropriate public agency when a public agency is willing to accept the dedication;

"(b) Ownership of the area by the applicant of the proposed development;

"(c) Dedication of the development rights of the area to an appropriate public agency with ownership remaining with the property owner. Maintenance of the area shall be the responsibility of the applicant or property owner; and

"(d) Deed or easement-restricted private ownership which prevents any use or future development of the area as specified in Section 421-7.6B.(5). Maintenance of the area shall be the responsibility of the applicant or property owner. A contract for conditions shall be required as specified by Section 207-6.3. The contract for conditions shall be recorded in the Washington County Deed Records."

Response: Any excess soil produced by pipeline installation in the floodway will be hauled off of the pipeline alignment and disposed of in an approved area of the floodway. (Exhibit 32.) Accordingly, the Project will not result in fill below the flood surface elevation.

(i) WCC § 421-7.8.

> "That the environmental impact of the disturbance or alteration of riparian wildlife and vegetation has been minimized to the extent practicable as required by Section 422. Enhancement of riparian habitats through planting or other such improvements may be required to mitigate adverse effects. Significant features such as natural ponds, large trees and endangered vegetation within the flood area shall be protected when practicable."

Response: The Project is in compliance with WCC § 422, which is discussed in Subsection D.2.b.(5), above.

(j) WCC § 421-7.9.

> "Drainage systems shall be designed and constructed according to the adopted Drainage Master Plan for the area, if one exists."

Response: There is no drainage master plan for the area. However, NWN is in compliance with Washington County's drainage control standards, as discussed in Subsection D.2.b.(8), below.

(k) WCC § 421-11.

WCC § 421-11 sets forth specific requirements for utilities. The only applicable requirement is contained in WCC § 421-11.6, which provides that

> "construction of utilities shall be done in a way which minimizes the impact on the flood area. The site shall be restored, as far as practicable, to its original state."

Response: Construction of the pipeline will be done in a way that minimizes the impact on the flood area, as described immediately above. The site will be restored, as far as practicable, to its original state by filling the trench with stockpiled topsoil and then replanting.

WCC § 421-14 contains general requirements and prohibitions. The applicable provisions contained in WCC § 421-14 are discussed below.

(l) WCC § 421-14.1.

"Property owners shall maintain the flood area in such a manner as to prevent reduction of the natural carrying capacity. Maintenance outside of the public right-of-way shall be done by means of hand implements unless a Development Permit for an alteration is first obtained (lawn mowers are considered hand implements)."

Response: As described above, the proposed pipeline will not reduce the natural carrying capacity of any flood area. (Exhibit 32.) NWN will comply with the County's maintenance requirement.

m. WCC § 421-14.4.

"Section 421 is in addition to any and all Federal, State or special district laws and regulations in force at the time of approval of the Development Permit. Any permits required from a local, state or federal agency shall be obtained prior to any development within the flood area."

Response: NWN's proposed pipeline will comply with all applicable state, federal and special district laws and regulations. All required permits will be obtained before to any development within the flood area. As noted above, NWN will comply with all requirements of the DSL and will obtain the approval of the Army Corps of Engineers before commencing any activity requiring a state removal/fill permit.

(n) WCC § 421-14.8.

"There shall be no dumping of fill in a flood area without a floodplain or drainage hazard area alteration permit."

Response: NWN will not dump fill in a flood area.

(7) Washington County's Erosion Control Regulations.

WCC § 410 addresses grading and slope requirements. The relevant sections of WCC § 410 are discussed immediately below.

(a) WCC § 410-1.2 and -1.3.

The general requirements for a grading plan are contained in WCC § 410-1.2, which states:

"All applications for a development, excluding developments which do not require a grading permit as provided by Section 410-1.3 or other development which will not involve a land disturbance greater than grading or removal of vegetation down to duff or bare soil, shall include a grading plan."

Specifically, WCC § 410-1.3(D) exempts the following activities from the requirement of a grading permit:

"Excavations for wells, tunnels, or utilities[.]"

Response: The Project is exempt from the requirement of obtaining a grading permit because it fits within the exemption contained in WCC § 410-1.3(D).

(b) WCC § 410-1.6B.

"Erosion Control Plan

"A. For areas inside the Tualatin River and Oswego Lake sub-basins, an erosion control plan as required by Section 426 shall be submitted.

"B. For areas outside the Tualatin River and Oswego Lake sub-basins an erosion control plan, which complies with the requirements of the 'Washington County Erosion Control Plans Technical Guidance Book,' January 1991, or its successor, is required when:

"(1) Grading requiring a permit is proposed to be conducted or left in an unfinished state during the period from October 1 through May 1; or

"(2) Land disturbance activities are conducted in geologically unstable areas, on slopes in excess of twenty (20) percent, there is disturbance of more than six-thousand (6,000) square feet of development area, or within fifty (50) feet of any drainage hazard or flood plain area."

Response: Erosion control measures for the Project are described in Exhibits 33-A and 33-B. All erosion control activities will be performed in accordance with the Washington County Technical Guidance Book dated February 1994.

(8) Washington County's Drainage Control Regulations.

WCC § 412 governs drainage. The relevant provisions of WCC § 412 are addressed immediately below.

(a) WCC § 412-1.

> "All applications for a development permit, excluding changes in occupancy, property line adjustments, signs, lighting, tree removal, and other applications which do not involve a land disturbance, including grading or removal of vegetation down to duff or bare soil, shall include a drainage plan. Drainage plans are to be submitted with or be made part of a Site Plan, grading plan or grading permit for a development."

Response: The only changes to existing drainage in the Project area will be very short-term, based on the removal of vegetation during pipeline installation. The entire route will be revegetated immediately after installation, which will fully restore the existing drainage pattern. The Project therefore will not change the grade of the Project area in any way and will not modify the permanent drainage patterns in the Project area.

(b) WCC § 412-2.

> "Drainage Plan
>
> "Drainage plans are to be neatly and accurately drawn, at an appropriate scale that will enable ready identification and recognition of submitted information. A drainage plan shall include:
>
> "412-2.1 Flow lines of surface waters onto and off the site;
>
> "412-2.2 Existing and finished contours consistent with Section 410-1.2 or Section 421-3.1, whichever is applicable;
>
> "412-2.3 Building pad, areas with an impervious surface and existing and proposed finished floor and street elevations if building or parking construction is proposed;
>
> "412-2.4 Existing and proposed drainage channels including drainage swales, wetlands, ditches and berms;

"412-2.5 Location and design of any proposed facilities for storage or for conveyance of runoff into indicated drainage channels, including sumps, basins, channels, culverts, ponds, storm drains and drop inlets;

"412-2.6 Estimates of existing and increased runoff resulting from the proposed improvements."[29]

Response: The Project does not include new impervious surfaces, buildings or parking, new drainage channels or new facilities for the conveyance of runoff and will not increase runoff in the Project area.

(c) WCC § 412-3.

"Drainage Standards

"The drainage plan shall:

"412-3.1 Except for permitted piping and culverting, protect and preserve existing natural drainage channels;

"412-3.2 Include design provisions to preserve the functioning of off-site drainage courses or bodies of water;

"412-3.3 Assure that waters are drained from the development in such a manner that will not cause erosion to any greater extent than would occur in the absence of development; and

"* * * * *

"412-3.5 Comply with the applicable standards for permanent storm water quality control facilities adopted by the Oregon State Department of Environmental Quality, as set forth in OAR 340-41-455 (3)(d-h). This standard is satisfied by submittal of a service provider letter from the Unified Sewerage Agency indicating the proposed development is in compliance with DEQ requirements or

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[29] This code section describes what should be included in a drainage plan for a project that will change existing drainage in some way. It contains no standards that could be characterized as "applicable substantive criteria" in the Energy Facility Siting Council ("EFSC") process and therefore does not, strictly speaking, apply to the Project.

will be in compliance upon compliance with requirements set forth in the service provider letter."

Response: The Project will not change existing natural drainage channels, will completely preserve off-site drainage and will not produce storm water runoff. NWN will take the erosion control measures described in Exhibits 33-A and 33-B.

(9) Washington County's Historic and Cultural Resource Overlay Zone.

WCC § 373 addresses the historic and cultural resource overlay district. A very small segment of the proposed 24-inch pipeline crosses through this overlay zone. The relevant provisions are discussed below.

(a) WCC § 373-6.1.

"No development permit shall be issued for exterior alteration, relocation or demolition of any designated resource or any potential resource which is under consideration for designation while a public hearing or any appeal thereof is pending."

Response: The Project does not involve the exterior alteration, relocation or demolition of any designated resource or any potential resource under consideration for designation. NWN's proposed pipeline will simply cross the property on which the Sam Rafferty House (Resource No. 170/79) is located. (Exhibit 34.)

(b) WCC § 373-10.

"Uses Allowed

"Allowed uses of an Historic and Cultural Resource within a designated Historic and Cultural Resource Overlay District shall be the same as those allowed in the primary district."

Response: The underlying district here is the EFU district, where the proposed pipeline is allowed as a conditional use. The EFU discussion above demonstrates that the proposed pipeline meets all applicable criteria. Given the location of the proposed pipeline in relation to the existing designated resource, the existence of this overlay zone does not impose any additional requirements on the Project.

(10) Washington County's Forest Structure Siting and Fire Safety Standards.

WCC § 428 applies to "all new dwellings and structures in the EFC District." WCC § 428-1. "Structure" is defined in WCC § 106-205 as "[a]nything which is built, erected or constructed and located on or under the ground, or attached to something fixed to the ground. Structures include but are not limited to * * * utilities." Thus NWN's pipeline arguably falls within the scope of WCC § 428. WCC § 428 contains siting standards that are intended to "ensure that structures are sited in a manner compatible with forest operations and agriculture, to minimize wildfire hazards and risks, and to conserve values found on forest lands." WCC § 428-1. The Project is consistent with this purpose.

WCC § 428 mostly applies to dwellings, accessory structures and roads and driveways. The only standard that potentially applies to the Project is contained in WCC § 428-4, which provides:

> "428-4 Standards for Dwellings and Structures Reviewed Through a Type II Procedure
>
> "Dwellings and structures, including replacement dwellings and accessory structures, that do not comply with the standards in Section 428-3 shall be reviewed through a Type II procedure and shall comply with the following standards.
>
> "428-4.1 Forest Structure Siting Standards
>
> "A. Dwellings and structures shall be sited on the parcel so that:
>
> "(1) They have the least impact on nearby or adjoining forest or agricultural lands;
>
> "(2) The siting ensures that forest operations and accepted farming practices will not be curtailed or impeded;
>
> "(3) The siting ensures that adverse impact on forest operations and accepted farming practices on the tract will be minimized;
>
> "(4) The amount of forest lands used to site access roads, service corridors, the dwelling and structures is minimized; and
>
> "(5) The risks associated with wildfire are minimized.

"B. Siting considerations satisfying Section 428-4.1 may include setbacks from adjoining properties, clustering near or among existing structures, siting close to existing roads and siting on that portion of the parcel least suited for growing trees."

Response: The proposed pipeline will run parallel to the existing South Mist Feeder pipeline. As noted above, the original pipeline was sited to minimize impacts on agricultural and forestry operations, in part by consulting each property owner about pipeline location. Both agricultural and forestry operators on the existing pipeline route attest to the minimal impacts of the pipeline and have no objections to the expansion. (Exhibits 24, 25.) Construction of the new pipeline within the existing pipeline corridor minimizes the amount of forest lands used to site the Project. Six fire districts along the pipeline route have reviewed NWN's proposed pipeline expansion and expressed a high degree of comfort that the Project poses little fire hazard. (Exhibit 23-A-23-E.) The current pipeline has operated for nine years in heavily forested areas without fire incident. The standards set forth in WCC § 428-4.1 are therefore satisfied.

E. Protected Areas (OAR 345-022-0040).

This standard prohibits the siting of an energy facility in any of the protected areas listed in the rule. The standard permits the siting of a facility outside the listed protected areas so long as the "design, construction and operation" of the facility "is not likely to result in significant adverse impact to" any of the protected areas. OAR 345-022-0040(1).

Protected areas are defined in OAR 345-022-0040 and include national parks, national monuments, wilderness areas, national and state wildlife refuges, national coordination areas, national and state fish hatcheries, national recreation and scenic areas, state parks and waysides, state natural heritage areas, state estuarine sanctuaries, scenic waterways, experimental areas established by the Rangeland Resources Program, agricultural experimental stations, research forests, Bureau of Land Management areas of critical environmental concern and state wildlife and management areas.

To identify protected areas in the vicinity of the Project area,[30] NWN's consultant reviewed a set of maps created by the Oregon Office of Energy covering national, state, Bureau of Land Management ("BLM") and Oregon State University ("OSU") protected

[30] In general, the studies conducted in connection with this Application cover the study areas set out in OAR 345-001-0010(50)(f) and (g) for pipelines and surface facilities related to underground gas storage reservoirs. The rule does not, however, establish a protected area study area for the latter type of facility. NWN therefore not only did a detailed review of protected areas within 20 miles, the study area for pipelines, of the Project site, but also consulted some maps that showed protected areas farther away.

areas. Information from ODFW was used to identify state hatcheries. Oregon Natural Heritage Program staff provided location information on state natural heritage areas.

The Project is not located in any protected area.

A BLM Area of Critical Environmental Concern ("ACEC") is within one mile of the pipeline route, west of Dairy Creek (T2N R3W Section 5). This area is a Late Successional Reserve ("LSR") that is managed as an old growth forest under the Northwest Forest Plan standards and guidelines.

An OSU research forest is located about five miles northwest of the Mist storage facility and the northern end of the South Mist Feeder pipeline route, north of Mist.

State wildlife areas are located 15 miles east and 15 miles west of the Project site. Saddle Mountain State Park is located about 20 miles west of the northern part of the pipeline route. A state estuarine sanctuary on the Columbia River is located about 15 miles from the northern end of the route.

The Nehalem Fish Hatchery is located more than 20 miles from the Project area along the Nehalem River. Several other state hatcheries are located more than 20 miles north of the Project area along the Columbia River.

Twenty-three state natural heritage areas are located in the northwestern portion of Oregon in Clatsop, Multnomah, Tillamook, Clackamas and Columbia Counties. Skull and Little Wallace Island, located in the Columbia River, is approximately 10 miles north of the northern tip of the pipeline route. Onion Peak and Nehalem Bay are more than 20 miles west of the Project area. The Blind Slough Swamp, established to protect an old growth Sitka spruce swamp, bald eagle nests and Columbian white-tailed deer, is located near the mouth of the Columbia River, more than 20 miles northwest of the Project area. All other heritage areas are also located more than 10 miles away from the Project area.

National protected areas within the study range include Mt. Rainier National Park and Goat Rocks Wilderness at more than 90 miles, Mt. Hood Wilderness at 90 miles, Mt. St. Helens National Monument at 40 miles and the Columbia Gorge National Scenic Area at 50 miles from the site. Several national wildlife refuges are located along the Columbia River more than 20 miles from the Project site.[31]

Of these protected areas, those closest to the Project area are the BLM LSR within one mile of the pipeline in the Dairy Creek area and an OSU research forest about five miles

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[31] The following types of protected areas were not identified within the range of the study: national coordination areas, national fish hatcheries, experimental range areas and agricultural experiment stations.

from the Project area. Other protected areas are found from 10 to more than 20 miles from the Project area.

As noted, the Project will not be located in any protected areas. Where it comes closest to protected areas it will be entirely underground. The construction period will be of limited duration and will not involve any protected area lands. The Project has no off-site environmental impacts that could affect protected areas. Accordingly, the design, construction and operation of the Project will not have any adverse impact on any of the areas listed as protected by OAR 345-022-0040.

F. Financial Assurance (OAR 345-022-0050).

Under this standard, EFSC determines whether the applicant has a reasonable likelihood of obtaining a bond or comparable security, satisfactory to EFSC, in an amount adequate to restore the site if the site certificate holder (1) begins but does not complete construction of the facility or (2) permanently closes the facility before establishing a financial mechanism or instrument, satisfactory to the Council, that will ensure funds will be available to adequately retire the facility and restore the site.

This standard and the retirement standard in OAR 345-022-0130 are designed to ensure that funds are available to restore the site in three different circumstances: (1) the facility construction is begun but not completed by the time required in the site certificate, (2) the facility is permanently closed before a retirement fund is fully funded, and (3) the facility is permanently closed after the retirement fund is fully funded. Under this standard, EFSC addresses the availability of funds in the first two circumstances.

An underground storage facility has an indefinite useful life; retirement of the Mist storage facility and the South Mist Feeder is unforeseeable at this time. However, retirement is theoretically possible at any time.

NWN estimates the cost of restoring the Mist site to be approximately $323,000 in 1998 dollars. This amount will be offset by an estimated salvage value of installed equipment of $604,000. The cost for retirement of the 24-inch addition to the South Mist Feeder is estimated at $66,000. A description of the bases for these estimates is set forth in Section V.N.

NWN's annual reports for 1995, 1996 and 1997 are attached as Exhibits 35, 36 and 37.

Together, Section V.N. and the annual reports demonstrate that the cost to restore the portions of the gas storage and pipeline sites related to the amendments proposed in this Application is small relative to the value of the existing certificated facilities at Mist and their salvage value. There is therefore no question that NWN could restore both the gas storage and pipeline sites after construction began if it did not intend to proceed with the Project or

if NWN were to close the facility before establishing a funding mechanism for site restoration. Furthermore, the existing site certificates, which this Application seeks to amend, do not require such a mechanism.

G. Fish and Wildlife Habitat (OAR 345-022-0060).

Under this standard, the Council determines whether the design, construction, operation and retirement of the facility, taking into account mitigation, is consistent with the fish and wildlife habitat mitigation goals and standards of OAR 635-415-0030.

OAR 635-415-0030 describes four categories of habitat in order of their value. The rule then establishes mitigation goals and corresponding implementation standards for each habitat category.

Habitat Category 1 is habitat of exceptional value. The goal is "no loss of either habitat units or habitat value." OAR 635-415-0030(1)(a). The implementation standard requires avoidance of impact.[32]

Habitat Category 2 is high-value habitat. The goal is "no net loss of either habitat units or habitat value." OAR 635-415-0030(2)(a). The implementation standard is avoidance of impact or mitigation in-kind, on-site.

Habitat Category 3 is habitat of high to medium value. The goal is "no net loss of either habitat units or habitat value." OAR 635-415-0030(3)(a). The implementation standard is avoidance of impact or mitigation either in-kind or out-of-kind and either on-site or off-site.

Habitat Category 4 is habitat of low value. The goal is to "minimize the loss" of habitat value or, if possible, conserve or enhance habitat. OAR 635-415-0030(4)(a). The implementation standard provides for flexible mitigation.

To ensure compliance with the fish and wildlife habitat mitigation goals and standards, NWN engaged Dames & Moore to conduct a biological resource investigation and evaluations of the proposed Project area. Dames & Moore conducted separate studies of the Mist storage area (including the new gathering lines) and the South Mist Feeder expansion. Dames & Moore's reports identify the major ecological habitats in the Project area, characterize the habitats by category, identify the potentially affected fish and wildlife species, evaluate the potential impacts to habitats and recommend mitigation measures. (Exhibits 15, 22.)

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[32] "Impact" is defined by ODFW rule to mean "an adverse effect of a development action upon fish and wildlife habitat." OAR 345-415-0005(12).

As part of the studies, a biologist walked the entire length of the 24-inch pipeline and smaller gathering line routes to identify all habitat, wetlands and streams that would be affected by the Project. A corridor 200 feet wide was evaluated to accommodate potential route adjustments. Dames & Moore identified areas as wetlands if they contained evidence of hydrophytic vegetation, hydric soils and wetland hydrology. Any watercourse with a defined channel was recognized as a stream.

The storage area study did not include the 12-acre Miller Station site because it is completely fenced, most of the site is paved with gravel or covered with buildings and the remainder is of no habitat value due to continuous human activity in the area.

Habitats affected by the gathering lines and the 24-inch expansion of the South Mist Feeder are discussed separately below.

South Mist Feeder Expansion

1. Habitat Types; Habitat Categories.

The proposed 24-inch pipeline extends through a variety of habitat types. For most of its length, the pipeline route crosses tree farms dominated by young conifer forests and 20- to 50-year-old conifer and mixed conifer/deciduous forests. The mixed conifer/deciduous forests are found mostly in lowland floodplains and riparian areas, especially near Dairy Creek and the Nehalem River. Two upland scrub-shrub areas are located along O'Black Mainline Road amidst conifer forest. The pipeline route crosses a variety of agricultural areas near Mist along Highway 47 and at the southern end of the route near Dairy Creek where there are pastures, hayfields, Christmas and willow tree farms and other agricultural fields. The pipeline will cross various types of forested, scrub-shrub, emergent and open water wetlands in forested and in agricultural areas. Each of these habitat types is described below. Exhibit 22 contains a more detailed description of the habitat types, including common plant species found in each one. Appendix B of Exhibit 22 also shows the locations of the various habitats along the pipeline route.

Dames & Moore assigned habitat categories to the habitats described below, under OAR 635-415-0030, based on professional judgment considering the common wildlife and

fish species likely to use those habitats. With the exception of coho salmon,[33] evaluation species have not been formally selected.

a. Conifer Forest.

These forests are second or third generation forests (20 to 50 years old) dominated by Douglas fir. Private timber companies manage the majority of these forest stands for timber production. Other trees in these forest stands include western red cedar, western hemlock and grand fir. The canopy is closed and the understory is sparse. The habitat is basically two-layered with the tree canopy and the understory herb and low shrub layer. In most areas there is limited cover except for logs and log piles left over from logging operations.

Category 4. This habitat is low-value because the conifer forest stands are managed as commercial timberland. The older stands along the pipeline route are reaching harvest age. Certain species, such as deer and elk and forest birds (kinglets, nuthatches, grouse, woodpeckers, etc.), are abundant in mature conifer forest stands but overall plant and wildlife species diversity is relatively low, and habitat structures like snags and woody debris are sparse in these second growth stands. None of these areas provide locations of special importance for deer fawning or elk calving. Future timber harvests will continue to adversely affect the habitat value of these stands.

b. Mixed Conifer/Deciduous Forest.

These forest stands along the pipeline route are also generally 20 to 50 years old and managed for timber production. The dominant trees include Douglas fir, big-leaf maple, western red cedar, red alder and western hemlock. Large woody debris in the form of

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[33] On August 10, 1998, the National Marine Fisheries Services ("NMFS") issued a final rule that lists the Oregon Coast Coho Salmon Evolutionarily Significant Unit ("ESU") as a threatened species under the federal Endangered Species Act (the "ESA"), 63 Fed Reg 42,587 (1998). The listing will take effect on October 9, 1998. Id. NMFS has not yet issued protective regulations under section 4(d) of the ESA so it is not yet clear whether the listing will place additional restrictions on the construction of the proposed pipeline in the vicinity of coho salmon habitat. NWN will, however, follow the actions of NMFS concerning the coho and will abide by the terms of any forthcoming applicable federal rules.

Section 7 of the ESA applies to action by any federal agency that may affect a listed species or its habitat.

NWN is aware of the need for compliance with section 7 in connection with any federal action on the Project (e.g. Army Corps of Engineers' approval), and with forthcoming federal rules. Those matters are, however, outside the scope of the EFSC process and are not further addressed in this Application.

downed logs with thick moss covering is an important habitat feature in some of the mixed forest stands, especially in wetlands along O'Black Mainline Road. These large logs provide moist sites for amphibians throughout the year and cover for small animals.

Category 3. Although most of these forests are managed as commercial timberland, they generally have greater habitat value than the less diverse conifer forests. Species diversity is higher, snags and woody debris are more abundant and forage and cover are available to a greater number of wildlife species.

c. Deciduous Forest.

These forests are associated with riparian and wetland areas. Deciduous forests bordering the Nehalem River, tributaries to the Nehalem River and Dairy Creek are important riparian buffer areas that provide shade, shelter and foraging and breeding areas for many wildlife species and are an important component of fish habitat in streams. Dominant trees in these forests include red alder, big-leaf maple, vine maple and Oregon ash.

Categories 1 and 3. Deciduous forests along the pipeline route are Category 1 habitat where they act as riparian buffers for streams and rivers inhabited by coho salmon. In all other cases they are Category 3 habitat because their habitat structure is similar to that of the mixed forest.

d. Young Coniferous Forest.

The more recent timber harvest areas along the pipeline route have been replanted with Douglas fir trees. Other conifer and deciduous tree seedlings are also present in places. The trees are mostly 10 to 20 years old. The open canopy allows for more vigorous growth of shrubs and herbs than in older conifer stands. These young forests provide forage for elk and deer and seeds and berries for birds and bears.

Category 4. Young conifer forests along the pipeline route are low-value habitat like conifer forests for the same reasons.

e. Forest Clear-Cuttings.

The pipeline route crosses a number of recent clear-cuttings. These areas provide very limited wildlife cover and forage.

Category 4. Clear-cuttings are low-value habitat due to their lack of forage, cover and habitat structures for wildlife species.

f. Scrub-Shrub.

Two small patches of upland scrub-shrub habitat are present in the vicinity of the route along O'Black Mainline Road. Douglas spiraea and salmonberry dominate these areas, surrounded by conifer forest. The shrubs provide browse for deer and elk and forage and cover for a variety of birds and small mammals.

Category 4. This habitat is low value because it provides habitat to only a few common-edge species and because habitat diversity is low.

g. Pastures.

The pipeline route crosses many hayfields and cow pastures. Relatively few wildlife species inhabit pastures. Some of the most visible are birds such as western meadowlarks, American robins, savanna sparrows and violet-green swallows.

Category 4. This habitat is low-value due to the limited habitat structures available, low plant species (forage) diversity and the impacts of hayfield operations or livestock grazing on habitat value.

h. Agricultural Crops.

The pipeline route crosses cultivated fields near Dairy Creek, including a Christmas tree farm and a corkscrew willow farm. Other crops along the pipeline route include strawberries, clover, beans, corn and wheat. These fields provide limited wildlife habitat.

Category 4. Agricultural crop land habitat is low-value due to little habitat diversity and the continuous impacts of human activities.

i. Wetlands.

The pipeline route crosses 61 wetland areas. Emergent plants dominate a majority of these wetlands. Emergent wetlands are found along streams and drainages in forested areas and on the Dairy Creek and Nehalem River floodplains. Most of the forested and scrub-shrub wetlands are found along O'Black Mainline Road and Corral Mainline Road and near Bacona Road.

The habitat categories for various wetlands are listed in Exhibit 22, Table 8. Wetlands along the pipeline route are Category 1 if they potentially provide streamside habitat for coho salmon. Wetlands are characterized as Category 2 if they provide habitat to a variety of species and potential habitat to a state sensitive amphibian, the northern red-legged frog. One Category 3 wetland along the pipeline route provides seasonal habitat for waterfowl. All other wetlands, including those in pastures, agricultural fields and degraded forested areas, are Category 4.

Forested Wetlands. Most of the forested wetlands on the pipeline route are associated with streams and narrow drainage channels. A few appear to be isolated depressions. These forested wetlands provide breeding, foraging and resting areas for a variety of wildlife species.

Many of these wetlands have a major component dominated by emergent plants commonly found in disturbed areas, such as reed canary grass, giant horsetail, small-flowered bulrush, creeping buttercup and soft rush. This emergent component is, in most cases, present along road corridors and the maintenance right-of-way for the existing South Mist Feeder.

Categories 1, 2 and 4. The only Category 1 forested wetland on the pipeline route borders Lindgren Creek (060515C).

Most of the other forested wetlands are Category 2 because they provide breeding, foraging and resting areas for a variety of wildlife species, including the northern red-legged frog.

Two forested wetlands are Category 4 because they provide very limited wildlife habitat. One is an isolated depression surrounded by forest clear-cutting; the other is a small seep located in a degraded horse pasture.

Scrub-Shrub Wetlands. All of the wetlands dominated by scrub-shrub vegetation line streams or small drainage channels. Dominant shrubs in these wetland areas include salmonberry, Douglas spiraea and shrubby willows. The wildlife habitat value of these wetlands is similar to that of the forested wetlands along the route. They also tend to be dominated by emergent plants near roads and in the maintenance right-of-way for the existing pipeline.

Category 2. All wetlands dominated by shrubs are considered Category 2 because they are connected with streams and provide habitat to a wide variety of wildlife species.

Emergent Wetlands. The habitat quality of these wetlands is generally high in forested areas and low in clear-cut, pasture and agricultural areas. A number of the emergent wetlands either border fish-bearing streams or are extensive enough to provide substantial amphibian breeding areas. However, most of the emergent wetlands along the proposed pipeline route provide very limited wildlife habitat. Even many emergent wetlands in forested areas provide low-quality habitat because they are small or are in recently clear-cut areas dominated by invasive species such as reed canary grass. Plants prevalent in uncultivated emergent wetlands along the route include small-flowered bulrush, soft rush, reed canary grass, water parsley, giant horsetail and stinging nettle.

Emergent wetlands found in pastures or other agricultural fields make up the majority of the emergent wetland acreage impacted by pipeline construction. They are located at the north and south ends of the pipeline route in the Nehalem River and Dairy Creek floodplains. Most are dominated by common pasture grasses and invasive plants such as reed canary grass, creeping buttercup and soft rush, providing limited wildlife habitat. The only exception is the southernmost wetland, which becomes a major waterfowl concentration area during the winter. This wetland remains inundated throughout the winter, spring and early summer months. Many other wetland birds are also associated with this wetland during the breeding season, including killdeer, yellowthroats and red-winged blackbirds.

Categories 1-4. Only one emergent wetland is Category 1 (040306B) because it borders Kenusky Creek.

Several of the emergent wetlands are Category 2 because they are connected to high-quality stream or forest habitats and provide breeding areas for a variety of aquatic organisms.

The only Category 3 wetland (020335A) is the one in the agricultural field that is inhabited by a number of bird species during the breeding season and waterfowl during the winter.

Most of the emergent wetlands are Category 4 either because they are small or because they have been degraded by grazing, mowing, cultivation or forest clear-cutting activities.

j. Mainstem Rivers.

The only mainstem river in the Project area is the Nehalem River, an undammed anadromous fish stream. At the two locations where the pipeline route crosses the river (Crossings 8 and 26), the banks are valley alluvium of a sandy texture and the stream bottom is composed of bedrock and cobble. Streamside vegetation is primarily composed of grasses and forbes with willows providing some in-stream cover on the south bank at Crossing 26. All stream crossings in the Project area are listed in Exhibit 22, Table 7.

Category 1. The Nehalem River is high-value habitat due to the presence of native coho salmon, which will be listed as a threatened species under the federal Endangered Species Act (the "ESA"), effective October 9, 1998. The riparian buffer along the Nehalem River is also Category 1 habitat.

k. Large-Size Tributary Streams.

Project area streams with average annual flows of 10 cubic feet/second or greater are defined as large size streams by the Oregon Department of Forestry (the "ODF"). The East Fork of the Nehalem River (Crossings 30 and 35), the East Fork of Dairy Creek (Crossing

51) and Battle, Crooked and Kenusky Creeks (Crossings 5, 20 and 34) are classified as large-size streams by the ODF. Field measurements of stream flows indicate that Lindgren and Messing Creeks (Crossings 2 and 4) should also be considered large-size streams. The pipeline route therefore crosses a total of seven large streams at eight crossing points.

Categories 1 and 2. All Project area large-size streams in the Nehalem River watershed have populations of native coho salmon and are considered Category 1 habitat.

Coho salmon are not native to the Willamette River Basin above Willamette Falls. The East Fork of Dairy Creek is the only Project-area large tributary stream in this watershed. This stream provides high-quality spawning and rearing habitat for native fluvial and resident coastal cutthroat trout. Accordingly, this stream and its riparian buffer are Category 2 habitat.

l. Medium-Size Tributary Streams.

Streams with average annual flows greater than two and less than 10 cubic feet/second are defined as medium-size streams by the ODF rules. Fall, Elk and Plentywater Creeks (Crossings 16, 29 and 54) are medium-size streams.[34]

Categories 1 and 2. Fall and Elk Creeks, in the Nehalem River drainage, host runs of native coho salmon. These creeks and their riparian buffers are therefore Category 1 habitat.

Plentywater Creek in the Dairy Creek watershed provides high-quality spawning and rearing habitat for native resident coastal cutthroat trout. The creek and its riparian buffer are considered Category 2 habitat.

m. Small Size Tributary Streams.

Streams with average flows of two cubic feet/second or less are defined as small-size streams by the ODF rules. There are 47 small stream crossings on the pipeline route. Most of these streams are unnamed.

Categories 2, 3 and 4. None of the small-size tributary streams in the Project area host coho salmon runs. For the purpose of assigning habitat categories, the small-size streams fall into the following three groups:

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[34] The Oregon Department of Forestry (the "ODF") also classifies Gumm Creek (Crossings 62 through 64) as a medium size stream. This application treats the Gumm Creek crossings as canal crossings, described below, because the pipeline crossings occur where the creek has been channelized to form a canal for draining and irrigating agricultural lands.

Category 2. Twelve of the small-size streams on the pipeline route are classified as fish-bearing streams[35] by the ODF. Five of these streams (Crossings 52, 56, 57, 58 and 60) have at least moderate spawning and rearing habitat at the pipeline crossings, and populations of cutthroat trout were found in each of these streams during surveys. These five streams are all located in the East Fork of Dairy Creek watershed and provide high-value habitat for resident and fluvial populations of coastal cutthroat trout.

Category 3. Five of the 12 streams classified as fish-bearing streams by the ODF have marginal spawning and rearing habitat at the pipeline crossings (Crossings 12, 13, 18, 19 and 23). These streams occur in the Nehalem River watershed alongside the O'Black and Crooked Creek Mainline Roads. In each case, fish passage is blocked either at the road culverts or immediately below. Dames & Moore found no fish in these streams during its surveys and no surveys have been done by the ODF or ODFW. These streams may have resident fish above the pipeline crossing points but it is doubtful that any resident populations provide recruitment to the Nehalem River or fish habitat near the crossings.

Category 4. Of the 47 small-size streams crossed by the pipeline, 35 have not been classified by the ODF and do not contain fish or suitable habitat for fish due to their small size or degraded nature. These streams are low-value habitat.

In addition, two small streams (Crossings 3 and 50) that are listed as fish-bearing streams by the ODF are low-value habitat at the pipeline crossings. Crossing 3, of Lyons Creek, occurs in pastureland immediately above a beaver pond situated beside the Longview Fibre Mainline Road. Coastal cutthroat trout populations probably occur in forested reaches of this stream upstream from the pipeline crossing, but no fish were found in the crossing area during Dames & Moore's July 8, 1998 survey. The state has not conducted fish surveys at Lyons Creek. This stream segment is low-value habitat because no useable habitat exists near the crossing and the creek does not have a defined channel conveying water into the beaver pond or any culvert crossing under the road. This situation prevents passage of downstream fish populations into the section of Lyons Creek crossed by the pipeline route.

Crossing 50 occurs in the extreme headwaters of Roundy Creek. Roundy Creek extends approximately 200 yards upstream from the pipeline crossing and there is no spawning or rearing habitat available in this stream section. Although the ODF surveys indicate that coastal cutthroat trout have been found all the way to the extreme headwaters of Roundy Creek, no fish were found during the Dames & Moore survey. Because this section of Roundy Creek provides no habitat for fish, it is low-value habitat.

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[35] Under the ODF rules, a fish bearing stream is a stream that contains anadromous, game, threatened or endangered species of fish.

n. Canals.

The five southernmost pipeline crossings occur at dredged channels. The pipeline route crosses Gumm Creek (Crossings 62 through 64) in a channelized portion of the creek that functions as a canal to drain agricultural fields and provide irrigation water. The stream follows a straight ditched channel with reed canary grass forming the dominant streamside vegetation.

Crossing 61 occurs at a ditch used to drain agricultural fields. This man-made ditch empties into Gumm Creek just below Crossing 62. The banks, streambed and streamside vegetation are similar to that of Gumm Creek.

The southernmost stream crossing (Crossing 65) occurs at the short outlet of a farm pond near where it connects with Gumm Creek just below Crossing 64. The streambanks and streambed are similar to those of Gumm Creek, above. Relative to Gumm Creek's flow, the farm pond outlet has very little current and is just a narrowing of the pond.

Categories 3 and 4. Crossing 61 occurs at a man-made ditch that does not qualify as a stream channel under the ODF rules. Although fish were found in this stream during the Dames & Moore survey, this watercourse is considered low-value habitat (Category 4) because of its degraded nature.

Habitat at the three Gumm Creek crossings is also Category 4. The ODF lists this creek as a fish-bearing stream but the stream channel is extremely degraded with no available spawning habitat and extremes of temperature and turbidity. This section of Gumm Creek has little structure to serve as holding water for fish and does not appear to support a sports fishery.

Crossing 65 occurs at a channel that connects a farm pond with Gumm Creek. The banks of the channel and the pond are easily walked and the pond/channel supports a fishery for largemouth bass and bluegill sunfish. Because this waterway supports a sports fishery, it is considered Category 3 habitat.

2. Potentially Affected Fish and Wildlife Species.

The wildlife species that use the habitats along the pipeline route are common to the coastal region of Oregon. Large mammals like elk and black-tailed deer make trails along the existing pipeline corridor, especially where the corridor provides a clear path through forested areas. Common mammal predators are coyote, bear, cougar, weasels and mink. Beaver, muskrat and river otters can be found near streams, rivers and ponds. Small mammals include red squirrels, deer mice, jumping mice, shrews, moles, voles and other small rodents. Birds commonly observed along the pipeline route, especially in forested areas, included American robins, song sparrows, mountain and black-capped chickadees, ruffed grouse, red-tailed hawks and great horned owls. Pileated and downy woodpeckers,

varied thrushes and winter wrens were common in mixed forests, especially along the O'Black Mainline Road. Red-winged blackbirds, killdeer and common yellowthroats are common nesters in the agricultural wetlands in the Dairy Creek and Highway 47 areas. Other birds in agricultural areas include barn swallows, violet-green swallows and western meadowlarks. Pacific treefrogs, roughskin newts and northern red-legged frogs were observed in forested ponds and other wetlands in forested areas.

Salmonid species reported or surveyed in the Nehalem River and its Project area tributaries include coho salmon, fall- and summer-run chinook salmon, winter-run steelhead trout, rainbow trout and anadromous, fluvial and resident coastal cutthroat trout. Rainbow trout surveyed in this watershed were probably juvenile winter-run steelhead. Other fish species reported or surveyed in the Nehalem River and its tributaries were large-scale sucker, Pacific lamprey, western brook lamprey, three-spine stickleback and reticulate, torrent, riffle, coastrange and prickly sculpin. Although these species have not been reported or surveyed within the Project area, the Nehalem River basin falls within the native range of the mountain whitefish, northern squawfish, longnose dace and peamouth.

Resident and fluvial coastal cutthroat trout have been reported or surveyed in the East Fork of Dairy Creek and its tributaries within the Project area. Hatchery strains of winter-run steelhead trout and coho salmon are no longer planted in this drainage but a small naturalized population of steelhead trout may occur in the East Fork of Dairy Creek within the Project area. These fish are not considered part of the native Upper Willamette River Evolutionarily Significant Unit by the National Marine Fisheries Service.

Other species of fish reported or surveyed in the East Fork of Dairy Creek and its tributaries were western brook lamprey, three-spine stickleback, speckled dace, carp, reticulate sculpin, torrent sculpin, bluegill sunfish and largemouth bass. Although these species have not been reported or surveyed within the Project area, the East Fork of Dairy Creek watershed falls within the native or introduced range of the following fish species: mountain whitefish, northern squawfish, longnose dace, peamouth, Pacific lamprey, leopard dace, mountain sucker, chiselmouth, piute sculpin, black bullhead, brown bullhead, black crappie, pumpkinseed sunfish, redside shiner, shorthead sculpin and brook trout.

3. Potential Impacts: Compliance with Goals and Standards.

In most areas the new pipeline will be placed in the existing pipeline corridor or will follow existing road corridors. In a few instances, however, the pipeline will pass through more intact ecological communities. The temporary construction right-of-way will be 80 feet wide except at streams, wetlands and other sensitive areas. In the vast majority of these areas, the construction right-of-way will be a maximum of 30 feet in width. There are, however, seven wetlands where NWN will need a broader construction right-of-way of up to 60 feet, due to construction constraints. None of these wetlands, which are discussed in greater detail below, are Category 1 habitat.

The permanent maintenance right-of-way will be restored but kept free of trees and large vegetation to allow for visual inspection and maintenance. As noted in Section IV.B. above, for most of the pipeline route, NWN will simply widen the maintenance right-of-way for the existing pipeline by 10 feet, for a total width of 50 feet. In the few cases where the pipeline route deviates from the existing pipeline corridor, the maintenance right-of-way will be 40 feet wide. In streams, wetlands and other sensitive areas, the maintenance right-of-way will be 30 feet.

a. Category 1 Habitat. These habitats include:

The Nehalem River, the East Fork of the Nehalem River, Battle Creek, Crooked Creek, Kenusky Creek, Fall Creek, Elk Creek, Lindgren Creek and Messing Creek (the Category 1 streams) (see Exhibit 22, Table 7);

Riparian buffers of the Category 1 streams;

Forested wetland on the banks of Lindgren Creek;

Emergent wetland on the north bank of Kenusky Creek.

(1) Streams and Riparian Areas.

NWN will avoid three of the Category 1 streams--the Nehalem River, the East Fork of the Nehalem River and Elk Creek (Crossings 8, 26, 29, 30 and 35)--and their deciduous forest riparian buffers by the use of directional boring under the streams. NWN will leave a buffer of approximately 250 to 300 feet on either side.

NWN cannot cross Lindgren, Messing, Battle, Fall, Crooked or Kenusky Creeks (Crossings 2, 4, 5, 16, 20 and 34) by the directional boring method due to geological constraints. NWN will avoid impacts to the habitat in these streams and their riparian buffers by using a flume or diversion methodology to prevent the release of sediment into the stream channel and by the following measures:

a. Streams will be trenched during low flow periods to minimize sediment entering the stream;

b. The number of stream crossings will be minimized;

c. Effective sediment barriers will be constructed at approaches to channels;

d. Trenched crossings will be completed quickly and temporary stream crossing structures will be removed promptly after use with no blockage of fish migration during seasons when fish movement normally occurs;

e. Pipeline construction will occur during periods of low flow (July 15-August 31 in the Nehalem River basin and July 1-September 30 in the East Fork of Dairy Creek watershed) before adult anadromous salmonids return to their spawning beds and after the emergence of salmonid fry from the gravel;

f. The construction corridor through streams and riparian areas will be kept as narrow as possible and no more than 30 feet in width;

g. Disturbance to streambanks, existing channels and riparian management areas will be minimized;

h. Machine activity in streambeds will be kept to an absolute minimum; and

i. Streambanks will be stabilized and revegetated after construction is completed.

By employing these protective measures, NWN will avoid adverse effects on the habitat in these Category 1 areas.

(2) Wetlands.

NWN will avoid three Category 1 wetlands along the Nehalem River and Elk Creek by the use of directional boring. Impacts to the forested wetland along Lindgren Creek and the emergent wetland along Kenusky Creek will be avoided by the following measures:

a. Keeping the construction corridor through all wetlands as narrow as possible, approximately 30 feet in width;

b. Avoiding the rest of each wetland area by using adjacent roads for equipment staging where this is possible;

c. Timing construction to occur during the driest time of the year (April to late summer);

d. Separating and returning topsoil to the trench backfill surface; and

e. Avoiding changes to wetland hydrology by installing clay barriers at each end of the wetland crossing.

These measures will ensure that there will be no loss of either habitat units or habitat value in the Category 1 habitats along the pipeline route and that the Project will meet the "avoidance of impact" standard.

b. Category 2. These habitats include:

Forested wetlands;

Scrub-shrub wetlands;

Emergent wetlands;

East Fork of Dairy Creek, Plentywater Creek and five small, unnamed streams in the East Fork of the Dairy Creek watershed (the Category 2 streams) (see Exhibit 22, Table 7); and

Riparian buffers of Category 2 streams.

(1) Wetlands.

NWN will completely avoid 16 Category 2 wetlands along the pipeline route by various means, including changes to the pipeline route and limiting construction to road banks.

Impacts to all other Category 2 wetland habitats will be avoided by:

a. Keeping the construction right-of-way through all wetlands to 30 feet in width, except in three instances (wetlands 060428A, 050403A and 040436B) where the right-of-way will be no wider than 60 feet;

b. Avoiding the rest of each wetland area by using adjacent roads for equipment staging where this is possible;

c. Timing construction to occur during the driest time of the year (April to late summer);

d. Separating and returning topsoil to the trench backfill surface; and

e. Avoiding changes to wetland hydrology by installing clay barriers at each end of the wetland crossing.

All of the forested and scrub-shrub wetlands are located along roads and/or the cleared, permanent right-of-way for the existing South Mist Feeder pipeline. Additional tree and shrub removal at these wetland locations will be minimized as much as possible. Woody vegetation will not be removed where the width of the road or the existing pipeline right-of-way is wide enough to accommodate the trenching activities. There also will be extremely limited or no tree removal where the pipeline will be installed in the fog lines of Highway 47

and Dairy Creek Road. Four Category 2 wetlands, including the largest forested wetland within the Project area, will be avoided using this construction technique.

The existing South Mist Feeder pipeline crosses two of the large wetland complexes (060514A and 030412A), which include forest, shrub, emergent and open water components. These wetlands, as well as many others along the pipeline route, appear to have recovered completely from the 1989 pipeline construction activities. Complete restoration of these habitats is also expected after construction of the proposed pipeline expansion. The proposed pipeline will cross wetland 060514A through a short section of open water and shrubs and through a longer section of emergent pasture wetland. The pipeline will cross wetland 030412A near a road where the dominant vegetation is reed canary grass.

Most wetland habitats will be fully restored to their preconstruction condition within one or two growing seasons. Forested or scrub-shrub wetland areas will take longer. They will be fully reestablished where the woody vegetation will not interfere with the permanent right-of-way needed for pipeline maintenance. In areas where pipeline construction and maintenance will convert forested or scrub-shrub wetlands to emergent wetlands, NWN will mitigate these impacts by replanting an equal amount of degraded emergent wetland along the pipeline route with native trees and shrubs. Accordingly, there will be no net loss of either habitat units or habitat value, and mitigation will be in-kind, on-site.

(2) Streams and Riparian Buffers.

Impacts to the Category 2 streams and their riparian buffers will be minimized by the following methods:

a. Streams will be trenched during low-flow periods to minimize sediment entering the stream;

b. The number of stream crossings will be minimized;

c. Effective sediment barriers will be constructed at approaches to channels;

d. Trenched crossings will be completed quickly and temporary stream crossing structures will be removed promptly after use with no blockage of fish migration during seasons when fish movement normally occurs;

e. The pipeline construction will occur during periods of low flow (July 15-August 31 in the Nehalem River basin and July 1-September 30 in the East Fork of the Dairy Creek watershed) before adult anadromous salmonids return to their spawning beds and after the emergence of salmonid fry from the gravel;

f. The construction corridor through streams and riparian areas will be kept as narrow as possible (approximately 30 feet);

g. Disturbance to stream banks, existing channels and riparian management areas will be minimized;

h. Machine activity in streambeds will be kept to an absolute minimum; and

i. Streambanks will be stabilized and revegetated after construction is completed.

Most aquatic and riparian habitats at stream crossings will be fully restored to their preconstruction condition within one or two growing seasons. Forested or scrub-shrub riparian areas will take longer. They will be fully reestablished in all areas where the woody vegetation will not interfere with the permanent right-of-way needed for pipeline maintenance. In areas where pipeline construction and maintenance will convert forested or scrub-shrub riparian areas to grass and forbes, NWN will mitigate these impacts by replanting an equal amount of degraded riparian habitat along the pipeline route with native trees and shrubs. Accordingly, there will be no net loss of either habitat units or value, and mitigation will be in-kind, on-site.

c. Category 3. These habitats include:

Mixed forest;

Deciduous forest;

One emergent wetland; and

Category 3 streams and canals and their riparian buffers. (Exhibit 22, Table 7.)

(1) Forests.

Patches of mixed forest habitat will be affected by pipeline construction along Highway 47, O'Black Mainline Road and Corral Mainline Road. One small patch of Category 3 deciduous forest is located along Corral Mainline Road. Impacts to these roadside habitats will be minimal because approximately half of the construction will occur in areas that are already cleared. There is also Category 3 deciduous forest habitat in the pipeline study area near Dairy Creek. NWN will avoid all impacts to these habitat areas by placing the pipeline in an area devoid of trees.

NWN will avoid the mixed forest along Dairy Creek Road and much of the mixed forest along Highway 47 because the pipeline will be placed in the fog lines of the roads at these locations. No habitat units or value are expected to be lost at these locations.

(2) Wetlands, Streams and Riparian Buffers.

No habitat units or value will be lost at the single Category 3 emergent wetland, which is located in agricultural fields.[36] NWN will avoid impacts to winter waterfowl by constructing the pipeline in the late spring and summer months. The mitigation measures described above for Category 2 wetlands, streams and riparian areas will also apply to this Category 3 habitat and the Category 3 streams and riparian areas.

For these reasons, there will be no net loss of habitat units or value, and any needed mitigation will be in-kind, on-site.

d. Category 4. These habitats include:

Conifer forest;

Young conifer forest;

Forest clear-cuttings;

Scrub-shrub;

Pasture;

Agricultural crops;

Two forested wetlands;

Emergent wetlands; and

Category 4 streams and canals and their riparian buffers. (Exhibit 22, Table 7.)

(1) Forests, Scrub-Shrub.

The impact to forest and scrub-shrub habitat outside the permanent maintenance right-of-way will be temporary. The vegetative cover will be encouraged to grow back and the

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[36] The construction right-of-way across the single Category 3 wetland (020335A) will be a maximum of 60 feet in width.

habitat value will be gradually restored over time to the level allowed in a tree farm operation. Within the maintenance right-of-way, trees will be discouraged but other vegetation will be encouraged to prevent erosion and provide some habitat value. The loss of habitat value will therefore be minimized and no mitigation is needed.

(2) Pasture, Agriculture.

In agricultural areas, NWN will restore the surface after construction. The land will continue to be cultivated as it was before pipeline construction. Therefore, the impacts to this habitat will be small and very short-term. There will be no loss of habitat value apart from temporary construction activities and no need for mitigation.

(3) Wetlands.

Impacts to Category 4 wetlands will be short-term because the wetlands will be restored soon after construction is complete. The construction corridor through all wetlands will be 30 feet wide in most cases and no more than 60 feet wide in the three instances (wetlands 020322E, 020322A and 030333B) where a 30-foot right-of-way is not feasible. Best management practices will be used during construction to minimize impacts, including separating the upper 6 to 12 inches of topsoil from the rest of the trench spoils and putting it back in the top of the trench. NWN will minimize the amount of time that equipment is in the wetlands. Any water that is pumped from the trench during construction will be filtered to remove sediments and returned to the wetland. Mitigation for any loss of trees in the two forested wetlands will be the same as for impacts to Category 2 forested wetlands, as described above.

(4) Streams and Riparian Areas.

The aquatic and streamside habitat of the Category 4 streams on the pipeline route is heavily degraded. Impacts to streams and riparian areas will be short-term because streams will be crossed during low-flow periods and streambeds and banks will be restored soon after construction is complete. The construction corridor through all stream crossings will be a maximum of 30 feet in width. Best management practices and the ODF Forest Practice Administrative Rules will be used during construction. With the exception that there are no riparian buffers for non-fish-bearing streams, NWN will employ the mitigation measures described above for Category 2 streams to its activities in Category 4 streams and riparian areas.

Gathering Lines.

The new gathering lines into the Reichhold Pool area (see Exhibit 13) cross young coniferous forest and recently cleared forest areas. Young coniferous forest is found along the longest connection between the 16-inch terminus well site and the center ridge line well site and for most of the connection between the easternmost well site and the center well site.

Clear-cut areas surround the center and southern well sites and gathering lines. A newly clear-cut area is also positioned immediately west of the eastern well site. The land crossed by all of these gathering lines and the well sites is owned and managed by Longview Fibre for timber production. The gathering lines will pass near two wetlands but will avoid both of them.

All young coniferous forest and forest clear-cut areas in the Project area are Category 4 habitat. Impacts to these habitats include the removal of vegetative cover and temporary disturbance of the soil in the trench and of the adjacent surface from movement of construction equipment. The vegetative cover will be encouraged to grow back in the construction corridor with the exception of trees and large shrubs in the area directly over the pipe. This maintenance right-of-way must be kept clear of tall vegetation to allow for visual inspections.

The impact to forest habitat in the construction right-of-way not containing the pipe will be temporary, and the habitat value will be gradually restored over time to the level allowed in a tree farm operation. In the maintenance right-of-way, trees will be discouraged but other vegetation will be encouraged to prevent erosion and provide some habitat value. The loss of habitat value is therefore minimized and no mitigation is needed.

For these reasons, the design, construction, operation and retirement of the Project, taking mitigation into account, is consistent with the habitat mitigation goals and standards of OAR 635-415-0030.

H. Threatened & Endangered Species (OAR 345-022-0070).

Under this standard, the Council determines whether the design, construction, operation and retirement of a facility will be consistent with applicable conservation programs adopted pursuant to ORS 496.172(3) (wildlife) and ORS 564.105(3) (plants). If no conservation program applies, the Council determines whether the facility has the potential to significantly reduce the likelihood of the survival or recovery of any threatened or endangered species listed under ORS 496.172(2) or ORS 564.105(2).

No conservation program adopted under ORS 496.172(3) or ORS 564.105(3) applies to the study area.

To evaluate the potential of the Project to affect threatened or endangered species, NWN contacted the U.S. Fish and Wildlife Service ("FWS"), the NMFS and the Oregon Natural Heritage Program ("ONHP") to obtain information concerning threatened and endangered species and habitats. These agencies provided information on listed species, species proposed to be listed and species of concern.

NWN also engaged Dames & Moore to conduct a field study. Ms. Linda Krippner, wildlife biologist, walked the gathering line and South Mist Feeder expansion routes to look

for evidence of use of the area by any of the specifies identified by the agencies. Dr. Rob. Nielsen, a Dames & Moore fisheries biologist, surveyed all stream crossings along the route.

Based on its field work, Dames & Moore concluded that the expansion of the Mist storage facility, including the new gathering lines, would have no adverse impact on any species listed as threatened or endangered under state or federal law. (Exhibit 15.) Dames & Moore also conclude that the South Mist Feeder expansion was not likely to adversely affect any of the species currently listed or proposed for listing under ORS 496.172(2) or ORS 564.105(2). A summary of the consultants' findings about key species and potential impacts of the South Mist Feeder expansion is presented below.[37] Additional detail appears in Exhibit 22.

1. Listed Species.

a. Northern Spotted Owl. Threatened (state and federal).

This species will not be affected. The proposed pipeline will pass through a patchwork of clear-cutting, young forests and older second growth forests (30-50 years old). Even the second growth forests are not suitable for spotted owl nesting. These forests are small patches surrounded by clear-cuttings and young forest stands, and they lack the diversity of vegetation, snags and other habitat features found in a more mature forest canopy. The small amount of forest removed, primarily along existing roads, power lines and gas lines, will not affect the spotted owl.

b. Coho Salmon. Federal listing as threatened will take effect October 9; not state listed.

The Project is not likely to adversely affect this species. Coho habitat streams in the Project area have an average spawning density of four fish per stream mile. NWN will cross Elk Creek, the Nehalem River mainstem and the East Fork of the Nehalem River by directional drilling with no effect on coho spawning or rearing habitat. Where directional boring is infeasible due to physical restraints (Lindgren, Messing, Battle, Fall, Crooked and Kenusky Creeks), coho salmon streams will be crossed by trenching. Diversions or flumes will be used when trenching salmon streams to prevent sediment release during construction. In-stream work will be limited to the following low-flow construction windows when these streams will probably be dry, to minimize potential impacts to salmonids: July 15 to August 31 in the upper Nehalem River basin and July 1 to September 30 in the East Fork of the Dairy Creek basin.

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[37] Because Dames & Moore concluded that there was no potential habitat for listed species in the vicinity of the gathering lines (see Exhibit 15), the gathering line routes are not further discussed in this section.

The pipe will be buried below the depth of maximum scour and any trenches will be infilled with substrate matching the excavated material in size and form. Stream banks will be stabilized and restored. Construction will not occur during upstream or downstream migration of coho salmon or during spawning or in-gravel incubation of coho salmon eggs or fry. A temporary increase in turbidity may occur during and slightly after construction at trenched crossings, but restricting in-stream work to low-flow periods before the migration period of coho salmon will prevent any harassment or other injury to adult spawners. Construction activities in tributary streams will only last for a few days and upstream migration by adult spawners will not be prevented. No loss of spawning or rearing habitat will occur.

2. Species Proposed for Listing.

a. Steelhead Trout. NMFS decided federal listing was not warranted on March 3, 1998; not listed under ORS 496.172(2).

The Project is not likely to adversely affect this species. NWN will cross Elk Creek, the Nehalem River mainstem and the East Fork of the Nehalem River by directional drilling with no effect on critical steelhead spawning or rearing habitat. Where directional boring is infeasible due to physical restraints (Lindgren, Messing, Battle, Fall, Crooked and Kenusky Creeks), NWN will cross steelhead streams by trenching. Diversions or flumes will be used when trenching these streams to prevent sediment release during construction. In-stream work will be limited to July 15 through August 31 in the Nehalem River basin and July 1 through September 30 in the East Fork of the Dairy Creek basin to minimize potential impacts to salmonids.

The pipe will be buried below the depth of maximum scour and any trenches will be filled with substrate matching the excavated material in size and form. Stream banks will be stabilized and restored. Construction will not occur during upstream or downstream migration of steelhead trout or during spawning or in-gravel incubation of steelhead eggs or fry. A temporary increase in turbidity may occur during and slightly after construction at trenched crossings, but restricting in-stream work to low-flow periods before the migration period of steelhead trout will prevent any harassment or other injury to adult spawners. Construction activities in tributary streams will only last for a few days and upstream migration by adult spawners will not be prevented. No loss of spawning or rearing habitat will occur.

b. Anadromous Cutthroat Trout. Candidate for federal listing; not listed under ORS 496.172(2).

The Project is not likely to adversely affect this species. NWN will cross Elk Creek, the Nehalem River mainstem and the East Fork of the Nehalem River by directional drilling with no effect on critical cutthroat trout spawning or rearing habitat. Where directional boring is infeasible due to physical restraints (Lindgren, Messing, Battle, Fall, Crooked and

Kenusky Creeks), streams will be crossed by trenching. Diversions or flumes will be used when trenching these streams to prevent sediment release during construction. All in-stream work will be limited to July 15 through August 31 in the Nehalem River basin and July 1 through September 30 in the East Fork of the Dairy Creek basin to minimize potential impacts to salmonids.

The pipe will be buried below the depth of maximum scour and any trenches will be filled with substrate matching the excavated material in size and form. Stream banks will be stabilized and restored. Construction will not occur during upstream or downstream migration of cutthroat trout or during spawning or in-gravel incubation of trout eggs or fry. A temporary increase in turbidity may occur during and slightly after construction at trenched crossings, but restricting in-stream work to low-flow periods before the migration period of anadromous cutthroat trout will prevent any harassment or other injury to adult spawners. Construction activities in tributary streams will only last for a few days and upstream migration by adult spawners will not be prevented. No loss of spawning or rearing habitat will occur.

3. Federal Species of Concern.

Dames & Moore evaluated the Project impacts on a number of federal species of concern and concluded that the Project was not likely to have an adverse impact on any of them. A full discussion appears in Exhibit 22.

4. Oregon Natural Heritage Program Status Species.

Male Fern.

This species will not be affected. No male fern populations were found along the pipeline route; therefore, none should be affected by Project construction. Timber harvesting and road clearing activities have previously disturbed the forests crossed by the pipeline route. It is therefore unlikely that even individual plants not identified during the survey will be present and affected by pipeline construction.

For these reasons, the Project does not have the potential to reduce the likelihood of the survival or recovery of any species that is, or is likely to be, listed as threatened or endangered under Oregon law.

I. Scenic/Aesthetic (OAR 345-022-0080).

Under this standard, the Council determines whether

> "the design, construction, operation and retirement of the facility, taking into account mitigation, is * * * likely to result in significant adverse impact to scenic and aesthetic

values identified as significant or important in applicable federal land management plans or in the local land use plan for the site or its vicinity." OAR 345-022-0080.

To address this standard, the following text includes a description of the visual appearance of the Project site and its vicinity, a description of points from which the existing storage facility is visible, a list of county- and state-designated scenic and aesthetic resources in the vicinity of the Project and an analysis of the proposed Project's impacts on these resources.

1. Baseline Description of Visual Features of Project Area.

The Project area is located in Columbia and Washington Counties. The applicant's existing Mist Field facilities are located on both sides of the Nehalem River near the town of Mist in Columbia County. The river in this area follows a winding course through a flat valley floor at about 500 feet above sea level. The valley is about one-quarter to one-half of a mile wide. The valley floor is bounded by a network of ridges rising to elevations of 1,000 to 1,500 feet above sea level. These ridges are forested with second growth fir and checkerboarded with clear-cutting. All of the surface lands around the Mist Field portion of the Project are in private ownership. The lands along the valley floor are primarily dedicated to agricultural use, and the rest of the area is largely owned by private timber concerns.

The South Mist Feeder looping project will follow the Nehalem River southeast through the town of Mist and continue parallel to the river for several miles until it crosses the river and runs through privately owned timber lands to the west. The route will cross the river again about three miles northeast of Vernonia and then will head south, out of the Nehalem River drainage, to the border of Washington County. Again, the majority of the lands crossed by this part of the route are private timberlands in various stages of development from clear-cut to second growth, and some lands in the river valley are in agricultural or rural residential use.

Once in Washington County, the pipeline route will continue south through private timberlands and then southwest into the East Fork of Dairy Creek drainage. The route follows this drainage south through timberland and farm lands to the terminus northwest of North Plains.

2. Points from Which Existing Project Is Visible.

Miller Station is the only Project facility that is visible from any distance. It occupies several acres along a ridgeline northwest of Mist, at an elevation of approximately 1,000 feet. (Exhibit 38, Photos 1-3.) The main visual elements are two adjacent compressor buildings and a combined office and maintenance building. The site is surrounded by second growth fir trees that are generally 30 to 40 feet tall. These trees and the surrounding hilly

terrain block views of Miller Station from most directions. The existing compressor building and other buildings at Miller Station are visible from the following locations:

a. The intersection of Highway 47 and Highway 202 in Mist (Exhibit 38, Photo 1);

b. About one-quarter mile along Highway 202, west of the intersection with Highway 47;

c. A bend in Highway 47 at milepost 8, north of Mist (Exhibit 38, Photo 2); and

d. Privately owned lands near the sites mentioned above.

A field reconnaissance of the area did not reveal any other points on publicly owned land or rights-of-way from which Miller Station could be seen.

There are a number of existing wellheads serving the applicant's existing Mist Field storage operations. The wellsites are fenced areas, usually no larger than 50 feet square, containing above-ground pipes and other equipment less than 10 feet high. (Exhibit 38, Photos 7-9.) Most are in forested areas. The chain-link fences and wellhead equipment are generally dull metal or painted grey and consequently are not noticeable from any significant distance.

The existing South Mist Feeder pipeline is buried and therefore not visible from any portion of the Project area or beyond. There is one surface facility associated with the existing pipeline: a "pig catching" station located along Bacona Road on private timberland in the northern portion of Washington County. This facility is composed of above-ground pipeline and related equipment about five to six feet in height and less than 100 feet long.

3. Significant Scenic and Aesthetic Values Near the Project Area.

Under OAR 345-022-0080, the Council considers impacts to "scenic and aesthetic values identified as significant or important in applicable federal land management plans or in the local land use plan for the site or its vicinity."

a. Federal.

There is no federally owned surface land in the vicinity of the Mist Field. There are approximately 19,000 acres of federal land administered by the BLM in the portions of Columbia and Washington Counties traversed by the South Mist Feeder route. This land is managed for timber production under the Northwest Forest Plan and consequently has a "Visual Resourcement Management" designation of category IV--the lowest category (with one exception--Big Canyon--discussed below). This land does not contain any federally

identified scenic or aesthetic resource within sight distance of the South Mist Feeder. No river in the Project vicinity has been identified by the federal government as a wild or scenic river.

b. Columbia County.

The County's Comprehensive Plan contains an inventory of five "County Scenic Resources." (Exhibit 39.) None of the Project's components are visible from (or within the viewshed of) any area identified by Columbia County as a scenic resource.

The County's Comprehensive Plan also identifies Highway 47 as a state-designated scenic highway from the Washington County line to Treharne and between Pittsburgh and Clatskanie. (Id.) Miller Station is visible from two points along Highway 47 (Exhibit 38, Photos 1, 2). No other portion of the Project is visible from Highway 47.

The County's Comprehensive Plan also identifies two "Scenic Views." These are both near Rainier, more than 10 miles from any portion of the Project.

c. Washington County.

The County's Comprehensive Plan identifies a "scenic view" from a clear-cutting in the vicinity of Red Slide Hill, located in the East Fork of Dairy Creek drainage about a mile west of the existing and proposed South Mist Feeder pipeline route. The viewpoint itself (see Exhibit 38, Photo 11) is from a clear-cutting located on a private road and there is no public access. A similar view can be gained from Bump Road, a public road just below Red Slide Hill, back down the valley into Hillsboro. (Exhibit 38, Photo 12.) The existing South Mist Feeder right-of-way is not visible from this location because the topography prevents views directly down into the Dairy Creek valley. (Id.)

The county's Plan also identifies a "scenic feature" at Big Canyon, also in the East Fork of Dairy Creek drainage and also about one-half mile west of the South Mist Feeder. Big Canyon is a steep, heavily forested drainage tributary to East Fork of Dairy Creek. It is primarily BLM land. The county's comprehensive plan states that the BLM has designated Big Canyon as a "Natural Area" but BLM staff informed the applicant in August 1998 that the designation has been rescinded. There is no public access to Big Canyon. Even if the pipeline were an above-ground facility, it would not be visible from Big Canyon because of the extremely dense vegetation. (Exhibit 38, Photo 13 (view of Big Canyon from approximate location of pipeline right-of-way).)

Finally, the county's Plan identifies Dairy Creek Road as a "Scenic Route" with good views of a "narrow farm valley and forested canyon with stream." (Exhibit 38, Photo 14.) The existing pipeline follows Dairy Creek Road over significant stretches but is not visible because it is buried and no surface facilities are related to this portion of the pipeline.

The South Mist Feeder does not involve any above-ground facilities in the vicinity of or visible from either Red Slide Hill or Big Canyon.

4. Proposed Project's Impact on Scenic Resources.

a. Miller Station.

The modifications proposed at Miller Station involve lifting the 6,650-BHP limit on the existing compressor equipment. This will not change the facility's visual impact. In addition, a natural-gas dehydration tower approximately 20 feet in height and four or five feet in diameter will be built next to a similar existing structure. Due to the surrounding 30- to 40-foot fir trees (see Exhibit 38, Photos 3-6), the existing dehydration tower is not visible from any significant distance. Therefore, the new tower (in essentially the same location) also will have no effect on the facility's visual impact. Thus there will be no adverse impacts on the scenic views from State Highway 47.

b. South Mist Feeder.

The looping pipeline will be located underground and thus will not be visible from any scenic site in Columbia or Washington Counties. The only surface facility associated with the pipeline is the proposed expansion of the pig-catching facility in northern Washington County. This expansion will not significantly increase the visibility of the existing facility, which is not visible from Red Slide Hill, Big Canyon or any designated scenic site in Columbia County.

c. Gathering Lines.

The gathering lines will be located underground and thus will not be visible from any scenic site in Columbia or Washington Counties.

5. Construction.

During construction, the applicant's ditch-digging and pipe-laying equipment and operations will be visible along Highway 47 and along Dairy Creek Road for a limited period of time. The impact on the view will be similar to that of substantial road repair activities. The visual impact of these operations will be lessened because the landscape in this area shows numerous marks of development, including clear-cuttings (see Exhibit 38, Photo 10) and rural residential development along the highway. Because of topography and vegetation, construction activities along Dairy Creek Road will not be visible from Red Slide Hill or Big Canyon. In sum, the work along Highway 47 and Dairy Creek Road--the only scenic impacts of any sort--actually will affect the highway rather than the scenic landscape visible from it, and the impacts will be neither severe nor permanent in nature.

For these reasons, the Project will not adversely impact any scenic or aesthetic value identified as significant or important in any applicable federal land management or local land use plan for the Project site or its vicinity.

J. Historic, Cultural and Archeological Resources (OAR 345-022-0090).

Under this standard, the Council considers whether the construction, operation and retirement of a facility, taking mitigation into account, is likely to result in significant adverse impacts to:

1. Historic, cultural or archaeological resources that have been listed on, or would likely be listed on, the National Register of Historic Places;

2. For a facility on private land, "archaeological objects" as defined in ORS 358.905(1)(a) or "archaeological sites" as defined in ORS 358.905(1)(c); and

3. For a facility on public land, "archaeological sites" as defined in ORS 358.905(1)(c).

ORS 358.905(1)(a) defines an "archaeological object" as an object that (1) is at least 50 years old, (2) comprises "the physical record" of any culture and (3) is "material remains of past human life or activity that are of archaeological significance."

ORS 358.905(1)(c) defines "archaeological site" as any location that "contains archaeological objects and the contextual associations of the archaeological objects" with each other or biotic or geological remains or deposits.

To determine the extent of previous research in the Project area, NWN contacted the State Historic Preservation Office (the "SHPO") in Salem, Oregon, on May 5, 1998. This inquiry indicated that few archaeological investigations have been conducted in this region of Oregon. No archaeological studies have been conducted along the existing South Mist Feeder pipeline corridor since the studies NWN conducted when the existing South Mist Feeder was sited and permitted (Gaddis 1987; Hibbs and Ellis 1988a, 1988b), except that Dames & Moore conducted limited studies last year in connection with Phase II, along portions of the same route. No additional archaeological inventories have been conducted within a one-half mile radius of the Project area. As a result, other than the sites recorded during the original pipeline study, no previously recorded archaeological sites are known in the immediate area (Leland Gilsen: personal communications 1997 and 1998).

Given the terrain and environment of the Project area, overall archaeological sensitivity along much of the pipeline route is relatively low. However, 23 archaeological sites, including both historic and prehistoric resources, were recorded in conjunction with the survey conducted for the construction of the existing South Mist Feeder pipeline. (Hibbs and

Ellis 1988a.) These sites, located in either the Nehalem River Valley or along the East Fork of Dairy Creek, consist of prehistoric artifact scatters and historic structures or homesteads.

Limited subsurface testing has been conducted at these sites, indicating the presence of some subsurface deposits at the sites in the Nehalem Valley. In addition, numerous cultural observations have been made, including isolated artifacts, roads, fences, bridges and logging railroad grades and trestles. Most of these features are either outside of the study corridor or of insufficient historic note to merit recordation as sites (Hibbs and Ellis 1988a:131). Monitoring and minor pipeline route adjustments have been used to reduce or eliminate potential impacts to identified sites during pipeline construction (Hibbs and Ellis 1988b).

Dames & Moore conducted archaeological inventories of the proposed gathering line and 24-inch pipeline routes on May 6, 7 and 8 and June 19, 25 and 26, 1998. (Exhibits 15, 22.) No new cultural resources were identified within the pipeline corridor or along the gathering line route. Twelve sites identified during NWN's 1987 fieldwork occur along the proposed new 24-inch pipeline route. Eight of these are located in the Nehalem Valley, in the vicinity of Natal. The other four are located along the East Fork of Dairy Creek, between the Meacham Corner and Mountaindale areas.

With one exception (35WN35, see below), all of these sites can probably be avoided through adherence to the recommendations included in the original pipeline study (Hibbs and Ellis 1988b). Monitoring will be required at site 35WN35 and in a number of additional locations where the pipeline will be constructed near archaeological sites or sensitive areas. These recommendations, developed in consultation with the SHPO (Leland Gilsen, personal communication 1998), are presented in the site-by-site discussion that follows.

1. Site 35CO41.

This site consists of a small prehistoric lithic scatter with a buried subsurface component located on the lower terrace along the Nehalem River west of Battle Creek. It extends approximately 25 meters east from the east edge of the highway. NWN avoided this site by rerouting the existing pipeline 120 feet east of the highway. Construction of the new pipeline is planned for the east side of the existing line, resulting in a construction zone even farther from the site. As a result, no impacts are anticipated. Given the presence of a buried cultural deposit in this area, however, construction in this area will be monitored by a qualified archaeologist.

2. ORCO6.

This is the historic Peterson House, now a private museum, located in the upper Nehalem Valley between Mist and Natal. The existing pipeline was placed along the west edge of the highway to avoid impacts to this property. Placement of the new line on the

eastern side of the highway, as proposed, will result in no impacts to cultural resources at this site.

3. ORCO5.

This site consists of the O'Black homestead, a late nineteenth-century occupation in the upper Nehalem Valley near Natal. The existing pipeline was rerouted 50 to 100 meters east to avoid impacts to the site. Construction of the new line east of the existing line will similarly avoid impacts to the site.

4. 35CO40.

This site consists of a small surface scatter of prehistoric artifacts along the right bank of the Nehalem River, west of Natal. The proposed pipeline is located approximately 150 meters southwest of the site, resulting in no effect to the resource.

5. 35CO38.

This is a significant, early prehistoric site located on an old terrace of the Nehalem River southeast of Natal. It is relatively large, encompassing 3.7 acres, and contains both surface and subsurface components. The existing pipeline was rerouted to avoid this site by approximately 100 meters. The proposed pipeline, located on the west side of the existing line, will be a greater distance from the site. As a result, the pipeline will avoid all cultural deposits.

6. ORCO4.

This site consists of the historic Cole homestead, settled in 1874 and one of the earliest known historic sites in the upper Nehalem Valley. It is located near Natal, approximately one-half mile south of the Nehalem River. Surface and subsurface deposits were noted at the site. The existing pipeline was rerouted to avoid this site, passing 50 to 100 meters to the north. Construction of the new pipeline on the north side of the existing line will increase this distance.

7. ORCO3.

This site consists of the historic Burris homestead, a late nineteenth-century homestead near the community of Natal. The existing pipeline passes 100 to 150 meters east of this site. Construction of the new pipeline within this existing corridor will have no impact on this site.

8. 35CO39.

This site consists of an extensive scatter of prehistoric artifacts located on an old river terrace about 500 meters west of the Nehalem River, southeast of Natal. The site encompasses approximately 13.4 acres and contains both surface and subsurface deposits. O'Black Mainline Road passes along the eastern edge of the site. To avoid impacting the site during construction of the existing pipeline, the pipeline was rerouted 25 to 50 meters to the east within the corridor. The new line will be constructed to the east of the existing line to result in similar avoidance. Given the extensive nature of the subsurface deposits at this site, however, construction at this location will be monitored by a qualified archaeologist.

9. 35WN33.

This site consists of a dispersed surface scatter of prehistoric artifacts on a low terrace of the East Fork of Dairy Creek. The area is currently used as a Christmas tree farm and no intact cultural deposits were noted during original recordation. The existing pipeline crosses the west and south edges of the site, resulting in minimal disturbance to the resource. Construction of the proposed line within the same corridor should likewise result in no adverse effect. Construction activities will, however, be monitored by a qualified archaeologist.

10. 35WN35.

This site consists of a sparse surface scatter of prehistoric artifacts in a cultivated field east of Dairy Creek Road, encompassing an area of approximately 5.2 acres. The current pipeline corridor appears to bisect this site. Because the parcel is currently planted with ornamental willow and blackberry, thorough examination of the ground surface was not possible. For this reason, a transect of four 50 x 50 centimeters shovel probes was excavated across the site, paralleling a narrow access route through the field. Each probe was excavated to an average depth of 30 centimeters. All sediments were passed through one-eighth-inch mesh screening. No cultural materials were observed on the surface or recovered from the shovel probes. The proposed pipeline follows the existing corridor, similarly bisecting the site. NWN will conduct an additional archaeological survey during ground-clearing activities, followed by monitoring of trenching activities.

11. ORWN1/35WN34.

These sites consist of extensive, overlapping deposits of historic and prehistoric materials located on the slopes and crest of a ridge east of Dairy Creek, near the community of Mountaindale. The prehistoric component (35WN34) consists of two concentrations of prehistoric materials at the northern and southern ends of the site, with fewer materials scattered between. No indications of subsurface materials were identified. The historic component (ORWN1) consists of a late nineteenth-century homestead, several structures of which are still occupied. To avoid impacts to this site, the existing pipeline was rerouted to

skirt the western and southern boundaries of the site. Construction of the proposed pipeline immediately adjacent to the existing pipeline should likewise avoid adverse effects to the resource. Given the extent of historic and prehistoric materials in the area, however, a qualified archaeologist will monitor construction.

As noted above, much of the remainder of the proposed pipeline route is in an area of low archaeological sensitivity. One additional exception to this is the proposed crossing of the Nehalem River, in the vicinity of Natal, where NWN proposes grading and excavation to facilitate boring under the river for the pipeline crossing. Previously recorded archaeological resources are present in the vicinity. While no archaeological resources were observed at the crossing site, sensitivity should be considered moderate to high. To allow for the potential of undiscovered resources in this area, all grading and excavating activities associated with the boring operation will be monitored by a qualified archaeologist.

If any artifacts or other cultural materials that might qualify as "archaeological sites" or "archaeological objects" are identified during monitoring, all ground-disturbing activities in the area will cease until the archaeologist can evaluate their potential significance. If the materials are potentially eligible for listing on the National Register of Historic Places or likely to qualify as archaeological sites or objects, NWN will consult with the SHPO and comply with archaeological permit requirements administered by the SHPO (currently set forth in OAR chapter 736, division 51).

K. Recreation (OAR 345-022-0100).

Under this standard, the Council determines whether the "design, construction and operation" of a facility will result in "significant adverse impact to important recreational opportunities in the impact area." OAR 345-022-0100. Factors considered in judging the importance of a recreational opportunity include:

> "(1) Any special designation or management of the location;
>
> "(2) The degree of demand;
>
> "(3) Uniqueness;
>
> "(4) Outstanding or unusual qualities;
>
> "(5) Availability or rareness; and
>
> "(6) Irreplaceability or irretrievability of the opportunity." Id.

NWN evaluated recreational impacts based on the study area defined in OAR 345-001-0010(50)(g) for a surface facility related to an underground gas storage reservoir. That study area is the area within five miles of the site boundary.[38]

1. Existing Recreational Facilities.

a. Columbia County.

In 1993, Columbia County adopted the Columbia County Forests, Parks and Recreation Master Plan (the "Plan"). (Exhibit 40.) The Plan was updated in 1995 and 1997. The Plan identifies 20 county parks, forests, forest/parks and boat dock facilities and another 20 public and private facilities that now provide recreational opportunities to county residents and visitors. (Exhibit 40 at 6-11.)

According to Mr. Charles Ashcroft, the Director of the Columbia County Forests, Parks and Recreation Department, only one of the identified facilities, Big Eddy Park, is within five miles of the Project site. The Project will not have a significant adverse impact on this facility because, as Mr. Ashcroft states: "[T]he pipeline will not be occupying any land within the park or land which potentially could be used for further park expansion." (Exhibit 41.)

b. Washington County.

The only recreational facilities under Washington County's jurisdiction are Metzger Park and Hagg Lake. Neither facility is located within five miles of any portion of the Project site.

Most of the recreational opportunities and facilities in Washington County are managed by the Tualatin Hills Parks and Recreation District (the "District"). The outer boundary of the District's planning area closest to the Project is bounded by Sunset Highway, Cornelius Pass Road and West Union Road, more than five miles from the nearest portion of the Project site. (Exhibit 42.) According to the District's planning staff, the District does not now have any facilities located within five miles of the Project site. (Exhibit 43.)

NWN is aware of no other recreational facilities within five miles of the Project site.

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[38] The rule arguably establishes a smaller study area for the pipeline portion of the Project. See OAR 345-001-0010(50)(f). NWN has chosen to evaluate the larger five-mile area for the sake of consistency.

2. Proposed Recreational Facilities.

a. Columbia County.

Columbia County plans to develop bicycle trails in the future. Preliminary plans call for a bike trail to be located along Highway 202 in the vicinity of the Project. However, the development of this bicycle trail is at least four years away. (Exhibit 44.) Construction of the Project will be concluded by the end of 1999. Accordingly, the construction activities will not have any impact on the proposed bike trail. Because the pipeline will be buried, it will not affect the future development of the bike trail.

NWN is aware of no other proposed recreational facilities within five miles of the Project site.

b. Washington County.

To the best of our knowledge, Washington County has no plans for the development of future recreational facilities within five miles of the Project site. The District has no plans for future facilities within five miles of the Project site. (Exhibit 43.)

3. Fishing.

The proposed 24-inch pipeline will cross the Nehalem River, which is used for fishing. Because the pipeline will be buried below the bed of the river, it will have no impact on Nehalem River fishing. None of the other streams on the pipeline route have been identified as significant areas of fishing activity.

4. Hunting.

The Project site is within a major big game habitat area. (Exhibits 27, 30.) The area is used for hunting elk, deer, pheasant, grouse and bears.

Changes to Miller Station will all be within the current fenced Miller Station site. The remainder of the Project will be underground. Accordingly, the only impact to hunting will be some habitat loss and possible minor disturbance of hunting activities during Project construction.

Out of a total Project area of approximately 220 acres, only 66 acres will be permanently cleared for the Project. The vast majority of that acreage is low-value habitat. See Section V.G. Habitat loss therefore will not have an adverse impact on recreational hunting opportunities in the area.

Similarly, the area that will be affected by Project construction is a minute fraction of the land available for hunting in the area and is in no way unique. (Exhibits 27, 30.)

Project construction activities will last approximately nine months. Consequently, construction of the proposed Project will not have an adverse impact on important hunting opportunities in the area.

To NWN's knowledge there are no other recreational opportunities, important or otherwise, within the study area.

For these reasons, the Project will not result in a significant adverse impact to important recreational opportunities within the study area for the Project.

L. Socioeconomic Impacts (OAR 345-022-0110).

Under this standard, the Council determines whether the construction and operation of a facility, taking mitigation into account, will result in significant adverse impact to the ability of communities within the study area to provide the following governmental services: sewers and sewage treatment, water, storm water drainage, solid waste management, housing, traffic safety, police and fire protection, health care and schools.

The Project includes modifications to two separate facilities, each with different impacts and different study areas. The study area for socioeconomic impacts of a surface facility related to an underground gas storage reservoir is the area within 30 miles of the site boundary. OAR 345-01-010(50)(g)(G). The study area for the South Mist Feeder pipeline expansion is not set by Council rule. After consultation with Office of Energy staff to determine the appropriate study area, NWN evaluated the socioeconomic impacts of the Project on the communities nearest to the pipeline corridor, including Mist, Vernonia, North Plains and Banks.

Potential providers of governmental services in the Mist storage study area include Columbia and Clatsop Counties and the incorporated cities and towns within 30 miles of the site boundary. The nearest communities include Mist, which is unincorporated; Vernonia, which is approximately 15 miles away; and Clatskanie, which is approximately 12 miles away. Potential providers of governmental services for the South Mist Feeder expansion include Columbia and Washington Counties. The pipeline corridor does not pass through any incorporated city or town. The nearest cities to the pipeline corridor are North Plains, approximately two miles from the right-of-way, and Vernonia, approximately three miles away.

For the South Mist Feeder expansion, construction workers will work along various sections of the construction right-of-way for a nine-month period from March through October 1999. There will be an average of approximately 200 workers on-site during that period, with a peak of 250 to 300 workers during the summer months. Less than 50 percent of the work force will be from outside of the study area. A small percentage of workers from outside the area may bring their families with school age children, but this is estimated to be not greater than 15 children.

The expansion of the Mist Storage facility as part of this Project will include construction work at Miller Station as well as construction of new gathering lines to new wells. The gathering line work is scheduled for April and May 2000, and the station modifications will occur May through August 2000. These items are relatively minor in nature and will be accomplished primarily with local workers. Any out-of-area contract workers are expected to be on site no longer than two months.

The population of Columbia County is approximately 40,100 and of Washington County is approximately 376,500. Oregon Blue Book, at 315, 330 (1997-98). Accordingly, even during the peak construction period, the Project will not have a significant impact on the population in the area.

1. Sewers and Sewage Treatment.

No community in the study area provides sewers or sewage treatment to the existing certificated energy facilities or the surrounding areas. For Miller Station, the existing and expanded facilities have been and will be served by on-site sewage disposal systems. For the South Mist Feeder, no sewage treatment facilities are in place or anticipated. During construction, contract portable toilets will be used. The Project therefore will not have any adverse impact on any community's ability to provide sewers or sewage treatment.

2. Water.

No community in the study area provides water to the existing certificated energy facilities or the surrounding areas. The existing and expanded Miller Station facility has been and will be served by existing water wells. Expansion of the South Mist Feeder will require water only during the construction phase. That water will be acquired through temporary permits, as described in Section VI of this Application. Accordingly, the Project will not have an adverse impact on the ability of any community to provide water.

3. Storm Water Drainage.

Again, no community in the study area provides storm water drainage to the existing certificated energy facilities or the surrounding areas. Storm water drainage will be handled on site by natural drainage and the existing collection system for facility pad runoff. The Project therefore will not have an adverse impact on the ability of any community to provide storm water drainage.

4. Solid Waste Management.

No community in the study area provides solid waste management services to the existing certificated energy facilities or the areas around them. Current and future solid waste disposal for the energy facilities is and will be handled through private contracts with

local service companies. There will therefore be no adverse impact on the ability of any community in the area to provide solid waste management services.

5. Housing.

At the peak of construction activity there will be approximately 250 to 300 workers assigned to work on the pipeline expansion. NWN anticipates that fewer than 50 percent of this work force will require temporary housing. Even though there is very little temporary housing near Miller Station, there are numerous communities within a 30-mile commute distance that have a wide array of facilities. The cities of Vernonia, Clatskanie and St. Helens have motel facilities totaling approximately 100 rooms. Longview and Kelso, Washington, are also within 30 miles of Mist; there are several hundred motel rooms available in these communities.

For the pipeline construction, Washington County also has numerous temporary housing facilities. For example, the Greater Hillsboro area Chamber of Commerce has identified 976 units available in the Hillsboro area and 89 units available in the Forest Grove area. Approximately one-half of the construction workers from outside the area are expected to bring travel trailers and recreational vehicles that can be parked at a variety of parks established to accommodate this type of mobile housing.

Temporary housing in the area is therefore adequate to handle the number of construction workers for the Project. There will be no adverse impact on the ability of the communities in the area to provide housing.

6. Traffic Safety.

The only impact to local traffic will be from the construction activity associated with the Project. Once the expanded facilities are operational, there will be no additional traffic in the area.

For the Mist storage expansion, the principal roads in the vicinity of the Project are Highway 202, a two-lane highway that bisects the Project area as it runs generally southeast/northwest from Mist to Astoria, and Highway 47, a two-lane highway that runs generally north/south from Clatskanie, through Mist, to its intersection with Highway 26 west of Hillsboro. (Exhibit 10.) The southeastern endpoint of Highway 202 occurs at its intersection with Highway 47 in Mist. The minor amount of construction activity in the Mist area will have minimal impact on these roads.

The primary impact to local roads will result from the South Mist Feeder expansion. The principal roads that will be used to access the pipeline's construction right-of-way are Highways 47 and 202 described above, Dairy Creek Road north of North Plains, Bacona Road southeast of Vernonia and the Scappoose-Vernonia Highway near the intersection with Highway 47. (Exhibit 10.)

Oregon Department of Transportation ("ODOT") statistics for the state highways indicate that average daily traffic on Highway 202 was 870 vehicles per day in 1995 and that average daily traffic on Highway 47 was 800 vehicles per day in 1995. According to ODOT, neither highway is at or near its capacity of approximately 50,000 to 75,000 vehicles per day.

According to the Washington County Department of Land Use and Transportation, Dairy Creek Road has the capacity to handle 14,400 vehicles per day (600 vehicles per hour). The county's 1998 traffic counts for Dairy Creek Road show average daily traffic of only 1,237 vehicles per day. Bacona Road is a lightly traveled, rural road. Washington County does not take traffic counts for this road.

According to the Columbia County Engineer, the Scappoose-Vernonia Highway has the capacity to handle 48,000 vehicles per day (2,000 per hour). The county's 1998 traffic counts show average daily traffic of 662 vehicles per day.

During the construction phases, most Project-related traffic will access the Project area on either Highways 202 or 47 and then on the county roads listed above or other various local roads, including private logging roads controlled by Longview Fibre and Olympic Resource Management.

During the peak pipeline construction phase, the Project will require approximately 250 to 300 workers on-site. This could yield up to 600 additional vehicle trips per day (ODOT counts each direction of an out-and-back journey as a "trip") if single occupancy vehicles are used. Other construction-related traffic will include equipment delivery and NWN Project personnel, totaling up to 200 additional vehicle trips per day. Together with employee vehicle trips, the maximum total number of additional trips on area roads will be 800 per day, an extremely small percentage of the currently unused daily vehicle capacity for these roads. Note that this incremental traffic related to the construction of the pipeline will be scattered along various sections of the construction right-of-way so that no single section of road will be solely impacted.

One of the roads that will host significant additional traffic is Longview Fibre's private Mainline Road. Access to this road is controlled with close cooperation between Longview Fibre and NWN. Longview Fibre has expressed no concern about Project impacts on this road and, in fact, has expressed its support for the Project in a recent letter to Columbia County, noting the successful degree of cooperation between the two companies. (Exhibit 24.)

Given the excess capacity of the existing roads in the area, the negligible traffic associated with facility operation and the relatively light traffic associated with Project construction, the Project will not have a significant adverse impact on the ability of communities in the area to ensure traffic safety.

7. Police Protection.

Police protection in the area is provided by the City of Vernonia, the Columbia County Sheriff's Department and the Washington County Sheriff's Department. Conversations with these police departments indicate that they expect little if any impact from the construction activity and no impact from ongoing Project operations. The 250 to 300 person construction work force does not create any significant concerns for the effected police departments. Letters from the Vernonia Police Chief and Columbia County Sheriff both confirmed that the Project will not place a significant burden on their abilities to provide police protection. (Exhibit 45.)

8. Fire Protection.

The Mist-Birkenfeld Rural Fire Protection District provides fire protection services in the Mist area. In a recent letter, District Chief Dave Crawford stated:

> "Your company has committed to a number of projects, including a new pipeline and additional storage locations, which will increase the storage and transportation activity within our fire district. Representatives of our district have met with you to discuss the projects and their impact upon our district. We are satisfied that the concerns we have expressed have been answered in an appropriate manner * * *. The cooperation demonstrated by NNG with the needs of our fire district has been exemplary. Mist-Birkenfeld is in total support of the continuance of these projects." (Exhibit 23-A.)

Additional fire districts along the pipeline corridor have been contacted and briefed on the scope of the Project. These include the Vernonia Rural Fire Protection District in Columbia County, as well as Forest Grove Fire and Rescue, the Tri-City Rural Fire Protection District (in Banks) and Washington County Fire District Two in Washington County. (Exhibit 23.) The response of Washington County Fire District Two (Exhibit 23-B) is representative, concluding with the following statement:

> "There have been no fire incidents with the existing South Mist Feeder in the nine years since its installation. For the reasons described above, we do not expect the expansion of the pipeline to increase fire hazard, fire suppression costs, or risks to fire suppression personnel to any significant degree."

Moreover, the Project will pose very little if any additional fire hazard in the area. NWN has operated its existing underground natural gas storage facility and the South Mist Feeder

pipeline for approximately 10 years without causing any fires or other hazards. The wellhead and pipeline facilities have numerous safety features, including relief valves and automatic shutdown systems.

Finally, the facilities are monitored from the "nerve center" at Miller Station by NWN's trained personnel. Miller Station was inspected by the PUC in 1996 and was found to be in full compliance with the pipeline safety regulations of the U.S. Department of Transportation (49 CFR part 192). (Exhibit 17.) A very recent letter from the PUC confirms that NWN's track record "provides a high level of confidence in public safety." (Exhibit 18.) Accordingly, the Project will not have an adverse impact on the ability of communities in the area to provide fire protection.

9. Health Care.

The minimal number of permanent employees and the relatively small construction work force should place few additional demands on the health care facilities that serve the area. Local hospitalization needs are currently met by hospitals in the Portland area, Astoria and Longview, Washington. The communities in the area therefore provide very little in the way of health care.

However, to the extent that there are injuries or other health care needs associated with the Project, the Mist-Birkenfeld Rural Fire Protection District has a Multiple Casualty Incident Plan in place. The district confirmed last year that it has the supplies and materials necessary to support the plan and that its resources are available in connection with the Project. (Exhibit 46.) In addition, the Tri-City Rural Fire Protection District in Banks states that Metro West Ambulance and Lifeflight will respond to any medical incidents in the area of Washington County that is served by the district. (Exhibit 23-D.)

The Project therefore will not have a significant adverse impact on the ability of the communities in the area to provide health care services.

10. Schools.

As noted above, pipeline construction workers are expected to bring no more than 15 school age children into the area during the construction phase of the Project. It is difficult to predict where these families will obtain housing but even if all of the families were housed in one of the smaller school districts such as Vernonia, the expected impact would be minimal. Vernonia School District expects its enrollment to be approximately 850 students during the 1998-99 school year. NWN contacted the Vernonia School District superintendent and he confirmed that an additional 15 students enrolled for the duration of the Project would have no significant impact on the district.

There are smaller communities along the corridor, such as Mist, that would not be able to accommodate as many as 15 additional students, but because of the limited amount of

temporary housing in these locations it is not likely that this situation will arise. Most construction workers will locate in areas where housing is available, which are also the areas that have schools of sufficient size to accommodate 15 additional students with little difficulty.

M. Waste Minimization (OAR 345-022-0120).

This standard requires an applicant, to the extent reasonably practicable, to

> "minimize generation of solid waste and wastewater in the construction, operation, and retirement of the facility, and when solid waste or wastewater is generated, recycle and reuse such wastes." OAR 345-022-0120(1).

In addition, to the extent reasonably practicable,

> "the accumulation, storage, disposal and transportation of waste generated by the construction and operation of the facility must have minimal adverse impact on surrounding and adjacent areas." OAR 345-022-0120(2).

1. Introduction.

NWN has in place a hazardous and nonhazardous waste reduction and recycling program for all of its facilities. Recycling and reuse is a priority for the company and, as described below, will be implemented during the construction phase and during the day-to-day operations of the Project.

2. Minimization of Solid Waste.

a. Construction Phase.

There will be solid wastes generated during construction. These solid wastes will consist of nonhazardous construction materials. The solid materials will consist of scrap steel, welding rod and erosion control materials such as straw bales and silt fencing. The scrap steel and welding rod will be collected and transported to a recycling facility. The silt fence material and the straw bales will be transported to a local landfill.

b. Operational Phase.

There will be no generation of waste, hazardous or nonhazardous, during the operational phase of the Project beyond what was described in NWN's Application for Amendment No. 4 to the Storage Certificate and approved by the Council in that process.

3. Minimization of Wastewater.

During pipeline construction, waters from local sources will be used for directional boring and hydrostatic testing of the pipeline. All waters will be disposed of in a manner consistent with requirements specified in approved permits. See Section VI.B. Approximately one-quarter of the hydrostatic test water will be filtered and discharged to a farmer's retention pond to be used for crop irrigation.

4. Minimization of Water Use.

The water acquired from local sources for the hydrostatical testing of the pipeline will be held to a minimum. The pipeline will be tested as a whole with two discharge locations. This process will reduce the need for different water sources. It also will reduce the overall amount of water required for the test protocol. Apart from the water use necessary for hydrostatic testing, directional drilling and dust control, there will be no water use associated with the Project beyond what was described and approved in the process that resulted in Amendment No. 4 to the Storage Certificate.

5. Impact on Surrounding Areas.

The accumulation and storage of Project waste will take place at Miller Station and transportation of it will be from Miller Station. Miller Station is fully fenced and virtually surrounded by second growth forest with no neighbors nearby. The accumulation, storage and transportation of Project waste will therefore have little impact, if any, on surrounding and adjacent areas.

N. Retirement (OAR 345-022-0130).

Under this standard, the Council determines whether "the site * * * can be restored adequately to a useful, nonhazardous condition following facility retirement." OAR 345-022-0130.

Retirement of the Mist storage facility is unforeseeable at this time. This Application does not propose any major changes at the storage facility. The estimated facility life is indefinite because it is not anticipated that the natural reservoirs will lose their storage capacity and the process equipment will be replaced as needed. The original Mist storage facility has been fully operational since 1988. The integrity of the formation and capacity of the reservoir have not changed in nearly 11 years of operation. However, if retirement is necessary, the site can be restored to a useful nonhazardous condition.

As described in NWN's 1997 application, the storage facility is composed of three distinct areas, plus the South Mist Feeder pipeline to which NWN proposes to add a parallel pipeline. The three storage areas are the gas processing facility, the gathering lines and the

injection/withdrawal wells. Retirement would be conducted in accordance with the nature of the equipment and structures in these areas.

The only changes at the storage facility approved in 1997 are the request to utilize the full nameplate rated horsepower in the compressor, which does not require any new facilities, and the addition of one new glycol contact tower with an overhead scrubber and the associated gas and glycol piping. In addition, some meters will be replaced with higher-capacity meters. The retirement process for these facilities would be the same as for those described in 1997.

1. Gas Processing Facility.

The gas processing facility at Miller Station is located on a 12-acre site and contains the gathering line manifold and six buildings, including the new compressor building. A chain-link fence surrounds the site. The buildings are steel prefabricated structures mounted on a concrete slab. The buildings house process equipment such as compressors, a gas dehydration system, control systems and safety equipment. The gathering line manifold consists of a series of above-ground pipes and valves.

Upon decommission, the process equipment would be removed and sold as used equipment or scrap. Any hazardous materials stored in the buildings or located within the process equipment would be removed and disposed of following the applicable state hazardous materials statutes and rules. The building would be disassembled and the steel siding and frames would be sold as scrap metal. The concrete slabs would be broken up and the concrete would be disposed of at an appropriate landfill. The gathering line manifold and the above-ground portion of the pipelines would be removed and sold as scrap metal. The fence would be removed and sold as scrap metal. If necessary, NWN would revegetate the area to prevent erosion and encourage habitat redevelopment.

2. Gathering Lines.

The gathering lines extend underground from the processing facility at Miller Station to the wellheads, including the twin 8-inch and 16-inch pipelines. Upon decommission, the pipelines would be left in place because removing the pipelines would cause unnecessary disruption to the environment. Before abandoning the pipelines, NWN would inspect them and would remove any hazardous materials in the pipelines. The above-ground portions of the pipelines would be removed and sold as scrap metal. If necessary, NWN will revegetate the right-of-way in the area above the pipelines to encourage habitat redevelopment.

3. Injection/Withdrawal Wells.

The injection/withdrawal wells[39] are comprised of an above-ground portion, the wellhead, and a below-ground portion, the encased well. The wellhead is installed on a concrete base. Upon decommission, the wellhead would be removed and the well would be plugged in compliance with DOGAMI regulations. The wellhead would be sold as scrap metal. The concrete base would be broken up and the concrete would be disposed of at an appropriate landfill. The well would be capped at a point below ground level. If necessary, NWN would revegetate the wellhead area to prevent erosion and encourage habitat redevelopment and would otherwise reclaim the well site in accordance with DOGAMI regulations.

4. Cost of Restoration.

The costs of retiring the Project are nearly all associated with Miller Station. The restoration cost of the Miller Station plant site is equal to its salvage value less the removal and disposal cost of all the structures and foundations.

The major items that have significant salvage value are the station compressors, which consist of a single 5,035-horsepower turbine-driven centrifugal compressor and two 1,350-horsepower reciprocating compressors. The nominal salvage value of these units is estimated to be 15 percent of their cost. The remaining items are the buildings, valves, pressure vessels, above-ground piping and all other auxiliary equipment. All of these items will also have some intrinsic value, but it is assumed they will be removed and disposed of for their salvage value.

The demolition and disposal cost will consist of the labor costs of disassembling the above-ground equipment and the disposal costs for the foundations. It is assumed that all gravel would be left on location and the grade left as is. It is also assumed that all buried piping will be purged then cut and capped below grade and left in place.

The total estimated salvage value is $604,059 in 1998 dollars. This is offset by approximately $323,000 of demolition and disposal costs. As the salvage value of the facility is greater than the removal and disposal costs, NWN estimates that a cash surplus would result from the retirement of the facility. All estimates are in 1998 dollars.

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[39] These wells probably are not technically subject to the retirement standard. See ORS 469.300(9)(a)(H), (23). They are nonetheless included in this discussion to give EFSC a complete picture of the decommissioning of the underground storage facility at Mist.

5. Retirement of Addition to South Mist Feeder of Parallel 24-Inch Pipeline.

The cost for retirement of the 24-inch pipeline addition is $66,000. The estimate is based on the following:

Cut and cap pipeline at each end	$16,000
Nitrogen purge pipeline	$10,000
Cut and plug pipeline in five-mile increments	$40,000
	$66,000

The process for pipeline retirement would be similar to that described above for retirement of the gathering lines at Mist.

6. Financial Mechanism.

Under this standard, EFSC determines whether the site can be restored to a useful, nonhazardous condition upon retirement. EFSC has interpreted this standard to require a finding that the applicant will be able to cover the cost of that retirement.

As noted above, the salvage value of the facility exceeds the total cost of retiring the entire underground storage facility at Mist, including both the Project and the existing facility. Furthermore, the site certificates for the existing facility and pipeline do not require NWN to establish a funding mechanism for facility retirement. These facts coupled with NWN's financial strength demonstrate that NWN will be able to cover the cost of facility retirement and that no new funding mechanism needs to be established in anticipation of facility retirement.

The foregoing discussion demonstrates that the Project site can be restored to a useful, nonhazardous condition following facility retirement.

VI. DIVISION 23 STANDARDS

A. Applicability of Need for Facility Standard.

In general, an applicant for an amendment to an existing site certificate does not have to demonstrate compliance with the "Need for Facility" standard contained in OAR chapter 345, division 23. NWN did not address that standard in Amendment No. 4 of the Storage Certificate because underground storage is specifically exempted from the "need" standard by OAR 345-023-0010(1)(f).

The South Mist Feeder expansion is a pipeline. Although it is arguable that the need for facility standard does not apply to an amendment to a certificate that predated the need standard for pipelines, this expansion will in any case meet the need standard for pipelines as described below.

B. Demonstration of Compliance for South Mist Feeder.

Under the need for facility standard (OAR 345-023-0020(1)), the Council must find that the facility is "needed." The Council must find that such need exists if the capacity of the proposed facility is identified for acquisition (through purchase or construction) in a least cost plan approved by the PUC. Exhibit 47 contains excerpts from NWN's Integrated Resource Plan for 1995 and associated briefings of OPUC. Looping of the South Mist Feeder is part of the plan. In fact, the South Mist Feeder looping, originally scheduled for 1996, is the first item listed in NWN's Long Range Projections of infrastructure pipeline projects as necessary to accommodate future growth. OPUC acknowledged the 1995 plan in the Order No. 96-219. (Exhibit 21.)

Since the South Mist Feeder looping is part of a least cost plan acknowledged by the OPUC, it meets the need for facility standard under the criteria specified in OAR 345-023-0200(2).

VII. DIVISION 24 STANDARDS

A. Public Health and Safety Standards for Surface Facilities Related to Underground Gas Storage Reservoirs (OAR 345-024-0030).

This standard provides:

"(1) The following surface facilities related to underground gas storage reservoirs shall be located at distances in accordance with the schedule below from any existing permanent habitable dwelling:

"(a) Major facilities -- 220 meters;

"(b) Minor facilities, excluding compressors -- 15 meters;

"(c) Compressors rated less than 1,000 horsepower -- 100 meters; and

"(d) Roads and road maintenance equipment housing -- 15 meters.

"(2) The surface facilities related to an underground gas storage reservoir shall be constructed and maintained in accordance with the applicable requirements of the U.S. Department of Transportation as set forth in 49 CFR, Part 192, and OAR 860-024-0020 in effect as of the date of this rule.

"(3) The surface facilities related to an underground gas storage reservoir shall be designed so that noise resulting from operation of the facilities shall not violate standards specified in OAR 340, Division 35, in effect as of the date of this rule.

"(4) The surface facilities related to an underground gas storage reservoir shall be designed, constructed, operated and retired so as not to allow leakage of natural gas that endangers public health and safety.

"(5) A program shall be developed using technology that is both practicable and reliable to monitor surface facilities related to underground gas storage reservoirs to ensure the public health and safety.

"(6) The surface facilities related to an underground gas storage reservoir shall be designed, constructed and operated so as not

to produce or contribute to seismic hazards that could endanger the public health and safety or result in damage to property." OAR 345-024-0030.

Each section of this rule is discussed below.

Section 1.

All major surface facilities are located at NWN's Miller Station. This facility is located in a second growth conifer forest approximately 2,750 meters (9,000 feet) north-northwest of the town of Mist. The nearest permanent habitable dwelling is located approximately 1,980 meters (6,500 feet) south-southwest of the facility.

All compressors are located at Miller Station.

Road construction will be limited to improving existing logging roads and constructing short extensions (less than 500 feet) of existing logging roads to wellsites. There will be no road maintenance equipment housing constructed.

Section 2.

The facilities will be constructed and maintained in accordance with the applicable requirements of the U.S. Department of Transportation as set forth in 49 CFR part 192 and OAR 860-024-0020 in effect as of November 30, 1994, the effective date of the rule. The existing underground storage facility at Mist was constructed and is maintained in accordance with the same regulations. The PUC, which administers these rules under a delegation from the federal government, inspected the current facility and its operation and maintenance procedures in May 1996 and found them to be in complete compliance. (Exhibit 17.) NWN intends to adhere to the same degree of compliance in the construction of the Project and to use the same operation and maintenance procedures.

Section 3.

The existing facilities at Mist were designed to comply with the Department of Environmental Quality (the "DEQ") noise standards in OAR chapter 340, division 35, in effect as of November 30, 1994. In its Order Approving Amendment No. 4 (July 21, 1997) at 25-26, the Council found that NWN had demonstrated compliance with the standards. The Council also imposed a condition requiring NWN to conduct additional noise tests following installation of the new equipment and to provide the results to the Office of Energy. (Final Order at 48.) The tests were conducted this past July. The results are included in Exhibit 48, which states that all measured sound levels were "well below the Oregon standards for industrial and commercial sources." The proposed changes to the storage facility will not generate additional noise beyond the DEQ limits.

Section 4.

The subject facilities will be designed, constructed, operated and retired so as not to allow natural gas leakage that endangers public health and safety. As noted under Section 1 above, the facilities will be designed, constructed and operated in accordance with federal safety regulations enforced by the PUC. Among other things, these regulations require measures to prevent leakage, including factory-installed pipeline coating, individual joint wrap, cathodic protection and insulation from other pipes that could cause inadvertent electrical contact. NWN has a perfect record of compliance with these regulations at its existing Mist storage facility.

The wellhead and pipeline facilities' numerous safety features include relief valves and automatic shutdown systems. In addition, the facilities are monitored by trained personnel from NWN's nerve center at Miller Station.

As a normal course of abandonment, underground pipelines are plugged at intervals to ensure minimum migration of gas should leakage occur.

Section 5.

NWN has an existing practicable, reliable monitoring program for its surface facilities.

U.S. Department of Transportation Pipeline Safety Regulation, 49 CFR part 192 subpart D (Design of Pipeline Components), addresses specifically the design and operational safety requirements for compressor plants. These requirements have been strictly adhered to in the original plant design, completed modifications and the current proposed additions.

An Emergency Shutdown system is in place that can be either manually or automatically activated. It stops all active plant process, closes all plant inlet and outlet valves, shuts off engine fuel and start gas systems and, upon closure of necessary valves, vents to the atmosphere all process and fuel gas within the plant. As methane is lighter than air, the safe location is to vent vertically. These systems are maintained on a regular basis and tested at least annually to ensure proper response.

Systems are in place that monitor compressor, process and control building atmospheres for the presence of flammable vapors as well as systems that detect the presence of a fire. These instruments will trigger an alarm or plant shutdown when certain preset levels are reached.

The plant has a staff of seven operators and maintenance personnel working rotating shifts. A communication link is maintained between the plant and the NWN operations control room in Portland.

In addition, the following items are indications of NWN's commitment to public health and safety:

(1) fire training school for plant operators and maintenance personnel, generally on an annual basis;

(2) written action emergency procedures for company gas dispatchers and plant personnel; and

(3) maintenance of both Life Flight and C-Com procedures and phone numbers.

The emergency plan from the original storage development will be expanded to include the proposed additional reservoir and equipment at Miller Station.

Section 6.

Section V.B of this Application fully demonstrates that the facilities will not produce or contribute to seismic hazards that could endanger the public health and safety or result in property damage.

The public health and safety standards in OAR 345-024-0030 are therefore satisfied.

B. Public Health and Safety Standards for Pipelines (OAR 345-024-0060).

This standard provides:

> "(1) This rule applies to all pipelines under Council jurisdiction.
>
> "(2) Pipelines shall be constructed in accordance with the requirements of the U.S. Department of Transportation as set forth in Title 49 Code of Federal Regulations Part 192, in effect as of the date of this rule.
>
> "(3) A pipeline shall be designed so that noise resulting from operation of compressor stations and other related or supporting facilities shall not violate standards specified in OAR 340, Division 35, in effect as of the date of this rule.
>
> "(4) A pipeline shall have mechanical structures that allow the pipeline to be sealed off, in the event of leakage, in a manner that will minimize the release of flammable materials. This is rebuttably

presumed to be satisfied by the requirements of Title 49, Code of Federal Regulations, Part 192, in effect as of the date of this rule.

"(5) A program shall be developed using the best available practicable technology to monitor a proposed pipeline to ensure protection of public health and safety." OAR 345-024-0060.

Section 1 of this rule does not contain a siting standard. Sections 2 through 5 are addressed below.

Section 2.

The pipelines will be constructed and maintained in accordance with the applicable requirements of the U.S. Department of Transportation as set forth in 49 CFR part 192, in effect as of November 30, 1994, the effective date of the rule. The existing underground storage facility at Mist and the existing South Mist Feeder pipeline were constructed and are maintained in accordance with the same regulations. As noted above, the PUC inspected the storage facility and its operation and maintenance procedures in May 1996 and found them to be in complete compliance. (Exhibit 17.) In August 1998, the PUC issued a letter confirming that NWN also operated the South Mist Feeder in a safe and prudent manner. (Exhibit 18.) NWN intends to adhere to the same degree of compliance in the construction of the Project and to use the same operation and maintenance procedures.

Section 3.

The subject facilities will be designed so that resulting noise will not violate the standards in OAR chapter 340, division 35, in effect as of November 30, 1994.

Vibration monitoring has been performed quarterly since 1989, the first year of the Mist storage operation. Each and every report to the Council has been negative; that is, there have been no complaints or reports of vibrations potentially related to Mist operations.

Section 4.

This standard is presumed to be met because the pipelines will be constructed in accordance with the 49 CFR part 192 regulations. The pipeline will have isolation valves, as specified in 49 CFR § 192.179, which will allow the line to be sealed off in the event of leakage in a manner that will minimize the release of flammable materials. Twenty four-inch valves and cross ties will be installed adjacent to the valves on the existing 16-inch transmission line.

Section 5.

NWN has a program that uses the best available practicable technology to monitor the pipelines to ensure protection of public health and safety. Pressure sensing devices are positioned on the pipeline at Miller Station and at the Rock Creek regulator station near Portland to relay critical information to both the Miller Station and Portland gas control centers. High and low pressure alarms monitored on a 24-hour basis detect and locate areas where pressure variations may indicate abnormal conditions. Trained emergency response personnel are on duty 24 hours a day to react to any situation that requires immediate attention.

The public health and safety standards in OAR 345-024-0060 are therefore satisfied.

VIII. OTHER STATE STANDARDS

In its final Order approving Amendment No. 4, the Council concluded that the site certificate amendment process, like the original siting process, properly includes Council action on all state environmental permits needed for facility construction. (Final Order, pp. 5 and 6.) Three such permits are needed for the Project: (1) a removal/fill permit issued pursuant to statutes and rules ordinarily administered by DSL; (2) a water pollution control facility ("WPCF") permit, ordinarily issued by DEQ, for discharge of the water used for hydrostatic pipeline testing; and (3) a water right for withdrawal and use of local water sources for hydrostatic pipeline testing. Completed applications for each of these permits are included with this Application in Appendices A, for the removal/fill permit, B for the WPCF permit, and C for the water right. Completed applications will be submitted to DSL, DEQ and the Department of Water Resources, respectively, at the same time this Application is filed with the Council.

IX. NOTICE LIST

See next page.

Township North	Range West	Section	Qtr. Sec.	Tax Lot Number	Total Acres	Name	Buyer Name	Care of Name	Mailing Address	City	State	Zip
4	3	06	000	00100	613.92	FORESTREE WASHINGTON LIMITED PARTNERSHIP		OLYMPIC RESOURCE MANAGEMENT LLC	PO BOX 1780	POULSBO	WA	98370
4	3	06	000	00200	14.01	FORESTREE WASHINGTON LIMITED PARTNERSHIP		OLYMPIC RESOURCE MANAGEMENT LLC	PO BOX 1780	POULSBO	WA	98370
4	3	06	000	00300	19.88	KENNEDY ELDRID G REVOCABLE LIVING TRUST			22071 SCAPPOOSE VERNONIA HWY	SCAPPOOSE	OR	97056
4	3	06	000	00301	1.14	KLEINMAN WALTER D & PATRICIA L			21995 SCAPPOOSE VERNONIA HWY	SCAPPOOSE	OR	97056
4	3	07	000	00100	89.56	FORESTREE WASHINGTON LIMITED PARTNERSHIP		OLYMPIC RESOURCE MANAGEMENT LLC	PO BOX 1780	POULSBO	WA	98370
4	3	07	000	00200	222.75	FORESTREE WASHINGTON LIMITED PARTNERSHIP		OLYMPIC RESOURCE MANAGEMENT LLC	PO BOX 1780	POULSBO	WA	98370
4	3	07	000	00300	10.4	NEWCOMER C FLOETER W JR & LARSON L G			22660 VERNONIA HWY	SCAPPOOSE	OR	97056
4	3	07	000	00301	20.2	KOCH KARL			890 SPENCER AVE	VERNONIA	OR	97064
4	3	07	000	00400	29.55	FORESTREE WASHINGTON LIMITED PARTNERSHIP		OLYMPIC RESOURCE MANAGEMENT LLC	PO BOX 1780	POULSBO	WA	98370
4	3	07	000	00500	9.34	REMSEN JAMES R & SUSAN E			22660 VERNONIA HWY	SCAPPOOSE	OR	97056
4	3	12	000	00200	140	FORESTREE 96 LIMITED PARTNERSHIP		OLYMPIC RESOURCE MANAGEMENT LLC	PO BOX 1780	POULSBO	WA	98370
4	3	18	000	00100	453.22	FORESTREE WASHINGTON LIMITED PARTNERSHIP		OLYMPIC RESOURCE MANAGEMENT LLC	PO BOX 1780	POULSBO	WA	98370
4	4	00	000	03000	480	FORESTREE WASHINGTON LIMITED PARTNERSHIP		OLYMPIC RESOURCE MANAGEMENT LLC	PO BOX 1780	POULSBO	WA	98370
4	4	00	000	03100	160	FORESTREE WASHINGTON LIMITED PARTNERSHIP		OLYMPIC RESOURCE MANAGEMENT LLC	PO BOX 1780	POULSBO	WA	98370
4	4	00	000	03200	465	FORESTREE WASHINGTON LIMITED PARTNERSHIP		OLYMPIC RESOURCE MANAGEMENT LLC	PO BOX 1780	POULSBO	WA	98370
4	4	00	000	03300	55	FORESTREE WASHINGTON LIMITED PARTNERSHIP		OLYMPIC RESOURCE MANAGEMENT LLC	PO BOX 1780	POULSBO	WA	98370
4	4	00	000	03400	120	FORESTREE WASHINGTON LIMITED PARTNERSHIP		OLYMPIC RESOURCE MANAGEMENT LLC	PO BOX 1780	POULSBO	WA	98370
4	4	00	000	05200	120	JTF INC		%CARPENTER M A	1409 CORTE CAMALETE	BAKERSFIELD	CA	93309
4	4	00	000	05300	240	LONGVIEW FIBRE			P.O. BOX 3000	LONGVIEW	WA	98632
4	4	00	000	05400	200	FORESTREE WASHINGTON LIMITED PARTNERSHIP		OLYMPIC RESOURCE MANAGEMENT LLC	PO BOX 1780	POULSBO	WA	98370
4	4	00	000	05500	78.79	FORESTREE WASHINGTON LIMITED PARTNERSHIP		OLYMPIC RESOURCE MANAGEMENT LLC	PO BOX 1780	POULSBO	WA	98370
4	4	01	000	00100	651.03	FORESTREE WASHINGTON LIMITED PARTNERSHIP		OLYMPIC RESOURCE MANAGEMENT LLC	PO BOX 1780	POULSBO	WA	98370
4	4	12	000	01000	640	FORESTREE WASHINGTON LIMITED PARTNERSHIP		OLYMPIC RESOURCE MANAGEMENT LLC	PO BOX 1780	POULSBO	WA	98370
4	4	13	000	01100	480	FORESTREE WASHINGTON LIMITED PARTNERSHIP		OLYMPIC RESOURCE MANAGEMENT LLC	PO BOX 1780	POULSBO	WA	98370
4	4	13	000	01200	160	FORESTREE WASHINGTON LIMITED PARTNERSHIP		OLYMPIC RESOURCE MANAGEMENT LLC	PO BOX 1780	POULSBO	WA	98370
5	4	00	000	01100	160	LONGVIEW FIBRE			P.O. BOX 3000	LONGVIEW	WA	98632
5	4	03	000	00100	115.9	ACTON JW AD 1/2 BRUMM 1/4 MORELAND 1/4		ACTON JOSEPH W & ANN D	1339 85TH AVE NE	BELLEVUE	WA	98004
5	4	03	000	00100	67.54	FJP LLC		VERNON F PETERSON	PO BOX 65009	VANCOUVER	WA	98665
5	4	03	000	00101	8.36	COOK MICHAEL			65820 NEHALEM HWY	VERNONIA	OR	97064
5	4	03	000	00200	75.43	FJP LLC		VERNON F PETERSON	PO BOX 65009	VANCOUVER	WA	98665
5	4	03	000	00201	1.55	MIST BIRKENFELD RURAL F PROT DIST			6900 BANZER RD	MIST	OR	97016
5	4	03	000	00202	3.08	HOILAND AMY J			65586 NEHALEM HWY NORTH	VERNONIA	OR	97064
5	4	03	000	00300	2.55	EKHOFF RICHARD J & MARY M			65736 NEHALEM HWY N	VERNONIA	OR	97064
5	4	03	000	00301	6.6	COOK MICHAEL J & CAROLINE M			65820 NEHALEM HWY N	VERNONIA	OR	97064
5	4	03	000	00302	8.88	COOK MICHAEL J & CAROLINE M			65820 NEHALEM HWY N	VERNONIA	OR	97064
5	4	03	000	00303	5.92	EKHOFF MARY A	COOK MICHAEL J & CAROLINE		65820 NEHALEM HWY NORTH	VERNONIA	OR	97064
5	4	03	000	00400	41.8	COLUMBIA COUNTY			COURTHOUSE	ST HELENS	OR	97051
5	4	03	000	00400	41.8	SCHROEDER & O'NEIL		C H O'NEIL SCHROEDER	15200 SW 133RD	TIGARD	OR	97224
5	4	03	000	00500	118.87	JOHN HANCOCK MUTUAL LIFE INS CO		OLYMPIC RESOURCE MANAGEMENT LLC	PO BOX 1780	POULSBO	WA	98370
5	4	03	000	00600	103.8	JOHN HANCOCK MUTUAL LIFE INS CO		OLYMPIC RESOURCE MANAGEMENT LLC	PO BOX 1780	POULSBO	WA	98370
5	4	03	000	00700	3.32	BOETTCHER ALLEN & DEBRA L			64977 N NEHALEM HIWAY	VERNONIA	OR	97064
5	4	03	000	00800	19.14	JOHN HANCOCK MUTUAL LIFE INS CO		OLYMPIC RESOURCE MANAGEMENT LLC	PO BOX 1780	POULSBO	WA	98370
5	4	03	000	00900	65.43	DASS EDWARD A & JEANETTE			63380 NEHALEM HWY NORTH	VERNONIA	OR	97064
5	4	03	000	01000	40	LONGVIEW FIBRE			P.O. BOX 3000	LONGVIEW	WA	98632
5	4	03	000	01100	40	JOHN HANCOCK MUTUAL LIFE INS CO		OLYMPIC RESOURCE MANAGEMENT LLC	PO BOX 1780	POULSBO	WA	98370
5	4	03	000	01100	40	LONGVIEW FIBRE			P.O. BOX 3000	LONGVIEW	WA	98632
5	4	10	000	00100	40	LONGVIEW FIBRE			P.O. BOX 3000	LONGVIEW	WA	98632
5	4	10	000	00200	40	DASS B DASS A & DASS J EA 1/3 UND INT			63380 NEHALEM HWY NORTH	VERNONIA	OR	97064
5	4	10	000	00300	24.23	WILLAMETTE COLUMBIA TIMBER CO		MCNEILL DON D	1300 SW FIFTH AVE #3800	PORTLAND	OR	97201
5	4	10	000	00390	6.17	COLUMBIA COUNTY			COURTHOUSE	ST HELENS	OR	97051
5	4	10	000	00400	1.68	DASS EDWARD A & JEANETTE			63380 NEHALEM HWY NORTH	VERNONIA	OR	97064
5	4	10	000	00400	6.58	DASS EDWARD A & JEANETTE			63380 NEHALEM HWY NORTH	VERNONIA	OR	97064
5	4	10	000	00401	46.36	DASS EDWARD ARCHIE & JEANNETTE			63380 NEHALEM HWY NORTH	VERNONIA	OR	97064

COLUMBIA COUNTY

LAND OWNERS LOCATED WITHIN THE 1320' WIDE SMF III PIPELINE CORRIDOR

AND WITHIN 1000' OF EACH SIDE OF PIPELINE CORRIDOR

Township North	Range West	Section	Qtr. Sec.	Tax Lot Number	Total Acres	Name	Buyer Name	Care of Name	Mailing Address	City	State	Zip
5	4	10	000	00402	4.9	GRANT MARION & JEANNETTE			64820 NEHALEM HWY NORTH	VERNONIA	OR	97064
5	4	10	000	00500	334.6	WILLAMETTE COLUMBIA TIMBER CO		MCNEILL DON D	1300 SW FIFTH AVE #3800	PORTLAND	OR	97201
5	4	10	020	00100	0.13	OR DOT HWY DIV		PROPERTY MGR	ROOM #417 TRANSPORTATION BLDG	SALEM	OR	97310
5	4	10	020	00101	0.87	DASS ARCHIE & JEANETTE			63380 NEHALEM HWY NORTH	VERNONIA	OR	97064
5	4	10	020	00200	3.55	ACTON JOSEPH W & ANN 1/2 ETAL			PO BOX 1515	BELLEVUE	WA	98009
5	4	10	020	00200	3.55	SCHARF DAVID G & MARGARET A			64975 NEHALEM HWY NORTH	VERNONIA	OR	97064
5	4	10	020	00300	15.68	DASS EDWARD A & JEANETTE			63380 NEHALEM HWY NORTH	VERNONIA	OR	97064
5	4	10	020	00300	3.65	HALVORSON CORY ROBERT & KOCINA CAROLE			13220 S W SARATOGA LANE	BEAVERTON	OR	97008
5	4	10	020	00400	9.8	GRANT MARION & JEANNETTE			64820 NEHALEM HWY NORTH	VERNONIA	OR	97064
5	4	10	020	00500	2.23	WHEELER JOHN F & PATRICIA L			PO BOX 183	VERNONIA	OR	97064
5	4	10	040	00100	2.3	COLUMBIA COUNTY			COURTHOUSE	ST HELENS	OR	97051
5	4	10	040	00200	3.75	TORGERSON LEON A			PO BOX 301	VERNONIA	OR	97064
5	4	10	040	00300	0.87	MITCHELL SYKES & BEVERLY ANN			64505 NEHALEM HWY NORTH	VERNONIA	OR	97064
5	4	10	040	00400	0.87	MITCHELL SYKES & BEVERLY ANN			64505 NEHALEM HWY NORTH	VERNONIA	OR	97064
5	4	10	040	00500	1.69	BUCK ARLENE			1831 N JANTZEN	PORTLAND	OR	97217
5	4	10	040	00600	0.45	MCMILLEN STARR & BEVERLY ANN			64479 NEHALEM HWY NORTH	VERNONIA	OR	97064
5	4	10	040	00700	1.17	BIRCH MERRI ZWEIGART GARY ZWEIGART CHRIS			394 S 15TH	ST HELENS	OR	97051
5	4	10	040	00800	4.85	DASS EDWARD ARCHIE			63380 NEHALEM HWY NORTH	VERNONIA	OR	97064
5	4	10	040	00900	7.35	JOHNSON DONALD OWEN & CLAUDIA M			64420 NEHALEM HWY N	VERNONIA	OR	97064
5	4	10	040	01000	56.94	WILLAMETTE COLUMBIA TIMBER CO		MCNEILL DON D	1300 SW FIFTH AVE #3800	PORTLAND	OR	97201
5	4	11	000	00100	320	LONGVIEW FIBRE			P.O. BOX 3000	LONGVIEW	WA	98632
5	4	11	000	00200	63.69	DASS BRENT			63380 NEHALEM HIGHWAY N	VERNONIA	OR	97064
5	4	11	000	00200	63.69	PRINGLE WILLIAM CALVIN			1719 NUT TREE DR NW	SALEM	OR	97304
5	4	11	000	00201	40	DASS BRENT			63380 NEHALEM HWY NORTH	VERNONIA	OR	97064
5	4	11	000	00202	11.96	DASS ARCHIE LOGGING INC			63380 NEHALEM HIGHWAY NORTH	VERNONIA	OR	97064
5	4	11	000	00202	11.96	PRINGLE WILLIAM CALVIN			1719 NUT TREE DR NW	SALEM	OR	97304
5	4	11	000	00300	40	DILLARD MAX W & DIANE M			400 COLUMBIA BLVD	ST HELENS	OR	97051
5	4	11	000	00400	5.86	COLEMAN DANIEL M & ANNE M			64196 NEHALEM HWY NORTH	VERNONIA	OR	97064
5	4	11	000	00500	39.29	WILLAMETTE COLUMBIA TIMBER CO		MCNEILL DON D	1300 SW FIFTH AVE #3800	PORTLAND	OR	97201
5	4	11	000	00700	1.55	WILLAMETTE COLUMBIA TIMBER CO		MCNEILL DON D	1300 SW FIFTH AVE #3800	PORTLAND	OR	97201
5	4	11	000	00800	2.05	MORAN JAMES J			79248 ALSTON MAYGER RD	RAINIER	OR	97048
5	4	11	000	00900	2.65	JOHNS JAMES T & JOHNS VIRGINIA B &			64086 NEHALEM HWY N	VERNONIA	OR	97064
5	4	11	000	01000	23.41	JOHNS JAMES T & VIRGINIA BELLE			64086 N NEHALEM HWY	VERNONIA	OR	97064
5	4	14	000	00100	91.3	LONGVIEW FIBRE			P.O. BOX 3000	LONGVIEW	WA	98632
5	4	14	000	00200	5.3	DASS EDWARD ARCHIE & JEANETTE			63380 NEHALEM HWY NORTH	VERNONIA	OR	97064
5	4	14	000	00300	88.1	DASS EDWARD ARCHIE & JEANETTE			63380 NEHALEM HWY NORTH	VERNONIA	OR	97064
5	4	14	000	00301	7	RAGNER FLOYD S & ROSE MARIE			63664 NEHALEM HWY N	VERNONIA	OR	97064
5	4	14	000	00400	366.6	LONGVIEW FIBRE			P.O. BOX 3000	LONGVIEW	WA	98632
5	4	14	000	00500	11.4	RYAN CLAUDIA K & GARY A			63135 NEHALEM HWY NORTH	VERNONIA	OR	97064
5	4	14	000	00600	2.45	LONGVIEW FIBRE			P.O. BOX 3000	LONGVIEW	WA	98632
5	4	14	000	00700	2.75	DASS EDWARD ARCHIE & JEANETTE			63380 NEHALEM HWY NORTH	VERNONIA	OR	97064
5	4	14	000	00800	56.55	LONGVIEW FIBRE			P.O. BOX 3000	LONGVIEW	WA	98632
5	4	23	000	00100	60.36	FORESTREE WASHINGTON LIMITED PARTNERSHIP		OLYMPIC RESOURCE MANAGEMENT LLC	PO BOX 1780	POULSBO	WA	98370
5	4	23	000	00100	60.36	LONGVIEW FIBRE			P.O. BOX 3000	LONGVIEW	WA	98632
5	4	23	000	00200	59.04	LONGVIEW FIBRE			P.O. BOX 3000	LONGVIEW	WA	98632
5	4	23	000	00400	2.36	DASS EDWARD ARCHIE & JEANETTE			63380 NEHALEM HWY NORTH	VERNONIA	OR	97064
5	4	23	000	00500	34.56	LONGVIEW FIBRE			P.O. BOX 3000	LONGVIEW	WA	98632
5	4	23	000	00600	108.46	LONGVIEW FIBRE			P.O. BOX 3000	LONGVIEW	WA	98632
5	4	23	000	00800	24.56	LONGVIEW FIBRE			P.O. BOX 3000	LONGVIEW	WA	98632
5	4	23	000	00900	16.04	LONGVIEW FIBRE			P.O. BOX 3000	LONGVIEW	WA	98632
5	4	23	000	01000	0.98	PUTMAN DOUGLAS J & MARILYN J			75443 MT VIEW DR	CLATSKANIE	OR	97016
5	4	23	000	01200	1	OLSON CANDICE K			2630 N ARGYLE	PORTLAND	OR	97217
5	4	23	000	01400	64.05	FORESTREE WASHINGTON LIMITED PARTNERSHIP		OLYMPIC RESOURCE MANAGEMENT LLC	PO BOX 1780	POULSBO	WA	98370

Township North	Range West	Section	Qtr. Sec.	Tax Lot Number	Total Acres	Name	Buyer Name	Care of Name	Mailing Address	City	State	Zip
5	4	23	000	01401	1.62	GWIN & SONS LOGGING			1400 GROVE ST PO BOX 294	VERNONIA	OR	97064
5	4	23	000	01500	80	FORESTREE WASHINGTON LIMITED PARTNERSHIP		OLYMPIC RESOURCE MANAGEMENT LLC	PO BOX 1780	POULSBO	WA	98370
5	4	23	000	01900	0.62	REEDY BRUCE A & KUSCH TAMMY S			62290 NEHALEM HIGHWAY NORTH	VERNONIA	OR	97064
5	4	23	023	00101	2.61	GANS GEORGE & MULCAHY NAOMI			62471 NEHALEM HWY N	VERNONIA	OR	97064
5	4	23	023	00200	0.61	ATCHLEY W KEITH & GLORIA			62465 NEHALEM HWY N	VERNONIA	OR	97064
5	4	23	023	00300	0.38	ATCHLEY W KEITH & GLORIA			P O BOX 44	VERNONIA	OR	97064
5	4	23	023	00500	2.02	FORESTREE WASHINGTON LIMITED PARTNERSHIP		OLYMPIC RESOURCE MANAGEMENT LLC	PO BOX 1780	POULSBO	WA	98370
5	4	23	023	00501	1.07	ORE DEPART FISH & WILDLIFE			PO BOX 59	PORTLAND	OR	97207
5	4	23	023	00600	0.24	FORESTREE WASHINGTON LIMITED PARTNERSHIP		OLYMPIC RESOURCE MANAGEMENT LLC	PO BOX 1780	POULSBO	WA	98370
5	4	23	023	00700	0.75	OR DOT HWY DIV		PROPERTY MGR	ROOM #417 TRANSPORTATION BLDG	SALEM	OR	97310
5	4	23	023	00800	3.41	TAYLOR RICHARD D & MICHELLE R			62419 NEHALEM HIGHWAY NORTH	VERNONIA	OR	97064
5	4	23	023	00900	1.46	TAYLOR RICHARD D & MICHELLE R			62419 NEHALEM HWY N.	VERNONIA	OR	97064
5	4	23	023	01000	0.67	HALEY KAREN & HOLMES JANICE		HOLMES JANICE	1457 NEHALEM	VERNONIA	OR	97064
5	4	23	023	01100	0.64	HALEY KAREN & HOLMES JANICE		HOLMES JANICE	1457 NEHALEM	VERNONIA	OR	97064
5	4	23	023	01200	2.02	BERNARDI ORESTI J & JANET			62467 SLEEPY LANE	VERNONIA	OR	97064
5	4	23	023	01300	1.63	BERNARDI ORESTE J & JANET			62467 SLEEPY LANE	VERNONIA	OR	97064
5	4	23	023	01400	0.4	DUVENDACK KELLY M			390 E ARKANSAS	VERNONIA	OR	97064
5	4	23	023	01500	0.38	BERNARDI O & JANET			MIST RT BOX 34	VERNONIA	OR	97064
5	4	23	023	01600	0.37	BERNARDI ORESTE J & JANET			62467 SLEEPY LANE	VERNONIA	OR	97064
5	4	23	023	01700	0.3	BISHOP ORVAL O & FRANCES L			62411 NEHALEM HWY N	VERNONIA	OR	97064
5	4	23	023	01800	0.28	ELTON DANNY W & DONNELL			62440 SLEEPY LANE	VERNONIA	OR	97064
5	4	23	023	01900	0.37	ELSTON DANNY W & DONNELL			62440 SLEEPY LANE	VERNONIA	OR	97064
5	4	23	023	02000	0.41	ELTON DANNY W & DONNELL			62440 SLEEPY LANE	VERNONIA	OR	97064
5	4	23	040	00200	6.95	NUNNENKAMP DOUGLAS RAY			PO BOX 1	NORTH PLAIN	OR	97133
5	4	23	040	00300	0.42	FORESTREE WASHINGTON LIMITED PARTNERSHIP		OLYMPIC RESOURCE MANAGEMENT LLC	PO BOX 1780	POULSBO	WA	98370
5	4	23	040	00400	0.58	OR DOT HWY DIV		PROPERTY MGR	ROOM #417 TRANSPORTATION BLDG	SALEM	OR	97310
5	4	23	040	00500	7.61	SMEJKAL JAMES A			42142 NW PALACE DR	BANKS	OR	97106
5	4	23	040	00600	99.81	FORESTREE WASHINGTON LIMITED PARTNERSHIP		OLYMPIC RESOURCE MANAGEMENT LLC	PO BOX 1780	POULSBO	WA	98370
5	4	23	040	00800	5.03	RAINBOLT WILLIAM A & BARBARA J			20736 SCAPPOOSE VERNONIA HWY	SCAPPOOSE	OR	97056
5	4	23	040	00801	1.03	RAINBOLT WILLIAM A & BARBARA J			20736 SCAPPOOSE-VERNONIA RD	SCAPPOOSE	OR	97056
5	4	23	040	00900	0.65	FRAGALL ROBIN L			307 NE BITTINGHER DR	PORTLAND	OR	97220
5	4	23	040	01000	0.81	GOLSON CURTIS LEE & KAREN KAYE			20804 SCAPPOOSE VERNONIA HWY	SCAPPOOSE	OR	97056
5	4	23	040	01100	3.32	VINSON LEVI C & ANNA ADELL			20830 SCAPPOOSE VERNONIA HWY	SCAPPOOSE	OR	97056
5	4	23	040	01200	8.82	RANEY JERRY C & GLENDA J			20960 SCAPPOOSE VERNONIA HWY	SCAPPOOSE	OR	97056
5	4	26	000	00100	154.54	FORESTREE WASHINGTON LIMITED PARTNERSHIP		OLYMPIC RESOURCE MANAGEMENT LLC	PO BOX 1780	POULSBO	WA	98370
5	4	26	000	00101	2.6	FLOETER FRANCES H TRUST			21046 SCAPPOOSE VERNONIA HWY	SCAPPOOSE	OR	97056
5	4	26	000	00200	123.96	FORESTREE WASHINGTON LIMITED PARTNERSHIP		OLYMPIC RESOURCE MANAGEMENT LLC	PO BOX 1780	POULSBO	WA	98370
5	4	26	000	00300	152.65	ELLIS LOREN JR & GLORIA FAYE			P O BOX 1147	SCAPPOOSE	OR	97056
5	4	26	000	00302	96.68	COLUMBIA NORTHWEST INC	ELLIS STEPHEN E		58176 WILSON CUTOFF RD	VERNONIA	OR	97064
5	4	26	000	00400	26.74	RAY CAROL A BOLING VIRGINIA RAY ALLEN			10798 SE FOREST VIEW LANE	PORTLAND	OR	97266
5	4	26	000	00500	23.4	ROOZING-GRIMSRUD RUTH M & ROGER A			61785 N NEHALEM HIGHWAY 47	VERNONIA	OR	97064
5	4	29	000	00500	80	JOHN HANCOCK MUTUAL LIFE INS CO		OLYMPIC RESOURCE MANAGEMENT LLC	PO BOX 1780	POULSBO	WA	98370
5	4	34	000	00901	2.36	NICE MELVIN & ROCELIA			60335 NEHALEM HWY N	VERNONIA	OR	97064
5	4	35	000	00100	111.67	FORESTREE WASHINGTON LIMITED PARTNERSHIP		OLYMPIC RESOURCE MANAGEMENT LLC	PO BOX 1780	POULSBO	WA	98370
5	4	35	000	00200	515.35	FORESTREE WASHINGTON LIMITED PARTNERSHIP		OLYMPIC RESOURCE MANAGEMENT LLC	PO BOX 1780	POULSBO	WA	98370
5	4	36	000	00100	256.52	FORESTREE WASHINGTON LIMITED PARTNERSHIP		OLYMPIC RESOURCE MANAGEMENT LLC	PO BOX 1780	POULSBO	WA	98370
5	4	36	000	00101	17.69	FORESTREE WASHINGTON LIMITED PARTNERSHIP		OLYMPIC RESOURCE MANAGEMENT LLC	PO BOX 1780	POULSBO	WA	98370
5	4	36	000	00102	192	FORESTREE WASHINGTON LIMITED PARTNERSHIP		OLYMPIC RESOURCE MANAGEMENT LLC	PO BOX 1780	POULSBO	WA	98370
5	4	36	000	00200	122.76	FLOETER FRANCES H TRUST			21046 SCAPPOOSE VERNONIA HWY	SCAPPOOSE	OR	97056
5	4	36	000	00301	1.04	FLOETER FRANCES H TRUST			21046 SCAPPOOSE VERNONIA HWY	SCAPPOOSE	OR	97056
6	4	00	000	04500	438.69	JOHN HANCOCK MUTUAL LIFE INS CO		OLYMPIC RESOURCE MANAGEMENT LLC	PO BOX 1780	POULSBO	WA	98370
6	4	00	000	04600	138.88	JOHN HANCOCK MUTUAL LIFE INS CO		OLYMPIC RESOURCE MANAGEMENT LLC	PO BOX 1780	POULSBO	WA	98370
6	4	00	000	04600	138.88	LARSON EDWARD L ETAL			PO BOX 243	CLATSKANIE	OR	97016

Township North	Range West	Section	Qtr. Sec.	Tax Lot Number	Total Acres	Name	Buyer Name	Care of Name	Mailing Address	City	State	Zip
6	4	00	000	06400	560	JOHN HANCOCK MUTUAL LIFE INS CO		OLYMPIC RESOURCE MANAGEMENT LLC	PO BOX 1780	POULSBO	WA	98370
6	4	28	000	00100	175.3	JOHN HANCOCK MUTUAL LIFE INS CO		OLYMPIC RESOURCE MANAGEMENT LLC	PO BOX 1780	POULSBO	WA	98370
6	4	28	000	00200	14.31	CRAWFORD CHARLES F & JEINA L			67330 NEHALEM HWY NORTH	VERNONIA	OR	97064
6	4	28	000	00300	2.41	ROBERTS DANNY ROSS & M MICHELLE			67400 NEHALEM HWY N	VERNONIA	OR	97064
6	4	28	000	00400	12.92	OBLACK MAX & BERTHA L			67475 BURRIS RD	VERNONIA	OR	97064
6	4	28	000	00401	34.68	O'BLACK LARRY			67730 NEHALEM HWY N	VERNONIA	OR	97064
6	4	28	000	00499	1.05	OR DOT HWY DIV		PROPERTY MGR	ROOM #417 TRANSPORTATION BLDG	SALEM	OR	97310
6	4	28	000	00500	1.05	TOVEY ROBERT W			67478 NEHALEM HIWAY N	VERNONIA	OR	97064
6	4	28	000	00600	1.23	TOVEY ROBERT W			67478 NEHALEM HWY	VERNONIA	OR	97064
6	4	28	000	00601	1.4	ANDERSON ALAN J			67461 NEHALEM HWY NORTH	VERNONIA 18	OR	97064
6	4	28	000	00700	0.65	ADAMS DONNA S CHRISTENSEN MARY E			PO BOX 131	VERNONIA	OR	97064
6	4	28	000	00800	0.5	SIEBERT WILBERT L JR & CONNIE L			18269 O'BLACK LANE	VERNONIA	OR	97064
6	4	28	000	00801	2.46	ADAMS DONNA S & CHRISTENSEN MARY E			PO BOX 131	VERNONIA	OR	97064
6	4	28	000	00900	11.32	SIEBERT WILLIAM L JR & CONNIE			18269 O'BLACK LANE	VERNONIA	OR	97064
6	4	28	000	00901	9.24	SIEBERT WILLIAM L JR & CONNIE			18269 O'BLACK LANE	VERNONIA	OR	97064
6	4	28	000	C1000	8.16	SIEBERT WILLIAM L JR & CONNIE			18269 O'BLACK LANE	VERNONIA	OR	97064
6	4	28	000	01100	87.2	O'BLACK LARRY			67730 NEHALEM HWY N	VERNONIA	OR	97064
6	4	28	000	01101	5	BENES LAWRENCE & LAURADA C			67230 BURRIS RD	VERNONIA	OR	97064
6	4	28	000	01102	31.62	O'BLACK BERTHA L			67475 BURRIS RD	VERNONIA	OR	97064
6	4	28	000	01103	5.06	WALKER DAVID K & JO A			1969 SW 3RD DR	GRESHAM	OR	97080
6	4	28	000	01104	4.52	SISCO ROBERT C & PHYLLIS J			16495 S HIGHWAY 211	MOLALLA	OR	97038
6	4	28	000	01200	2.38	CRAWFORD LEON G & MICHELE A			67275 BURRIS RD	VERNONIA	OR	97064
6	4	28	000	01300	0.8	JOHN HANCOCK MUTUAL LIFE INS CO		OLYMPIC RESOURCE MANAGEMENT LLC	PO BOX 1780	POULSBO	WA	98370
6	4	28	000	01400	36.94	BENES DAN L & JULIE A			67077 BURRIS RD	VERNONIA	OR	97064
6	4	28	000	01401	0.17	BENES DAN E & JULIE A	MIST-BIRKENFELD RFPD (LEASE)		69500 BANZER RD	MIST	OR	97016
6	4	28	000	01401	0	MIST BIRKENFELD RFPD			6900 BANZER RD	CLATSKANIE	OR	97016
6	4	28	000	01500	0.06	JOHN HANCOCK MUTUAL LIFE INS CO		OLYMPIC RESOURCE MANAGEMENT LLC	PO BOX 1780	POULSBO	WA	98370
6	4	28	000	01600	63.5	JOHN HANCOCK MUTUAL LIFE INS CO		OLYMPIC RESOURCE MANAGEMENT LLC	PO BOX 1780	POULSBO	WA	98370
6	4	28	000	01700	2.41	CLIFFORD WILLIAM T & LAURIE R	PETERSON THOMAS K & WENDY L		17785 SW VINCENT	BEAVERTON	OR	97007
6	4	28	000	01800	3.12	PARKER LENORE			4670 NW NESKOWIN AVE	PORTLAND	OR	97229
6	4	28	000	01900	4.84	LANE MYRON & MARIANNE			18629 OBLACK LANE	VERNONIA	OR	97064
6	4	28	000	02000	4.12	THE ROCCA RAUPACH TRUST			2815 S W RIDGE DR	PORTLAND	OR	97219
6	4	28	000	02100	93.63	O'BLACK LARRY & CLAUDIA			67730 NEHALEM HWY N	VERNONIA	OR	97064
6	4	28	000	02200	0.23	ACTON JW AD 1/2 BRUMM 1/4 MORELAND 1/4		ACTON JOSEPH W & ANN D	1339 85TH AVE NE	BELLEVUE	WA	98004
6	4	28	000	02300	0.71	ACTON JW AD 1/2 BRUMM 1/4 MORELAND 1/4		ACTON JOSEPH W & ANN D	1339 85TH AVE NE	BELLEVUE	WA	98004
6	4	29	000	00200	0.38	JOHN HANCOCK MUTUAL LIFE INS CO		OLYMPIC RESOURCE MANAGEMENT LLC	PO BOX 1780	POULSBO	WA	98370
6	4	29	000	00300	220.5	STIMSON LUMBER CO			P O BOX 68	FOREST GRO	OR	97116
6	4	29	000	00400	5.2	COX DR & GD 1/3 & BUCHHOLZ DM & RE 1/2			PO BOX 219	VERNONIA	OR	97064
6	4	29	000	00600	31.04	OBLACK LARRY			67730 NEHALEM HWY N	VERNONIA	OR	97064
6	4	29	000	00700	20.16	O'BLACK BERTHA LOUISE			67475 BURRIS RD	VERNONIA	OR	97064
6	4	29	000	00800	142.76	JOHN HANCOCK MUTUAL LIFE INS CO		OLYMPIC RESOURCE MANAGEMENT LLC	PO BOX 1780	POULSBO	WA	98370
6	4	29	000	00900	2.76	SLINGER TROY W & KATHLEEN L			7340 SW WILSON COURT	BEAVERTON	OR	97008
6	4	29	000	01000	2.9	SLINGER TROY W & KATHLEEN L			7340 SW WILSON CT	BEAVERTON	OR	97008
6	4	29	000	01100	1.04	MEISER MICHAEL JAMES			67669 NEHALEM HWY. N.	VERNONIA	OR	97064
6	4	29	000	01200	2.92	LARSEN ERIC J & COLLEEN M			67631 NEHALEM HWY NORTH	VERNONIA	OR	97064
6	4	29	000	01400	6.56	WALKER FAYE TRUSTEE OF WALKER F LVG TRST			PO BOX 584	CORNELIUS	OR	97113
6	4	29	000	01500	95.57	O'BLACK BERTHA L			67475 BURRIS RD	VERNONIA	OR	97064
6	4	29	000	01600	3.2	COLUMBIA COUNTY POMONA GRANGE				VERNONIA	OR	97064
6	4	29	000	01601	0.92	NATAL GRANGE NO-302 PATRONS OF HUSBANDRY				VERNONIA	OR	97064
6	4	29	000	01602	0.14	NATAL GRANGE NO-302 PATRONS OF HUSBANDRY				VERNONIA	OR	97064
6	4	29	000	01700	14.08	COLUMBIA COUNTY POMONA GRANGE				VERNONIA	OR	97051
6	4	29	000	01800	0.42	COLUMBIA COUNTY NATAL GRANGE				VERNONIA	OR	97064
6	4	29	000	01901	1.13	WINCH THOMAS A & COLLEEN			67551 N NEHALEM HWY	VERNONIA	OR	97064

Township North	Range West	Section	Qtr. Sec.	Tax Lot Number	Total Acres	Name	Buyer Name	Care of Name	Mailing Address	City	State	Zip
6	4	29	000	02000	38.03	JOHN HANCOCK MUTUAL LIFE INS CO		OLYMPIC RESOURCE MANAGEMENT LLC	PO BOX 1780	POULSBO	WA	98370
6	4	30	000	00100	77.23	JOHN HANCOCK MUTUAL LIFE INS CO		OLYMPIC RESOURCE MANAGEMENT LLC	PO BOX 1780	POULSBO	WA	98370
6	4	30	000	00200	80	JOHN HANCOCK MUTUAL LIFE INS CO		OLYMPIC RESOURCE MANAGEMENT LLC	PO BOX 1780	POULSBO	WA	98370
6	4	30	000	00300	40	JOHN HANCOCK MUTUAL LIFE INS CO		OLYMPIC RESOURCE MANAGEMENT LLC	PO BOX 1780	POULSBO	WA	98370
6	4	30	000	00400	117.51	LONGVIEW FIBRE			P.O. BOX 3000	LONGVIEW	WA	98632
6	4	30	010	00100	12.28	WAGNER W & K & GOETTSCH W & P			17507 SE TIBBETTS	PORTLAND	OR	97236
6	4	30	010	00200	20.6	NOAKES LARRY R & MERLE A			67872 NEHALEM HWY N	VERNONIA	OR	97064
6	4	30	101	201	6.75	WIRTANEN DAVID G & DIANA E			67892 NEHALEM HWY N	VERNONIA	OR	97064
6	4	30	010	00300	20.37	LAJAMBE A R		LAJAMBE PATRICIA	22921 - 85TH PL W	EDMONDS	WA	98020
6	4	30	010	00300	20.37	MEYER ROGER M & DEBRA L			67836 NEHALEM HWY NORTH	VERNONIA	OR	97064
6	4	30	010	00400	5.71	COLUMBIA COUNTY			COURTHOUSE	ST HELENS	OR	97051
6	4	30	010	00400	5.71	TITUS DONNIE M & RENA A			67825 TAYLOR LANE	VERNONIA	OR	97064
6	4	30	010	00500	6.15	COLE DONALD T & SHIRLEY J			7132 N PORTSMOUTH AVE	PORTLAND	OR	97203
6	4	30	010	00600	5.23	WASHBURN JOHN T & MARY E			67991 N NEHALEM HWY	VERNONIA	OR	97064
6	4	30	010	00700	5.09	LINDEMANN STEPHEN L, TRUSTEE			6435 SE SCOTT DR	PORTLAND	OR	97215
6	4	30	010	00800	5.2	WARNKE WALTER P & BETTY M	CARR ALAN R & BARBARA A		67801 NEHALEM HIGHWAY	VERNONIA	OR	97064
6	4	30	010	00900	5.33	BUDGE JOHN & RHONDA			67823 NEHALEM HWY N	VERNONIA	OR	97064
6	4	30	010	01000	5.16	LOOSLI CHARLES GARY			57755 OLD PORTLAND RD	WARREN	OR	97053
6	4	30	010	01100	4.64	FRITSCH HORST & CAROL	WARNKE WALTER & BETTY (L E)		67865 NEHALEM HIGH N	VERNONIA	OR	97064
6	4	30	010	01200	3.81	CANDIDO MITCHELL & PATRICIA J			2383 HAWKINS AVE	SANFORD	NC	27330
6	4	30	010	01300	1.7	WISER CHARLES E & WISER CHRISTOPHER P			19138 SW PILKINGTON RD	LAKE OSWEG	OR	97035
6	4	30	010	01400	29.5	LONGVIEW FIBRE			P.O. BOX 3000	LONGVIEW	WA	98632
6	4	30	010	01500	6	JOHN HANCOCK MUTUAL LIFE INS CO		OLYMPIC RESOURCE MANAGEMENT LLC	PO BOX 1780	POULSBO	WA	98370
6	4	30	020	00100	0.13	HAMAR E TR FOR MASTIN 1/2 & HAMAR 1/2			22022 SW SCHOLLS SHERWOOD RO	SHERWOOD	OR	97140
6	4	30	020	00200	31.63	MATHIS GLENN & MARIE			67924 NEHALEM HWY N	VERNONIA	OR	97064
6	4	30	020	00300	0.32	MCGUFFY JAMES D & LINDA MARIE			24914 SE SWEETWATER LN	EAGLE CREEK	OR	97022
6	4	30	020	00400	2.1	CULWELL P M & E L LOWE T B & SHORB J D			400 JASMINE PL NW	ISSAQUAH	WA	98027
6	4	30	020	00500	19.6	CULWELL P & M LOWE T B & SHORB J D		CULWELL PAUL	400 JASMINE PL NW	ISSAQUAH	WA	98027
6	4	30	020	00600	1.46	MATHEWS ROBERT D UND 20% ETAL			59530 YARMER LANE	ST HELENS	OR	97051
6	4	30	020	00700	5.88	POLLARD WILLIAM W & LOLA J			1781 E CRESTWOOD DR	SIERRA VISTA	AZ	85635
6	4	30	020	00701	5.28	WOOD JIM & RUTH			18240 NW HERITAGE PARKWAY UNIT	BEAVERTON	OR	97006
6	4	30	020	00800	106.46	LONGVIEW FIBRE			P.O. BOX 3000	LONGVIEW	WA	98632
6	4	33	000	00100	29	EVANS MILDRED & CRINKLAW S L		SANDRA CRINKLAW	290 NE DONELSON	HILLSBORO	OR	97124
6	4	33	000	00200	11	FRANZEN FAMILY TRUST		MCBRIDE LOUISE L TRUSTEE	3605 NE 65TH ST	VANCOUVER	WA	98661
6	4	33	000	00300	8	O'BLACK LARRY & CLAUDIA			67730 NEHALEM HWY N	VERNONIA	OR	97064
6	4	33	000	00400	31.05	JOHN HANCOCK MUTUAL LIFE INS CO		OLYMPIC RESOURCE MANAGEMENT LLC	PO BOX 1780	POULSBO	WA	98370
6	4	33	000	00500	0.95	DEEDS ROBERT SCOTT & MARJORIE R A			8462 SNOVILLE DR	SANDY	UT	84093
6	4	33	000	00600	78	BENES DAVE & DIANE			67075 BURRIS RD	VERNONIA	OR	97064
6	4	33	000	00700	440	JOHN HANCOCK MUTUAL LIFE INS CO		OLYMPIC RESOURCE MANAGEMENT LLC	PO BOX 1780	POULSBO	WA	98370
6	4	33	000	00800	40	STIMSON LUMBER CO			P O BOX 68	FOREST GRO	OR	97116
6	4	34	000	00800	84	STIMSON LUMBER CO			P O BOX 68	FOREST GRO	OR	97116
6	4	34	000	00900	60	JOHN HANCOCK MUTUAL LIFE INS CO		OLYMPIC RESOURCE MANAGEMENT LLC	PO BOX 1780	POULSBO	WA	98370
6	4	34	000	01000	9.2	CLIFFORD ROSEMARY WILLIAM & STEVEN			8016 SE TAGGART	PORTLAND	OR	97206
6	4	34	000	01204	3.68	HARMON JAMES & BARBARA			6606 NEHALEM HIGHWAY	VERNONIA	OR	97064
6	5	00	000	00200	423.78	JOHN HANCOCK MUTUAL LIFE INS CO		OLYMPIC RESOURCE MANAGEMENT LLC	PO BOX 1780	POULSBO	WA	98370
6	5	00	000	02500	467.77	JOHN HANCOCK MUTUAL LIFE INS CO		OLYMPIC RESOURCE MANAGEMENT LLC	PO BOX 1780	POULSBO	WA	98370
6	5	00	000	02501	12.23	NORTHWEST NATURAL GAS COMPANY			220 NW SECOND AVE	PORTLAND	OR	97209
6	5	00	000	02600	160	LONGVIEW FIBRE			P.O. BOX 3000	LONGVIEW	WA	98632
6	5	00	000	02700	80	JOHN HANCOCK MUTUAL LIFE INS CO		OLYMPIC RESOURCE MANAGEMENT LLC	PO BOX 1780	POULSBO	WA	98370
6	5	00	000	02800	60	BUSCH FRED W JR & PHYLIS R			13163 BUSCH LANE	MIST	OR	97016
6	5	00	000	02900	65	BUSCH FRED W JR & PHYLIS R			13163 BUSCH LANE	MIST	OR	97016
6	5	00	000	03000	35	BUSCH FRED W JR & PHYLIS R			13163 BUSCH LANE	MIST	OR	97016
6	5	00	000	03300	160	LONGVIEW FIBRE			P.O. BOX 3000	LONGVIEW	WA	98632

Township North	Range West	Section	Qtr. Sec.	Tax Lot Number	Total Acres	Name	Buyer Name	Care of Name	Mailing Address	City	State	Zip
6	5	00	000	05000	1203.36	LONGVIEW FIBRE			P.O. BOX 3000	LONGVIEW	WA	98632
6	5	00	000	05100	228.61	JOHN HANCOCK MUTUAL LIFE INS CO		OLYMPIC RESOURCE MANAGEMENT LLC	PO BOX 1780	POULSBO	WA	98370
6	5	00	000	05200	320	LONGVIEW FIBRE			P.O. BOX 3000	LONGVIEW	WA	98632
6	5	13	000	00300	160	LONGVIEW FIBRE			P.O. BOX 3000	LONGVIEW	WA	98632
6	5	13	000	00500	3.92	GREEN ORIN L & LOUISE F			69355 HWY 47	MIST	OR	97016
6	5	13	000	00600	4.56	SIDERS DONALD & LINDA	DOZIER PM, FEAGINS EM		69415 HWY 47	MIST	OR	97016
6	5	13	000	00700	45.08	LAUBACH ARTHUR C & DOROTHY M			69306 HWY 47	MIST	OR	97016
6	5	13	000	00701	4.72	LEVINGS WM 1/2 & LEVINGS JANIS 1/2			5795 SW 187TH PL	ALOHA	OR	97007
6	5	13	000	00702	5.2	LEVINGS WM 1/2 & LEVINGS JANIS 1/2			5795 SW 187TH PL	ALOHA	OR	97007
6	5	13	000	00703	0	LAUBACH ARTHUR C & DOROTHY M			69306 HWY 47	MIST	OR	97016
6	5	13	000	00800	39.94	SWEARINGEN STEVEN M & KARI E			69231 CRAWFORD RD	CLATSKANIE	OR	97016
6	5	13	000	00801	41.22	SWEARINGEN STEVEN & KARI E			15952 EASTMAN RD	CLATSKANIE	OR	97016
6	5	13	030	00100	23.83	TRASS FAMILY REVOCABLE LIVING TRUST		TRASS HG & RG NELSON TR & TRASS D TR	69143 DIAMOND T RANCH	MIST	OR	97016
6	5	13	030	00101	105.63	LONGVIEW FIBRE			P.O. BOX 3000	LONGVIEW	WA	98632
6	5	13	030	00200	3.08	COL CO ADM SCHOOL DIST 47J-VERNONIA			475 BRIDGE ST	VERNONIA	OR	97064
6	5	13	030	00400	0.69	KYSER JAMES & SHIRLEY			69203 HWY 47	MIST	OR	97016
6	5	13	030	00600	1.05	OR DOT HWY DIV		PROPERTY MGR	ROOM #417 TRANSPORTATION BLDG	SALEM	OR	97310
6	5	13	030	00700	0.25	MIST-BIRKENFELD COMM CHURCH			11249 HWY 202	BIRKENFELD	OR	97016
6	5	13	030	00701	1.42	MIST CEMETERY ASSOCIATION				MIST	OR	97016
6	5	13	030	00800	0.64	KEELER MICHAEL E			69212 HIGHWAY 47	MIST	OR	97016
6	5	13	030	00900	5	JONES THOMAS E & JOAN MARIE			69180 HWY 47	MIST	OR	97016
6	5	13	030	01000	1.47	DOWLING BERNARD & DEANE			BOX 30 MIST RT	CLATSKANIE	OR	97016
6	5	13	033	00100	0	DOWLING BERNARD & DEANE			BOX 30 MIST RT	CLATSKANIE	OR	97016
6	5	13	033	00500	0	ROMBACH TIM A & REGINA A			13990 HWY 202 MIST RT	CLATSKANIE	OR	97016
6	5	13	033	00700	0	ORCHARD FEDERAL SAVINGS BANK	BLOOMER MARVIN E		69076 HIGHWAY 47	MIST	OR	97016
6	5	13	033	01000	0	COLUMBIA COUNTY			COURTHOUSE	ST HELENS	OR	97051
6	5	13	033	01000	0	COLUMBIA COUNTY			COURTHOUSE	ST HELENS	OR	97051
6	5	13	033	01000	0	NIEDERMEYER D G			P O BOX 4078	PORTLAND	OR	97208
6	5	13	033	01100	0	LANE LELAND & GLORIANN FAMILY TRUST			105 3RD ST NE	HAMPTON	IA	50441
6	5	13	033	01200	1.02	ALLEN RAYFORD W & JUDY K			69055 HIWAY 47	MIST	OR	97016
6	5	13	033	01800	0.97	TURSKA ARDYS A			69027 HWY 47	MIST	OR	97016
6	5	13	033	01900	0	BYERS RICHARD C & ELIZABETH A			69005 HWY 47	MIST	OR	97016
6	5	13	033	02000	0.34	BYERS RICHARD C & ELIZABETH A			69005 HWY 47	MIST	OR	97016
6	5	13	033	02300	0.24	BYERS RICHARD C & ELIZABETH A			69005 HWY 47	MIST	OR	97016
6	5	13	033	02400	0.22	GRAU LAMBERT J			STAR RT 1 BOX 58 C	CLATSKANIE	OR	97016
6	5	13	033	02600	1.12	HALL ABE & ANNIE B			69028 HWY 47	CLATSKANIE	OR	97016
6	5	13	033	02700	0.23	MCPIKE LA MCPIKE RA & GRODIO MJ	FITCH JOHN F & CONNIE J		1544 E 2ND ST	NEWBERG	OR	97132
6	5	13	033	02701	0.02	FITCH JOHN F & CONNIE J			69058 HIGHWAY 47	MIST	OR	97016
6	5	13	033	02800	0	MCPIKE LA MCPIKE RA & GRODIO MJ	FITCH JOHN F & CONNIE J		1544 E 2ND ST	NEWBERG	OR	97132
6	5	13	033	02900	0	SIMMONS KENNETH R & RUTH L			76435 HWY 47	CLATSKANIE	OR	97016
6	5	13	033	03000	0.96	MCPIKE LA MCPIKE RA & GRODIO MJ	FITCH J MCPIKE LARRY		1544 E 2ND ST	NEWBERG	OR	97132
6	5	14	000	00100	101.76	LONGVIEW FIBRE			P.O. BOX 3000	LONGVIEW	WA	98632
6	5	14	000	00200	57	LIBEL SHALMON L				MIST	OR	97016
6	5	14	000	00300	4.7	DAVIS RICK L & ELITA D			14040 HWY 202	CLATSKANIE	OR	97016
6	5	14	000	00400	96.8	FERGUSON WALTER V			14563 HWY 202	MIST	OR	97016
6	5	14	000	00401	43.2	HAMMERBERG ALLEN E & MINNIE L			75327 MOUNTAIN VIEW DR	CLATSKANIE	OR	97016
6	5	14	000	00500	15.58	DUCE MICHAEL D & FLORENCE E			14911 HWY 202	MIST	OR	97016
6	5	14	000	00501	19.4	LONGVIEW FIBRE			P.O. BOX 3000	LONGVIEW	WA	98632
6	5	14	000	00502	10.11	HANEY ERIC SHAWN & KIMBERLY JEAN			14919 HIGHWAY 202	MIST	OR	97016
6	5	14	000	00503	5.26	ESPINOZA GILBERT P & JENNIE G			21100 NW QUATAMA #139	PORTLAND	OR	97006
6	5	14	000	00600	7.6	NELSON JAN PATRICK & CINDY DARLENE			14998 HWY 202	MIST	OR	97016
6	5	14	000	00700	83.61	REYNOLDS H WAYNE & VIVIAN L			14431 WALLACE RD	MIST	OR	97016
6	5	14	000	00801	17.92	GOOD SHIRLEY A TRSTE REVOCABLE TRST			BOX 203	RANCHO COR	CA	95741

Township North	Range West	Section	Qtr. Sec.	Tax Lot Number	Total Acres	Name	Buyer Name	Care of Name	Mailing Address	City	State	Zip
6	5	14	000	00802	4.01	HEMEON STEPHEN			14340 WALLACE RD	MIST	OR	97016
6	5	14	000	00803	3.38	WELLER VICKI L & JOHN A			14291 WALLACE RD	MIST	OR	97016
6	5	14	000	00804	8.99	HEMEON STEPHEN B			14087 WALLACE RD	CLATSKANIE	OR	97016
6	5	14	000	00806	6.15	WELLER JOHN A & VICKY LYN	HEMEON FORREST L & GERALDINE L (LE)		14044 WALLACE RD	CLATSKANIE	OR	97016
6	5	14	000	00900	54.6	HEMEON FOREST L & GERALDINE L			WALLACE RD	MIST	OR	97016
6	5	23	000	00100	1.4	CRAWFORD DAVID F JR & PAMELA			68901 NEHALEM HWY N	VERNONIA	OR	97064
6	5	23	000	00200	29.5	JONES ROBERT V & LINDA			221 EAGLE DR	CHEWELAN	WA	99109
6	5	23	000	00200	29.51	REYNOLDS LENORE A			3414 COLUMBIA HEIGHTS	LONGVIEW	WA	98632
6	5	23	000	00200	5.7	WOODS JAMES E			68760 BURN RD	CLATSKANIE	OR	97016
6	5	23	000	00201	5.96	COLUMBIA COUNTY			COURTHOUSE	ST HELENS	OR	97051
6	5	23	000	00201	5.96	WOODS JAMES W			68760 BURN RD	CLATSKANIE	OR	97016
6	5	23	000	00203	1.5	WOODS JAMES W			68760 BURN RD	CLATSKANIE	OR	97016
6	5	23	000	00300	74.62	LARKINS TRUST NO. 1			2600 LARKINS LANE	FOREST GRO	OR	97116
6	5	23	000	00400	81.18	LONGVIEW FIBRE			P.O. BOX 3000	LONGVIEW	WA	98632
6	5	24	000	00100	80	HOLCE WILFRED E & EVELYN L			17633 KEASEY RD	VERNONIA	OR	97064
6	5	24	000	00100	80	KOBERSTEIN NANCY L 1/2 INT			14504 NE ROSE PARKWAY	PORTLAND	OR	97230
6	5	24	000	00200	8.16	HARTWICK GREGORY			68185 NEHALEM HWY N	VERNONIA	OR	97064
6	5	24	000	00201	78.58	EPLING DONALD H & ETTA M			68445 NEHALEM HWY N	VERNONIA	OR	97064
6	5	24	000	00202	109.03	LONGVIEW FIBRE			P.O. BOX 3000	LONGVIEW	WA	98632
6	5	24	000	00300	20	BALL FRED N & BEVERLY J			68744 NEHALEM HWY N	VERNONIA	OR	97064
6	5	24	000	00301	9.38	BLANKENSHIP BRIEN K & PAMELA J			68912 NEHALEM HWY N	VERNONIA	OR	97064
6	5	24	000	00302	4.12	WORKMAN CAROL A			69000 NEHALEM HWY	VERNONIA	OR	97064
6	5	24	000	00400	1.6	OR DOT HWY DIV	PROPERTY MGR		ROOM #417 TRANSPORTATION BLDG	SALEM	OR	97310
6	5	24	000	00500	0.2	BLANCHARD PAUL C			2343 SE 44TH AVE	PORTLAND	OR	97215
6	5	24	000	00600	47.21	EPLING DONALD H & ETTA M			68445 NEHALEM HWY N	VERNONIA	OR	97064
6	5	24	000	00601	39.4	LONGVIEW FIBRE			P.O. BOX 3000	LONGVIEW	WA	98632
6	5	24	000	00602	4.28	ARMSTRONG WILLIAM G & BEVERLY R			735 SE 16TH	HILLSBORO	OR	97123
6	5	24	000	00700	49.9	CHRISTOPHERSEN LAVERNE J			68170 NEHALEM HWY N	VERNONIA	OR	97064
6	5	24	000	00800	6.8	WRIGHT DAVID A & PATRICIA A			68171 NEHALEM HWY NORTH	VERNONIA	OR	97064
6	5	24	000	00900	2.56	MATHEWS STANLEY L			68171 NEHALEM HWY N	VERNONIA	OR	97064
6	5	24	000	01000	6.5	BURLINGTON RESOURCES OIL & GAS COMPANY			801 CHERRY STREET	FORT WORTH	TX	76102
6	5	24	000	01000	6.5	GLACIER PARK COMPANY			801 CHERRY STREET	FORT WORTH	TX	76102
6	5	24	000	01000	17.4	MATHEWS ROBERT D UND 20% ETAL			59530 YARMER LANE	ST HELENS	OR	97051
6	5	24	000	01001	64.58	LONGVIEW FIBRE			P.O. BOX 3000	LONGVIEW	WA	98632
6	5	24	000	01002	17.4	MATHEWS STANLEY L			68171 NEHALEM HWY N	VERNONIA	OR	97064

PARCEL ID # TAX LOT NO.	OWNER1	FIRST OWNER ADDRESS	FIRST OWN ADDRESS	FIRST OWN ADDRESS	CITY	STATE	ZIP
3N300C004800	ANCELL, LAURA LYNN & STEVEN WAYNE	26530 NW DAIRY CREEK			CORNELIUS	OR	97113
3N300C004002	ANTHONY, EARL R/SUSAN M	26649 NW DAIRY CREEK RD			CORNELIUS	OR	97113
2N3040000301	BAMBUSCH, GARY D & MARY A	11000 SW 74TH			TIGARD	OR	97223
2N3090000600	BANKE, DONALD W & ADELE	21562 NW DAIRY CREEK RD			CORNELIUS	OR	97113
3N3330000500	**BARBOUR, JAMES RICHMOND & ARTHA**	**TRUSTEES**	**BY LINDA PETERS**	**7400 SW BARNES RD APT 133**	**PORTLAND**	**OR**	**97225**
3N300C003600	BARNEY, HARRY R/ELSIE H	27075 NE MOUNTAINTOP RD			NEWBERG	OR	97132
3N300C001900	BARNHART, LEROY F & JACQUELINE M	39050 NW SHERMAN'S MILL RD			CORNELIUS	OR	97113
2N3350000200	BEHRENS, TERRY R AND SHIRLEY M	33025 NW PEACEFUL LN			CORNELIUS	OR	97113
2N3150000501	BELT, VIRGIL J JR & JO ANN	RT 1 BOX 122-T			CORNELIUS	OR	97113
2N3050000103	BENJAMIN, BARBARA ANN	6150 SW 170TH			BEAVERTON	OR	97007
3N333C000200	BOGGS, BILLY G ETHEL	6802 SW CANYON RD			PORTLAND	OR	97225
2N3220000601	**BONTJE, MARJORIE M**	**c/o WHITE, HARRY & ELIZABETH**	**17231 NW DAIRY CREEK RD**		**CORNELIUS**	**OR**	**97113**
2N3090002000	BRAUKMAN, FRANK/IRENE	20560 NW DAIRY CREEK RD			CORNELIUS	OR	97113
3N300C003500	BRENNER, SUSAN L	PO BOX 176			NORTH PLAINS	OR	97133
2N3160000300	BRISTOL, AURORA	19547 NW DAIRY CREEK RD			CORNELIUS	OR	97113
3N300C003700	BROWN, BARRETT D & SUSAN G	988 MEADOWRIDGE ST NE			KEIZER	OR	97303
3N3210000500	BROWN, GREG H	28525 NW FERN FLAT RD			CORNELIUS	OR	97113
2N3090001400	BROWN, LEROY LARRY & CHARLENE	20195 NW DAIRY CREEK RD			CORNELIUS	OR	97113
3N300C004300	BUEHLER, FRITZ A TRUSTEE &	BUEHLER, ELIZABETH F TRUSTEE	2721 SW HUME CT		PORTLAND	OR	97229
3N300C004303	BUESSELER, JOHN & JABKE	26228 NW DAIRY CREEK RD			CORNELIUS	OR	97113
3N300C004600	CAMPBELL, DAVID E	1185 NW 107TH AVE			PORTLAND	OR	97229
2N3160001000	CHAMPLIN, DONALD A	18797 NW DAIRYCREEK RD			CORNELIUS	OR	97113
2N3340001000	CHRISTENSEN, CLARENCE A & JANET	33940 NW MOUNTAINDALE RD			CORNELIUS	OR	97113
2N3220000803	**CHURCHILL, FRANK & MARJORIE L**	**c/o CASE, ROBERT & JACQUELINE**	**PO BOX 398**		**BEAVERTON**	**OR**	**97075**
2N3040001100	CLARK, GARY A	22411 NW DAIRY CREEK RD			CORNELIUS	OR	97113
2N3150001401	CLARK, WILLIAM M & MARILYN R TRS	18633 NW DAIRY CREEK RD			CORNELIUS	OR	97113
3N300C003801	CLEMENT, EDLAND A/JANIS V	27447 NW DAIRY CREEK RD			CORNELIUS	OR	97113
3N300C004001	COLE, ROBERT R & PATRICIA L	26721 NW DAIRY CREEK RD			CORNELIUS	OR	97113
2N3340000901	CROCKER, JOHN C LYNNE D.	33830 NW MOUNTAINDALE RD			CORNELIUS	OR	97113
2N3340000900	CROCKER, LYNNE D	33830 NW MOUNTAINDALE RD			CORNELIUS	OR	97113
2N3350000500	CROPP, MICHAEL V	31345 NW NORTH AVE			CORNELIUS	OR	97113
3N400A000200	CUNNINGHAM, CARL LEE	35550 NW BACONA RD			BUXTON	OR	97109
2N3040000902	DALESKY, RONALD A & CANDUS D	2562 SE BLUEBONNET CT			HILLSBORO	OR	97123
2N3260001204	DEMARINIS, PASQUALE V & ELEANOR	3909 SW IDAHO TERRACE			PORTLAND	OR	97221
2N3160000501	DEVLAEMINCK, BERTRAM LEO	19339 NW DAIRY CREEK RD			CORNELIUS	OR	97113
2N3260001203	DRISCOLL, JOHN C & BAILEY, JANET I	14909 NW COREY RD.			CORNELIUS	OR	97113
2N3350001200	DUYCK, LAWRENCE J	34203 NW MOUNTAINDALE RD			CORNELIUS	OR	97113
2N3040001702	DYER, BRUCE O & ROXIE A	37420 NW ESSNER DR			CORNELIUS	OR	97113
2N3160001003	FISHER, SHIRLEY A & AVERY, CHRISTINE M	18989 NW DAIRY CREEK RD			CORNELIUS	OR	97113
3N3330000400	FIVE OAKS LIMITED PARTNERSHIP	17980 SW KEMMER RD			BEAVERTON	OR	97007
3N3210000900	FREDETTE, CATHERINE E	1800 NW 167TH PL STE 100			BEAVERTON	OR	97006
3N333C000500	FRIEDMAN, LUCINDA JANE	24100 NW MEACHAM			CORNELIUS	OR	97113

WASHINGTON COUNTY

LAND OWNERS LOCATED WITHIN THE 1320' WIDE SMF III PIPELINE CORRIDOR

AND WITHIN 1000' OF EACH SIDE OF PIPELINE CORRIDOR

PARCEL ID #	OWNER1	FIRST OWNER ADDRESS	FIRST OWN ADDRESS	FIRST OWN ADDRESS	CITY	STATE	ZIP
3N333C000300	GARDNER, LILLIAN R TRUSTEE	24255 NW DAIRY CREEK RD			CORNELIUS	OR	97113
2N3040000200	**GARLAND, CASEY**	**c/o BLACKBURN, WADE**	**3172 NE 185TH AVE**		**PORTLAND**	**OR**	**97229**
2N3160000800	**GIRARD, G E/KATHERINE E &**	**GIRARD, GEORGE VICTOR &**	**GIRARD, THOMAS E/FATIMA E T**	**BOX 8 BANKS LUMBER CO**	**BANKS**	**OR**	**97106**
2N3260001100	**GOFF, ALLAN J/PATRICIA E**	**c/o MURPHY, ROBERT M**	**34405 NW MOUNTAINDALE RD**		**CORNELIUS**	**OR**	**97113**
3N333C000301	GREUB, HANS	24070 NW MEACHAN RD			CORNELIUS	OR	97113
2N3160001200	GUISINGER, JOHN E & JOANNE P	19955 NW DAIRY CREEK RD			CORNELIUS	OR	97113
2N3160000600	GUTMANN NURSERIES INC	19131 NW DAIRY CREEK RD			CORNELIUS	OR	97113
2N3100000700	HALL, DENNIS, CAROLINE MARGARET	20064 NW DAIRY CREEK RD			CORNELIUS	OR	97113
2N3150001400	HALL, TIMOTHY C & JUDITH A	18555 NW DAIRY CREEK RD			CORNELIUS	OR	97113
2N3350000100	HAN, NAM SOO AND ZA YOUNG	P O BOX 481			MILFORD	DE	19963
2N304BB00700	HARE, WILLIAM D	1887 FRONT ST, NE			SALEM	OR	97303
3N333C000100	HARTMAN, DALE ROSEMARY	6200 SW RIVER RD			HILLSBORO	OR	97123
2N3040001104	HAUTH, MARK A	22303 NW DAIRY CREEK RD			CORNELIUS	OR	97113
2N3220000602	HAYES, MACLLOYD LYNN AND JANNICE D	36330 NW UEBEL RD.			CORNELIUS	OR	97113
2N3040000401	HENNINGSEN, HOWARD & BARBARA	23720 NW DAIRY CREEK RD			CORNELIUS	OR	97113
3N333C001100	HESS, LOUIS F WANDA	PO BOX 949			NORTH PLAINS	OR	97133
3N333C001200	HESS, LOUIS F/WANDA M	PO BOX 949			NORTH PLAINS	OR	97133
3N333C000400	HILL, MICHELLE A	24040 NW BRAGA RD			CORNELIUS	OR	97113
2N3090000201	HODGSON, ROBERT W	21400 NW OLIVER HILL RD			CORNELIUS	OR	97113
2N3270002003	HORTNAGL, GEORGE/NANCY	34945 MOUNTAINDALE DR			CORNELIUS	OR	97113
3N3210000800	**HOTT, PHILIP ROBIN**	**NELSON, WILLIAM H**	**NELSON, JOHN G JR**	**1192 ANDREWS RD**	**LAKE OSWEGO**	**OR**	**97034**
2N3090001300	HUGHES, BARBARA K	PO BOX 221			PORT TOWNSE	WA	98368
2N3270002004	HYDE, LINDA L	623 NW PACIFIC GROVE DR			BEAVERTON	OR	97006
3N3210001100	ISHAM, JAMES R	450 W ENDICOTT DR			SOLDOTNA	AK	99669
3N3210001200	JAMIESON, MICHAEL R	30180 NW FERN FLAT RD			CORNELIUS	OR	97113
2N3100000800	JOHNSON, RUBEN KAZUKO	20076 NW DAIRY CREEK RD			CORNELIUS	OR	97113
3N3210000700	JOLMA, TODD N & LAURA K	38485 SW SHERMAN'S MILL RD			CORNELIUS	OR	97113
2N3040000900	JONES, DUDLEY WILLIAM	22665 NW DAIRY CREEK RD			CORNELIUS	OR	97113
2N3040000800	JONES, LUCILLE P JACQUELINE M & SUGURA, T.	22670 NW DAIRY CREEK RD			CORNELIUS	OR	97113
2N3260000701	JONES, WILLIAM SHERMAN & JEANETTE A	14880 NW COREY RD			CORNELIUS	OR	97113
3N400A000300	JTF INC C/O MARJORIE CARPENTER	1409 CORTE CANALETE			BAKERSFIELD	CA	93388
2N3350000206	KELSO, STANLEY R & JUDITH M	33150 NW PEACEFUL LN			CORNELIUS	OR	97113
2N3090000500	KINDEL, ROBERT J & MARGARET	21394 NW DAIRY CREEK RD			CORNELIUS	OR	97113
2N3090000501	KINDEL, THOMAS H AND JANE	21555 NW OLIVER HILL RD			CORNELIUS	OR	97113
2N3150001300	KIRK, JOHN MERCER & CHERYL CARTER	1610 NW JOLIE PL			PORTLAND	OR	97229
2N3040001601	KOLODZIEJCZAK, MITCHELL & ANNIE	37630 NW ESSNER DR			CORNELIUS	OR	97113
3N3210001000	KRANZ, DENNIS B	4020 SW HEWETT			PORTLAND	OR	97221
2N3150001500	KRUEGER, RICHARD A	PO BOX 32			NORTH PLAINS	OR	97133
2N3090001100	KRUEGER, RICHARD A & DEBRA A	21001 NW DAIRY CREEK RD			CORNELIUS	OR	97113
2N3160000500	**L & V HOLDINGS I CORPORATION &**	**WESTCOTT, DIANE**	**40 LAKE BELLEVUE DR, STE 101**		**BELLEVUE**	**WA**	**98005**
3N300C004200	LAHAIE, GARY A	139 CRESTVIEW DR			HILLSBORO	OR	97123
2N3040001600	LEWIS, WILLIAM J & DIANE M	37520 NW ESSNER DR			CORNELIUS	OR	97113
2N3040001103	LINZ, WILLIAM & BABETTE H TRS	22105 NW DAIRY CREEK RD			CORNELIUS	OR	97113

PARCEL ID #	OWNER1	FIRST OWNER ADDRESS	FIRST OWN ADDRESS	FIRST OWN ADDRESS	CITY	STATE	ZIP
3N400A000100	LONGVIEW FIBRE COMPANY	PO BOX 667			LONGVIEW	WA	98632
2N3040001000	MATHIESEN, DAVID & MARTHA TRS	23845 NW PUMPKIN RIDGE RD			CORNELIUS	OR	97113
2N3270002300	MCCUBBIN, JOSEPH, SHARON & CARLE	PO BOX 866			NORTH PLAINS	OR	97133
2N3340000101	MCGOLDRICK, ARLETA	4063 NE 29TH			PORTLAND	OR	97212
2N304BB00500	MCINTYRE, DAVID N AND POTTER, MARY E	4371 SW FRASER AVE			PORTLAND	OR	97225
2N3040001300	MCNEIL, RODERICK & ELLYN M	39086 NW HIDDEN ACRES LANE			CORNELIUS	OR	97113
2N3350000600	MEEK, DAVID L	PO BOX 14032			PORTLAND	OR	97293
2N3050000200	MID-VALLEY RESOURCES INC-ATTN: VP	9400 SW BARNES RD #400			PORTLAND	OR	97225
3N333C001300	MILLER, BARRY L/MARY E	37350 NW SHILOH LANE			CORNELIUS	OR	97113
2N3160000504	MINERS, PATRICK D/LAURA M	19295 NW DAIRY CREEK RD			CORNELIUS	OR	97113
2N3160000503	MINERS, PATRICK DAVID &.LAURA M	19245 NW DAIRY CREEK RD.			CORNELIUS	OR	97113
3N300C003601	MOUNTS, CHARLES & BARBARA & WARRINER, JL	27791 NW DAIRY CREEK RD.			CORNELIUS	OR	97113
3N333C000800	NEAL, DARRON M & KELLY C	24264 NW DAIRY CREEK RD			CORNELIUS	OR	97113
2N3220000202	NEUMANN, JOHN S/MARIAN S	17635 NW COREY RD			CORNELIUS	OR	97113
2N3050000101	O'LEARY, ROBERT	23985 NW BRAGA RD			CORNELIUS	OR	97113
2N304BB00801	O'LEARY, ROBERT D	23985 NW BRAGA RD			CORNELIUS	OR	97113
2N3150001601	OCHOA, RODRIGO A & PARRICIA JEAN	18101 NW DAIRY CREEK RD			CORNELIUS	OR	97113
2N3090000400	OLESEN, THEODORE H C/O VANDOMELEN	19441 NW DAIRY CREEK RD			CORNELIUS	OR	97113
3N300C004900	OREGON, STATE OF				SALE 04500 0		00000
2N3260001201	**OREGON, STATE OF C-04503**	**DEPT OF VETERANS' AFFAIRS**	**700 SUMMER ST NE**		**SALEM**	**OR**	**97310**
2N304BB00200	PATTERSON, HELEN & CONNELL, GELTA M	3845 SW 94TH	3845 SW 94TH		PORTLAND	OR	97225
2N3090001900	PEACHEY, WILLIAM C/O FRANK BRAUKMAN	20560 NW DAIRY CREEK RD			CORNELIUS	OR	97113
3N3210000600	PFAFF, JOHN C & ANN	28485 NW FERN FLAT RD			CORNELIUS	OR	97113
3N300C004400	PHELPS, AMY	1996 SW TERRACE DR			PORTLAND	OR	97201
3N300C004301	PHELPS, EUGENE V AND AMY J	1996 SW TERRACE DR			PORTLAND	OR	97201
2N3090001500	PILKINGTON, CHARLES/RUBY	20121 NW DAIRY CREEK RD			CORNELIUS	OR	97113
3N300C004000	PURKEY, DAVID J	26585 NW DAIRY CREEK RD			CORNELIUS	OR	97113
3N333C000101	RAAB, DANIEL	24737 NW DAIRY CREEK RD			CORNELIUS	OR	97113
2N3090001000	RAAB, DONALD PAUL	21045 NW DAIRY CREEK RD			CORNELIUS	OR	97113
2N3270002401	RAFFETY, NORRIS/BETTY	15500 NW DAIRY CREEK RD			CORNELIUS	OR	97113
3N300C004302	RAMIREZ, ROBERT W & BARBARA G	26090 NW DAIRY CREEK RD			CORNELIUS	OR	97113
2N3220000302	**RANDALL, JANETTE GRACE AND**	**JOHNSON, MARGARETTE M, TRUSTEES**	**1542 NE GRANT**		**HILLSBORO**	**OR**	**97124**
2N3040000700	REHLING, PHYLLIS M AND RONALD E	PO BOX 864			HILLSBORO	OR	97123
3N300C003900	RHODES, CHARLES W	10105 HOWELL DR			UPPER MARLB	MD	20772
2N3150001000	RIDDELL, EILEEN	19600 NW DAIRY CREEK RD			CORNELIUS	OR	97113
2N304BB00600	ROBINSON, IRMA NILES TR	15738 NW CLUBHOUSE DR			PORTLAND	OR	97229
3N333C000900	ROE, D B AND NEAL, DARRON & KELLY	24264 NW DAIRY CREEK RD			CORNELIUS	OR	97113
2N3090000900	ROGERS, KRISTINA K & HETTEMA, HENDRIK	21151 NW DAIRY CREEK RD			CORNELIUS	OR	97113
2N3040001401	ROGERS, R W & BESSIE	22022 NW DAIRY CREEK RD			CORNELIUS	OR	97113
2N3040001901	ROGERS, R W/BESSIE	22022 NW DAIRY CREK RD			CORNELIUS	OR	97113
2N3160000201	ROSAUER, DANIEL J & DARNELLA R	19695 NW DAIRY CREEK RD			CORNELIUS	OR	97113
2N3270002400	RUECKER, PHYLLIS R	923 NE LINCOLN			HILLSBORO	OR	97124
2N3090000702	RUMPAKIS, GEORGE E	21420 NW NICKOLAS CT			HILLSBORO	OR	97124

PARCEL ID #	OWNER1	FIRST OWNER ADDRESS	FIRST OWN ADDRESS	FIRST OWN ADDRESS	CITY	STATE	ZIP
2N3040001101	RUSSELL, MICHAEL J	22029 NW DAIRY CREEK RD			CORNELIUS	OR	97113
2N3220000804	SAGE, DANIEL E	16263 NW DAIRY CREEK RD			CORNELIUS	OR	97113
2N3210000100	SAGMILLER, AMELIA	36505 NW UEBEL			CORNELIUS	OR	97113
3N300C004700	SCARROTT, SHELDON & JEAN V	822 NW MURRAY RD #259			PORTLAND	OR	97229
2N304BB00400	SCHAECHER, EDWARD F & PATRICIA J	4400 NW COLUMBIA			PORTLAND	OR	97229
2N3150001200	SCHARLEPP, KEITH J & JACALYN C	18944 NW DAIRY CREEK RD			CORNELIUS	OR	97113
2N3220000300	SCHMIDLIN, PAUL B/JEAN & GEORGE/ENOLA	16658 NW DIARY CREEK RD			CORNELIUS	OR	97113
2N3090001301	SCHMIDLKOFER, MURIEL A	20682 NW DAIRY CREEK RD			CORNELIUS	OR	97113
3N300C004100	SHEELEY, JOHN P C/O LESTER SHEELEY	9900 SE LAWNFIELD RD			CLACKAMAS	OR	97015
2N3340000102	SHIRAZI, ASAD & LINDA	34260 NW MOUNTAINDALE RD			CORNELIUS	OR	97113
2N3090000401	SIMSON, NEIL W & JUDY A	21090 NW DAIRY CREEK RD			CORNELIUS	OR	97113
2N3260000900	SOHLER, RONALD F & LYNETTA	15105 NW COREY RD			CORNELIUS	OR	97113
2N3270000200	SOUTH, DONALD S/LINDA A	16036 NW DAIRY CREEK RD			CORNELIUS	OR	97113
2N3090000700	SPINK, DOUGLAS B & SLAYTON, JUDY K	21641 NW DAIRY CREEK RD			CORNELIUS	OR	97113
3N333C000601	SPROULL, WILLIAM R & ANGELA L	24420 DAIRY CREEK RD			CORNELIUS	OR	97113
3N333C000700	ST MARIE, ELLEN, C/O GARDNER LILLIAN TRUST	24255 NW DAIRY CREEK RD			CORNELIUS	OR	97113
2N3260001000	STADELMAN, FREDRICK J & MARY J	15859 NW COREY RD			CORNELIUS	OR	97113
2N3350000201	STADELMAN, HENRY AND BARBARA, TRUST THE	13673 NW OLD PUMPKIN RIDGE RD			CORNELIUS	OR	97113
2N3260001001	**STADELMAN, JOE E & PAUL E**	**STADELMAN, CHARLES A & HENRY L**	**STADELMAN, BARBARA**	**16805 NW COREY RD**	**CORNELIUS**	**OR**	**97113**
2N3230001200	**STADELMAN, JOE E/PAUL E &**	**STADELMAN, HENRY LEONARD/BARBAR**	**STADELMAN, CHARLES A**	**16805 NW COREY RD**	**CORNELIUS**	**OR**	**97113**
2N3270000100	STADELMAN, PAUL	16805 NW COREY RD			CORNELUIS	OR	97113
2N3150001600	STADELMAN, REGINA M ET AL TRUSTE	17142 NW COREY RD	18101 NW DAIRY CREEK RD		CORNELIUS	OR	97113
3N300B005002	**STIMSON LUMBER CO**	**ATTN: JOHN MCGHEHEY VICE PRES**	**PO BOX 68**		**FOREST GROV**	**OR**	**97116**
2N3220000200	STORM, MYRTHA & JON, MCGRAW,KIRK & CAROLE	5599 S PINNACLE DR			GOLD CANYON	AZ	85219
2N3150000905	STRODE, MARTIN R	36329 NW THREE CEDARS LN			CORNELIUS	OR	97113
2N3340000100	STRONG, ARLENE B AND WHORLEY, JOYCE J	34325 NW MOUNTAINDALE RD			CORNELIUS	OR	97113
2N3220000500	TANNER, JAMES E/BETTY A	17765 NW DAIRY CREEK RD			CORNELIUS	OR	97113
2N3220000603	TANNER, TIMOTHY V AND VICTORIA ANN	36496 NW UEBEL RD			CORNELIUS	OR	97113
2N3040000500	TAYLOR, THOMAS L AND VICKI	23707 NW DAIRY CREEK RD			CORNELIUS	OR	97113
2N3040000600	TAYLOR, THOMAS L/VICKI	23707 NW DAIRY CREEK RD			CORNELIUS	OR	97113
2N3040000400	THOMAS, BLAINE E AND KATHIE	37600 SW SHILOH LN			CORNELIUS	OR	97113
2N3090000800	THOMPSON, LEONARD L & GEORGEAN A	21263 NW DAIRY CREEK RD			CORNELIUS	OR	97113
2N3220000802	THOMPSON, RICHARD W & SHERRY L	16567 NW DAIRY CREEK RD			CORNELIUS	OR	97113
2N3040001400	TIBBS, THOMAS N & JULIA M	6070 SW 190TH AVE			BEAVERTON	OR	97007
2N3040001900	TIBBS, THOMAS N JR/JULIA M & TIBBS, ASHLEY	6070 SW 190TH AVE			ALOHA	OR	97007
2N3160000100	**TRACHSEL, HERBERT K & PATRICIA**	**c/o DILLENBURG, ROGER R**	**19890 NW DAIRY CREEK RD**		**CORNELIUS**	**OR**	**97113**
3N300C002100	U. S. GOVERNMENT						00000
2N3090002090	UNITED STATES OF AMERICA						00000
2N3160001006	VANDEHEY, TIMOTHY H & CLARA D	18775 NW DIARY CREEK RD			CORNELIUS	OR	97113
2N3160000400	VANDOMELEN, ALLEN O DOLORIS V	19441 NW DAIRY CREEK RD			CORNELIUS	OR	97113
2N3150000906	VANDOMELEN, ALLEN O &	19441 NW DAIRY CREEK RD			CORNELIUS	OR	97113
2N3150001700	VANDOMELEN, ALLEN O & DOLORIS	19441 NW DAIRY CREEK RD			CORNELIUS	OR	97113
2N3270002000	VANDOMELEN, MELVIN M & MARY E	14650 NW DAIRY CREEK RD			CORNELIUS	OR	97113

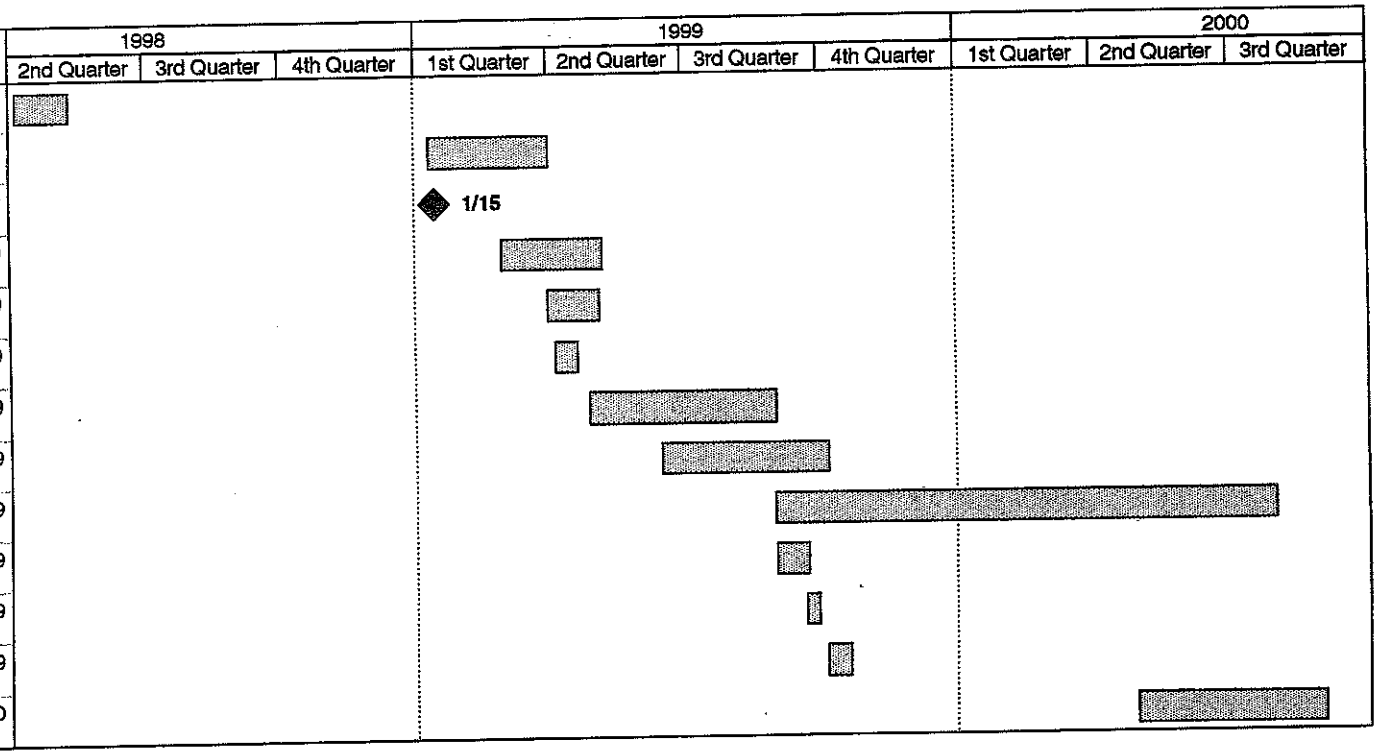
PARCEL ID #	OWNER1	FIRST OWNER ADDRESS	FIRST OWN ADDRESS	FIRST OWN ADDRESS	CITY	STATE	ZIP
2N304BB00800	VILKS, KSENIJA TRUSTEE	1255 NW SALTZMAN			PORTLAND	OR	97229
3N300C003800	VIRELL, CLYDE G & HARRIET	27355 NW DAIRY CREEK RD			CORNELIUS	OR	97113
3N3330000300	VOGT, CYNTHIA C	PO BOX 920			NORTH PLAINS	OR	97133
2N3150002100	**WASHINGTON COUNTY**	**FACILITIES MGMT-ADMIN**	**111 SE WASHINGTON ST**		**HILLSBORO**	**OR**	**97123**
2N304BB00900	WELSH, MARGARET C ET AL	8060 SW VALLEY VIEW COURT			PORTLAND	OR	97225
3N333C000501	WEST, KELLY KAY	24122 NW MEACHAM RD			CORNELIUS	OR	97113
2N304BB00300	WESTGATE, MOLLY J	3057 W IRONWOOD CIR			CHANDLER	AZ	85226
2N3150001501	WETLESEN, EINAR A & CYNTHIA A	18407 NW KELLER RD			CORNELIUS	OR	97113
2N3350000400	WHORLEY, JOYCE J & STRONG, ARLENE B	34325 NW MOUNTAINDALE RD			CORNELIUS	OR	97113
2N3220000600	WILDER, GLENNA MARIE JONES & STEVEN E	36460 NW UEBEL RD			CORNELIUS	OR	97113
2N3090000200	WILFERT, CLARK & MICHELLE	21020 NW OLIVER HILL RD			CORNELIUS	OR	97113
3N300B005000	WILLAMETTE INDUSTRIES INC	1300 SW 5TH AVE, #3800			PORTLAND	OR	97201
2N3220000801	**WYNWOOD PACIFIC, INC**	**c/o WORNSTAFF, RENEE W**	**16985 NW DAIRY CREEK RD**		**CORNELIUS**	**OR**	**97113**
2N3040000601	**YAZZOLINO, EDWARD R/JAYMI R &**	**ROBINSON, JENS J/KATHRYN P**	**4405 SE FLAVEL**		**PORTLAND**	**OR**	**97206**
2N3220000201	YERGEN, CARL SUZANNE	17567 NW COREY RD			CORNELIUS	OR	97113

X. CONSTRUCTION SCHEDULE

See next page.

South Mist Feeder Looping Project
Construction Schedule

Task Name	Start
Identify Staging Areas	Mon 4/6/98
Clear Timber & Brush	Mon 1/11/99
Conduct Pre-construction Meeting	Fri 1/15/99
Survey/Flag Construction ROW	Mon 3/1/99
Mobilize Crews & Equipment	Thu 4/1/99
Deliver Pipe	Tue 4/6/99
Dig Trench & Install Pipe	Thu 4/29/99
Clean UP/Reseed ROW	Thu 6/17/99
Develop Reichhold Pool	Wed 9/1/99
Hydrotest Line	Thu 9/2/99
Complete Tie-ins	Wed 9/22/99
Demobilize Crews & Equipment	Wed 10/6/99
Modify Miller Station	Mon 5/1/00



APPENDIX A

U.S. ARMY CORPS OF ENGINEERS

JOINT PERMIT APPLICATION FORM

THIS APPLICATION WILL MEET THE REQUIREMENTS OF BOTH AGENCIES

AGENCIES WILL ASSIGN NUMBERS

Corps Action ID Number_____ **Oregon Division of State Lands Number** _____

SEND ONE SIGNED COPY OF YOUR APPLICATION TO EACH AGENCY

District Engineer
ATTN: CENPP-OP-GP
P.O. Box 2946
Portland, OR 97208-2946
503-808-4371

State of Oregon
Division of State Lands
775 Summer Street NE
Salem, OR 97310
503-378-3805

1 Applicant Name and Address: Northwest Natural Gas, 220 N.W. Second Avenue, Portland, OR 97209
business phone # (503) 226-4211
home phone #
FAX # (503) 273-4815

[ ] Co-Applicant
[ ] Authorized Agent
[ ] Contractor
Name and Address
business phone #
home phone #
FAX #

Property Owner (if different than applicant) Name and Address: See attached table of property owners
business phone #
home phone #
FAX #

2 See attached wetland and stream location table **PROJECT LOCATION**

Street, Road or other descriptive location		Legal Description			
		Quarter	Section	Township	Range
In or Near (City or Town)	County	Tax Map #		Tax Lot	
Waterway	River Mile	Latitude		Longitude	

Is consent to enter property granted to the Corps and the Division of State Lands? [X] Yes [ ] No

3 **PROPOSED PROJECT INFORMATION**

Activity Type: [X] Fill [X] Excavation (removal) [ ] In-Water Structure [ ] Maintain/Repair an Existing Structure
Brief Description: The trench for the natural gas pipeline will be an average of 4' wide by 7' deep. Soil excavated from the trench will be used to fill the trench once the pipe has been laid. Topsoil will be replaced in all wetlands.
Fill will involve _____ cubic yards annually and/or 12161.7 cubic yards for the total project
_____ cubic yards in a wetland or below, the ordinary high water or high tide line
Fill will be [ ] rip rap [ ] rock [X] gravel [X] sand [X] silt [X] clay [X] organics [ ] depth (backfill)
Fill Impact Area is 15.2 acres; 11727' length; 4' width; 7' depth (includes wetlands and streams: see attached tables)
Removal will involve _____ cubic yards annually and/or 12161.7 cubic yards for the total project
_____ cubic yards in a wetland or below, the ordinary high water or high tide line
Removal will be [ ] rip rap [ ] rock [X] gravel [X] sand [X] silt [X] clay [X] organics [ ] depth
Removal Impact Area is 15.2 acres; 11727' length; 4' width; 7' depth (includes wetlands and streams: see attached tables)
Is the Disposal area: Upland? [X] Yes [ ] No Wetland/Waterway? [ ] Yes [ ] No

Are you aware of any Endangered Species on the project site?	[X] Yes [ ] No	If Yes, please explain in the project description (on page 2, block 4).
Are you aware of any Cultural Resources on the project site?	[X] Yes [ ] No	
Is the project site near a Wild and Scenic River?	[ ] Yes [X] No	

4 PROPOSED PROJECT PURPOSE AND DESCRIPTION

Project Purpose and Need:

Northwest Natural Gas Company proposes to construct a 40-mile-long underground natural gas pipeline from near Mist, OR to North Plains, OR. The 24-inch pipeline will begin at the existing Miller Station and end just north of North Plains. The Mist Feeder Loop will transport natural gas from an underground storage facility at Mist to North Plains. The Mist Feeder Loop is necessary to increase Northwest Natural Gas' ability to deliver gas to its customers during peak use periods.

Project Description:

Much of the proposed alignment is immediately adjacent to an existing 16-inch pipeline. The pipeline corridor will be widened to accommodate the new line, and a new corridor will be created for one major and several smaller reroutes. Where the route deviates from the existing pipeline, revisions have primarily been made to avoid houses, wetlands, or geologically unstable areas. Much of the pipeline route and reroutes follows road corridors. The construction corridor will be 80' wide except in streams and in most wetland areas, where the construction corridor will be limited to 30' wide. The construction corridor will be 60' in six agricultural wetlands, and in one forested and emergent (050403A) and one scrub-shrub and emergent wetland (040436B) because of the length of these wetlands. The maintenance corridor will be 40' to 50' wide.

See item 4 continuation

How many project drawing sheets are included with this application? 55 See Wetland Report, Dames & Moore 1998
NOTE: A complete application must include drawings and a location map submitted on separate 8-1/2x11 sheets.

Will any material, construction debris, runoff, etc., enter a wetland or waterway? [X] Yes [ ] No
If yes, describe the type of discharge (above) and show the discharge location on the site plan.

Estimated Start Date 1/1/99 Estimated Completion Date 11/1/99

PROJECT IMPACTS AND ALTERNATIVES

Describe alternative sites and project designs that were considered to avoid impacts to the waterway or wetland.

Other methods or sites are not available to accomplish the same result. Proximity to the existing 16-inch pipeline makes the proposed route the only feasible alternative. The pipeline corridor will simply be widened to accommodate a new line; thus, alleviating impacts of new corridor construction. See item 5 continuation

Describe what measures you will use (before and after construction) to minimize impacts to the waterway or wetland.

See item 5 continuation and the Wetland Report, Dames & Moore
NOTE: If necessary, use additional sheets.

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6 ADDITIONAL INFORMATION

Adjoining Property Owners and Their Addresses and Phone Numbers

See Property Owner Table

Has the proposed activity or related activity received the attention of the Corps of Engineers or the State of Oregon in the past, e.g., wetland delineation, violation, permit, lease request, etc.? [ ] Yes [X] No

If yes, what identification number(s) were assigned by the respective agencies:

Corps # _____

State of Oregon # _____

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7 CITY/COUNTY PLANNING DEPARTMENT AFFIDAVIT

(to be completed by local planning official)

[ ] This project is not regulated by the local comprehensive plan and zoning ordinance.

[ ] This project has been reviewed and is consistent with the local comprehensive plan and zoning ordinance.

[ ] This project has been reviewed and is **not** consistent with the local comprehensive plan and zoning ordinance.

[ ] Consistency of this project with the local planning ordinance cannot be determined until the following local approval(s) are obtained:

_____ Conditional Use Approval
_____ Plan Amendment
_____ Other _____

_____ Development Permit
_____ Zone Change

An application _____ has _____ has not been made for local approvals checked above.

Signature (of local planning official)	Title	City/County	Date

8 COASTAL ZONE CERTIFICATIONS

If the proposed activity described in your permit application is within the Oregon coastal zone, the following certification is required before your application can be processed. A public notice will be issued with the certification statement which will be forwarded to the Oregon Department of Land Conservation and Development (DLCD) for its concurrence or objection. For additional information on the Oregon Coastal Zone Management Program, contact the department at 1175 Court Street NE, Salem, Oregon 97310 or call 503-373-0050.

CERTIFICATION STATEMENT

Print/Type Name	Title
Applicant Signature	Date

9 SIGNATURE FOR JOINT APPLICATION

(REQUIRED)

Application is hereby made for the activities described herein. I certify that I am familiar with the information contained in the application, and, to the best of my knowledge and believe, this information is true, complete, and accurate. If further certify that I possess the authority, including the necessary requisite property interests to undertake the proposed activities. I understand that the granting of other permits by local, county, state or federal agencies does not release me from the requirement of obtaining the permits requested before commencing the project. I understand that local permits may be required before the state removal-fill permit is issued. In understand that payment of the required state processing fee does not guarantee permit issuance.

Michael J. Hayward	Senior Environmental Specialist
Print/Type Name (co-applicant)	Title
Applicant Signature (co-applicant)	9-15-98 Date

I certify that I may act as the duly authorized agent of the applicant.

Print/Type Name	Title
Applicant Signature	Date

10

SUPPLEMENTAL WETLAND IMPACT INFORMATION*
(FOR WETLAND FILLS ONLY)

Site Conditions of impact area

Impact area is [ ] Ocean [ ] Estuary [ ] River [ ] Lake [X] Stream [X] Freshwater Wetland

Note: Estuarian Resource Replacement is required by state law for projects involving intertidal or tidal marsh alterations. A separate Wetlands Resource Compensation Plan may be appended to the application.

Has a wetland delineation been completed for this site? [X] Yes [ ] No
If yes, by whom:

Linda Krippner, Wetland Scientist (Dames & Moore)
Donna Frostholm, Wetland Scientist (Dames & Moore)
Melinda Trask, Wetland Scientist (Dames & Moore)

Describe the existing physical and biological character of the wetland/waterway site by area and type of resource (use separate sheets and photos, if necessary)

See enclosed Wetland Report, Dames & Moore 1998

Resource Replacement Mitigation
Describe measures to be taken to replace unavoidably impacted wetland resources

See item 10 continuation, the attached table titled "Construction Method, Water Quality, and Fisheries Impacts and Mitigation, and The Wetland Report, Dames & Moore 1998

* Because this information is not necessary for a complete application, you may submit this sheet and other environmental information after submitting your application.

FILE NO.	OWNER	ADDRESS	PHONE	PAGE NO.	INST. NO.	T & R*	SEC.	TL	DATE SECURED	EASEMENT AMOUNT	DAMAGES AMOUNT	DATE TO RECORDER	RECORDE INST. NO.	COMMENTS
1	Whorley, Joyce Strong, Arlene	34325 NW Mountaindale Rd., Cornelius, OR 97113	647-5936	20 of 82		2N-3W	35	400						ADDED
2	Duyck, Lawrence	34203 NW Mountaindale Rd. Cornelius, OR 97113	H-647-2429 O-324-4101 C-708-8305	20 of 82	96108090 81011103 96108090 81011103	2N-3W 2N-3W	35 35	1200 1100						
3	Murphy, Robert M. Contract w/Goff, Allan J.	34405 NW Mountaindale Rd.Cornelius, OR 97113 fax - 647-5420	647-5428	21 of 82	90-3394	2N-3W	26	1100						
4	Stadelman, Fredrick J. and Mary	15859 NW Corey Rd., Cornelius, OR 97113	647-2739	22 of 82	831462	2N-3W	26	1000						
5	Stadelman, Paul E., Joe E, & Charles A.	16805 NW Corey Rd.,Cornelius, OR 97113	647-2634	23 of 82	88-51176 90-05372	2N-3W	26 & 27 27	1001 100						
6	Kauer, Darlene c/o Paul B and Jean Schmidlin Charles Schmidlin	Rt. 1, Box 111, Cornelius, OR 97113 16658 NW Dairy Creek, Cornelius, OR 97113	647-0190	23,24 of 8	79032965	2N-3W	22 22	900 300						
8-A	Stadelman, Regina c/o Rodrigo & Patricia Ochoa, Buyer	18101 NW Dairy Creek Rd., Cornelius, OR 97113	647-2749	25 of 82		2N-3W	22	301						Changed from tax lot 302 need to change file ------
8-B	Stadelman, Regina M. et al TR c/o Rodrigo & Patricia Ochoa, Buyer	18101 NW Dairy Creek Rd., Cornelius, OR 97113	647-2749	25 of 82	94025981	2N-3W	22	401						
9	Ochoa, Rodrigo A.&Patricia	18101 NW Dairy Creek Rd., Cornelius, OR 97113	647-5721	25 of 82	94058227	2N-3W	15	1601						
10	Wellesen, Elnar A.&Cynthia	18407 NW Keller Rd., Cornelius, OR 97113	647-5305 647-0002 (H)	25 of 82	94049075	2N-3W	15	1501						SON-IN-LAW TO FARMER #14
11	Kirk, John Mercer and Cheryl Carter	PO Box 1065, North Plains, OR 97133	647-9246 (H)	26 of 82	97033569	2N-3W	15	1300						
12	Scharlepp, Keith J.& Jacalyn	18944 NW Dairy Creek Rd.,Cornelius, OR 97113	647-9974	26 of 82	91039602	2N-3W	15	1200						
13	Eggiman, Michael & Elizabeth	18797 NW Dairy Creek Rd., Cornelius, OR 97113	642-4487/223 640-8087 (H)	26 of 82	98040296	2N-3W	16	1004						recent change of ownership
14	Fisher, Shirley A. Christine M. Avery	18989 NW Dairy Creek Rd., Cornelius, OR 97113	647-2643	26 of 82	92030058	2N-3W	15	1003						Mother to Cynthia Weskesen #10
15	Carl A. Gutman Nurseries Inc. attn: Bob Gutman	19131 NW Dairy Creek Rd., Cornelius, OR 97113	647-5167 647-5810	26 of 82	93106135	2N-3W	16	600						Renters/Doris VanDomelen 647-2698
16	Miners, Patrick D.&Laura M.	19295 NW Dairy Creek Rd., Cornelius, OR 97113	647-2494	26 of 82	83046190	2N-3W	16	504						
17	Guisinger, John E. & Joanne P.	19955 NW Dairy Creek Rd., Cornelius, OR 97113	647-2189	27 of 82	93034996	2N-3W	16 16	1100 1200						Verify Easement

* additional tax maps apply

FROM : GAS STORAGE DEPT - NW NATURAL PHONE NO. : 5032202595 Sep. 11 1998 04:54PM P3

FILE NO.	OWNER	ADDRESS	PHONE	PAGE NO.	INST. NO.	T & R*	SEC.	TL	DATE SECURED	EASEMENT AMOUNT	DAMAGES AMOUNT	DATE TO RECORDER	RECORDE INST. NO.	COMMENTS
18	L&V Holdings Corporation-75% Dave Wescott Diane Wescott- (sister)-25%	200 SW Market,Ste. 1800, Portland, OR 97201 19205 NW Dairy Creek Rd.,Cornelius, Or 97113	between 7-12 220-1050 647-0614	27 of 82	97076101	2N-3W	16	500						NEED TRIO
19	Hughes, Barbara K.	PO Box 221, Port Townsend, WA 98368	206/627-0892 385-5022	27 of 82	82015496	2N-3W	9	1300						Leased to Allen VanDomelen 647-2698
20	Krueger, Richard & Debra	21001 NW Dairy Creek Rd., Cornelius, OR 97113 Renter-Theresa Jones Sugara (File #27) Lillian Gardner - (File #30)-Seller	686-5694 R-647-9934	28 of 82	92040238 84018368 92400677 79006049	2N-3W	9	1100						
21	Simson, Judy A. & Neil W.	21090 NW Dairy Creek Rd., Cornelius, OR 97113	647-0921	28 of 82	97088525	2N-3W	9	401						
22	Oleson, Theodore H. c/o Allen and Dolori Vandomelen	19441 NW Dairy Creek Rd., Cornelius, OR 97113	647-2698	28 of 82	92045005	2N-3W	9	400						
23	Kindel, Margaret	21394 NW Dairy Creek Rd., Cornelius, OR 97113	647-2630	28,29 of 8	2970242	2N-3W	9	500						
24	Rogers, R.W.	22022 NW Dairy Creek Rd., Cornelius, OR 97113	647-0650	29 of 82	78003737 95075518	2N-3W	4	1401						
25	Tibbs, Thomas N. & Julia M.	6070 SW 190th Ave., Beaverton, OR 97007	591-7433	29 of 82	95085519	2N-3W	4	1400						
26	McNeil, Roderick & Ellyn M.	39086 NW Hidden Acres Lane, Cornelius, OR 97113	647-5715	29 of 82	91020327	2N-3W	4	1300						Trees - Special Handling Report
27	Jones, Lucille p. & Jacqueline M. C/O Theresa Jones Sugura	22670 NW Dairy Creek Rd., Cornelius, OR 97113 PO Box 341, North Plains 97153	647-9051 647-9934	30 of 82		2N-3W	4	600						ADDED
28	Rehling, Phyllis and Ronald	PO Box 864, Hillsboro, OR 97123	647-5937 fax647-5637	30 of 82		2N-3W	4	700						ADDED
29	Taylor, Thomas L. & Vicki	23707 NW Dairy Creek Rd., Cornelius, OR 97113	647-5585	31 of 82	79000539	2N-3W 2N-3W	4 4	600 500						
30	Gardner, Lillian R. Attn: Kate Gregory	24255 NW Dairy Creek Rd., Cornelius, OR 97113 Premier Mortgage Co.	647-2950 690-8200	31 of 82	97043851	3N-3W	33C	300						
31	Mounts, Charles & Barbara, Warriner, Jill Lee	27792 NW Dairy Creek Rd., Cornelius, OR 97113		34 of 82	97082739	3N-3W (C)	28	3601						
32	Nelson, John G., Jr. Hott. Philip R.	1192 Andrews Rd.,Lake Oswego, OR 97034 PO Box 563, Covello, CA 95428	638-7546	34 of 82	92083525	3N-3W (C) 3N-3W	28 21	3400 800						
33	Willamette Industries, Inc.	1300 SW 5th Ave., #3800 - Portland, OR 97201	295-7013 852-7171	35,36 of 8 36 of 82	86059592 11660009	3N-3W (C) 3N-3W (B)	20 17	2000 5000						

* additional tax maps apply

FILE NO.	OWNER	ADDRESS	PHONE	PAGE NO.	INST. NO.	T & R*	SEC.	TL	DATE SECURED	EASEMENT AMOUNT	DAMAGES AMOUNT	DATE TO RECORDER	RECORDE INST. NO.	COMMENTS
34	Stimson Lumber Co.,	PO Box 68, Forest Grove, OR 97116		35 of 82	12160646	3N-3W (C)	20	1500						
	Attn: Kent Boring			36,37 of 8	12160646	3N-3W (B)	17	5002						
			357-2131											
35	Longview Fibre Co.	PO Box 667, Longview, WA 98632		38 thru 44	10470254	3N-3W (B)	18	800						
				of 82	3970253	3N-4W (A)	13	100						
					3970253	3N-4W (A)	12	100						
			397-6689		3970253	3N-4W (A)	1	100						

COLUMBIA COUNTY

50	JTF Inc.c/o Jeppesen, Burt	9945 SW 170th, Beaverton, OR 97007	590-7305			T4N-R3W	31	400						
	RE ROUTE INTO W 1/2, SW1/4 OF 31, T4N R3W ALONG ROAD - NEED TRIOS FOR ALL													
51	Longview Fibre Company	PO Box 667, Longview, WA 98632		44-45 of 82		T4N-R4W	36	5300						
			397-6689											
52-A	Forestree Washington Lmt.	PO Box 1780, Poulsbo, WA 98370		45 of 82		T4N-R4W	36	5500						Coal Canyon
	Partnership c/o Olympic Res. Mangement LLC		429-5040											
B	Forestree Washington Lmt.	PO Box 1780, Poulsbo, WA 98370		45,46 of 82		T4N-R4W	36	5400						
C	Forestree Washington Lmt.	PO Box 1780, Poulsbo, WA 98370		47,48 of 82		T4N-R4W	25	3200						
D	Forestree Washington Lmt.	PO Box 1780, Poulsbo, WA 98370		48 of 82		T4N-R4W	24	3100						
E	Forestree Washington Lmt.	PO Box 1780, Poulsbo, WA 98370		49,50 of 82		T4N-R4W	24	3000						
F	Forestree Washington Lmt.	PO Box 1780, Poulsbo, WA 98370		50,51 of 82		T4N-R4W	13	1100						
G	Forestree Washington Lmt.	PO Box 1780, Poulsbo, WA 98370		51,52 of 82		T4N-R4W	12	1000						
H	Forestree Washington Lmt.	PO Box 1780, Poulsbo, WA 98370		52,53 of 82		T4N-R3W	7	200						
I	Forestree Washington Lmt.	PO Box 1780, Poulsbo, WA 98370		53 of 82		T4N-R3W	7	400						
J	Forestree Washington Lmt.	PO Box 1780, Poulsbo, WA 98370		53 of 82		T4N-R3W	6	200						
K	Forestree Washington Lmt.	PO Box 1780, Poulsbo, WA 98370		53,54 of 82		T4N-R3W	6	100						
L	Forestree Washington Lmt.	PO Box 1780, Poulsbo, WA 98370		54,55 of 82		T4N-R4W	1	100						
M	Forestree Washington Lmt.	PO Box 1780, Poulsbo, WA 98370				T5N-R4W	35	200						added/reroute-inst. #97-03998
N	Forestree Washington Lmt.	PO Box 1780, Poulsbo, WA 98370				T5N-R4W	35	100						added/reroute-inst. #97-03998
O	Forestree Washington Lmt.	PO Box 1780, Poulsbo, WA 98370				T5N-R4W	26	100						added/reroute-inst. #97-03998
P	Forestree Washington Lmt.	PO Box 1780, Poulsbo, WA 98370				T5N-R4W	26	200						added-inst. #97-03998
53	Ellis, Stephen E.	58176 Wilson Cutoff Rd., Vernonia, OR 97064				T5N-R4W	26	302						added-inst. #92-6887
			429-1620											
54-A	Forestree Washington Lmt.	PO Box 1780, Poulsbo, WA 98370		55 of 82		T5N-R4W	36	101						added-inst. #97-03998
	Partnership c/o Olympic Res. Mangement LLC		429-5040											
B	Forestree Washington Lmt.	PO Box 1780, Poulsbo, WA 98370		55 of 82		T5N-R4W	36	102						added-inst. #97-03998
C	Forestree Washington Lmt.	PO Box 1780, Poulsbo, WA 98370				T5N-R4W	35	200						added-inst. #97-03998

FROM : GAS STORAGE DEPT - NW NATURAL PHONE NO. : 5032202595

* additional tax maps apply

FILE NO.	OWNER	ADDRESS	PHONE	PAGE NO.	INST. NO.	T & R*	SEC.	TL	DATE SECURED	EASEMENT AMOUNT	DAMAGES AMOUNT	DATE TO RECORDER	RECORDE INST. NO.	COMMENTS
D	Forestree Washington Lmt.	PO Box 1780, Poulsbo, WA 98370				T5N-R4W	35	100						added-inst. #97-03998
E	Forestree Washington Lmt.	PO Box 1780, Poulsbo, WA 98370				T5N-R4W	25	1600						
F	Forestree Washington Lmt.	PO Box 1780, Poulsbo, WA 98370				T5N-R4W	23	1500						added-inst. 97-03998
55	Gwin & Sons Logging Inc.	1400 Grove St., PO Box 294, Vernonia, OR 97064	429-5959 429-0254-fax	61 of 82		T5N-R4W	23	1401						
56-A	Forestree Washington Lmt. Partnership c/o Olympic Res. Mangement LLC	PO Box 1780, Poulsbo, WA 98370	429-5040	61 of 82		T5N-R4W	23	1400						added-inst. 97-03998
	cross highway													
B	Forestree Washington Lmt.	PO Box 1780, Poulsbo, WA 98370		61 of 82		T5N-R4W	23*	600						added-inst. #97-03998
57	ODOT c/o property manager	Room 417, Transportation Bldg. Salem, OR 97310		61 of 82		T5N-R4W	23 *	700						added inst. AAA-AAA
58	Taylor, Richard D. & Michele R.	62419 Nehalem Hwy N. Vernonia, OR 97064	429-4012	61 of 82		T5N-R4W	23*	800						added-inst. 95-04855
59	Gans, George & Mulcahy, Naomi	62471 Nehalem Hwy N. Vernonia, OR 97065 e-mail -EGROEG@VERNONIA.COM	429-6027	61 of 82		T5N-R4W	23*	101						added-inst. F95-10650/F94-3073
60	Forestree Washington Lmt. Partnership c/o Olympic Res. Mangement LLC	PO Box 1780, Poulsbo, WA 98370	429-5040	61 of 82		T5N-R4W	23	500						added-inst. #97-03998 added-inst. #F90-0477
61	Oregon Dept. of Fish and Wildlife	PO Box 59, Portland, OR 97207	872-5270	61 of 82		T5N-R4W	23	501						
	cross river													
62	Forestree Washington Lmt. Partnership c/o Olympic Res. Mangement LLC	PO Box 1780, Poulsbo, WA 98370	429-5040	62 of 82		T5N-R4W	23	400						GO OVER W/BOB - WHY ADD???
63-A	Longview Fibre Company	PO Box 3000, Longview, WA 98612	397-6889	62 of 82		T5N-R4W	23	600						104-580
B	Longview Fibre Company			63 of 82		T5N-R4W	14	400						131-347
64-A	JHMLI c/o Olympic Resource Management LLC	PO Box 1780, Poulsbo, WA 98370		64/65 of 82		T5N-R4W	11	500						added-inst. 97-1671 county had incorrect information
B	JHMLI c/o Olympic Resource			65/66 of 82		T5N-R4W	10*	1000						added-inst. 97-1671
C	JHMLI c/o Olympic Resource			67 of 82		T5N-R4W	10	500						added - inst. 97-1671
D	JHMLI c/o Olympic Resource			66 of 82		T5N-R4W	10	300						added-inst. #97-1671
E	JHMLI c/o Olympic Resource			66/67 of 82		T5N-R4W	10*	600						added-inst. #97-1671
F	John Hancock Mutual Life Ins.			67 of 82		T5N-R4W	3	600						changed from LVF-inst. 97-01671
G	John Hancock Mutual Life Ins.			68 of 82		T5N-R4W	3	500						changed from LVF-inst. 97-01671
H	JHMLI c/o Olympic Resource			69 of 82		T5N-R4W	4	200						
I	JHMLI c/o Olympic Resource			69/70/81 of 82		T6N-R4W	33	700						

* additional tax maps apply

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FROM : GAS STORAGE DEPT - NW NATURAL PHONE NO. : 5032202595 Sep. 11 1998 04:56PM P6

FILE NO.	OWNER	ADDRESS	PHONE	PAGE NO.	INST. NO.	T & R*	SEC.	TL	DATE SECURED	EASEMENT AMOUNT	DAMAGES AMOUNT	DATE TO RECORDER	RECORDE INST. NO.	COMMENTS
65-A	Benes, Dave & Diane	67075 Burris Rd., Vernonia, OR 97064	429-4633	71/72 of 82		T6N-R4W	33	600						works swing shift
B	Benes, Dan L. & Julie A.	67077 Burris Rd., Vernonia, OR 97064	429-4590			T6N-R4W	28	1400						works graveyard
66	JHMLI c/o Olympic Resource Management LLC	PO Box 1780, Poulsbo, WA 98370		71/72 of 82		T6N-R4W	29	2000						added-Inst. #97-01671
67	O'Black, Bertha L.	67475 Burris Rd., Vernonia, OR 97064	429-7791	73 of 82		T6N-R4W	29	1900						
68	Holt, Clarence C. C/O Joe Mercer	616 NW 139th, Vancouver, WA 98685	224-5613	73 of 82		T6N-R4W	29	1400						
69	O'Black, Bertha L.	67475 Burris Rd., Vernonia, OR	429-7791	73 of 82		T6N-R4W	29	1500						
70	O/Black, Larry	67730 Nehalem Hwy. N., Vernonia, OR	429-7503	73 of 82		T6N-R4W	29	600						added-inst. #189-356
71	Stimson Lumber Co.	PO Box 68, Forest Grove, OR 97116		74 of 82		T6N-R4W	29	300						added-Inst. #F93-5404
72	Titus, Donnie & Rena	67825 Taylor Ln., Vernonia, OR 97064	429-2013	74 of 82		T6N-R4W	30	400						see map 30-1 added - inst. #258-430
73	Meyer, Roger & Debra	67836 Nehalem Hwy. N., Vernonia, OR 97064	429-3012	75 of 82		T6N-R4W	30	300						20.37 ac added - inst. #F95-03482
74	Mathis, Glenn & Marie NW Natural Employee (Mist)	67924 Nehalem Hwy. N., Vernonia, OR 97064 work #226-4211 ext. 4732	429-6020	75/76 of 82		T6N-R4W	30	200*						F92-7065
75	Wirtanen, David G & Diana H	67892 Nehalem Hwy. N, Vernonia, OR 97064	429-8105	75 of 82		T6N-R4W	30	201						F-94-07800
76	Noakes, Larry & Merle	67872 Nehalem Hwy. N, Vernonia, OR 97064	429-0116	75 of 82		T6N-R4W	30	200*						F-92-7065 - Added
77	McGuffy, James D. & Linda	24914 SE Sweetwater Ln., Eagle Creek, OR 97022	637-3764	75 of 82		T6N-R4W	30	300						.32 ac added - inst. #268-947
78	Hamer, E. Trustee for Mastin 1/2 and Hamer 1/2	22022 SW Scholls Sherwood Rd Sherwood, OR 97140	628-1778	75 of 82		T6N-R4W	30	100						
79	JHMLI c/o Olympic Resource Management LLC	1780 Paulsbo, WA 98370		76 of 82		T6N-R4W	19	4700						
80	LVF	PO Box 300, Longview, WA 98632	429-2605	76 &77 of 82		T6N-R5W	24	1001						added-inst. #242-362
81	Christophersen, Laverne J. (Jack & Linda)	68170 Nehalem Hwy. N., Vernonia, OR 97064	755-2473	77 of 82		T6N-R5W	24	700						added-inst. #C27-214
82	Epling, Donald H. & Etta M.	68445 Nehalem Hwy. N., Vernonia, OR 97064 cell phone	755-9305 791-2060	78 of 82		T6N-R5W	24	201						added-inst. #254-552
83	LVF	PO Box 300, Longview, WA 98632		78 of 82		T6N-R5W	24	601						

* additional tax maps apply

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FROM : GAS STORAGE DEPT - NW NATURAL PHONE NO. : 5032202595 Sep. 11 1998 04:57PM P7

FILE NO.	OWNER	ADDRESS	PHONE	PAGE NO.	INST. NO.	T & R*	SEC.	TL	DATE SECURED	EASEMENT AMOUNT	DAMAGES AMOUNT	DATE TO RECORDER	RECORDE INST. NO.	COMMENTS
84	Ball, Fred N. & Beverly J. Deceased (Ron the Son)	68744 Nehalem Hwy N, Vernonia, OR 97064	NP	78 of 82 556-7176		T6N-R5W	24	300						
85	Blankenship, Brian K & Pam J.	68912 Nehalem Hwy N, Vernonia, OR 97064 e-mail BRIEN.BLANKENSHIP@Pii.com	h/755-2243 w/531-2050 ext. 1840	79 of 82		T6N-R5W	24	301						
86	Workman, Carol A	69000 Hwy 47, Mist, OR 97016	755-0409	79 of 82		T6N-R5W	24	302						w/771-2566 (call at work)
87-A	Byers, Richard C. & Elizabeth A	69005 Hwy. 47, Mist, OR 97016	755-0523	79 of 82		T6N-R5W	13	2300						added-inst. #F94-10436
B				79 of 82		T6N-R5W	13	2000						#F94-05224 added - look up inst. Map 3 of 3
88	Espinoza, Gilbert P & Jennie G	1721 East Rosewood Ct., Ontario, CA 91764	909/ 467-2629	79 of 82		T6N-R5W	14	503						call between hrs of 10-11:30 Am 5:30 - 7:00 PM
89	Haney, Shawn & Kimberly Jean	14919 Hwy 202, Mist, OR 97016	755-9427 w/520-1220 Kim	79 of 82		T6N-R5W	14	502						
90	Duce, Michael D. & Florance E.	14911 Hwy 202, Mist, OR 97016	765-9526 w/413-7463	80 of 82		T6N-R5W	14	500						
91	Longview Fibre	PO Box 300, Longview, WA 98632	429-2605	80 of 82		T6N-R5W	14	501						added - 5/11/98
92	Hammerburg, Allen E & Minnie L	75327 Mountain View Dr., Clatskanie, OR 97016	728-4419	80 of 82		T6N-R5W	14	401						
93	Ferguson, Walter V	14563 Hwy 202, Mist, OR 97016	755-9628	80 of 82		T6N-R5W	14	400						
94	Busch, Fred & Phylis	13163 Busch Ln., Mist, OR 97016	755-2452	80 of 82		T6N-R5W	14	2800						added-inst. #150-357
95-A	Longview Fibre	PO Box 300, Longview, WA 98632	429-2605	80 &81 of 82		T6N-R5W	14	100						added-inst. #160-429
B				81/82 of 82		T6N-R5W	11	2600						
96	JHMLI c/o Olympic Resource Management LLC	PO Box 1780 Poulsbo, WA 98370				T6N-R5W	11	2500						

* additional tax maps apply

Wetland and Stream Crossing Locations and Stream Types

Waterway Crossing (Name--D&M Number)	Wetland Spans Nearby Waterway	Wetland Crossing ID Number	Waterway Crossing Location Section, Township, and Range Latitude and Longitude			1/4 of 1/4 Section	COE Jurisdiction	ODF Stream Type	Habitat Category	Tributary To
	1	060511A	110605	46° 01'	123° 16'	SWSE	Yes (Wetland)			
Unnamed Creek -- 1			110605	46° 01'	123° 16'	SWSE	Yes (Stream)	SN	4	Lindgren Cr.
		060514G	140605	46° 00'	123° 16'	NWNE	Yes (Wetland)			
	2	060514C	140605	46° 00'	123° 16'	SWNE	Yes (Wetland)			
Lindgren Creek -- 2			140605	46° 00'	123° 16'	SWNE	Yes (Stream)	MF	1	Nehalem R.
		060514D	140605	46° 00'	123° 16'	SWNE	Yes (Wetland)			
		060514F	140605	46° 00'	123° 16'	SENE	Yes (Wetland)			
	3	060514A	140605	46° 00'	123° 16'	NESE, SENE	Yes (Wetland)			
Lyons Creek -- 3			140605	46° 00'	123° 16'	NESE	Yes (Stream)	SF	4	Nehalem R.
		060514B	140605	46° 00'	123° 15'	SESE	Yes (Wetland)			
Messing Creek -- 4			130605	46° 00'	123° 15'	SWSW	Yes (Stream)	MF	1	Nehalem R.
		060524C	240605	45° 59'	123° 15'	SWNW	Yes (Wetland)			
Battle Creek -- 5			300604	45° 59'	123° 13'	NENE	Yes (Stream)	LF	1	Nehalem R.
Unnamed Creek -- 6			290604	45° 59'	123° 13'	NWSW	Yes (Stream)	SN	4	Nehalem R.
	7	060429C	290604	46° 00'	123° 16'	NESW	Yes (Wetland)			
Unnamed Creek -- 7			290604	46° 00'	123° 16'	NESW	Yes (Stream)	SN	4	Nehalem R.
Nehalem River -- 8			290604	45° 58'	123° 12'	NWSE	Yes (Stream)	LF	1	Nehalem Bay
		060429F	290604	45° 58'	123° 11'	NENE	Yes (Wetland)			
		060428A	280604	45° 58'	123° 11'	SWSW	Yes (Wetland)			
		060428B	280604	45° 58'	123° 11'	SWSW	Yes (Wetland)			
	9	060433J	330604	45° 58'	123° 11'	NENW	Yes (Wetland)			
Unnamed Creek -- 9			330604	45° 58'	123° 11'	NENW	Yes (Stream)	SN	4	Nehalem R.
Unnamed Creek -- 10			330604	45° 57'	123° 11'	SENW	Yes (Stream)	SN	4	Nehalem R.
		060433A	330604	45° 57'	123° 11'	SENW	Yes (Wetland)			
		060433C	330604	45° 57'	123° 11'	SENW	Yes (Wetland)			
	11	060433D	330604	45° 57'	123° 11'	NESW	Yes (Wetland)			
Unnamed Creek -- 11			330604	45° 57'	123° 11'	NESW	Yes (Stream)	SN	4	Nehalem R.
	12	060433E	330604	45° 57'	123° 11'	SESW	Yes (Wetland)			
Unnamed Creek -- 12			330604	45° 57'	123° 11'	SESW	Yes (Stream)	SF	3	Nehalem R.
		060433F	330604	45° 57'	123° 11'	SESW	Yes (Wetland)			
		060433G	330604	45° 57'	123° 11'	SWSE	Yes (Wetland)			
	13	060433H	330604	45° 57'	123° 11'	SESE	Yes (Wetland)			
Unnamed Creek -- 13			330604	45° 57'	123° 11'	SESE	Yes (Stream)	SF	3	Nehalem R.

Wetland and Stream Crossing Locations and Stream Types

Waterway Crossing (Name--D&M Number)	Wetland Spans Nearby Waterway	Wetland Crossing ID Number	Waterway Crossing Location Section, Township, and Range Latitude and Longitude			1/4 of 1/4 Section	COE Jurisdiction	ODF Stream Type	Habitat Category	Tributary To
	14	060433I	330604	45° 57'	123° 11'	SESE	Yes (Wetland)			
Unnamed Creek -- 14			330604	45° 57'	123° 11'	SESE	Yes (Stream)	SN	4	Nehalem R.
	15	050404A	040504	45° 57'	123° 10'	NENE	Yes (Wetland)			
Unnamed Creek -- 15			040504	45° 57'	123° 10'	NENE	Yes (Stream)	SN	4	Nehalem R.
		050403A	030504	45° 57'	123° 10'	SWNW	Yes (Wetland)			
Fall Creek -- 16			030504	45° 56'	123° 10'	SWSW	Yes (Stream)	MF	1	Nehalem R.
	17	050410D	100504	45° 56'	123° 10'	NENW	Yes (Wetland)			
Unnamed Creek -- 17			100504	45° 56'	123° 10'	NENW	Yes (Stream)	SN	4	Fall Creek
		050410C	100504	45° 56'	123° 10'	NENW	Yes (Wetland)			
	18	050410E	100504	45° 56'	123° 10'	SENW	Yes (Wetland)			
Unnamed Creek -- 18			100504	45° 56'	123° 10'	SENW	Yes (Stream)	SF	3	Nehalem R.
	19	050410F	100504	45° 55'	123° 10'	NESW	Yes (Wetland)			
Unnamed Creek -- 19			100504	45° 55'	123° 10'	NESW	Yes (Stream)	SF	3	Nehalem R.
		050410A	100504	45° 55'	123° 10'	NWSE	Yes (Wetland)			
Crooked Creek -- 20			100504	45° 55'	123° 10'	NWSE	Yes (Stream)	LF	1	Nehalem R.
Unnamed Creek -- 21			100504	45° 55'	123° 09'	SESE	Yes (Stream)	SN	4	Nehalem R.
Unnamed Creek -- 22			100504	45° 55'	123° 09'	SESE	Yes (Stream)	SN	4	Nehalem R.
		050410G	100504	45° 55'	123° 09'	NENE	Yes (Wetland)			
	23	050414A	140504	45° 54'	123° 09'	NESW	Yes (Wetland)			
Unnamed Creek -- 23			140504	45° 54'	123° 09'	NESW	Yes (Stream)	SF	3	Nehalem R.
	24	050414D	140504	45° 54'	123° 09'	NESW	Yes (Wetland)			
Unnamed Creek -- 24			140504	45° 54'	123° 09'	NESW	Yes (Stream)	SN	4	Nehalem R.
		050414E	140504	45° 54'	123° 09'	SESW	Yes (Wetland)			
	25	050414F	140504	45° 54'	123° 09'	SWSW	Yes (Wetland)			
Unnamed Creek -- 25			140504	45° 54'	123° 09'	SESW	Yes (Stream)	SN	4	Nehalem R.
		050423D	230504	45° 54'	123° 09'	NWNW	Yes (Wetland)			
Nehalem River -- 26			230504	45° 53'	123° 09'	SWNW	Yes (Stream)	LF	1	Nehalem Bay
Unnamed Creek -- 27			260504	45° 53'	123° 08'	SWSE	Yes (Stream)	SN	4	Nehalem R.
	28	050436B	360504	45° 52'	123° 08'	SESW	Yes (Wetland)			
Unnamed Creek -- 28			360504	45° 52'	123° 08'	SESW	Yes (Stream)	SN	4	Elk Creek
Elk Creek -- 29			360504	45° 52'	123° 07'	SWSE	Yes (Stream)	MF	1	E. Fk. Nehalem R.
E. Fork Nehalem River -- 30			360504	45° 52'	123° 06'	SWSE	Yes (Stream)	LF	1	Nehalem River
Unnamed Creek -- 31			010404	45° 52'	123° 07'	NENE	Yes (Stream)	SN	4	E. Fk. Nehalem R.
Unnamed Creek -- 32			010404	45° 52'	123° 07'	NEME	Yes (Stream)	SN	4	E. Fk. Nehalem R.
Unnamed Creek -- 33			010404	45° 52'	123° 07'	NENE	Yes (Stream)	SN	4	E. Fk. Nehalem R.

Waterway Crossing (Name--D&M Number)	Wetland Spans Nearby Waterway	Wetland Crossing ID Number	Waterway Crossing Location Section, Township, and Range Latitude and Longitude			1/4 of 1/4 Section	COE Jurisdiction	ODF Stream Type	Habitat Category	Tributary To
	34	040306B	060403	45° 52'	123° 07'	SWNW	Yes (Wetland)			
Kenusky Creek -- 34			060403	45° 52'	123° 07'	SWNW	Yes (Stream)	LF	1	E. Fk. Nehalem R.
E. Fork Nehalem River -- 35			070403	45° 51'	123° 06'	NWNW	Yes (Stream)	LF	1	Nehalem River
Unnamed Creek -- 36			070403	45° 50'	123° 07'	SWSW	Yes (Stream)	SN	4	Elk Cr.
Unnamed Creek -- 37			250404	45° 49'	123° 07'	NENE	Yes (Stream)	SN	4	Jim George Cr.
	38	040425F	250404	45° 48'	123° 07'	SENE	Yes (Wetland)			
Unnamed Creek -- 38			250404	45° 48'	123° 07'	SENE	Yes (Stream)	SN	4	Coal Cr.
	39	040425C	250404	45° 48'	123° 07'	NESE	Yes (Wetland)			
Unnamed Creek -- 39			250404	45° 48'	123° 07'	NESE	Yes (Stream)	SN	4	Coal Cr.
		040425B	250404	45° 48'	123° 07'	NESE	Yes (Wetland)			
		040425A	250404	45° 48'	123° 07'	NESE	Yes (Wetland)			
		040430A	250404	45° 48'	123° 07'	SESE	Yes (Wetland)			
	40	040436B	360404	45° 48'	123° 07'	NWNE	Yes (Wetland)			
Unnamed Creek -- 40			360404	45° 48'	123° 07'	NWNE	Yes (Stream)	SN	4	Coal Cr.
	41	040436A	360404	45° 48'	123° 07'	NWNE	Yes (Wetland)			
Unnamed Creek -- 41			360404	45° 48'	123° 07'	NWNE	Yes (Stream)	SN	4	Coal Cr.
Unnamed Creek -- 42			360404	45° 47'	123° 07'	SENE	Yes (Stream)	SN	4	Coal Cr.
	43	040331B	310403	45° 47'	123° 06'	SWSW	Yes (Wetland)			
Unnamed Creek -- 43			310403	45° 47'	123° 06'	SWSW	Yes (Stream)	SN	4	Coal Cr.
	44	040331A	310403	45° 47'	123° 06'	SWSW	Yes (Wetland)			
Unnamed Creek -- 44			310403	45° 47'	123° 06'	SWSW	Yes (Stream)	SN	4	Coal Cr.
	45	030401E	010304	45° 47'	123° 07'	NENE	Yes (Wetland)			
Unnamed Creek -- 45			010304	45° 47'	123° 07'	NENE	Yes (Stream)	SN	4	Campbell Cr.
	46	030401D	010304	45° 47'	123° 07'	NENE	Yes (Wetland)			
Unnamed Creek -- 46			010304	45° 47'	123° 07'	NENE	Yes (Stream)	SN	4	Campbell Cr.
	47	030401C	010304	45° 47'	123° 07'	SENE	Yes (Wetland)			
Unnamed Creek -- 47			010304	45° 47'	123° 07'	SENE	Yes (Stream)	SN	4	Campbell Cr.
	48	030401B	010304	45° 46'	123° 07'	NWSE	Yes (Wetland)			
Unnamed Creek -- 48			010304	45° 46'	123° 07'	NWSE	Yes (Stream)	SN	4	Campbell Cr.
	49	030401A	010304	45° 46'	123° 07'	SWSE	Yes (Wetland)			
Unnamed Creek -- 49			010304	45° 46'	123° 07'	SWSE	Yes (Stream)	SN	4	Campbell Cr.
		030412A	120304	45° 46'	123° 07'	SENW, SWNE	Yes (Wetland)			
	50	030412B	120304	45° 46'	123° 07'	SENW	Yes (Wetland)			
Roundy Creek -- 50			120304	45° 46'	123° 07'	SENW	Yes (Stream)	SF	4	E. Fk. Dairy Cr.

Wetland and Stream Crossing Locations and Stream Types

Waterway Crossing (Name--D&M Number)	Wetland Spans Nearby Waterway	Wetland Crossing ID Number	Waterway Crossing Location Section, Township, and Range Latitude and Longitude			1/4 of 1/4 Section	COE Jurisdiction	ODF Stream Type	Habitat Category	Tributary To
E. Fork Dairy Creek -- 51			280303	45° 43'	123° 04'	NWNW	Yes (Stream)	LF	2	Dairy Creek
Unnamed Creek -- 52			280303	45° 43'	123° 04'	SENW	Yes (Stream)	SN	2	E. Fk. Dairy Cr.
Unnamed Creek -- 53			280303	45° 42'	123° 04'	NESW	Yes (Stream)	SN	4	E. Fk. Dairy Cr.
Plentywater Creek -- 54			280303	45° 43'	123° 04'	NESW	Yes (Stream)	MF	2	E. Fk. Dairy Cr.
Unnamed Creek -- 55			280303	45° 43'	123° 04'	SESW	Yes (Stream)	SN	4	E. Fk. Dairy Cr.
		030333B	330303	45° 42'	123° 04'	SESW	Yes (Wetland)			
Unnamed Creek -- 56			330303	45° 42'	123° 04'	SESW	Yes (Stream)	SF	2	E. Fk. Dairy Cr.
Unnamed Creek -- 57			040203	45° 41'	123° 04'	NESW	Yes (Stream)	SF	2	E. Fk. Dairy Cr.
	58	020309A	090203	45° 41'	123° 04'	NWNE	Yes (Wetland)			
Unnamed Creek -- 58			090203	45° 41'	123° 04'	NWNE	Yes (Stream)	SF	2	E. Fk. Dairy Cr.
	59	020309B	090203	45° 40'	123° 03'	NWSE	Yes (Wetland)			
Unnamed Creek -- 59			090203	45° 40'	123° 03'	NWSE	Yes (Stream)	SN	4	E. Fk. Dairy Cr.
		020309C	090203	45° 40'	123° 03'	SESE	Yes (Wetland)			
		020316A	160203	45° 40'	123° 03'	NENE	Yes (Wetland)			
Unnamed Creek -- 60			160203	45° 40'	123° 03'	NENE	Yes (Stream)	SF	2	E. Fk. Dairy Cr.
	61	020322D	220203	45° 39'	123° 03'	NENW	Yes (Wetland)			
Ditch -- 61			150203	45° 39'	123° 03'	NWSW	Yes (Stream)	Ditch	4	E. Fk. Dairy Cr.
		020322E	220203	45° 38'	123° 02'	SENW, SWNE, NWSE	Yes (Wetland)			
		020322A	220203	45° 38'	123° 02'	NWSE	Yes (Wetland)			
Gumm Creek -- 62			220203	45° 38'	123° 02'	SESE	Yes (Stream)	MF	4	E. Fk. Dairy Cr.
Gumm Creek -- 63			270203	45° 38'	123° 02'	SESE	Yes (Stream)	MF	4	E. Fk. Dairy Cr.
	64 & 65	020335A	260203	45° 37'	123° 01'	SESW, NESW	Yes (Wetland)			
Gumm Creek -- 64			260203	45° 37'	123° 01'	SESW	Yes (Stream)	MF	4	E. Fk. Dairy Cr.
Farm Pond Outlet -- 65			260203	45° 37'	123° 01'	SESW	Yes (Stream)	Ditch	3	E. Fk. Dairy Cr.

ODF Stream Types

Stream Class: F=Anadromous, game, threatened, or endangered fish species present in stream, N=Stream does not qualify as a fish (F) stream is not used as a domestic water supply.

Stream Size: L=Large stream, M=Medium stream, S=Small stream

Habitat Category

1= Exceptional value, 2=High value, 3=High to medium value, 4=Low value.

Wetland Impact Calculations

Wetland Crossing ID Number	Waterway Location (sec,twn,rge)	Volume of Excavation and Backfill (yd^3)	Soils	Acreage of Impacts by Wetland Type			
				Palustrine Forested	Palustrine Scrub-Shrub	Palustrine Emergent	Palustrine Open Water
060511A	110605	36	Braun-Scaponia Silt Loam	0.02		0.01	
060514G	140605	135	Braun-Scaponia Silt Loam	0.09		0.03	
060514C	140605	103	Hapludalfs-Udifluvents Complex	0.05		0.04	
060514D	140605	36	Treharne Silt Loam			0.03	
060514F	140605	176	Treharne Silt Loam			0.16	
060514A	140605	270	Treharne Silt Loam	0.05		0.18	0.01
060514B	140605	197	Treharne Silt Loam				0.17
060524C	240605	67	Treharne Silt Loam	0.09			
060429C	290604	20	Treharne Silt Loam	0.01			
060429F	290604	104	Natal Silty Clay Loam			0.16	
060428A	280604	1	Kenusky Silty Clay Loam	0.1			
060428B	280604	1493	Kenusky Silty Clay Loam			2.15	
060433J	330604	52	Kenusky Silty Clay Loam			0.05	
060433A	330604	26	Kenusky Silty Clay Loam			0.01	
060433C	330604	290	Mayger Silt Loam	0.13		0.13	
060433D	330604	31	Mayger Silt Loam	0.01		0.01	
060433E	330604	104	Mayger Silt Loam			0.07	
060433F	330604	36	Mayger Silt Loam	0.01		0.01	
060433G	330604	26	Mayger Silt Loam	0.01		0.01	
060433H	330604	41	Mayger Silt Loam	0.02		0.01	
060433I	330604	31	Mayger Silt Loam	0.01		0.01	
050404A	040504	11	Glohm Silt Loam			0.02	
050403A	030504	643	Mayger Silt Loam	0.16		0.35	
050410D	100504	16	Scaponia-Braun Silt Loam		0.01		
050410C	100504	16	Scaponia-Braun Silt Loam			0.01	

Wetland Crossing ID Number	Waterway Location (sec,twn,rge)	Volume of Excavation and Backfill (yd^3)	Soils	Acreage of Impacts by Wetland Type			
				Palustrine Forested	Palustrine Scrub-Shrub	Palustrine Emergent	Palustrine Open Water
050410E	100504	16	Scaponia-Braun Silt Loam		0.01		
050410F	100504	16	Mayger Silt Loam		0.01		
050410A	100504	83	Treharne Silt Loam			0.07	
050410G	100504	290	Mayger Silt Loam			0.13	
050414A	140504	26	Eilertsen Silt Loam	0.02		0.01	
050414D	140504	31	Natal Silty Clay Loam		0.01	0.02	
050414E	140504	21	Natal Silty Clay Loam			0.01	
050414F	140504	31	Natal Silty Clay Loam		0.01		
050423D	230504	31	Natal Silty Clay Loam		0.01		
050436B	360504	7	Glohm Silt Loam			0.01	
040306B	060403	52	Hapludalfs-Udifluvents Complex			0.04	
040425F	250404	41	Scaponia-Braun Silt Loam			0.03	
040425C	250404	52	Tolany Loam		0.04		
040425B	250404	83	Scaponia-Braun Silt Loam			0.07	
040425A	250404	233	Scaponia-Braun Silt Loam			0.21	
040430A	300404	73	Scaponia-Braun Silt Loam			0.04	
040436B	360404	363	Tolany Loam		0.28	0.12	
040436A	360404	31	Tolany Loam		0.01	0.01	
040331B	310403	7	Tolany Loam			0.01	
040331A	310403	62	Tolany Loam			0.04	
030401E	010304	23	Melby Silt Loam	0.02			
030401D	010304	62	Olyic Silt Loam	0.07			
030401C	010304	21	Olyic Silt Loam	0.02			
030401B	010304	52	Olyic Silt Loam	0.14			
030401A	010304	21	Melby Silt Loam	0.01			
030412A	120304	52	Melby Silt Loam		0.02	0.01	

Wetland Impact Calculations

Wetland Crossing ID Number	Waterway Location (sec,twn,rge)	Volume of Excavation and Backfill (yd^3)	Soils	Acreage of Impacts by Wetland Type			
				Palustrine Forested	Palustrine Scrub-Shrub	Palustrine Emergent	Palustrine Open Water
030412B	120304	290	Melby Silt Loam			0.23	
030333B	330303	612	McBee Silty Clay Loam			0.81	
020309A	090203	104	Woodburn Silt Loam	0.09			
020309B	090203	1	Amity Silt Loam	0.02		0.03	
020309C	090203	160	Woodburn Silt Loam	0.11		0.04	
020316A	160203	16	Woodburn Silt Loam			0.01	
020322D	220203	404	Wapato Silty Clay Loam			0.54	
020322E	220203	1711	Wapato Silty Clay Loam			2.65	
020322A	220203	985	Wapato Silty Clay Loam			1.74	
020335A	350203	1815	Wapato Silty Clay Loam			2.81	
Totals		11839		1.26	0.41	13.14	0.18

Stream Crossing Impact Calculations

Waterway crossing (Name--D&M Number)	Waterway Location (sec, twn, rge)	Volume of Excavation and Backfill (yd^3)
Unnamed Creek -- 1	110605	1.9
Lindgren Creek -- 2	140605	23.7
Lyons Creek -- 3	140605	3.0
Messing Creek -- 4	130605	11.9
Battle Creek -- 5	300604	2.2
Unnamed Creek -- 6	290604	1.5
Unnamed Creek -- 7	290604	3.0
Nehalem River -- 8	290604	BORE
Unnamed Creek -- 9	330604	0.7
Unnamed Creek -- 10	330604	2.2
Unnamed Creek -- 11	330604	1.5
Unnamed Creek -- 12	330604	1.5
Unnamed Creek -- 13	330604	3.0
Unnamed Creek -- 14	330604	1.5
Unnamed Creek -- 15	040504	1.5
Fall Creek -- 16	030504	8.9
Unnamed Creek -- 17	100504	1.5
Unnamed Creek -- 18	100504	1.9
Unnamed Creek -- 19	100504	1.9
Crooked Creek -- 20	100504	29.6
Unnamed Creek -- 21	100504	1.5
Unnamed Creek -- 22	100504	1.5
Unnamed Creek -- 23	140504	1.5
Unnamed Creek -- 24	140504	0.7
Unnamed Creek -- 25	140504	2.2
Nehalem River -- 26	230504	BORE
Unnamed Creek -- 27	260504	0.9
Unnamed Creek -- 28	360504	2.2
Elk Creek -- 29	360504	BORE
E. Fork Nehalem River -- 30	360504	BORE
Unnamed Creek -- 31	010404	0.7
Unnamed Creek -- 32	010404	0.7
Unnamed Creek -- 33	010404	0.4
Kenusky Creek -- 34	060403	20.7
E. Fork Nehalem River -- 35	070403	BORE
Unnamed Creek -- 36	070403	0.4

Stream Crossing Impact Calculations

Waterway crossing (Name--D&M Number)	Waterway Location (sec, twn, rge)	Volume of Excavation and Backfill (yd^3)
Unnamed Creek -- 37	250404	4.4
Unnamed Creek -- 38	250404	3.7
Unnamed Creek -- 39	250404	4.4
Unnamed Creek -- 40	360404	3.0
Unnamed Creek -- 41	360404	3.0
Unnamed Creek -- 42	360404	2.2
Unnamed Creek -- 43	310403	2.2
Unnamed Creek -- 44	310403	1.5
Unnamed Creek -- 45	010304	5.9
Unnamed Creek -- 46	010304	0.4
Unnamed Creek -- 47	010304	1.9
Unnamed Creek -- 48	010304	1.5
Unnamed Creek -- 49	010304	4.4
Roundy Creek -- 50	120304	3.0
E. Fork Dairy Creek -- 51	280303	44.4
Unnamed Creek -- 52	280303	2.2
Unnamed Creek -- 53	280303	0.7
Plentywater Creek -- 54	280303	14.8
Unnamed Creek -- 55	280303	0.4
Unnamed Creek -- 56	330303	6.7
Unnamed Creek -- 57	040203	5.6
Unnamed Creek -- 58	090203	5.9
Unnamed Creek -- 59	090203	1.5
Unnamed Creek -- 60	160203	4.4
Ditch -- 61	150203	5.9
Gumm Creek -- 62	220203	5.9
Gumm Creek -- 63	270203	13.3
Gumm Creek -- 64	260203	17.8
Farm Pond Outlet -- 65	260203	14.8

BORE: The stream will be crossed by directional drilling methodology. There will be no impact to the streambed.

Total Volume of Excavation and Backfill (cubic yards): 322.7

Construction Method, Water Quality and Fisheries Impacts and Mitigation

Waterway Crossing (Name--D&M Number)	Wetland Spans Nearby Waterway	Wetland Crossing ID Number	Crossing Method	COE Jurisdiction	Water Quality Impacts	Water Quality Mitigation	Fisheries Impacts	Fisheries Mitigation	Riparian Vegetation
	1	060511A		Yes (Wetland)					
Unnamed Creek -- 1			TRENCH	Yes (Stream)	SED	ESC, AV	NF		G
		060514G		Yes (Wetland)	SED	ESC, AV			
	2	060514C		Yes (Wetland)	SED	ESC, AV			
Lindgren Creek -- 2			F or D	Yes (Stream)	SED	ESC, AV	FT, SED, SH	RS, ESC, AV	G
		060514D		Yes (Wetland)	SED	ESC, AV			
		060514F		Yes (Wetland)	SED	ESC, AV			
	3	060514A		Yes (Wetland)	SED	ESC, AV			
Lyons Creek -- 3			TRENCH	Yes (Stream)	SED	ESC, AV	SED	ESC, AV	G
		060514B		Yes (Wetland)	SED	ESC, AV			
Messing Creek -- 4			F or D	Yes (Stream)	SED	ESC, AV	FT, SED, SH	RS, ESC, AV	G
		060524C		Yes (Wetland)	SED	ESC, AV			
Battle Creek -- 5			F or D	Yes (Stream)	SED	ESC, AV	FT, SED, SH	RS, ESC, AV	T
Unnamed Creek -- 6				Yes (Stream)	SED	ESC, AV	NF		T
	7	060429C		Yes (Wetland)	SED	ESC, AV			
Unnamed Creek -- 7			TRENCH	Yes (Stream)	SED	ESC, AV	NF		T
Nehalem River -- 8			BORE	Yes (Stream)	NI		NI		NI
		060429F		Yes (Wetland)	SED	ESC, AV			
		060428A		Yes (Wetland)	SED	ESC, AV			
		060428B		Yes (Wetland)	SED	ESC, AV			
	9	060433J		Yes (Wetland)	SED	ESC, AV			
Unnamed Creek -- 9			TRENCH	Yes (Stream)	SED	ESC, AV	NF		G
Unnamed Creek -- 10			TRENCH	Yes (Stream)	SED	ESC, AV	NF		G
		060433A		Yes (Wetland)	SED	ESC, AV			
		060433C		Yes (Wetland)	SED	ESC, AV			
	11	060433D		Yes (Wetland)	SED	ESC, AV			
Unnamed Creek -- 11			TRENCH	Yes (Stream)	SED	ESC, AV	NF		G
	12	060433E		Yes (Wetland)	SED	ESC, AV			
Unnamed Creek -- 12			TRENCH	Yes (Stream)	SED	ESC, AV	SED, SH	ESC, AV, RS	G
		060433F		Yes (Wetland)	SED	ESC, AV			

Construction Method, Water Quality and Fisheries Impacts and Mitigation

Waterway Crossing (Name--D&M Number)	Wetland Spans Nearby Waterway	Wetland Crossing ID Number	Crossing Method	COE Jurisdiction	Water Quality Impacts	Water Quality Mitigation	Fisheries Impacts	Fisheries Mitigation	Riparian Vegetation
		060433G		Yes (Wetland)	SED	ESC, AV			
	13	060433H		Yes (Wetland)	SED	ESC, AV			
Unnamed Creek -- 13			TRENCH	Yes (Stream)	SED	ESC, AV	SED, SH	ESC, AV, RS	G
	14	060433I		Yes (Wetland)	SED	ESC, AV			
Unnamed Creek -- 14			TRENCH	Yes (Stream)	SED	ESC, AV	NF		G
	15	050404A		Yes (Wetland)	SED	ESC, AV			
Unnamed Creek -- 15			TRENCH	Yes (Stream)	SED	ESC, AV	NF		G
		050403A		Yes (Wetland)	SED	ESC, AV			
Fall Creek -- 16			F or D	Yes (Stream)	SED	ESC, AV	FT, SED, SH	RS, ESC, AV	G/S
	17	050410D		Yes (Wetland)	SED	ESC, AV			
Unnamed Creek -- 17			TRENCH	Yes (Stream)	SED	ESC, AV	NF		G
		050410C		Yes (Wetland)	SED	ESC, AV			
	18	050410E		Yes (Wetland)	SED	ESC, AV			
Unnamed Creek -- 18			TRENCH	Yes (Stream)	SED	ESC, AV	SED, SH	ESC, AV, RS	G
	19	050410F		Yes (Wetland)	SED	ESC, AV			
Unnamed Creek -- 19			TRENCH	Yes (Stream)	SED	ESC, AV	SED, SH	ESC, AV, RS	G
		050410A		Yes (Wetland)	SED	ESC, AV			
Crooked Creek -- 20			F or D	Yes (Stream)	SED	ESC, AV	FT, SED, SH	RS, ESC, AV	G
Unnamed Creek -- 21			TRENCH	Yes (Stream)	SED	ESC, AV	NF		G
Unnamed Creek -- 22			TRENCH	Yes (Stream)	SED	ESC, AV	NF		S
		050410G		Yes (Wetland)	SED	ESC, AV			
	23	050414A		Yes (Wetland)	SED	ESC, AV			
Unnamed Creek -- 23			TRENCH	Yes (Stream)	SED	ESC, AV	SED, SH	ESC, AV, RS	G
	24	050414D		Yes (Wetland)	SED	ESC, AV			
Unnamed Creek -- 24			TRENCH	Yes (Stream)	SED	ESC, AV	NF		G
		050414E		Yes (Wetland)	SED	ESC, AV			
	25	050414F		Yes (Wetland)	SED	ESC, AV			
Unnamed Creek -- 25			TRENCH	Yes (Stream)	SED	ESC, AV	NF		G
		050423D		Yes (Wetland)	SED	ESC, AV			
Nehalem River -- 26			BORE	Yes (Stream)	NI		NI		NI
Unnamed Creek -- 27			TRENCH	Yes (Stream)	SED	ESC, AV	NF		T

Construction Method, Water Quality and Fisheries Impacts and Mitigation

Waterway Crossing (Name--D&M Number)	Wetland Spans Nearby Waterway	Wetland Crossing ID Number	Crossing Method	COE Jurisdiction	Water Quality Impacts	Water Quality Mitigation	Fisheries Impacts	Fisheries Mitigation	Riparian Vegetation
	28	050436B		Yes (Wetland)	SED	ESC, AV			
Unnamed Creek -- 28			TRENCH	Yes (Stream)	SED	ESC, AV	NF		G
Elk Creek -- 29			BORE	Yes (Stream)	NI		NI		NI
E. Fork Nehalem River -- 30			BORE	Yes (Stream)	NI		NI		NI
Unnamed Creek -- 31			TRENCH	Yes (Stream)	SED	ESC, AV	NF		G
Unnamed Creek -- 32			TRENCH	Yes (Stream)	SED	ESC, AV	NF		S
Unnamed Creek -- 33			TRENCH	Yes (Stream)	SED	ESC, AV	NF		G
	34	040306B		Yes (Wetland)	SED	ESC, AV			
Kenusky Creek -- 34			F or D	Yes (Stream)	SED	ESC, AV	FT, SED, SH	RS, ESC, AV	G/S
E. Fork Nehalem River -- 35			BORE	Yes (Stream)	NI		NI		NI
Unnamed Creek -- 36			TRENCH	Yes (Stream)	SED	ESC, AV	NF		G
Unnamed Creek -- 37			TRENCH	Yes (Stream)	SED	ESC, AV	NF		G
	38	040425F		Yes (Wetland)	SED	ESC, AV			
Unnamed Creek -- 38			TRENCH	Yes (Stream)	SED	ESC, AV	NF		G
	39	040425C		Yes (Wetland)	SED	ESC, AV			
Unnamed Creek -- 39			TRENCH	Yes (Stream)	SED	ESC, AV	NF		G
		040425B		Yes (Wetland)	SED	ESC, AV			
		040425A		Yes (Wetland)	SED	ESC, AV			
		040430A		Yes (Wetland)	SED	ESC, AV			
	40	040436B		Yes (Wetland)	SED	ESC, AV			
Unnamed Creek -- 40			TRENCH	Yes (Stream)	SED	ESC, AV	NF		G
	41	040436A		Yes (Wetland)	SED	ESC, AV			
Unnamed Creek -- 41			TRENCH	Yes (Stream)	SED	ESC, AV	NF		G
Unnamed Creek -- 42			TRENCH	Yes (Stream)	SED	ESC, AV	NF		G
	43	040331B		Yes (Wetland)	SED	ESC, AV			
Unnamed Creek -- 43			TRENCH	Yes (Stream)	SED	ESC, AV	NF		T
	44	040331A		Yes (Wetland)	SED	ESC, AV			
Unnamed Creek -- 44			TRENCH	Yes (Stream)	SED	ESC, AV	NF		T
	45	030401E		Yes (Wetland)	SED	ESC, AV			
Unnamed Creek -- 45			TRENCH	Yes (Stream)	SED	ESC, AV	NF		G
	46	030401D		Yes (Wetland)	SED	ESC, AV			

Construction Method, Water Quality and Fisheries Impacts and Mitigation

Waterway Crossing (Name--D&M Number)	Wetland Spans Nearby Waterway	Wetland Crossing ID Number	Crossing Method	COE Jurisdiction	Water Quality Impacts	Water Quality Mitigation	Fisheries Impacts	Fisheries Mitigation	Riparian Vegetation
Unnamed Creek -- 46			TRENCH	Yes (Stream)	SED	ESC, AV	NF		G
	47	030401C		Yes (Wetland)	SED	ESC, AV			
Unnamed Creek -- 47			TRENCH	Yes (Stream)	SED	ESC, AV	NF		G
	48	030401B		Yes (Wetland)	SED	ESC, AV			
Unnamed Creek -- 48			TRENCH	Yes (Stream)	SED	ESC, AV	NF		G
	49	030401A		Yes (Wetland)	SED	ESC, AV			
Unnamed Creek -- 49			TRENCH	Yes (Stream)	SED	ESC, AV	NF		G
		030412A		Yes (Wetland)	SED	ESC, AV			
	50	030412B		Yes (Wetland)	SED	ESC, AV			
Roundy Creek -- 50			TRENCH	Yes (Stream)	SED	ESC, AV	SED	ESC, AV	G
E. Fork Dairy Creek -- 51			TRENCH	Yes (Stream)	SED	ESC, AV	SED, SH	ESC, AV, RS	G
Unnamed Creek -- 52			TRENCH	Yes (Stream)	SED	ESC, AV	SED, SH	ESC, AV, RS	S
Unnamed Creek -- 53			TRENCH	Yes (Stream)	SED	ESC, AV	NF		S
Plentywater Creek -- 54			TRENCH	Yes (Stream)	SED	ESC, AV	SED, SH	ESC, AV, RS	T
Unnamed Creek -- 55			TRENCH	Yes (Stream)	SED	ESC, AV	NF		T/S
		030333B		Yes (Wetland)	SED	ESC, AV			
Unnamed Creek -- 56			TRENCH	Yes (Stream)	SED	ESC, AV	SED, SH	ESC, AV, RS	G
Unnamed Creek -- 57			TRENCH	Yes (Stream)	SED	ESC, AV	SED, SH	ESC, AV, RS	T
	58	020309A		Yes (Wetland)	SED	ESC, AV			
Unnamed Creek -- 58			TRENCH	Yes (Stream)	SED	ESC, AV	SED, SH	ESC, AV, RS	S
	59	020309B		Yes (Wetland)	SED	ESC, AV			
Unnamed Creek -- 59			TRENCH	Yes (Stream)	SED	ESC, AV	NF		G
		020309C		Yes (Wetland)	SED	ESC, AV			
		020316A		Yes (Wetland)	SED	ESC, AV			
Unnamed Creek -- 60			TRENCH	Yes (Stream)	SED	ESC, AV	SED, SH	ESC, AV, RS	T/S
	61	020322D		Yes (Wetland)	SED	ESC, AV			
Ditch -- 61			TRENCH	Yes (Stream)	SED	ESC, AV	Ditch	Ditch	G
		020322E		Yes (Wetland)	SED	ESC, AV			
		020322A		Yes (Wetland)	SED	ESC, AV			
Gumm Creek -- 62			TRENCH	Yes (Stream)	SED	ESC, AV	SED	ESC	G
Gumm Creek -- 63			TRENCH	Yes (Stream)	SED	ESC, AV	SED	ESC	G

Construction Method, Water Quality and Fisheries Impacts and Mitigation

Waterway Crossing (Name--D&M Number)	Wetland Spans Nearby Waterway	Wetland Crossing ID Number	Crossing Method	COE Jurisdiction	Water Quality Impacts	Water Quality Mitigation	Fisheries Impacts	Fisheries Mitigation	Riparian Vegetation
	64 & 65	020335A		Yes (Wetland)	SED	ESC, AV			
Gumm Creek -- 64			TRENCH	Yes (Stream)	SED	ESC, AV	SED	ESC	G
Farm Pond Outlet -- 65			TRENCH	Yes (Stream)	SED	ESC, AV	Ditch	Ditch	G

Crossing Method

TRENCH = Stream will be crossed by a wet or dry trench during low flow season.

BORE = Stream will be crossed by directional drilling.

F or D = Stream will be flumed or diverted during trenching to prevent the release of sediment into the stream channel.

Water Quality Impacts and Mitigation

SED = Suspended Sediment.

ESC = Erosion and Sediment Control.

AV = Avoid tree removal.

Ditch = A man-made waterway (not a channelized streambed) used to divert or collect water.

NI = No impact.

Fisheries Impacts and Mitigation

SED = Suspended sediment.

ESC = Erosion and sediment control.

AV = Avoid tree removal.

Ditch = A man-made waterway (not a channelized streambed) used to divert or collect water.

NI = No impact.

NF = No fish in stream.

SH = Salmonid spawning habitat.

FT = Species federally listed as threatened.

RS = Replace spawning gravels.

Riparian Vegetation: T= Trees, S=Shrubs, G=Grasses and forbes, G/S=Grasses and forbes on one bank with shrubs on the other bank, G/T=Grasses and forbes on one bank with trees on the other bank, T/S=Trees on one bank with shrubs on the other bank.

Item 4 continuation

The design, construction, and operation of the pipeline will not have any adverse impact on any of the listed protected areas. The closest protected areas are the BLM Late Successional Reserve within one mile of the pipeline, and an OSU research forest about five miles from the project area. Other protected areas are found from 10 to over 20 miles from the project area. Because this is an underground pipeline, no adverse impacts are expected to result to any of these protected areas. The pipeline crosses agricultural land and is next to Dairy Creek Road where it is within one mile of the LSR. It should therefore have no impact on this LSR.

The proposed pipeline crosses 61 wetland areas, 8 large streams, 3 medium size streams, and 47 small size streams. When possible, the line was routed away from wetlands and stream crossings.

The area contains potential habitat for two federally listed/proposed species, the northern spotted owl (*Strix occidentalis caurina*) and the coho salmon (*Oncorhynchus kisutch*). The northern spotted owl will not be affected. The pipeline project passes through a patchwork of clear cuts, young forests, and older second growth forests (30-50 years old). Even the second growth forests are not suitable for spotted owl nesting. These forests are small patches surrounded by clear cuts and young forest stands, and they lack the diversity of vegetation, snags, and other habitat features found in a more mature forest canopy. The small amount of forest removed, primarily along existing roads, power line, and gas lines, will not affect the spotted owl.

Coho salmon may be affected, but effects will either not likely be adverse or will be minor. Where possible, streams will be crossed by directional drilling with no effect on critical coho spawning or rearing habitat. Where directional boring is infeasible due to physical restraints, coho salmon streams will be crossed by trenching. Diversions or flumes will be used when trenching salmon streams to prevent sediment release during construction. Instream work will be limited to low flow construction windows to minimize the potential for impacts to salmonids. The top part of the pipeline trench will be filled with substrate matching the excavated material in size and form. Stream banks will be stabilized and restored. Construction will not occur during upstream or downstream migration of coho salmon or during spawning or in-gravel incubation of coho salmon eggs or fry. A temporary increase in turbidity may occur during and slightly after construction at trenched crossings, but restricting instream work to low flow periods before the migration period of coho salmon will prevent any harassment or "take of adult spawners." Construction activities in tributary streams will only last for a few days and upstream migration by adult spawners will not be prevented. No loss of spawning or rearing habitat will occur.

In general, given the terrain and environment of the project area, overall archaeological sensitivity along much of the pipeline route is relatively low. Twelve sites, identified during the 1987 fieldwork, occur along the currently proposed new pipeline route, but no new cultural resources were identified within the reroute corridors. Eight of these are located in the Nehalem Valley, in the vicinity of Natal. The other four are located along the East Fork of Dairy Creek, between the Meacham Corner and Mountaindale areas. A qualified archaeologist will monitor construction in these sensitive areas.

Item 5 continuation

Measures will be taken to minimize impacts to wetlands and waterways. Streams and wetlands have been avoided where possible by changing the alignment of the line or the use of directional boring as the crossing method. Impacts to all wetland habitats will be minimized by: (1) keeping the construction corridor through most wetland areas as narrow as possible (30' or less); (2) avoiding the rest of the wetland area by using adjacent roads for equipment staging where this is possible; (3) timing construction to occur during the driest time of the year (April to late summer); (4) separating and returning topsoil to the trench back-fill surface; and (4) avoiding changes to wetland hydrology by installing clay barriers at each end of the wetland crossing where appropriate for mitigating potential impacts.

Impacts to category 2 and 3 stream and riparian buffers will be minimized by the following methods: (1) Streams will be trenched during low flow periods to minimize sediment entering the stream; (2) The number of stream crossings will be minimized; (3) Effective sediment barriers will be constructed at approaches to channels; (4) Trenched crossings will be completed quickly and temporary stream crossing structures will be removed promptly after use with no blockage of fish migration during seasons when fish movement normally occurs; (5) The pipeline construction will occur during periods of low flow (July 15-August 31 in the Nehalem River basin and July 1-September 30 in the East Fork of Dairy Creek watershed) before adult anadromous salmonids return to their spawning beds and after the emergence of salmonid fry from the gravel; (6) The construction corridor through streams and riparian areas will be kept as narrow as possible (30' or less); (7) Disturbance to stream banks, existing channels, and riparian management areas will be minimized; (8) Machine activity in streambeds will be kept to an absolute minimum; and (9) Streambanks will be stabilized and re-vegetated after construction is completed.

Item 10 continuation

Wetland habitats will be restored to their preconstruction condition within one or two growing seasons, except for forested and shrub dominated areas. Forested or scrub-shrub wetland areas impacted by pipeline construction will become reestablished where the woody vegetation will not interfere with the 40' maintenance corridor. Areas that are converted from forested or shrub-scrub wetlands to emergent wetlands due to pipeline construction and maintenance will be mitigated by replanting an equal amount of degraded emergent wetland with native trees and shrubs (approximately 1.67 acres). This will accomplish the goal of no net loss of habitat units or value.

Aquatic and riparian habitats at stream crossings will be restored to their preconstruction condition within one or two growing seasons, or longer for forested and shrub dominated areas. Forested or scrub-shrub riparian areas impacted by pipeline construction will become reestablished where the woody vegetation will not interfere with the 40' maintenance corridor. Areas of forested or scrub-shrub riparian areas that are converted to grass and forbes due to pipeline construction and maintenance will be mitigated by replanting an equal amount of degraded riparian habitat with native trees and shrubs. This will accomplish the goal of no net loss of habitat units or value.

WETLAND REPORT
SOUTH MIST FEEDER LOOP
24" DIAMETER PIPE

For

NORTHWEST NATURAL GAS
D&M JOB NO.: 02114-018-020
September 15, 1998

TABLE OF CONTENTS

Page

1.0 INTRODUCTION **2**

1.1 PROPOSED PROJECT 2

1.2 WETLAND STUDY 2

2.0 METHODS **2**

2.1 INTRODUCTION 2

2.2 PRELIMINARY DATA COLLECTION 3

2.3 ON SITE DATA COLLECTION 3

2.3.1 Vegetation 4

2.3.2 Soils 4

2.3.3 Hydrology 4

2.4 WETLAND DETERMINATION 5

3.0 RESULTS **5**

3.1 PRELIMINARY DATA 5

3.1.1 Soils 5

3.1.2 Wetland Location/Presence 5

3.1.3 Wetland Functions 5

3.2 WETLAND DESCRIPTIONS 7

3.3 WETLAND IMPACTS AND MITIGATION 17

4.0 REFERENCES **18**

APPENDIX A TABLES 2-5

APPENDIX B VICINITY MAP AND WETLAND LOCATION MAP

APPENDIX C WETLAND SURVEY MAPS

APPENDIX D WETLAND FIELD DATA SHEETS

1.0 INTRODUCTION

1.1 PROPOSED PROJECT

Northwest Natural Gas (NWN) is proposing to build an approximately 40-mile-long pipeline from Mist to North Plains, Oregon. The 24-inch pipeline will begin at the existing Miller Station just north of Mist and end at an existing feeder station just north of the City of North Plains. Much of the proposed alignment is immediately adjacent to an existing 16-inch pipeline. Where the route deviates from the existing pipeline, the revisions have primarily been made to avoid houses, wetlands, or geologically unstable areas. A site vicinity map showing the proposed pipeline route is presented in Appendix B.

1.2 WETLAND STUDY

Wetland biologists conducted field studies along the proposed alignment extending from April through August 1998. Wetlands occurring within the proposed construction corridor were delineated and flagged by Dames & Moore wetland biologists and surveyed by NWN and other contracted surveyors. Potential wetlands occurring within a 200-foot-wide corridor centered on the pipeline route, but outside the impact area, were noted.

This report discusses the methods used to determine wetland locations within the project area; the vegetation, soils, hydrology, and functions of the wetlands identified along the proposed alignment; and impacts associated with construction and operation of the 24-inch pipeline.

2.0 METHODS

2.1 INTRODUCTION

Wetland determinations were made onsite by Dames & Moore wetland biologists using the 1987 US Army Corps of Engineers (Corps) Wetlands Delineation Manual. For regulatory purposes, wetlands are defined as:

> *Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.*

The methodology for wetland delineation is based on the presence of three parameters: hydrophytic vegetation, hydric soils, and wetland hydrology. Hydrophytic vegetation consists of those plant species growing in water, soil, or on a substrate that at least periodically lacks oxygen. Hydric soils are saturated, flooded, or ponded long enough during the growing season to become deoxygenated in the upper soil horizon. Wetland hydrology includes seasonal, periodic, or

permanent inundation or soil saturation that creates anaerobic conditions in the soil for a sufficient portion of the growing season for wetland soil and vegetation to be maintained.

2.2 PRELIMINARY DATA COLLECTION

Existing public information was reviewed to gain specific background knowledge and to identify the potential for wetlands to occur on the project site. Documents reviewed as part of this study include:

- Soil Conservation Service (SCS), Soil Survey of Washington County, Oregon, 1982;
- SCS, Soil Survey of Columbia County, Oregon, 1986;
- Natural Resources Conservation Service (NRCS), Washington County, Oregon, Comprehensive Hydric Soils List, 1995;
- NRCS, Columbia County, Oregon, Comprehensive Hydric Soils List, 1995;
- US Fish and Wildlife Service (USFWS), National Wetland Inventory (NWI) maps: Forest Grove (15 minute), Forest Grove (7.5 minute), Vernonia (15 minute), and Marshland (7.5 minute), Oregon quadrangles; and
- USGS Geological Topographic Survey: Marshland (Provisional Edition 1985), Birkenfeld (1979), Forest Grove (1956, revised 1992), Meacham Corner (1979, revised 1992), Pittsburg (1979), Vernonia, and Baker Point, Oregon quadrangles.

2.3 ON SITE DATA COLLECTION

Wetland biologists walked the proposed pipeline alignment to identify potential wetland areas within a 200-foot-wide study corridor. Field sampling was conducted using the routine methods described in the Corps (1987) manual. Representative plot data were collected in potential wetlands occurring within the proposed construction corridor. Data collected at each plot included information on vegetation, soils, and hydrology. If the plot data indicated that the area was wetland, the wetland area occurring in the construction corridor was delineated. Based on plot information and visual observations of site conditions, wetland boundaries were delineated and flagged in the field with orange or pink stake wire flags and with orange/black striped, orange, or pink flagging. NWN or other contracted professionals surveyed the wetland boundaries and plot location flags. Each wetland occurring along the proposed alignment was given a unique alphanumeric identifier, consisting of six numbers and one alpha character. The first two numbers refer to the township in which the wetland is located, the middle two to the range, and the last two to the section number. The letter following each number is sequential within each section. For example, wetland number 060433A is in township 6 north, range 4 west, section 33 and is the first wetland found in that section as indicated by the letter A. The next wetland found in that section would be 060433B. Potential wetlands occurring beyond the construction corridor, but within the 200-foot-wide survey area, were noted.

2.3.1 Vegetation

The Cowardin (1979) classification system was used to describe wetland types present at each wetland area. The plant species occurring in representative wetland and upland plots were recorded on the field data sheets. Percent cover was estimated for each plant species present in the 12' diameter plot. A plant indicator status designated by the USFWS (Reed 1988, 1993) was assigned to each of the dominant species and a determination was made as to whether the vegetation in each plot was hydrophytic. To meet the hydrophytic vegetation criteria, more than 50% of the dominant species must have an indicator status of obligate, facultative wetland, and/or facultative. Indicator categories and hydrophytic vegetation classification are defined in Table 1.

TABLE 1
PLANT SPECIES WETLAND INDICATOR CATEGORIES

Indicator Category	Occurrence	Probability in Wetlands (estimated)
Obligate (OBL)	Occurs almost always in wetlands under natural conditions.	>99%
Facultative Wetland (FACW)	Usually occurs in wetlands, but occasionally found in non-wetlands.	67-99%
Facultative (FAC)	Equally likely to occur in non-wetlands, but occasionally found in wetlands.	34-66%
Facultative Upland (FACU)	Usually occurs in non-wetlands, but often found in wetlands.	1-33%
Upland (UPL)	Occurs in wetlands in another region, occurs almost always under natural conditions in non-wetlands in this region.	<1%

2.3.2 Soils

Soils were sampled at each plot and evaluated for hydric indicators. Soil pits were dug to a depth of 18 inches unless noted on the field data sheets. Hydric indicators include mottles, gleyed soils, and low soil matrix chroma. Mottles are spots or blotches of contrasting color occurring within the soil matrix. Gleyed soils are predominantly neutral gray in color. A chroma of 2 (occurring with mottles) or less (with or without mottles) is considered to be indicative of a hydric soil (Corps 1987). Hydric soil indicators were recorded on field data sheets.

2.3.3 Hydrology

Direct evidence of wetland hydrology includes surface inundation and soil saturation at or near the soil surface. Direct observations of wetland hydrology are not always possible, especially during the drier times of the year. Indirect indicators of wetland hydrology may be present throughout the year that confirm the occurrence of saturation or inundation for periods of time that satisfy criteria designated by the Corps (1987) manual. Indicators include visible sediment

deposits on substrate and plant surfaces, and water-stained leaves, wetland drainage patterns, and oxidized root channels associated with live roots and rhizomes.

2.4 WETLAND DETERMINATION

Wetland determinations were made at potential wetland areas occurring within an 80-foot-wide corridor along the proposed pipeline alignment. Sampling results for the three parameters (vegetation, soils, and hydrology) were analyzed to determine whether or not each plot was wetland. If the analysis indicated a wetland was present, an overall assessment of the area was made and the boundaries were determined in the field based on plot information and visual observation of site characteristics.

3.0 RESULTS

3.1 PRELIMINARY DATA

3.1.1 Soils

Soils occurring along the proposed pipeline route are listed in Tables 2 and 3 (Appendix A). Of the 15 soil types occurring in Columbia County, two are hydric (Natal silty clay loam and Kenusky silty clay loam, 0 to 15 percent slopes) and six may have areas of hydric soil inclusions. In Washington County, most of the soils are hydric or may have areas of hydric soil inclusions. Of the 23 soil types, four are hydric (Cove clay, Dayton silt loam, Wapato silty clay loam, and Verboort silty clay loam) while 13 may have areas of hydric soil inclusions.

Wetlands would be expected to occur in those areas mapped as having hydric soils and in some areas of hydric soil inclusions.

3.1.2 Wetland Location/Presence

The NWI maps show wetlands occurring along the proposed pipeline alignment. Most of the mapped wetland locations occur along stream corridors that the pipeline crosses.

Based on the topographic maps, wetlands would be expected to occur in some of the drainages, depressional areas, and low-lying floodplain areas that the proposed alignment crosses.

3.1.3 Wetland Functions

Wetland functions were assessed in the field and through review of reference materials. Wetlands perform numerous functions including water quality improvement, flood flow moderation, groundwater recharge and discharge, and biological support. Important wetland functions noted in the field are summarized in the individual wetland descriptions. Habitat categories as listed in Table 5 refer only to the potential wildlife habitat available at each wetland.

Water Quality Improvement

Through a variety of physical, biological, and chemical processes, wetlands function to purify water by removing organic and mineral particulate matter, and water-borne pollutants. Water quality improvement occurs as a result of the natural processes of sedimentation, ion exchange, algal and bacterial degradation of pollutants, aerobic decomposition, and nutrient uptake and recycling (Reppert et al., 1979). Large, densely-vegetated wetlands can support the process of sedimentation, ion exchange, and degradation of pollutants. Factors affecting the ability of the wetland to function in water quality improvement include, but may not be limited to, herbaceous plant density, presence of topographic depressions, and the opportunity to perform this function.

Those wetlands with the greatest potential to improve water quality were located in moderate or large topographic depressions, had moderate or high herbaceous plant cover, and had moderate or high surface water retention time and/or percent sheet flow. Some of the wetlands are limited in their potential to perform this function because of small size and/or inability to retain surface water or because they receive surface waters that are relatively clean when they enter the wetland.

Flood Flow Moderation

Wetlands moderate flood flow by temporarily storing flood waters, slowing flood velocities, and reducing flood energy. As a result, flood peaks are de-synchronized and reduced, while flow duration is increased. The detention capacity and surface roughness (i.e., type and amount of vegetation) of wetlands are paramount in providing this wetland function (Reppert et al., 1979; Sather and Smith, 1984), attributes which also serve to improve water quality. Factors affecting the ability of the wetland to function in flood flow moderation include woody, persistent vegetation in a floodplain, topographic retention capability, and the opportunity to perform this function.

Many of the wetlands located in the Nehalem River and Dairy Creek floodplains, and others formed in large depressions near streams regularly retain and slowly release flood waters to nearby streams. Some of the wetlands are limited in this function because of low topographic retention capability and/or opportunity to perform this function.

Groundwater Recharge and Discharge

Groundwater recharge replenishes groundwater stores, which is important if the groundwater is used for municipal, agricultural, or industrial uses. Groundwater discharge not only creates and maintains wetlands (an important function in itself), but can also maintain streamflows, support plant and animal populations in upland as well as wetland communities, and provide surface water for multiple uses (Sather and Stuber, 1984).

Those wetlands with the greatest potential to function in groundwater recharge and discharge have high edge to volume ratios, undeveloped surroundings, and moderate or high opportunity to perform this function.

Biological Support

Wetlands provide essential habitat and food for many wildlife species. Biological support of fish and waterfowl is of particular economic and recreational value. Factors affecting the ability of wetlands to function in biological support include, but may not be limited to plant community complexity, plant community interspersion, plant richness/diversity, water quality, and nutrient exporting.

Many of the wetlands in forested areas contain diverse plant communities and provide habitat for a variety of wildlife species. Some of the wetlands are along the banks of, or are connected fish bearing streams and their tributaries. Wetland vegetation generally provides bank stability, improves water quality, and provides habitat to fish and their prey. The coho salmon, a federally listed species, is found in some of the streams crossed by the pipeline. The majority of wetlands in pasture and agricultural areas have limited biological support functions due to proximity to developed areas and/or low plant community complexity.

3.2 WETLAND DESCRIPTIONS

The pipeline will impact sixty-one wetland areas. Emergent plants dominate a majority of the wetlands crossed. Emergent wetlands are found along streams and drainages in forested areas, and on the Dairy Creek and Nehalem River floodplains. Most of the forested and scrub-shrub wetlands are found along the O'Black Mainline, the Corral Mainline, and near Bacona road.

Many of the forested and scrub-shrub wetlands have a major component dominated by emergent plants commonly found in disturbed areas such as reed canary grass (*Phalaris arundinacea*), giant horsetail (*Equisetum telemateia*), small-flowered bulrush (*Scirpus microcarpus*), creeping buttercup (*Ranunculus repens*), and soft rush (*Juncus effusus*). This emergent component is, in most cases, present along road corridors and the 16" gas pipeline installed in 1989.

The hydrology, soil, vegetation, and functions of each of the impacted wetlands are described in this section. The scientific name and wetland indicator status of common plants found in these wetlands is provided in Table 4 (Appendix A). Wetland location maps are in Appendix B. Wetland survey maps drawn by NWN surveyors and overlain on the pipeline construction drawings are provided in Appendix C. Wetland field data sheets are in Appendix D. The wetlands are listed in order from north to south along the pipeline route.

060511A is a narrow forested wetland that lines a steep-sided tributary to Lindgren Creek. Red alder and Douglas fir trees make up the canopy, with water parsley, trillium-leaved sorrel, ground ivy-leaved water-carpet, and lady fern making up the understory. Soft rush, small-fruited bulrush, and velvet grass dominate the cleared right-of-way for the 16" gas pipe. The soil is a silt loam. This wetland has limited flood retention ability, and only moderate to low water quality and groundwater support because it is a very shallow, narrow channel with steep sides. It

provides moderate biological support with it's vegetated bottom, forest surroundings, and flow to Lindgren Creek.

060514G is a scrub-shrub wetland dominated by Douglas spirea. This wetland also appears to act as a tributary to Lindgren Creek. The soil is silt loam. A dense and diverse mix of emergent sedges, rushes, and grasses has colonized the existing pipeline right-of-way. The wetland terminates about 80' west of the existing 16" pipeline right-of-way, and widens to the east in the direction of Lindgren Creek where it is dominated by willows and Douglas spiraea. This wetland has relatively high potential for water quality improvement, flood retention, groundwater recharge and discharge, and biological support, because of it's size, plant diversity and abundance, and position in the landscape, connected at a low gradient to a major stream.

060514C is a palustrine forested wetland bordering Lindgren Creek. Red alder, willows, and cascara are the dominant trees, and water parsley and Cooley's hedge-nettle are common in the understory. On the south side of the crossing the wetland area stretches into a hay pasture. The soils are sandy closer to the creek, changing to silt loam further from the creek. Organic layering was noted in the sandy loam soil near the creek and the existing pipeline crossing. This wetland has relatively high potential for water quality improvement and biological support, because of it's location along the banks of Lindgren Creek, a major stream inhabited by coho salmon, a Federally listed species. Flood retention and groundwater support functions are generally limited depending upon the width and soil substrate of the streamside wetland.

060514D is an emergent swale in a hay field. The swale is dominated by reed canary grass, and the soil is silt loam. This wetland probably provides floodwater retention during the wet season, but other functions are limited because it is located in pasture. It provides some water quality and groundwater support when it collects water during the winter and spring seasons, and releases it slowly to the water table.

060514F is another emergent wetland surrounded by hay pasture. In mid-July this area appeared to have been recently saturated and/or inundated due to the sediment deposits, mud flat areas, and dominance of wetland plant species such as willow herb and water cress. The soil is silty clay loam. This wetland is across the road from 060514A and probably has some connection with this much larger wetland complex. The wetland functions of 060515F are similar to 060514D. However, biological support is probably greater due to the greater plant species diversity and obvious ponding that occurs here, likely attracting a greater number of waterfowl, other birds, and other wildlife species.

060514A is a part of a large wetland complex including palustrine open water, emergent, scrub-shrub, and forested components. The pipeline passes through forested and open water areas near the road, and a larger area of emergent wetland appearing to be a fallow field or hay pasture. Red alder, willows, Oregon ash, and western red cedar are found, especially on hummocks and in patches in the forested and open water areas. Common emergent plants include velvet grass, creeping bentgrass, tall fescue, creeping buttercup, and patches of soft rush and reed canary grass. Soils are silt loam and are listed on the county hydric soils list. This wetland has relatively high

potential for water quality improvement, flood retention, groundwater recharge and discharge, and biological support, because of it's size, the diversity of plant communities, and it's position in the Nehalem River floodplain.

060514B is an emergent swale in a hay pasture. The swale remains inundated into the summer, this year into June. Spikerush, water foxtail, and reed canary grass are the dominant plants in this swale. The soil here is a silty clay loam. The functions this wetland provides are similar to other hay pasture wetlands in this region such as 060514D and F.

060524C is an isolated, forested wetland surrounded by clear cut and dominated by Oregon ash and patches of Douglas spirea. The soil is silt loam with organic inclusions. This depressional area extends from highway 47 to approximately 50' east of the highway. This wetland generally provides limited floodwater, groundwater, water quality, and biological support because of its small size, the surrounding clear cut, and close proximity to the highway.

060429C is a riparian, forested wetland which borders a stream shown on the USGS topographic map. This stream is a tributary to the Nehalem River, and the headwaters are part of a large wetland complex also shown on the topographic map. The wetland and channel are approximately 15' wide. The forest canopy is dominated by big-leaf and vine maples. The channel has a muddy bottom near Highway 47 and is vegetated with skunk cabbage and water parsley further upstream. The soil is silt loam. The wetland functions are similar to those of 060511A.

060429F is an emergent wetland dominated by northern mannagrass, water foxtail, and soft rush. This wetland swale or depression is positioned next to a low hill, and the soil is silt loam. The functions this wetland provides are similar to other hay pasture wetlands in this region such as 060514D.

060428A is a forested and scrub-shrub wetland dominated by Oregon ash, red alder, and Douglas spirea. The soil is silty clay loam. The project area only intersects a corner of this large wetland. This wetland provides moderate to high water quality improvement, flood retention, groundwater recharge and discharge, and biological support functions, because of it's size, plant diversity and abundance, and position in the Nehalem River floodplain..

060428B is a large emergent wetland that extends along the pipeline route from the fence line next to 060428A to the O'Black Mainline road. It is connected hydrologically to 060428A. The soil is silt loam in this heavily grazed and trampled cow pasture. The dominant plants include slough sedge, soft rush, reed canary grass, and velvet grass. The functions this wetland provides are probably slightly less than other pasture wetlands in this region due to the heavy grazing pressures.

060433J is an emergent wetland swale, with some clustered rose bushes at the wetland border near the O'Black Mainline road. The swale is dominated by small-fruited bulrush, slough sedge, and velvet grass, and drains through a culvert to the other side of the road. The swale is

surrounded by pasture grasses, and it appears to have been recently disturbed by a large vehicle. The soil is silty clay loam. The wetland functions are similar to other pasture wetland swales in this region.

060433A is a linear grassy swale that parallels a stream with an associated wetland which will be avoided by pipeline construction and maintenance activities. The clay loam soil is very gravelly, indicating that the soil profile has been impacted by the previous pipeline installation. The dominant plants are sweet vernalgrass, reed canary grass, horsetail, and creeping buttercup. Wetland hydrology is influenced by surface runoff, precipitation, and possibly the stream channel. Water flows to the stream where it is conveyed through the culvert. Wetland functions are very limited for this small, disturbed roadside wetland.

060433C is a forested wetland depression that parallels the O'Black Main Line. Douglas fir, vine maple, and red alder make up the canopy, and Dewey's sedge is common in the understory. The soil is organic to approximately 7", and silt loam below this top layer. Similar to other forested wetlands in this section, large woody debris in the form of downed, mossy logs is prevalent. This wetland provides moderate to high water quality improvement, flood retention, groundwater recharge and discharge, and biological support functions, because it is positioned within a diverse mixed forest, it is relatively large extending for 280' along the pipeline route, and important habitat features are present. In addition, the wetland edge to area ratio is large with numerous side channel pockets.

060433D is a forested wetland along the O'Black Main Line, with a portion of the wetland associated with a stream channel. Dominant species at this wetland include red alder, western red cedar, salmonberry, vine maple, Cooley's hedge-nettle, creeping buttercup, reed canary grass, water parsley, common velvetgrass, giant horsetail, and sweet vernalgrass. Soils in this wetland are primarily clay loams. The hydrology of the site is influenced in part by the stream, precipitation, and surface runoff. Water flows out of the wetland via a culvert under O'Black Main Line. The wetland functions are similar to wetland 060433C.

060433E is an emergent wetland along O'Black Main Line, with a portion of the wetland associated with a stream channel. Along the stream, there is upland forest providing cover for the wetland. Commonly-occurring plant species in the wetland include small-flowered bulrush, creeping buttercup, giant horsetail, and sweet vernalgrass. Red alder saplings are becoming established in the wetland. Soils in this wetland consist of clay and silty sandy loams. Wetland hydrology is influenced primarily by the stream and precipitation. The wetland functions are similar to wetland 060433C.

060433F is a forested wetland along O'Black Main Line. There is little vegetation in this wetland with woody debris in the portion of the wetland closest to the existing NWN pipeline. Some of the plant species in the wetland include western redcedar, salmonberry, vine maple, lady fern, and Cooley's hedge-nettle. Soil is silty sandy loam. This is a depressional wetland, and wetland hydrology is influenced by surface runoff and precipitation. At the time of the field survey (end of May), this wetland was saturated to the surface. Wetland functions are generally low to moderate because this wetland is smaller and has less emergent plant growth than wetland 060433C.

060433G is a forested wetland with very little vegetation except on the hummocks. This wetland is located along the O'Black Main Line. Commonly-occurring species include Douglas-fir, red

alder, cascara, big-leaf maple, sword fern, and Cooley's hedge-nettle. The soil is silty sandy loam. This is a depressional wetland that had standing water approximately one inch deep at the time of field sampling (end of May). Wetland functions are similar to 060433F.

060433H is a forested wetland bordering a stream. Red alder and cascara grow along the stream with a thick undergrowth of salmonberry, trillium-leaved sorrel and Dewey's sedge. The soil is silt loam. The wetland is approximately 30' wide and continues upstream in a westerly direction. Wetland functions are similar to 060433C.

060433I is another forested, red alder wetland bordering a stream. Northern mannagrass is dominant in the streambed. Giant horsetail, small-fruited bulrush, and soft rush are common in the disturbed emergent area extending from the road to the forest edge, approximately 30'. The soil is clay. The forested wetland is about 10' wide at the forest edge and narrows to approximately 5' west of the study area. This wetland has limited flood retention ability, and only moderate to low water quality and groundwater support because it is a narrow channel with limited water retention capacity. It provides moderate biological support with it's vegetated bottom, forest surroundings, and hydrologic connection to the Nehalem River.

050404A is an emergent wetland that borders a stream. Dominant plants in this wetland are common in disturbed areas along roads and the existing pipeline route and include small fruited bulrush, creeping buttercup, giant horsetail, and weak alkali grass. The soil is clay overlain by about 10" of sandy loam. This small wetland depression may have been created by the 1989 pipeline installation. At the forest edge, the stream and stream banks do not qualify as wetland because of the lack of wetland vegetation and other wetland indicators near the stream. Wetland functions are limited due to the small size of this wetland.

050403A is an emergent wetland near the road and a larger forested wetland at least 30' from the road. Vegetation in the emergent areas is common at disturbed sites and includes soft rush, slough sedge, small-fruited bulrush, and cattails. Willows, alder, vine maple, and salmonberry are found in the forested areas further from the road. The soil is clay loam. Wetland functions are similar to 060433C.

050410D is an emergent and scrub-shrub wetland associated with a creek. The shrubby portion lines the creek, and the emergent plants dominate from the road to approximately 20' west of the road. Shrubs include vine maple, red-osier dogwood, and red elderberry, common emergent plants include reed canary grass, giant horsetail, small-fruited bulrush, and stinging nettle. The soil is clay loam. Wetland functions are similar to 060433I.

0504010C is a very small emergent wetland surrounded by clearcut Douglas fir forest. The dominant plants are small-fruited bulrush, velvet grass, and policeman's helmet. The wetland appears to be a narrow drainage, about 1' wide, with sandy clay loam soil. The dimensions of this wetland are approximately 10' by 3'. Wetland functions are limited due to the small size of this wetland.

050410E is a narrow scrub-shrub wetland lining a rocky streambed. The steep stream banks only qualify as wetland near the road. The dominant shrubs are salmonberry and thimblebery, and understory herbs include trillium-leaved sorrel and youth-on-age. The soil is sandy loam. Wetland functions are limited due to the small size of this wetland.

050410F is another narrow scrub-shrub wetland lining a steep-sided stream. The stream banks do not qualify as wetland further upsteam where red alders grow along the stream. Salmonberry is

the dominant shrub with an understory of trillium-leaved sorrel and fringecup. Closer to the road, reed canary grass and giant horsetail are the dominant plants along the stream. The soil ranges from silty clay loam to silty sandy loam. Wetland functions are similar to 050410E.

050410A is an emergent wetland which is east of, but not adjacent to Crooked Creek. It probably is hydrologically connected to this creek. This linear wetland is positioned along the existing corridor which is lower than and surrounded by upland forest. The dominant plants are small-fruited bulrush and soft rush, and the soils are silt loam overlain by silty clay loam. This wetland probably serves as a flood retention basin for Crooked Creek, and provides some groundwater support functions because it is part of a larger depression between two upland forest areas. Water quality improvement and biological support functions are moderate to low due to the small size and low plant species diversity here.

050410G is a linear, emergent wetland paralleling the Crooked Creek Mainline. This wetland appears to be either created by the previous pipeline installation or logging operations, or disturbed by these activities. Dominant emergent plants include small-fruited bulrush and giant horsetail, and the soil is a mix of sand, gravel, muck, and clay. Wetland functions are considered low because it is located only along a disturbed roadside with limited retention capability and low plant diversity.

050414A is a forested wetland on the banks of an intermittent stream. The dominant wetland plants include red alder, willows, salmonberry, thimbleberry, wood reedgrass, water parsley, and Cooley's hedge-nettle. The soils present include sand, silt, and clay loams. Wetland functions are similar to 050433I.

050414D is a large emergent and forested wetland with scattered shrubs. The dominant emergent plants are reed canary grass and slough sedge. Clustered wild rose and Douglas spirea are common shrubs in the emergent and forested areas. Willows, red alder, and Oregon ash make up the forest canopy. The soil is silty clay loam. Deer as evidenced by many day beds and trails heavily uses this wetland. The wetland is surrounded by Douglas fir forest. This wetland provides moderate to high water quality improvement, flood retention, groundwater recharge and discharge, and biological support functions, because it has forested, shrub, and emergent components, it is relatively large extending beyond the pipeline route, it flows slowly to the Nehalem River, and important habitat features are present. In addition, the wetland edge to area ratio is large with numerous side channel pockets.

050414E is an emergent wetland with Douglas spiraea shrubs and alder saplings along the borders. Dominant emergent plants include small-fruited bulrush and soft rush. A small area of shrinking open water is host to Pacific treefrog tadpoles nearing the end of their development into frogs. The soil is silty clay loam. Wetland functions of this drainage are similar to 050414D.

050414F is a scrub-shrub wetland dominated by spiraea. Oregon ash trees are present along the wetland border near the road. The soil is silt loam, and the hydrology criteria was just barely met with water-borne sediments and oxidized root zones at this time of year. The wetland continues well beyond the project area. Wetland functions of this drainage are similar to 050414D.

050423D is a scrub-shrub wetland dominated by spiraea, willows, and reed canary grass. The soil is silt loam. Although the soil is not saturated in late August, the drainage pattern is evident and oxidized root zones are prevalent and bright. This wetland appears to be part of a drainage that flows to the Nehalem River. Wetland functions of this drainage are similar to 050414D.

050436B is a narrow, emergent wetland lining a steep-sided tributary to Elk Creek. Dominant emergent plants include reed canary grass, water parsley, soft rush, and willow seedlings. The soil is clay loam. This wetland has limited flood retention ability, and only moderate to low water quality and groundwater support because it is a narrow channel with limited water retention capacity. It provides moderate biological support with it's vegetated bottom and hydrologic connection to Elk Creek and the Nehalem River.

040306B is an emergent wetland adjacent to Kenusky Creek. Dominant species in this wetland include small-flowered bulrush, stinging nettle, reed canary grass, and coltsfoot. Soils were silt loam and silty clay loam. This wetland only provides moderate to low floodwater retention and groundwater support functions because the stream banks here are relatively steep and the wetland area is narrow. Water quality and biological support functions are relatively high because of the dense vegetation stabilizing the banks and filtering the water, and the direct connection to Kenusky Creek, a fish bearing stream.

040425F is connected to a large stream/wetland complex. It is associated with a stream channel and is composed primarily of emergent vegetation, including small-flowered bulrush. The stream, surface runoff, and precipitation influence wetland hydrology. The soil is silt loam. This wetland provides low floodwater retention and groundwater support because it is small and located on a slope. As a part of the larger surrounding stream/wetland complex it provides moderate water quality and biological support functions.

040425C is a scrub-shrub wetland that is part of a larger wetland complex. Dominant species in the wetland include red alder, oceanspray, small-flowered bulrush, American speedwell, and water parsley. The soil has high organic content and is mixed with gravel. This wetland was inundated to a depth of about one inch at the time of sampling. Wetland 040425A appears to be the hydrologic source for this wetland. Water flows out of the wetland via a culvert (under a logging road) where the wetland continues as a forested and scrub-shrub wetland. Wetland functions are similar to 040425F, with the shrubs providing additional wildlife habitat.

040425B is an emergent wetland adjacent to a logging road. Small-flowered bulrush is the dominant species in this wetland. The top six inches of soil is sandy clay loam with mottles. Water, up to one inch in depth, was present at the time of field sampling. This wetland is a side slope seep. The hydrology of the wetland appears to have been altered by the logging road and existing pipeline. Water from the other side of the logging road may be the hydrologic source for this wetland although subsurface flow from Wetland 040425A may influence this wetland. Wetland functions are similar to 040425F.

040425A is an emergent wetland on side slope. Dominant species include small-flowered bulrush, skunk cabbage, and ground ivy-leaved water-carpet. The top eight inches of soil is organic. The ground surface was inundated to a depth of one inch at the time of the field sampling. Water enters the wetland via a culvert under the logging road. The wetland continues beyond the construction corridor as a forested and scrub-shrub wetland. Wetland functions are similar to 040425F.

040430A is an emergent wetland on a side slope. Dominant species include small-flowered bulrush, common velvetgrass, white clover, common horsetail, and a rush. Soils are silt loams with mottling in the lower portion of the soil pit. At the time of the field sampling, water was seeping down the slope. This wetland continues beyond the proposed construction corridor as a scrub-shrub wetland. Wetland functions are similar to 040425F.

040436B is an emergent and scrub-shrub wetland connected with a stream in a large depressional area. The portion of the wetland in the construction corridor is composed of emergent vegetation, but salmonberry dominates in areas beyond the corridor. The soil is silt loam. This wetland provides moderate to high water quality improvement, flood retention, groundwater recharge and discharge, and biological support functions, because it has dense shrub and emergent components surrounded by upland forest, it has relatively high water retention capacity, it flows slowly to Coal Creek, and important habitat features are present.

040436A is an emergent and scrub-shrub wetland associated with a tributary to Coal Creek. Dominant species in the wetland include salmonberry, skunk cabbage, small-flowered bulrush, giant horsetail, coltsfoot, and ground ivy-leaved water-carpet. The soil is organic. A forested, Douglas fir canopy from the adjacent uplands provides cover for the stream. Wetland functions are similar to 040306B.

040331B is a narrow, emergent wetland channel dominated by water parsley at the pipeline crossing. This wetland is surrounded by clear cut, and appears to be spring-fed. The soil is silt loam, and not saturated in August. The channel appears to feed ponded areas along a closed, unmaintained road. The ponded areas connected to this wetland provide habitat for a number of amphibians. This channel is only a couple of feet wide at the pipeline crossing. This wetland has moderate flood retention, water quality, and groundwater support because it appears to be spring fed and is connected with larger depressional areas upstream and downstream. It provides moderate biological support with it's vegetated bottom, forest surroundings, and hydrologic connection to Coal Creek.

040331A is an emergent channel and ponded area near 040331B along the same closed road. Rushes and aquatic herbs are found in the ponded area. The soil at the road is a compacted clay at the surface, and silt loam below five inches. This small pond appears to be created by this clay layer as the silt loam below it is not saturated. It appears to be spring-fed. Wetland functions are similar to 040331B.

030401E is a forested wetland channel dominated by red alder, salmonberry, water parsley, and lady fern. The soil is silt loam with a high amount of organic matter. The surrounding upland forest is a young stand (10-20 years old) of Douglas fir with salal, sword fern, and salmonberry in the understory. This wetland has limited flood retention ability, and only moderate to low water quality and groundwater support because it has limited water retention capacity. It provides moderate biological support with it's vegetated bottom and forest surroundings.

030401D is a forested wetland only 200' south of 030401E. The vegetation is similar to that found in 030401E, and the soil is an organic peat. This wetland continues on the west side of the cleared right-of-way. Wetland functions are similar to 030401E except that there is greater potential area for water retention, and a greater edge to area ratio.

030401C is a forested wetland that drains to a lake to the northwest. Dominant plants near the cleared right of way include red alder, Douglas fir, Devil's club, reed canary grass, and water parsley. The soil is silt loam with some clay. The wetland is more extensive closer to the lake and on the west side of the cleared right-of-way. This wetland provides moderate floodwater retention, water quality, and groundwater, and biological support because it is densely vegetated and is directly connected with a small lake.

030401B is a forested wetland associated with a stream channel that is probably a tributary to Campbell Creek. Water parsley, skunk cabbage, stinging nettle, and lady fern carpet the red alder

forest floor. The soil is silty clay loam. The stream bed parallels the road and right-of-way for at least 300'-400'. Wetland functions are similar to 030401E.

030401A is another forested wetland lining a tributary to Campbell Creek. The stream bottom is rocky and vegetated with skunk cabbage, water parsley, salmonberry, and red alder. The soil is silty clay loam with gravel. Wetland functions are similar to 030401E.

030412A is a diverse wetland with open water, emergent, scrub-shrub, and forested components. The existing pipeline crosses a road that is situated between two ponds connected by a road culvert. Patches of reed canary grass, salmonberry, and red alder surround the ponds. The soil is silt loam with a high amount of organic material. The proposed pipeline will be placed east of the existing line, which would place it in reed canary grass near the smaller pond. This wetland has moderate to high potential for water quality improvement, flood retention, groundwater recharge and discharge, and biological support, because of it's size, plant community diversity, and water retention capacity.

030412B is an emergent wetland across the road and hydrologically connected with the ponds of 030412A. It is a clear cut area dominated by reed canary grass. The soil is silt loam. Floodwater retention, water quality, and groundwater support functions are similar to 030412A, but the biological support is lower due to the recent clear cut conditions and dominance of reed canary grass.

030333B is located in a plowed field along the existing pipeline alignment. There was no vegetation at the time of field sampling. Soils are dark silt loams with mottles. The soil was saturated to the surface with free-standing water in the soil pit three inches below the soil surface at the time of field sampling. A portion of the wetland had surface water that was no more than a few inches deep. Precipitation, surface runoff, and a nearby stream influence the hydrology of the wetland. This wetland probably provides floodwater retention during the wet season, but other functions are limited because it is located in a cultivated field. It provides some water quality and groundwater support when it collects water during the winter and spring seasons, and releases it slowly to the water table.

020309A is a forested wetland associated with a stream channel. Commonly occurring species include willows, red alder, trailing blackberry, Himalayan blackberry, and Cooley's hedge-nettle. The soil in this area has been altered by installation of the previous pipeline and the top ten inches of soil sampled is a mix of two soils jumbled together. The silt loam component is mottled and the clay component is gleyed. This wetland has limited flood retention and groundwater support functions because it is a very shallow, narrows channel with steep sides. Water quality improvement may be an important function here due to the influx of agricultural runoff potentially containing topsoil, fertilizers, and other agricultural chemicals. It provides moderate biological support with it's vegetated bottom, agricultural surroundings, and flow to Dairy Creek.

020309B is a forested and emergent wetland adjacent to Dairy Creek Road. Black cottonwood and reed canary grass are the dominant plant species in this wetland. Reed canary grass is

dominant closest to the road while the forested portion of the wetland is associated with a stream channel. The soil in the reed canary grass patch is a clay loam with mottles. The hydrologic source for this wetland is a culvert under Dairy Creek Road. Water flows through a channel to the south. This wetland provides moderate to high floodwater retention, groundwater support, water quality improvement, and biological support because it is surrounded by agricultural land, composed of several plant communities, and connected to Dairy Creek.

020309C is a forested wetland associated with Dairy Creek. The soil is silt loam and silty clay loam. Reed canary grass and Himalayan blackberry have invaded the 40' cleared pipeline right-of-way through and on either side of the wetland area. The Oregon ash wetland forest understory includes Cooley's hedge-nettle, Dewey's sedge, and clustered wild rose. Upland Oregon ash forest surrounds this wetland patch on the west side of the right-of-way. An upland ash and Douglas forest is located on the east side of the cleared right-of way. A deer fawn was sighted in this forested wetland. Wetland functions are similar to 020309B for similar reasons.

020316A is a small, low quality forested wetland located in a horse pasture. The wetland appears to be a heavily compacted, 20' diameter depression and seep in the vicinity of Dairy Creek. Oregon ash, Douglas fir, and big leaf maple trees are found in and near this wetland, and the understory is sparse with common pasture grasses, herbs, and soft rush. The soil is silt loam. This wetland provides limited wetland functions due to it's small size.

020322D is an emergent wetland. Most of the wetland is in a pasture, although a portion of it is in the willow farm. Dominant species in this wetland include reed canary grass, white clover, redtop, and ryegrass. Soils are clay loams with mottles. Soils were saturated at the time of sampling. The northern part of the wetland is near an excavated channel. Wetland functions are similar to 030333B for similar reasons.

020322E is an emergent wetland in a cow pasture. There is little vegetation present, however, red clover, white clover, ryegrass, colonial bentgrass, and other pasture grasses were present. Soils are clay loams with mottles in the lower portion of the soil pit. Soils were saturated to the surface at the time of sampling, and patches of surface inundation were present. This wetland is near an excavated channel. Wetland functions are similar to 030333B for similar reasons.

020322A is an emergent wetland in a pasture. Dominant species in this wetland include timothy, redtop, and white clover. Bluejoint, reed canary grass, perennial sow-thistle, red clover, and forget-me-not were common. Soils in the wetland are clay loams and appear to have been disked. Mottles are present in the lower portion of the soil pit. The soil was saturated to about eight inches below the soil surface at the time of field sampling. This wetland is near an excavated channel and surface water is present in portions of this wetland in May. Wetland functions are similar to 030333B for similar reasons.

020335A is a large emergent wetland in cropland. There is little vegetation in this wetland which becomes a cultivated field during the summer months. Soils are silt loams and silty clay loams and mottles are present throughout the top 18 inches. Portions of the wetland still had surface

inundation in May. Oxidized root zones were the indicators of wetland hydrology in areas where the soils were not saturated at the time of field sampling. Based on discussions with one landowner, this wetland is inundated during the winter and spring and is used by a number of species of birds including waterfowl and tundra swans. Killdeer were present during the survey in May. An excavated channel intersects this wetland. This wetland provides a more expansive floodwater retention and groundwater support area and a more productive wildlife habitat area than other floodplain wetlands in the area. Water quality functions may also be greater due to the longer retention times at this wetland.

3.3 WETLAND IMPACTS AND MITIGATION

A total of sixty-one wetlands will be impacted in some way by pipeline construction or maintenance. Wetland impact acreages for each wetland are listed in Table 5. Wetland impacts are calculated using a 40' construction corridor width except at six agricultural wetlands, one forested and emergent wetland (050403A), and one scrub-shrub and emergent wetland (040436B) where the construction corridor will be 60' due to the length of these wetlands. Approximately 15 acres of wetland will be impacted by pipeline construction and maintenance activities. Of this total impact acreage, 1.26 acres are palustrine forested, .41 acres are palustrine scrub-shrub, 13.14 acres are palustrine emergent, and .18 are palustrine open water.

Much effort has been made during the planning process to avoid and minimize impacts to wetland areas found along the route. Where possible, wetlands will be avoided, or impacts will be minimized within the limits of construction and maintenance requirements. At least twenty-three wetlands found along the pipeline route will be avoided by various means including changes to the alignment, construction limits, and limiting construction to road banks.

Wetlands impacts will be minimized by:

1. Keeping the construction corridor through wetland as narrow as possible.
2. Avoiding the rest of the wetland area by using adjacent roads for equipment staging where this is possible
3. Timing construction to occur during the driest time of the year.
4. Separating and returning topsoil to the trench back-fill surface
5. Avoiding changes to wetland hydrology by installing clay barriers at each end of the wetland crossing where appropriate for mitigating potential impacts.

All of the forested and scrub-shrub wetlands are located along roads and/or the cleared corridor for the 16" gas pipeline. Additional tree and shrub removal at wetland locations will be minimized as much as possible. Removal of woody vegetation will be avoided where the width of the road or pipeline corridor is wide enough to accommodate the trenching activities. There also will be extremely limited or no tree removal where the pipeline will be installed in the fog line of Highway 47 and Dairy Creek Road. Four wetlands, including the largest forested wetland within the potential impact area, will be avoided using this construction technique.

The 16" gas pipeline has previously crossed two large wetland complexes with forest, shrub, emergent, and open water components (060514A & 030412A). These wetlands, as well as many other wetlands along the route, appear to be completely restored from any previous pipeline activities. Complete restoration of these habitats is also expected after construction of the proposed 24" pipeline. The proposed pipeline will cross wetland 060514A through a short section of open water and shrubs and through a longer section of emergent pasture wetland. Wetland 030412A will be crossed near a road where the dominant vegetation is reed canary grass.

Wetland habitats will be restored to their preconstruction condition within one or two growing seasons, or longer for forested and shrub dominated areas. The new 24" pipeline right of way will have a 40' maintenance corridor while new pipeline parallel to existing pipeline will have a 50' maintenance corridor including 10' along the existing 16" line. Forested or scrub-shrub wetland areas impacted by pipeline construction will become reestablished where the woody vegetation will not interfere with the 40-50' maintenance corridor. Areas that are converted from forested or scrub-shrub wetlands to emergent wetlands due to pipeline construction and maintenance will be mitigated by replanting an equal amount (approximately 1.67 acres) of degraded emergent wetland with native trees and shrubs. This will accomplish the goal of no net loss of wetland functions or values.

4.0 REFERENCES

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APPENDIX A

TABLES 2-5

Table 2 Mapped Soils in Columbia County

Soil Type	Hydric	Hydric Inclusions	Non-hydric
Braun-Scaponia silt loams, 5 to 30 percent slopes			X
Braun-Scaponia silt loams, 60 to 90 percent south slopes			X
Eilertsen silt loam		X	
Glohm silt loam, 3 to 30 percent slopes		X	
Hapludalfs-Udifluvents complex		X	
Kenusky silty clay loam, 0 to 15 percent slopes	X		
Mayger silt loam, 3 to 30 percent slopes		X	
McNulty silt loam		X	
Natal silty clay loam	X		
Scaponia-Braun silt loams, 30 to 60 percent north slopes			X
Scaponia-Braun silt loams, 30 to 60 percent south slopes			X
Tolany loam, 3 to 30 percent slopes			X
Tolany loam, 30 to 60 percent south slopes			X
Treharne silt loam		X	
Vernonia silt loam, 3 to 30 percent slopes			X

Table 3 Mapped Soils in Washington County

Soil Type	Hydric	Hydric Inclusions	Non-hydric
Aloha sit loam		X	
Amity silt loam		X	
Chehalis silty clay loam, occasional overflow		X	
Cornelius and Kinton silt loams, 2 to 7 percent slopes		X	
Cornelius and Kinton silt loams, 7 to 12 percent slopes		X	
Dayton silt loam	X		
Goble silt loam, 2 to 7 percent slopes		X	
Goble silt loam, 2 to 30 percent slopes		X	
McBee silty clay loam		X	
Melbourne silty clay loam, 12 to 20 percent slopes		X	
Melby silt loam, 2 to 30 percent slopes			X
Melby silt loam, 30 to 60 percent slopes			X
Olyic silt loam, 5 to 30 percent slopes			X
Olyic silt loam, 30 to 60 percent slopes			X
Quatama loam, 0 to 3 percent slopes		X	
Saum silt loam, 2 to 7 percent slopes			X
Tolke silt loam, 5 to 30 percent slopes			X
Udifluvents, nearly level		X	
Verboort silty clay loam	X		
Wapato silty clay loam	X		
Woodburn silt loam, 0 to 3 percent slopes		X	
Woodburn silt loam, 3 to 7 percent slopes		X	

Table 4 Wetland Plant List

Scientific Name	Common Name	Wetland Indicator Status
Trees		
Acer macrophyllum	Big-leaf maple	FACU
Alnus rubra	Red alder	FAC
Fraxinus latifolia	Oregon ash	FACW
Malus fusca	Crabapple	FACW
Oemleria cerasiformes	Indian plum	FACU
Physocarpus capitatus	Pacific ninebark	FACW-
Populus balsamifera	Black cottonwood	FAC
Pseudotsuga menziesii	Douglas fir	FACU
Rhamnus purshiana	Cascara	FAC-
Salix lasiandra	Pacific willow	FACW+
Salix scouleriana	Scouler's willow	FAC
Salix sitchensis	Sitka willow	FACW
Salix spp.	Willows	NSPP
Shrubs		
Acer circinatum	Vine maple	FAC-
Cornus sericea (stolonifera)	Red-osier dogwood	FACW
Holodiscus discolor	Oceanspray	NL
Oploplanax horridus	Devil's club	FAC+
Rosa pisocarpa	Clustered wild rose	FAC
Rubus laciniatus	Evergreen blackberry	FACU+
Rubus leucodermis	Blackcap	NL
Rubus parviflorus	Thimbleberry	FAC-
Rubus procerus=Rubus discolor	Himalayan blackberry	FACU
Rubus spectabilis	Salmonberry	FAC+
Rubus ursinus	Trailing blackberry	FACU
Sambucus racemosa	Red elderberry	FACU
Spiraea douglasii	Douglas spirea	FACW
Herbs		
Agrostis alba	Redtop	FAC
Agrostis palustris	Creeping bentgrass	FACW
Agrostis tenuis	Colonial bentgrass	FAC
Alopecurus geniculatus	Water foxtail	OBL
Anthoxanthum odoratum	Sweet vernalgrass	FACU
Athyrium filix-femina	Lady fern	FAC
Blechnum spicant	Deer fern	FAC+
Calamagrostis canadensis	Bluejoint	FACW+
Callitriche sp.	Water starwort	NSPP
Cardamine angulata	Angled bitter-cress	FACW

Table 4 Wetland Plant List

Scientific Name	Common Name	Wetland Indicator Status
Carex arcta	Northern clustered sedge	OBL
Carex deweyana	Dewey's sedge	FACU
Carex jonesii	Jones sedge	FACW+
Carex lyngbyei	Lyngby's sedge	OBL
Carex obnupta	Slough sedge	OBL
Carex spp.	Sedges	NSPP
Chrysanthemum leucanthemum	Oxeye daisy	NL
Chrysospenium glechomaefolium	Gound ivy-leaved water-carpet	OBL
Cinna latifolia	Wood reedgrass	FACW
Circaea alpina	Enchanter's nightshade	FAC+
Cirsium vulgare	Bull thistle	FACU
Claytonia sibirica	Candyflower	FAC
Corydalis scouleri	Scouler's corydalis	FAC+
Daucus carota	Queen Anne's lace	NL
Dicentra formosa	Bleeding heart	FACU
Eleocharis ovata	Ovoid spikerush	OBL
Epilobium ciliatum	Willowherb	FACW-
Equisetum arvense	Common horsetail	FAC
Equisetum telmateia	Giant horsetail	FACW
Festuca arundinacea	Tall fescue	FAC-
Galium aparine	Bedstraw	FACU
Geranium dissectum	Cut-leaved geranium	NL
Geum macrophyllum	Large-leaved avens	FACW-
Glyceria borealis	Northern mannagrass	OBL
Glyceria elata	Tall mannagrass	FACW+
Glyceria sp.	Mannagrass	NSPP
Holcus lanatus	Velvetgrass	FAC
Hydrophyllum tenuipes	Pacific waterleaf	NL
Hypochaeris radicata	Hairy cat's ear	FACU
Impatiens glandulifera	Policeman't helmet	FACW
Juncus balticus	Baltic rush	FACW+
Juncus bufonius	Toad rush	FACW
Juncus effusus	Soft rush	FACW
Juncus ensifolius	Daggerleaf rush	FACW
Juncus spp.	Rush	NSPP
Lemna minor	Duckweed	OBL
Lolium multiflorum	Italian ryegrass	NL
Lolium perenne	Perennial ryegrass	FACU
Lotus corniculatus	Bird's foot trefoil	FAC
Lupinus sp.	Lupine	NSPP
Lycopus uniflorus	Northern bugleweed	OBL

Table 4 Wetland Plant List

Scientific Name	Common Name	Wetland Indicator Status
Lysichitum americanum	Skunk cabbage	OBL
Maianthemum dilatatum	False lily-of-the-valley	FAC
Medicago lupulina	Black medic	FAC
Medicago sativa	Alfalfa	NL
Mimulus guttatus	Yellow monkey-flower	OBL
Myosotis laxa	Forget-me-not	OBL
Oenanthe sarmentosa	Water parsley	OBL
Oxalis oregana	Oregon oxalis	NL
Oxalis trilliifolia	Trillium-leaved sorrel	FAC+
Petasites frigidus	Coltsfoot	FACW-
Phalaris arundinacea	Reed canary grass	FACW
Phleum pratense	Timothy	FAC-
Plantago lanceolata	Lance-leaved plantain	FAC
Plantago major	Plantain	FACU+
Poa trivialis	Roughstalk bluegrass	FACW
Polystichum munitum	Sword fern	FACU
Pteridium aquilinum	Bracken fern	FACU
Puccinellia panciflora	Weak alkali grass	OBL
Ranunculus acris	Meadow buttercup	OBL
Ranunculus repens	Creeping buttercup	FACW
Rorripa sp.	Cress	NSPP
Rumex acetosella	Sheep sorrel	FACU+
Rumex crispus	Curled dock	FAC+
Rumex occidentalis	Western dock	FACW+
Scirpus microcarpus	Small-fruited bulrush	OBL
Scrophularia californica	California figwort	FACW-
Sonchus arvensis	Perennial sow-thistle	FACU+
Stachys cooleyae	Cooley's hedge-nettle	FACW
Taraxacum officinale	Dandelion	FACU
Tellima grandiflora	Fringecup	NL
Tolmiea menziesii	Youth-on-age	FAC
Trifolium pratense	Red clover	FACU
Trifolium repens	White clover	FAC
Urtica dioica	Stinging nettle	FAC+
Veronica americana	American speedwell/brooklime	OBL

Table 5 Wetland Impact Acreages: 24" South Mist Feeder Loop

Wetland ID Number	Habitat Category	Impact Acres for each wetland type based on a 40' construction corridor				Quad Name	1/4 of 1/4 Sec	Wetland Hydrology
		PFO	PSS	PEM	POW			
060511A	2	0.02		0.01		Marshland	SWSE	Tributary to Lindgren Creek
060514G	2	0.09		0.03		Marshland	NWNE	Tributary to Lindgren Creek
060514C	1	0.05		0.04		Marshland	SWNE	Lindgren Creek crossing
060514D	4			0.03		Marshland	SWNE	Swale
060514F	4			0.16		Marshland	SENE	Depression
060514A	2 & 4	0.05		0.18	0.01	Marshland	SENE, NESE	Large wetland including Lyons Creek
060514B	4				0.17	Marshland	SESE	Swale
060524C	4	0.09				Birkenfeld	SWNW	Depression
060429C	2	0.01				Pittsburg	NESW	Steep-sided stream
060429F	4			0.16		Pittsburg	NESE	Swale or depression
060428A	2	0.1				Pittsburg	SWSW	Large forested depression
060428B	4			2.15		Pittsburg	SWSW	Long pasture depression
060433J	4			0.05		Pittsburg	NENW	Swale
060433A	4			0.01		Pittsburg	SENW	Swale
060433C	2	0.13		0.13		Pittsburg	SENW	Depressional
060433D	2	0.01		0.01		Pittsburg	NESW	Stream
060433E	2			0.07		Pittsburg	SESW	Stream
060433F	2	0.01		0.01		Pittsburg	SESW	Depressional pond
060433G	2	0.01		0.01		Pittsburg	SWSE	Depressional pond
060433H	2	0.02		0.01		Pittsburg	SESE	Stream
060433I	2	0.01		0.01		Pittsburg	SESE	Stream
050404A	4			0.02		Pittsburg	NENE	Stream
050403A	2	0.16		0.35		Pittsburg	SWNW	Large forested depression
050410D	2		0.01			Pittsburg	NENW	Stream
050410C	4			0.01		Pittsburg	NENW	Narrow drainage
050410E	2		0.01			Pittsburg	SENW	Stream
050410F	2		0.01			Pittsburg	NESW	Stream
050410A	4			0.07		Pittsburg	NWSE	Swale or depression
050410G	4			0.13		Pittsburg	NESE	Depression
050414A	2	0.02		0.01		Pittsburg	NESW	Intermittent stream
050414D	2		0.01	0.02		Pittsburg	NESW	Large depression and drainages
050414E	2			0.01		Pittsburg	SESW	Depression

Table 5 Wetland Impact Acreages: 24" South Mist Feeder Loop

Wetland ID Number	Habitat Category	Impact Acres for each wetland type based on a 40' construction corridor				Quad Name	1/4 of 1/4 Sec	Wetland Hydrology
		PFO	PSS	PEM	POW			
050414F	2		0.01			Pittsburg	SWSW	Large depression and drainages
050423D	2		0.01			Pittsburg	NWNW	Drainage flowing to Nehalem River
050436B	2			0.01		Vernonia	SESW	Tributary to Elk Creek
040306B	1			0.04		Bacona	SWNW	North bank of Kenusky Creek
040425F	2			0.03		Bacona	SENE	Connected w/stream and pond
040425C	2		0.04			Bacona	NESE	Connected w/040425A
040425B	2			0.07		Bacona	NESE	Side slope seep
040425A	2			0.21		Bacona	NESE	On side slope, Connected to larger PSS & PFO
040430A	2			0.04		Bacona	SESE in 040425	On side slope, Connected to larger PSS
040436B	2		0.28	0.12		Bacona	NWNE	Stream, Depressional area
040436A	2		0.01	0.01		Bacona	NWNE	Tributary to Coal Creek
040331B	2			0.01		Bacona	SWSW	Springs above Coal Creek
040331A	2			0.04		Bacona	SWSW	Springs above Coal Creek
030401E	2	0.02				Bacona	NENE	Drainage channel
030401D	2	0.07				Bacona	NENE	Drainage channel
030401C	2	0.02				Bacona	SENE	Connected to lake to west
030401B	2	0.14				Bacona	NWSE	Tributary to Campbell Creek
030401A	2	0.01				Bacona	SWSE	Tributary to Campbell Creek
030412A	2		0.02	0.01		Bacona	SWNE, SENW	Headwaters of Roundy Creek
030412B	4			0.23		Bacona	SENW	Headwaters of Roundy Creek
030333B	4			0.81		Meacham Corner	SESW	Depression, near Dairy Creek

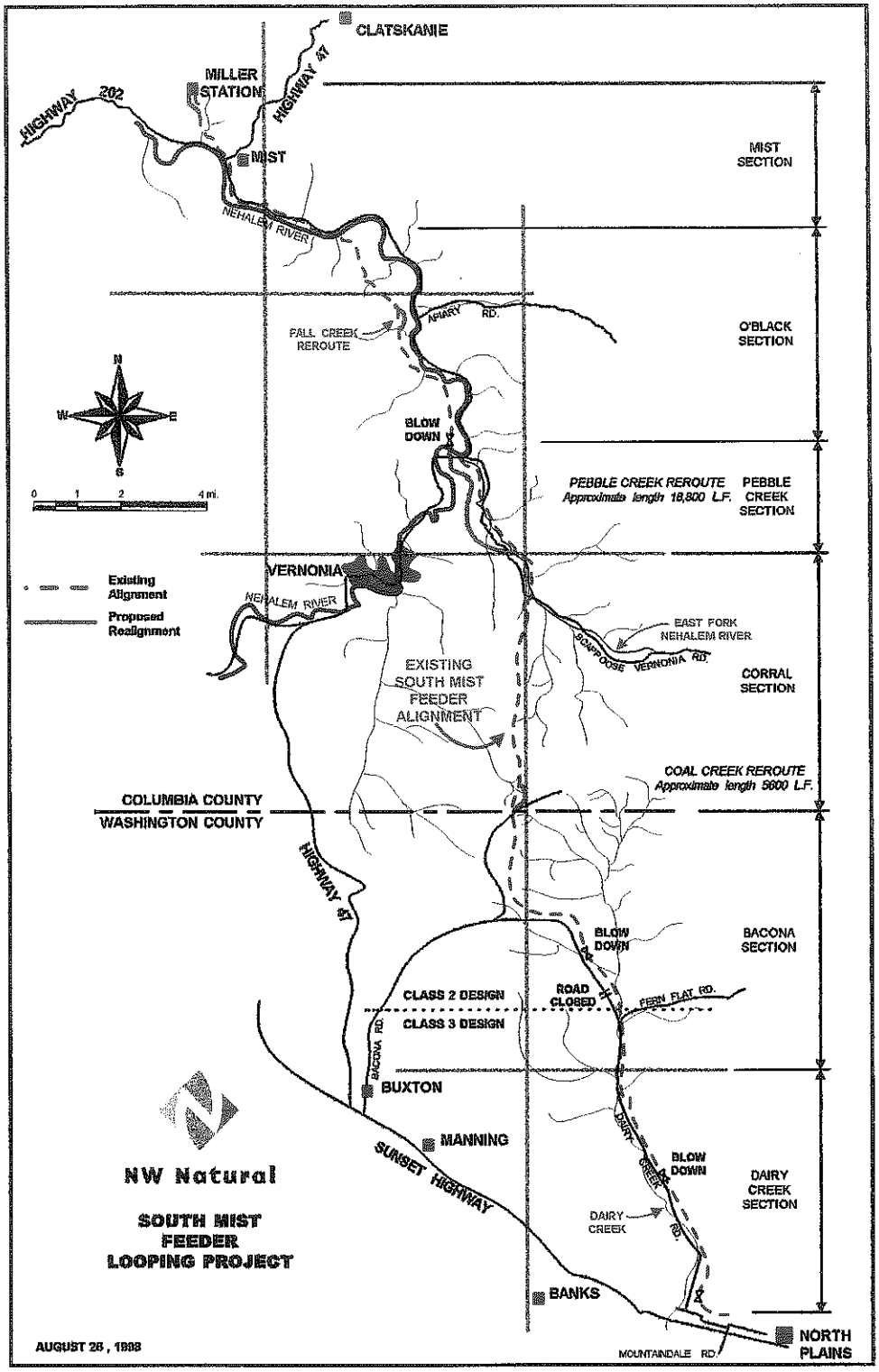
Table 5 Wetland Impact Acreages: 24" South Mist Feeder Loop

Wetland ID Number	Habitat Category	Impact Acres for each wetland type based on a 40' construction corridor				Quad Name	1/4 of 1/4 Sec	Wetland Hydrology
		PFO	PSS	PEM	POW			
020309A	2	0.09				Meacham Corner	NWNE	Tributary to Dairy Creek
020309B	4	0.02		0.03		Meacham Corner	NWSE	Associated with a small tributary to Dairy Creek
020309C	2	0.11		0.04		Meacham Corner	SESE	Side slope seep connected with Dairy Creek
020316A	4			0.01		Meacham Corner	NENE	Side slope seep near Dairy Creek
020322D	4			0.54		Meacham Corner	NENW	Dairy Creek floodplain
020322E	4			2.65		Meacham Corner	SENW, SWNE, NWSE	Dairy Creek floodplain
020322A	4			1.74		Meacham Corner	NWSE	Dairy Creek floodplain
020335A	3			2.81		Forest Grove	Sec 26-NESW	Dairy Creek floodplain
Total Acres		1.26	0.41	13.14	0.18			

Cowardin Classification	Habitat Category (OAR 635-415-030)
PFO = Palustrine Forested	1 = Exceptional value
PSS = Palustrine Scrub-Shrub	2 = High value
PEM = Palustrine Emergent	3 = High to medium value
POW = Palustrine Open Water	4 = Low value

APPENDIX B

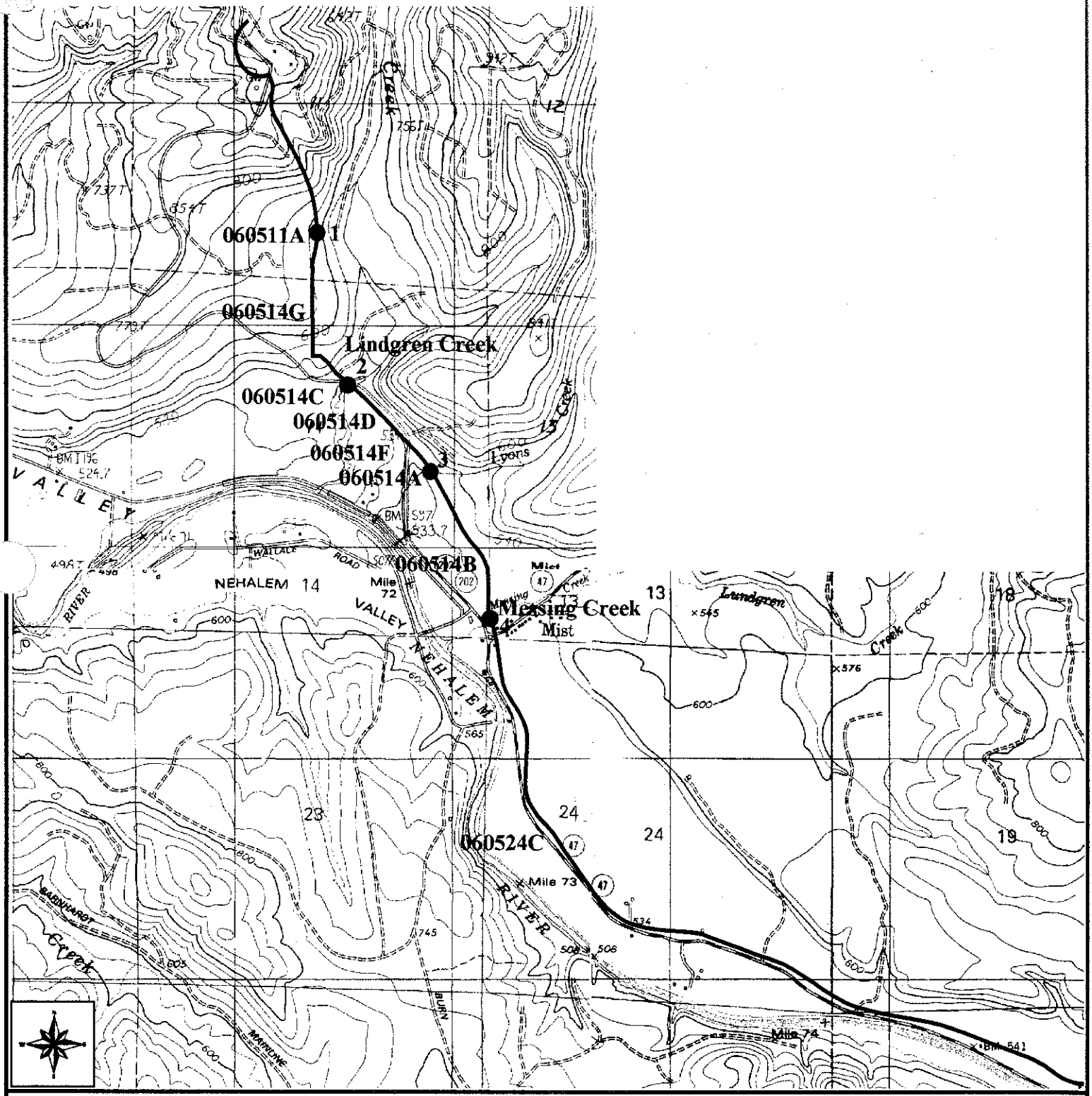
VICINITY MAP AND WETLAND LOCATION MAP



Map Source: Northwest Natural Gas, Wetland Report: Dames and Moore, Inc.

PURPOSE: Transport natural gas 09/11/98
ADJACENT PROPERTY OWNERS: Various APPLICATION BY: Northwest Natural Gas
PROPOSED: Excavation and fill for natural gas pipeline COUNTIES OF: Columbia and Washington, OR
IN: Wetlands and other waters of the U.S.

VICINITY MAP



Wetlands & Stream Crossings

- Stream Crossing Identifier
- South Mist Feeder Loop
- Contour Interval: 40 Feet

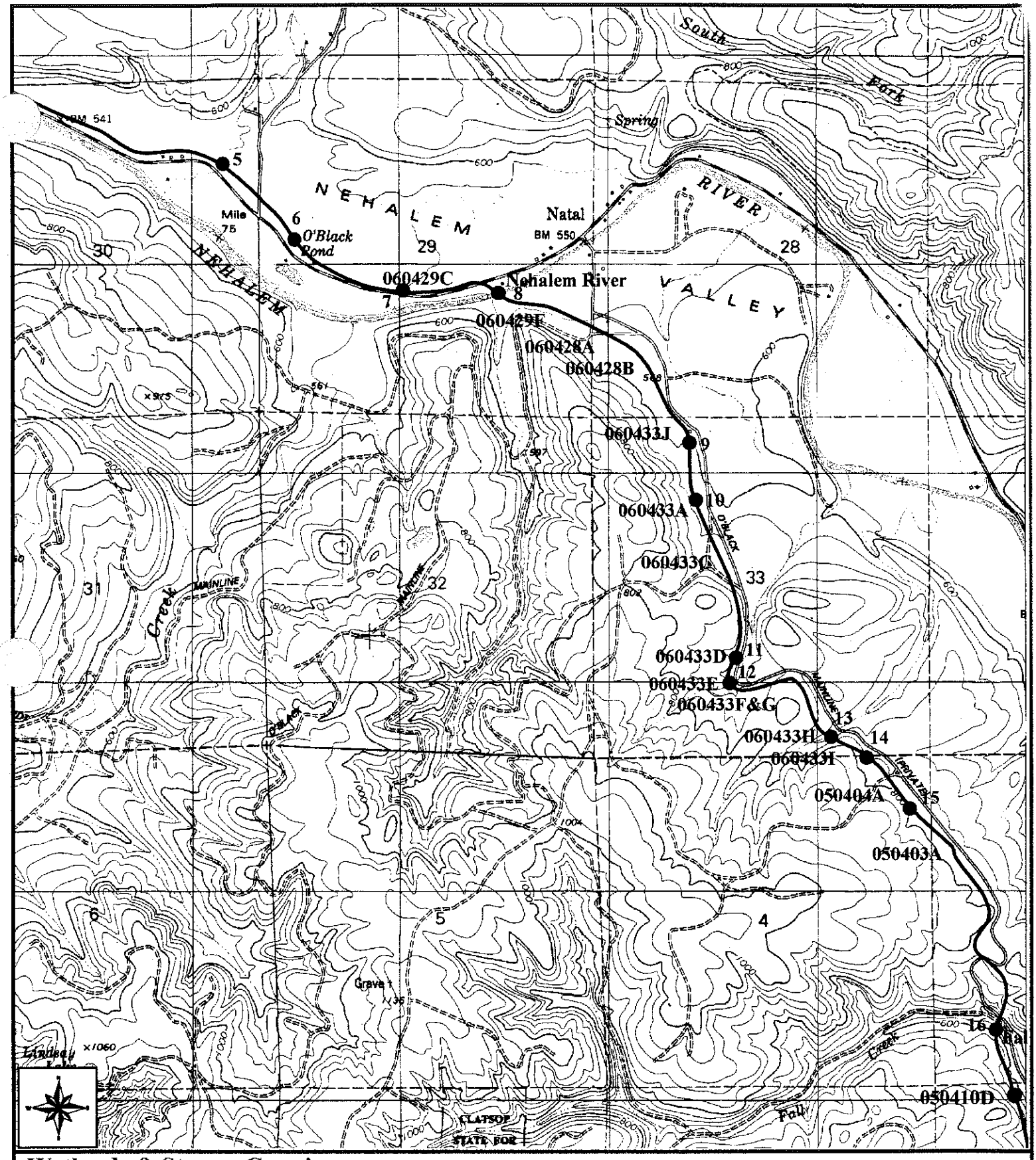
500 0 1000 2000

feet

1"=1500'

DAMES & MOORE

A DAMES & MOORE GROUP COMPANY



Wetlands & Stream Crossings

- ● Stream Crossing Identifier
- ✓ South Mist Feeder Loop
- Contour Interval: 40 Feet

500 0 1000 2000

feet

1"=1500'

DAMES & MOORE

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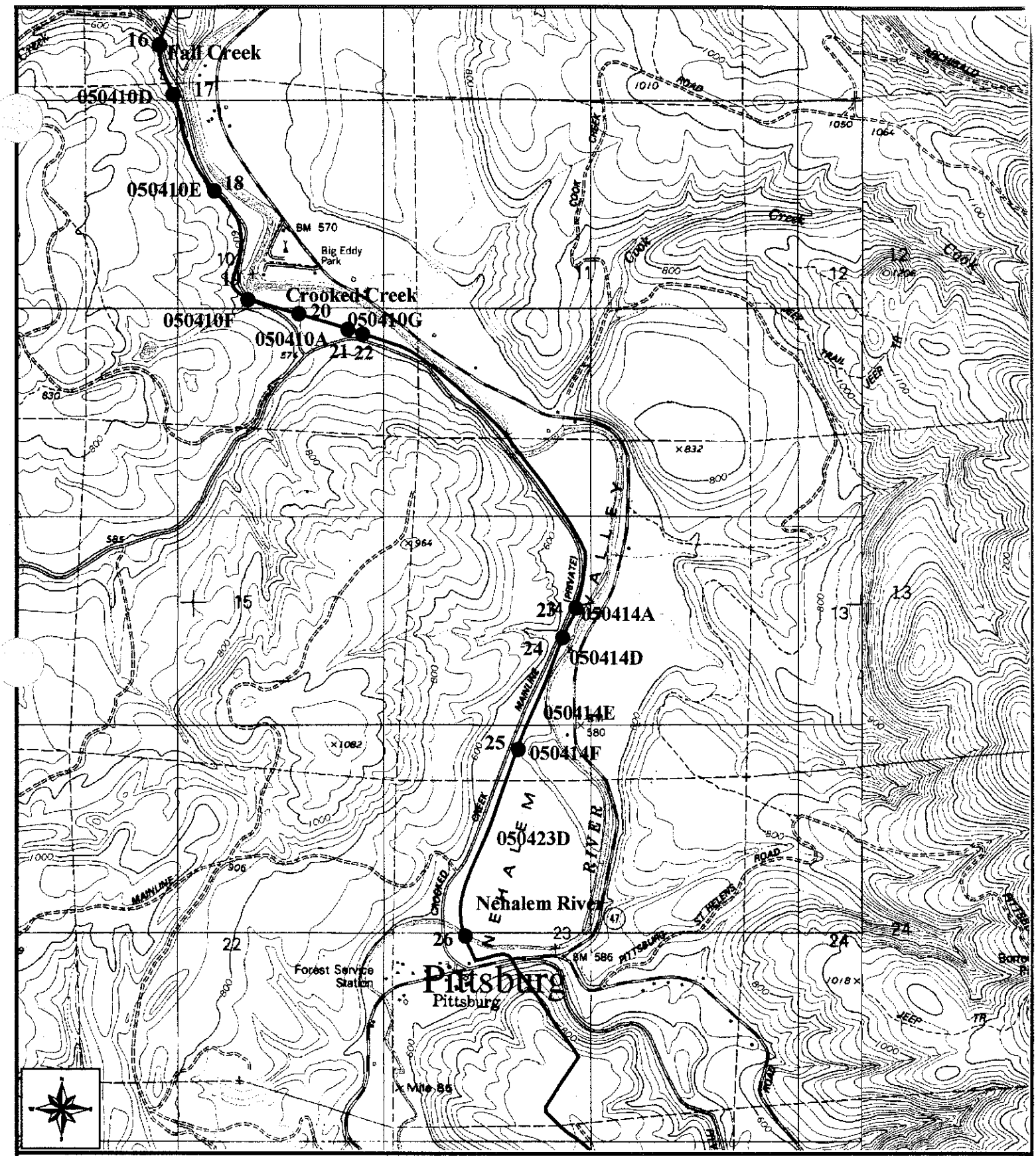
Page Number 2



Wetlands & Stream Crossings

- Stream Crossing Identifier
- South Mist Feeder Loop
- Contour Interval: 40 Feet

500 0 1000 2000

feet

1"=1500'

DAMES & MOORE

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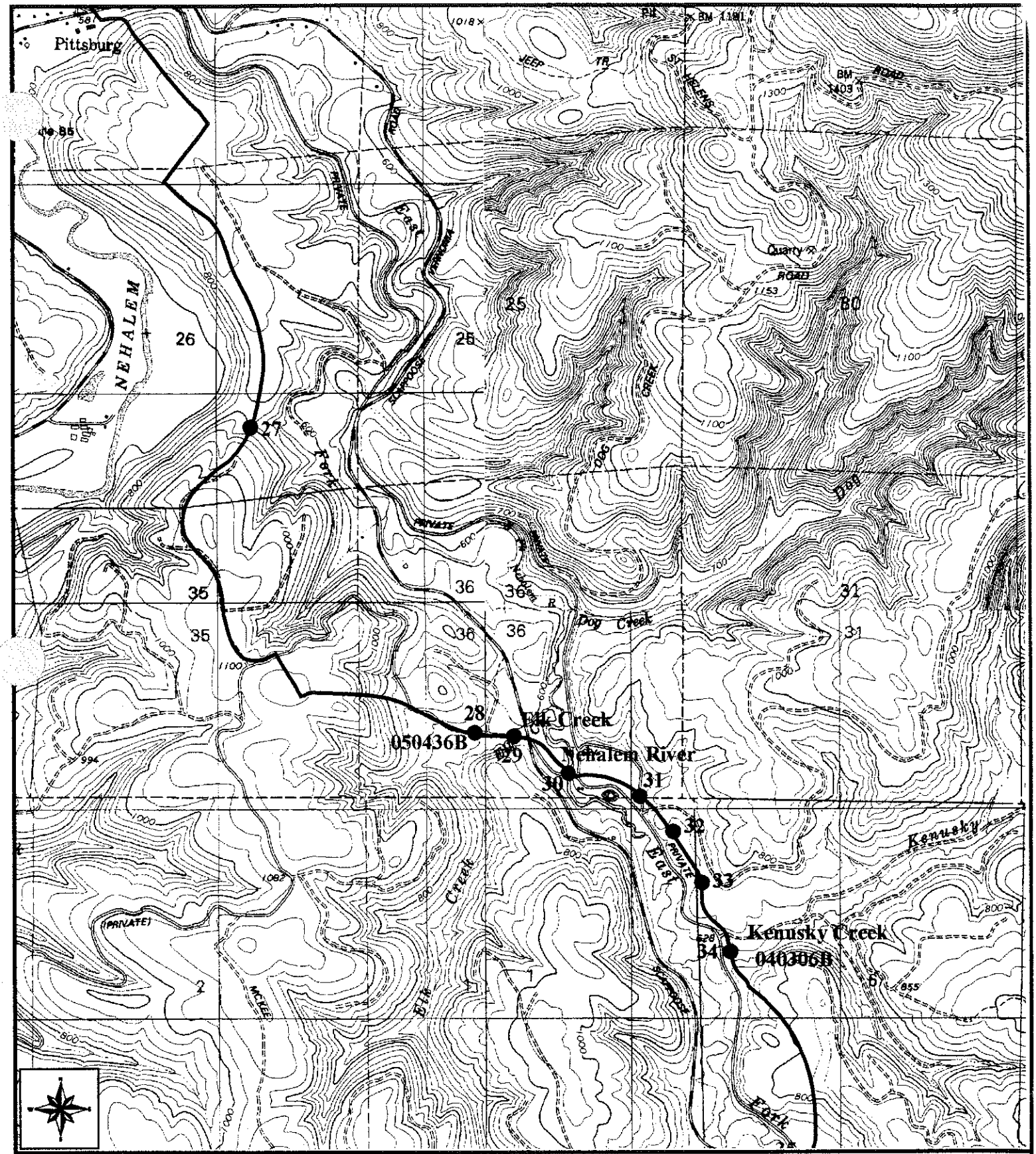
Page Number 3



Wetlands & Stream Crossings

- Stream Crossing Identifier
- South Mist Feeder Loop
- Contour Interval: 40 Feet

500 0 1000 2000

feet

1"=1500'

DAMES & MOORE

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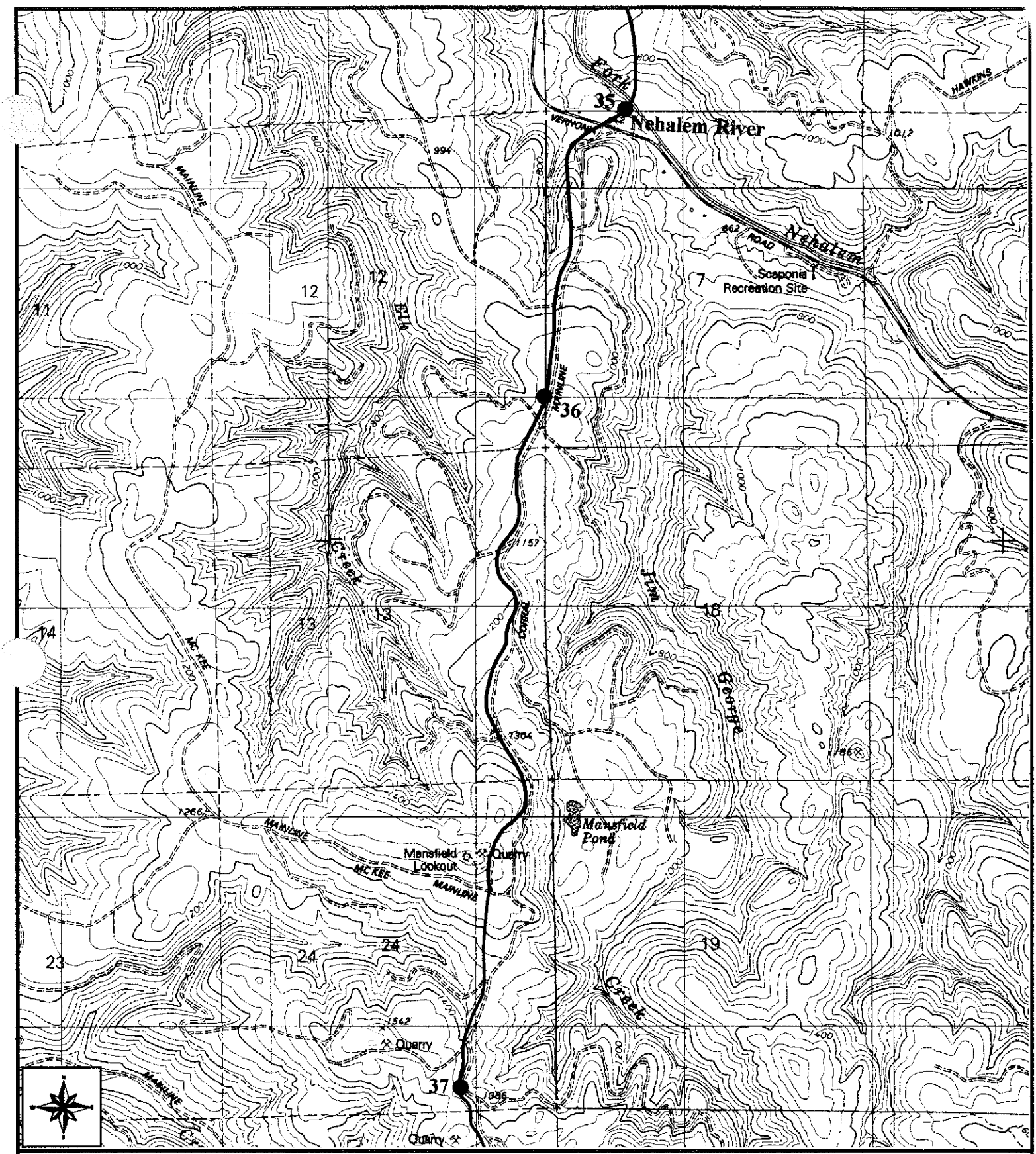
Page Number 4



Wetlands & Stream Crossings

500 0 1000 2000

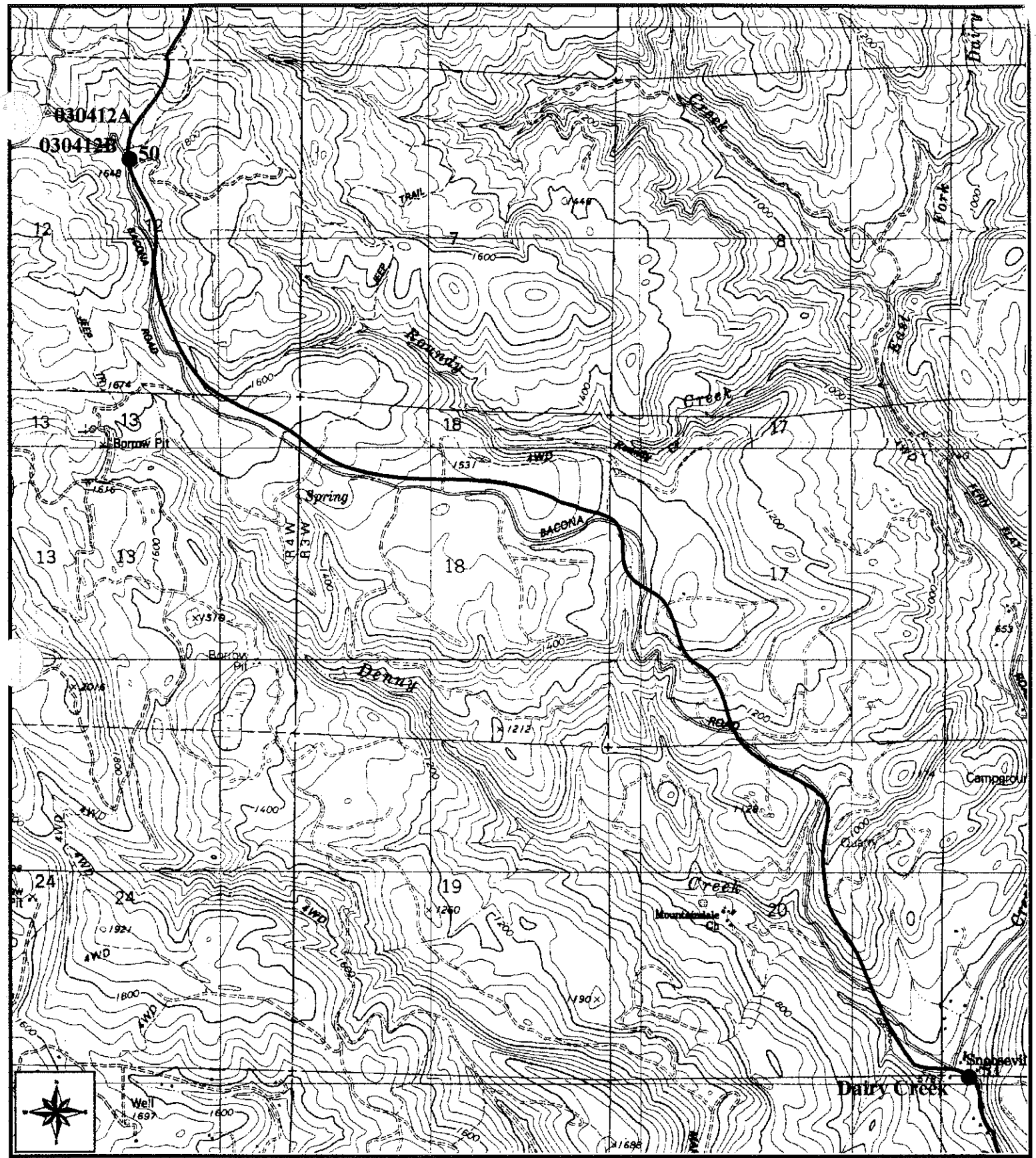
feet

1"=1500'

- Stream Crossing Identifier
- South Mist Feeder Loop

Contour Interval: 40 Feet

DAMES & MOORE
A DAMES & MOORE GROUP COMPANY



Wetlands & Stream Crossings

500 0 1000 2000

feet

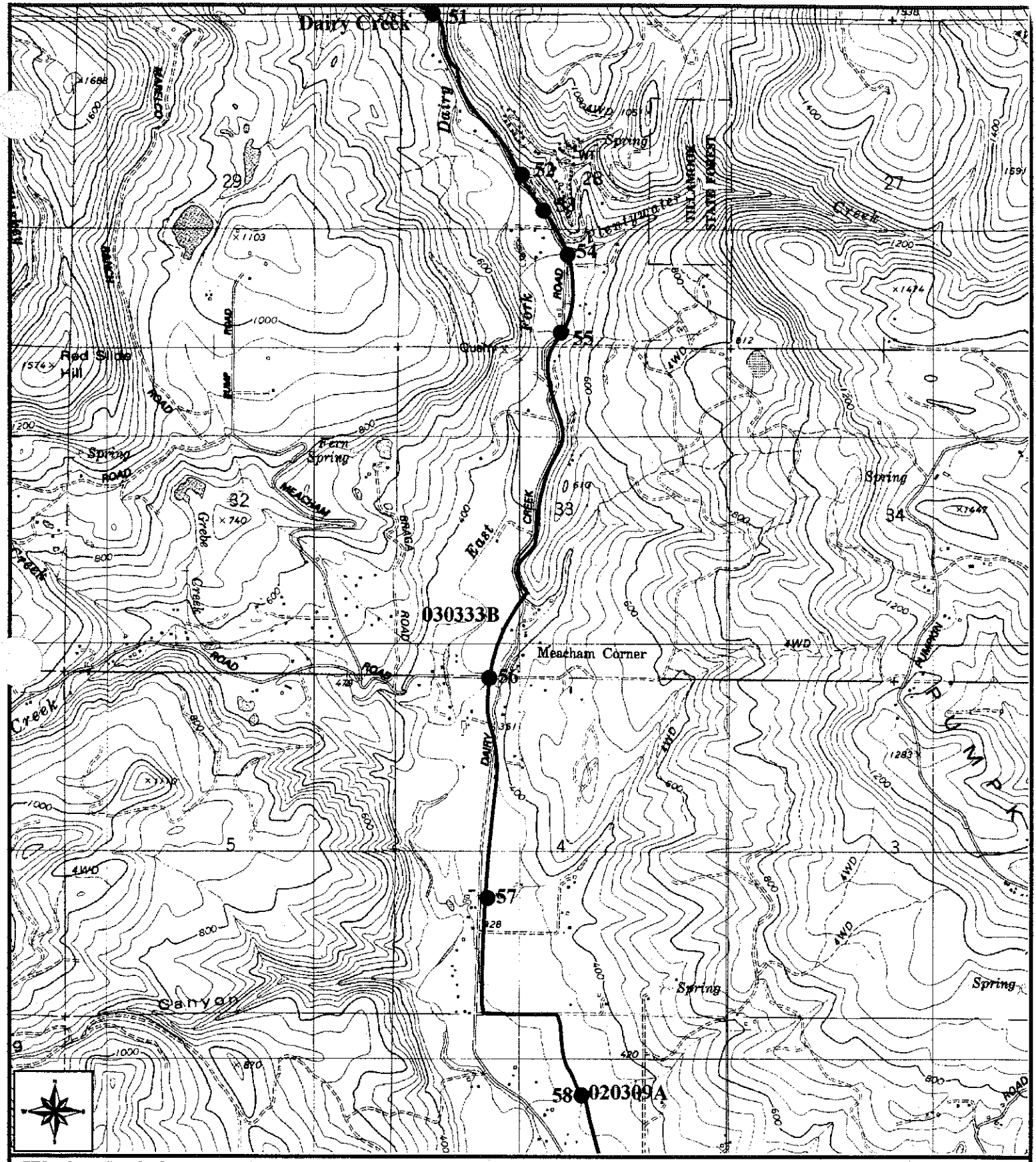
1"=1500'

- Stream Crossing Identifier
- South Mist Feeder Loop

Contour Interval: 40 Feet

DAMES & MOORE

A DAMES & MOORE GROUP COMPANY



Wetlands & Stream Crossings

- Stream Crossing Identifier
- South Mist Feeder Loop
- Contour Interval: 40 Feet

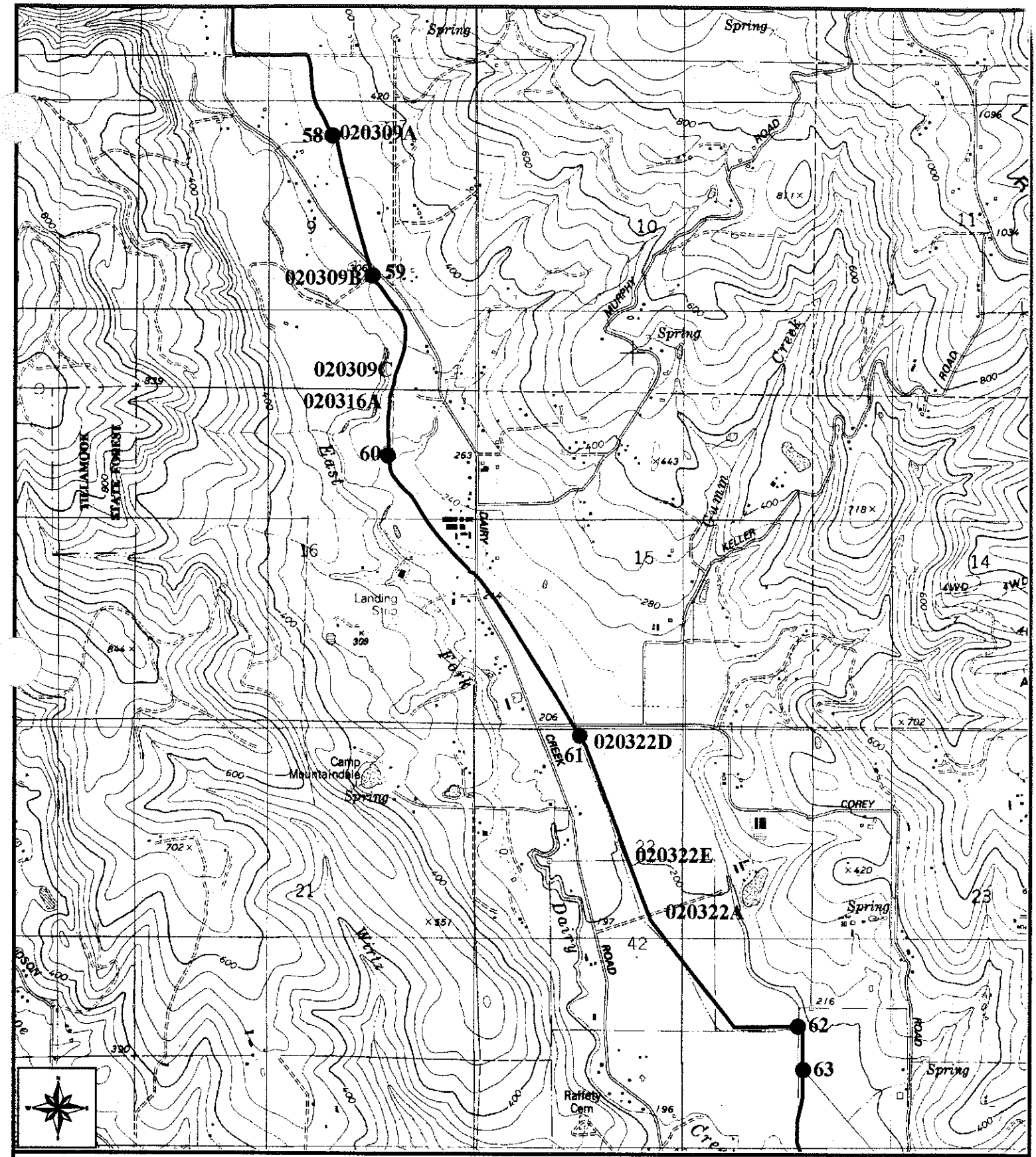
500 0 1000 2000

feet

1"=1500'

DAMES & MOORE

A DAMES & MOORE GROUP COMPANY



Wetlands & Stream Crossings

- Stream Crossing Identifier
- South Mist Feeder Loop
- Contour Interval: 40 Feet

500 0 1000 2000

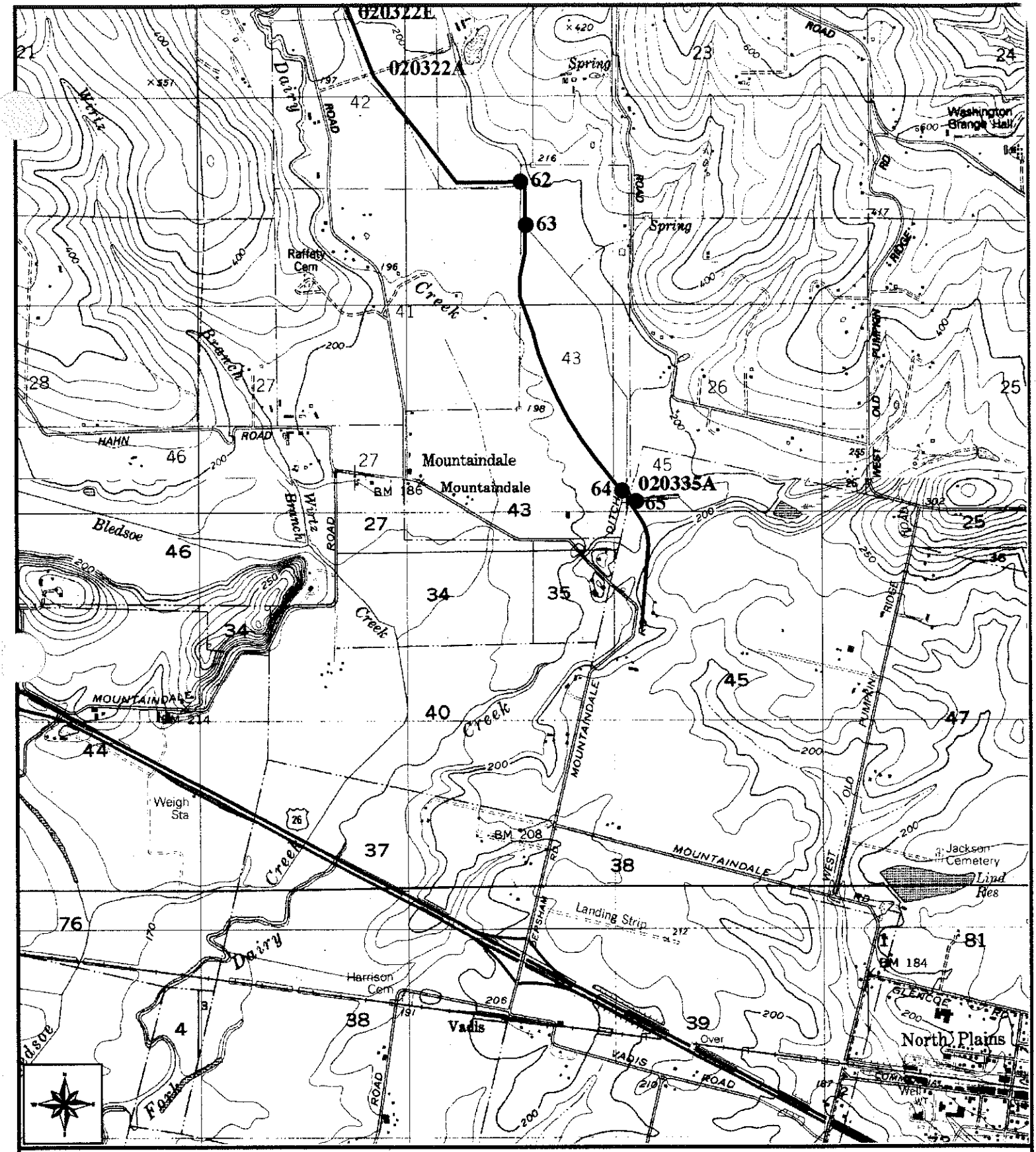
feet

1"=1500'

DCM GROUP

DAMES & MOORE

A DAMES & MOORE GROUP COMPANY



Wetlands & Stream Crossings

- Stream Crossing Identifier
- South Mist Feeder Loop

Contour Interval: 40 Feet

500 0 1000 2000

feet

1"=1500'

DAMES & MOORE

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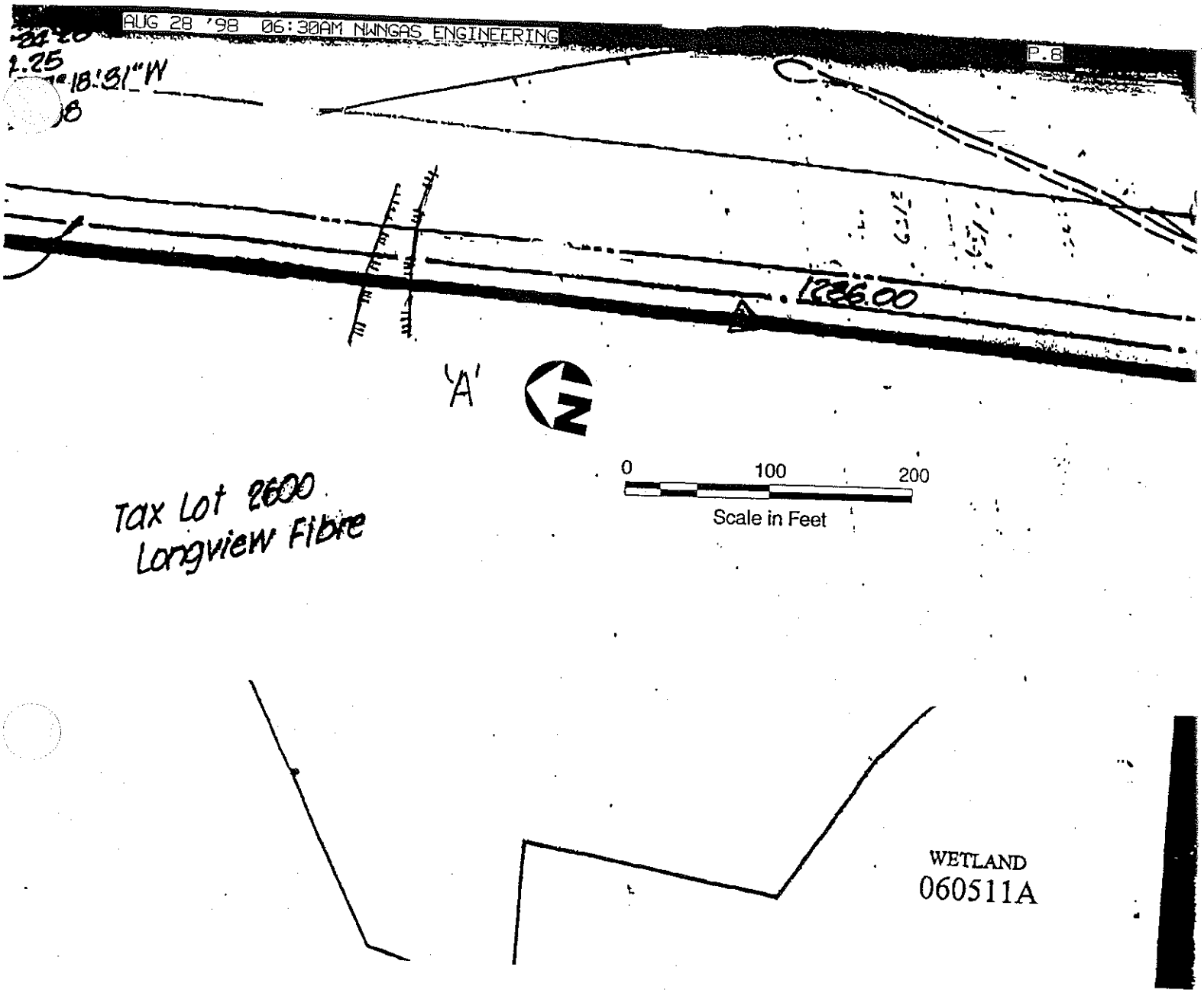
APPENDIX C

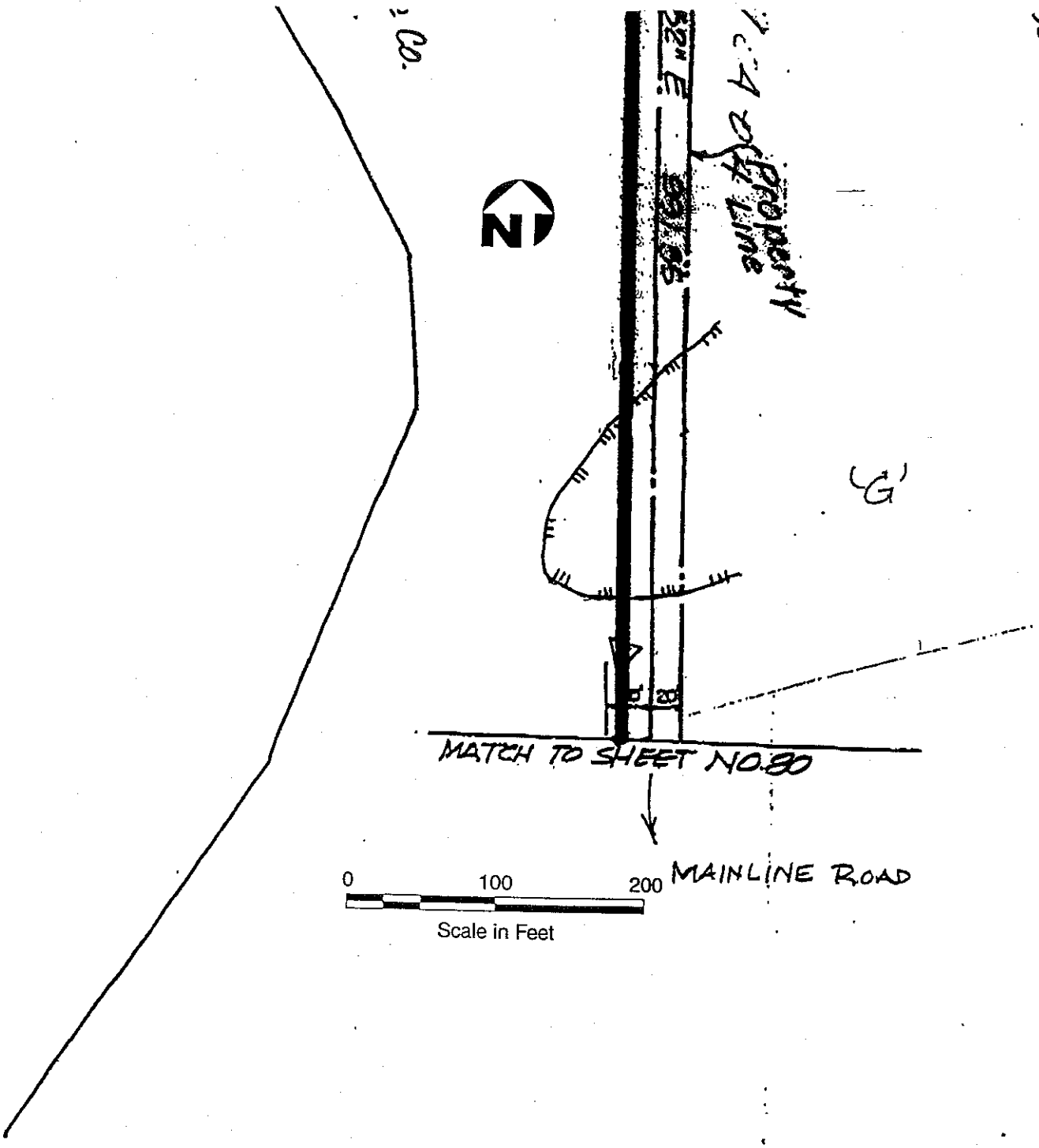
WETLAND SURVEY MAPS



Map Source: Northwest Natural Gas, Wetland Report: Dames and Moore, Inc.

PURPOSE: Transport natural gas 09/11/98
ADJACENT PROPERTY OWNERS: Various APPLICATION BY: Northwest Natural Gas
PROPOSED: Excavation and fill for natural gas pipeline COUNTIES OF: Columbia and Washington, OR
IN: Wetlands and other waters of the U.S.

WETLAND SURVEY MAP



WETLAND
060514G

Map Source: Northwest Natural Gas, Wetland Report: Dames and Moore, Inc.

PURPOSE: Transport natural gas 09/11/98
ADJACENT PROPERTY OWNERS: Various APPLICATION BY: Northwest Natural Gas
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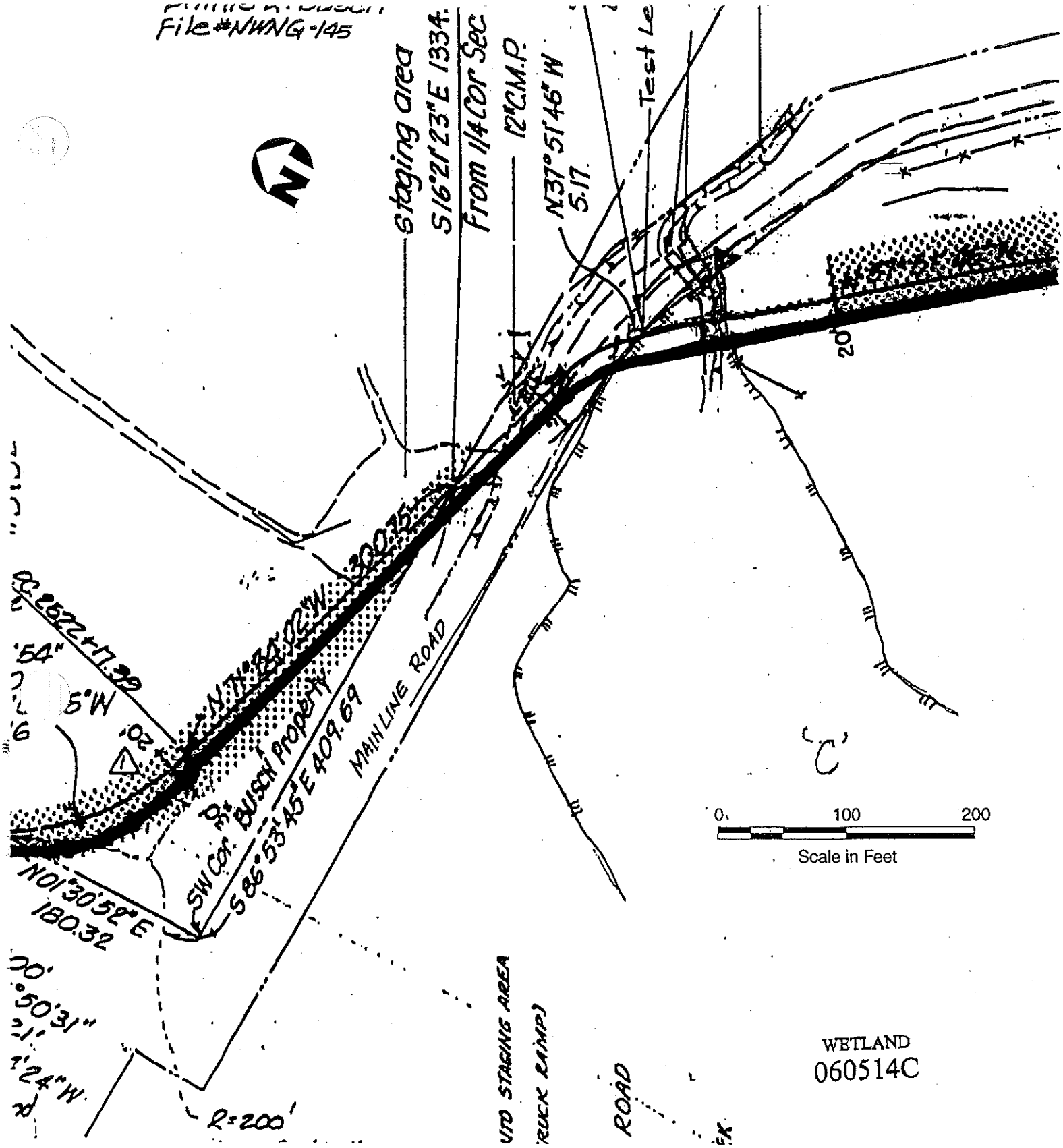
WETLAND SURVEY MAP



Map Source: Northwest Natural Gas, Wetland Report: Dames and Moore, Inc.

PURPOSE: Transport natural gas 09/11/98
ADJACENT PROPERTY OWNERS: Various APPLICATION BY: Northwest Natural Gas
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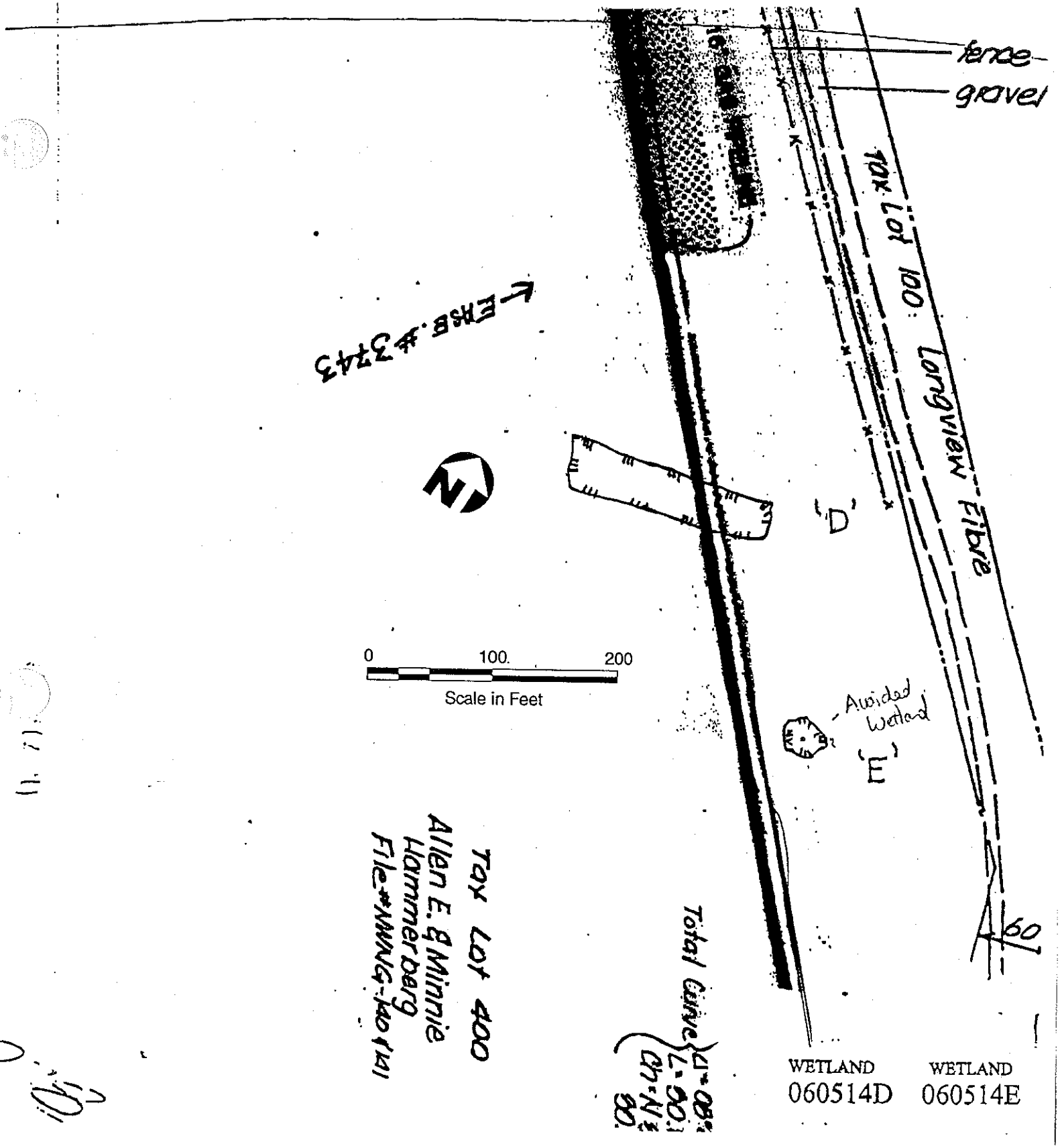
WETLAND SURVEY MAP



Map Source: Northwest Natural Gas, Wetland Report: Dames and Moore, Inc.

PURPOSE: Transport natural gas 09/11/98
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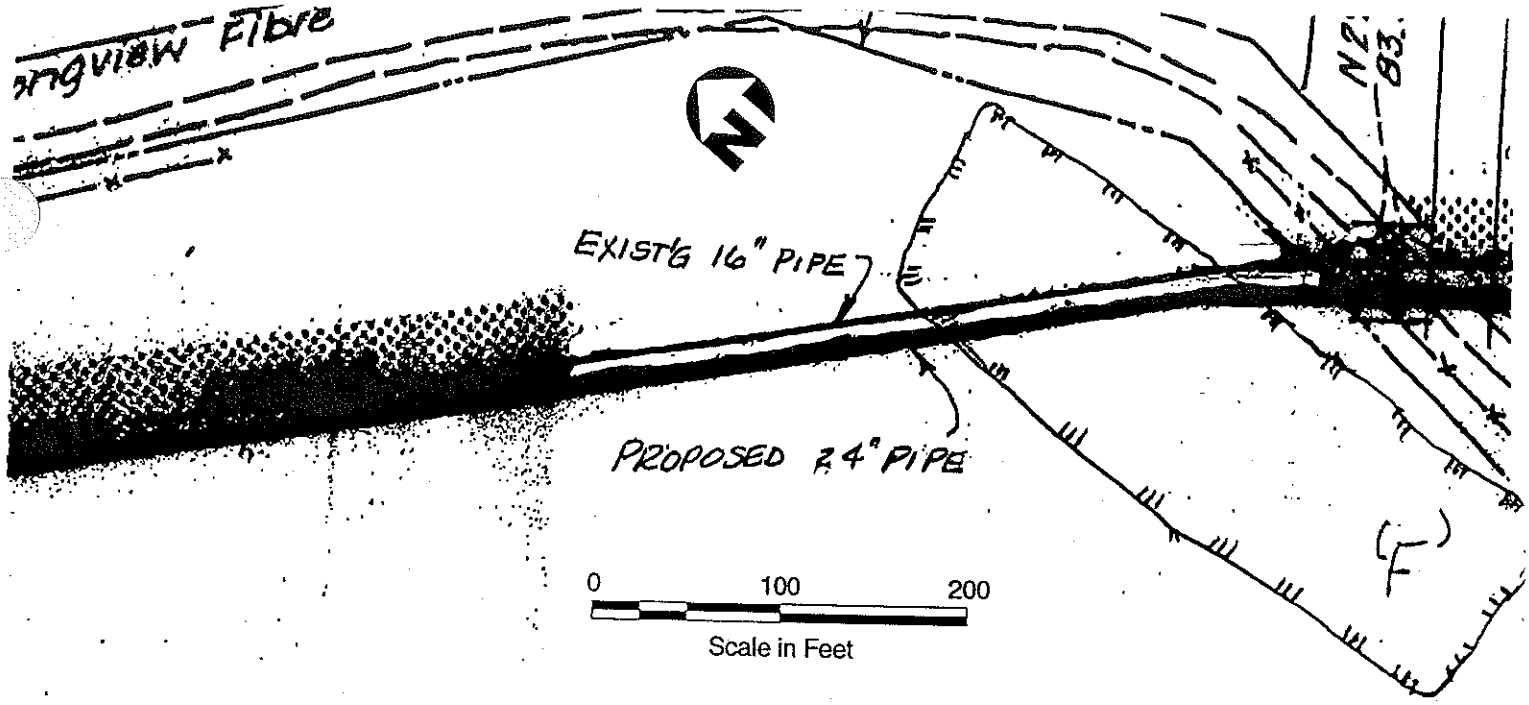
IN: Wetlands and other waters of the U.S.

WETLAND SURVEY MAP



Tax Lot 400
Allen E. & Minnie
Hammerberg
File #NWNG-140(141

R = 200
Δ = 00°40'48"
L = 2.37
Ch = N29°22'3(
2.37

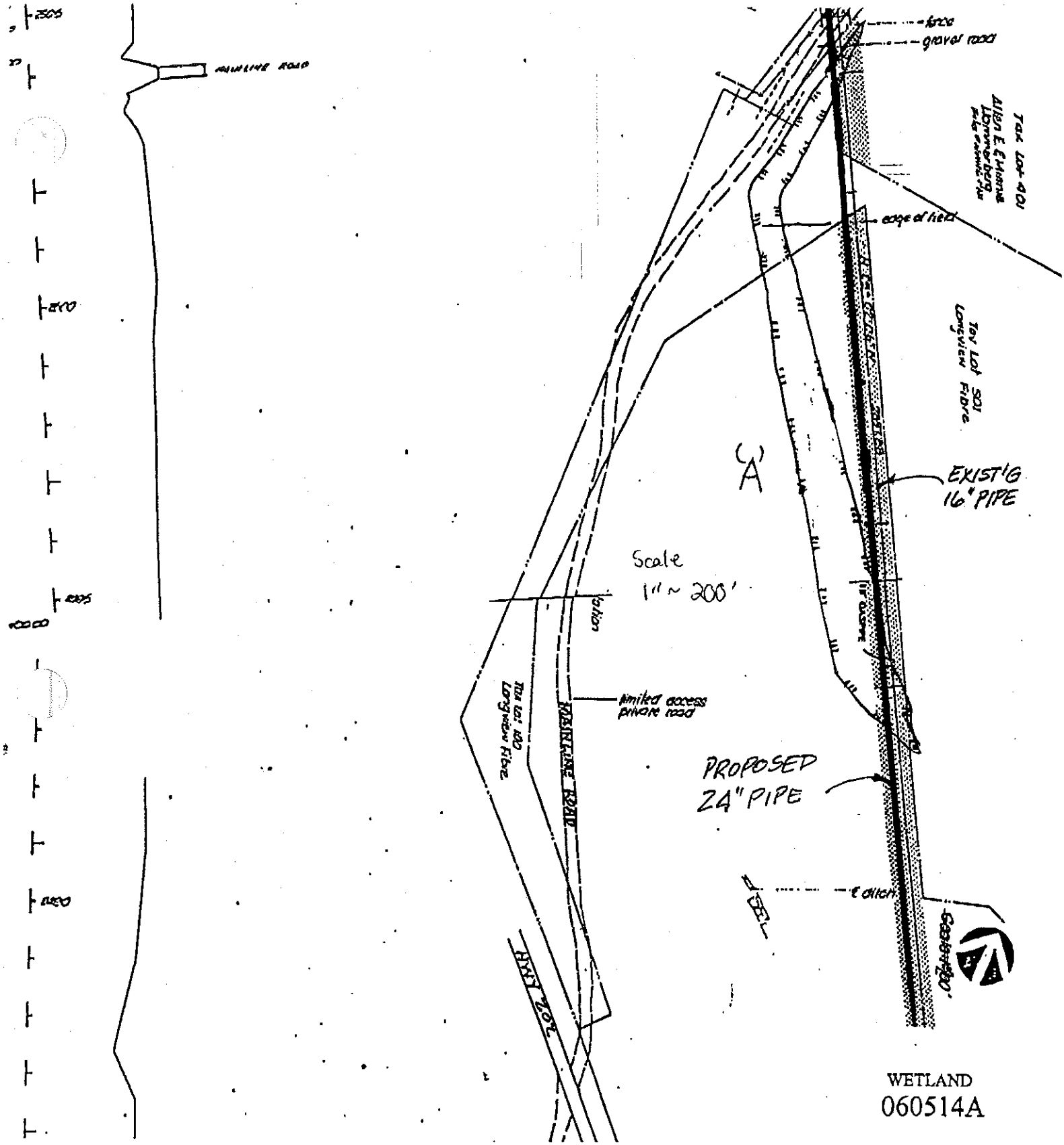
CA-04
CA-04

WETLAND
060514F

Map Source: Northwest Natural Gas, Wetland Report: Dames and Moore, Inc.

PURPOSE: Transport natural gas 09/11/98
ADJACENT PROPERTY OWNERS: Various APPLICATION BY: Northwest Natural Gas
PROPOSED: Excavation and fill for natural gas pipeline COUNTIES OF: Columbia and Washington, OR
IN: Wetlands and other waters of the U.S. Page 5 of 55

WETLAND SURVEY MAP



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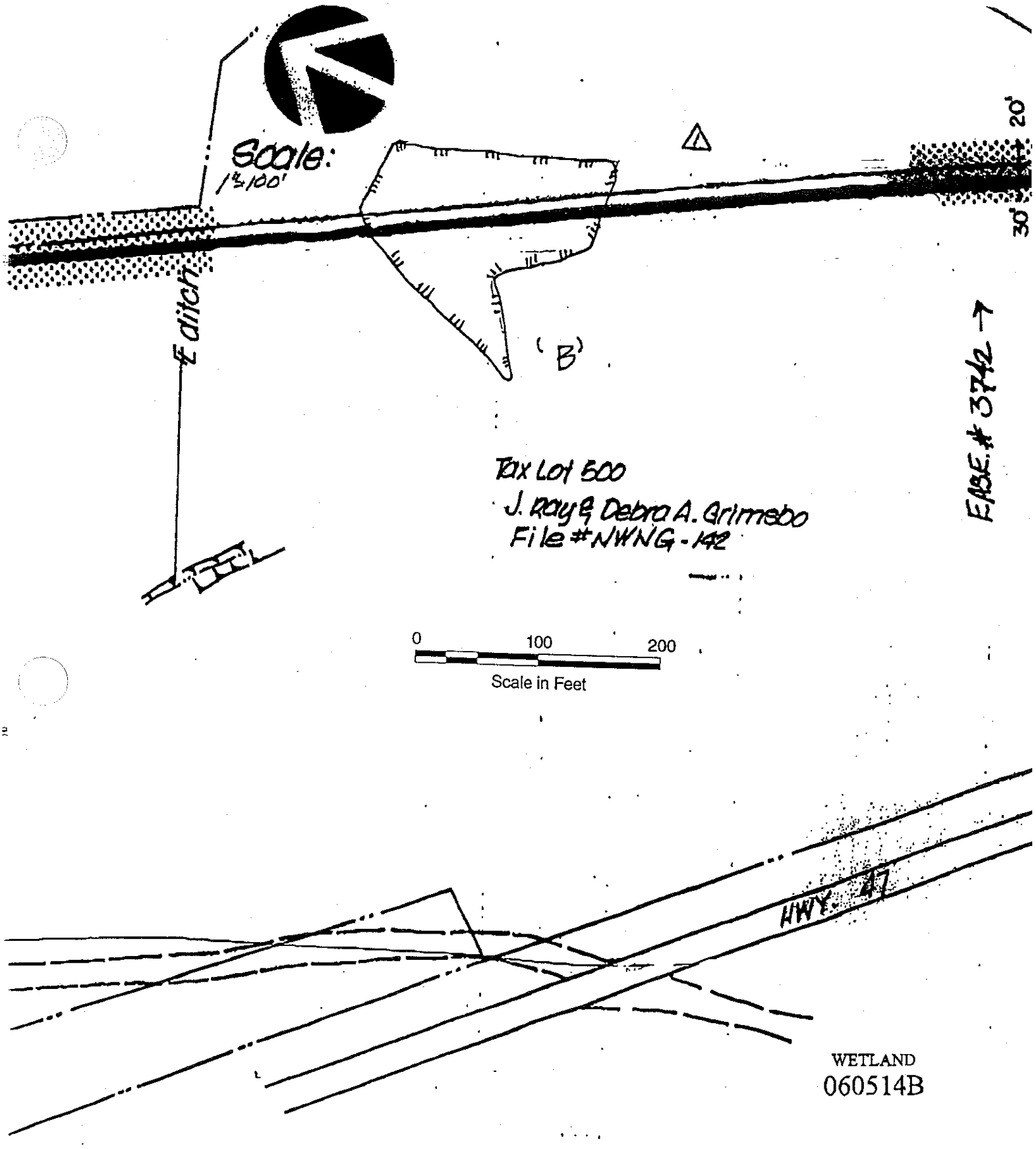

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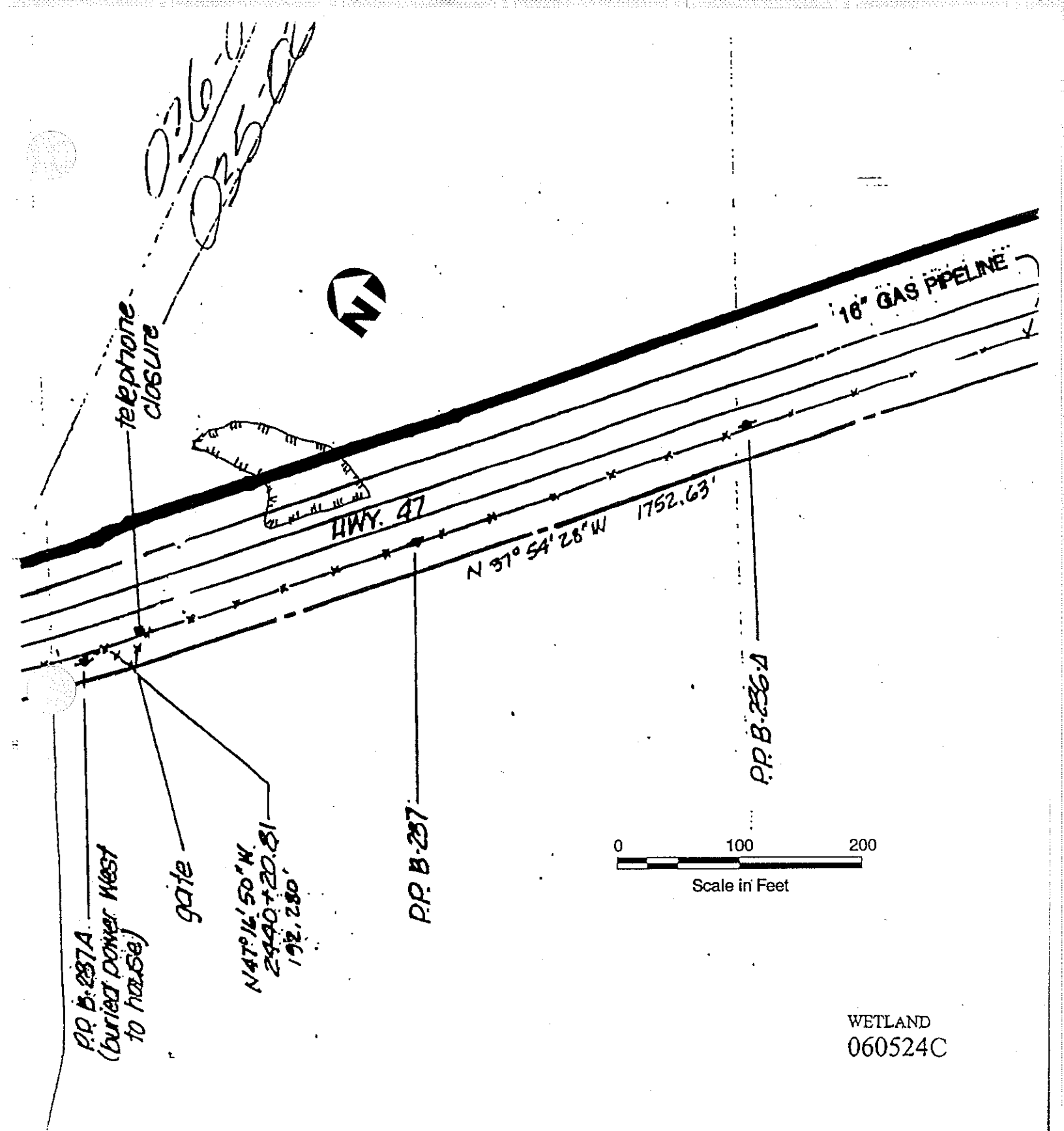

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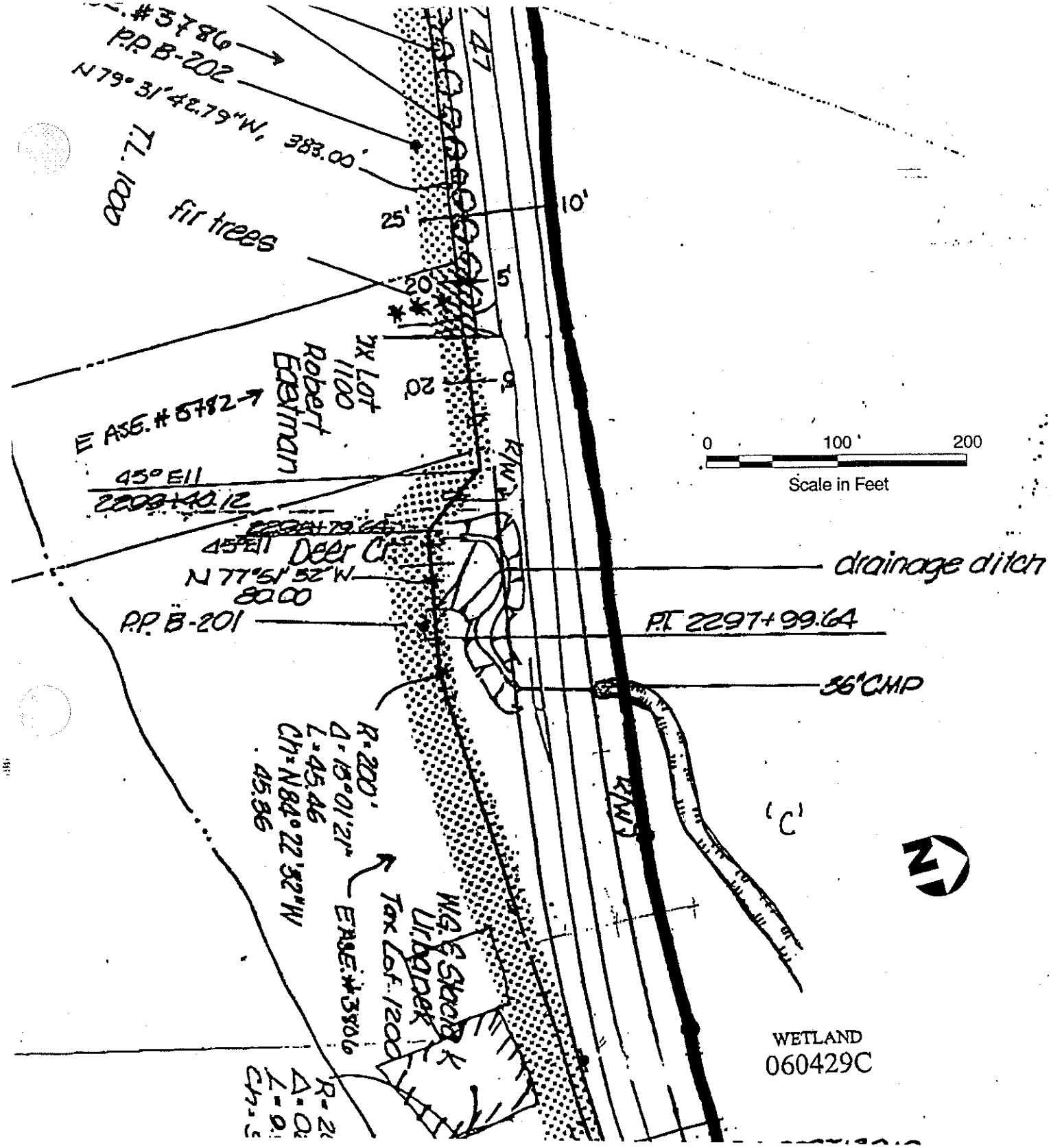

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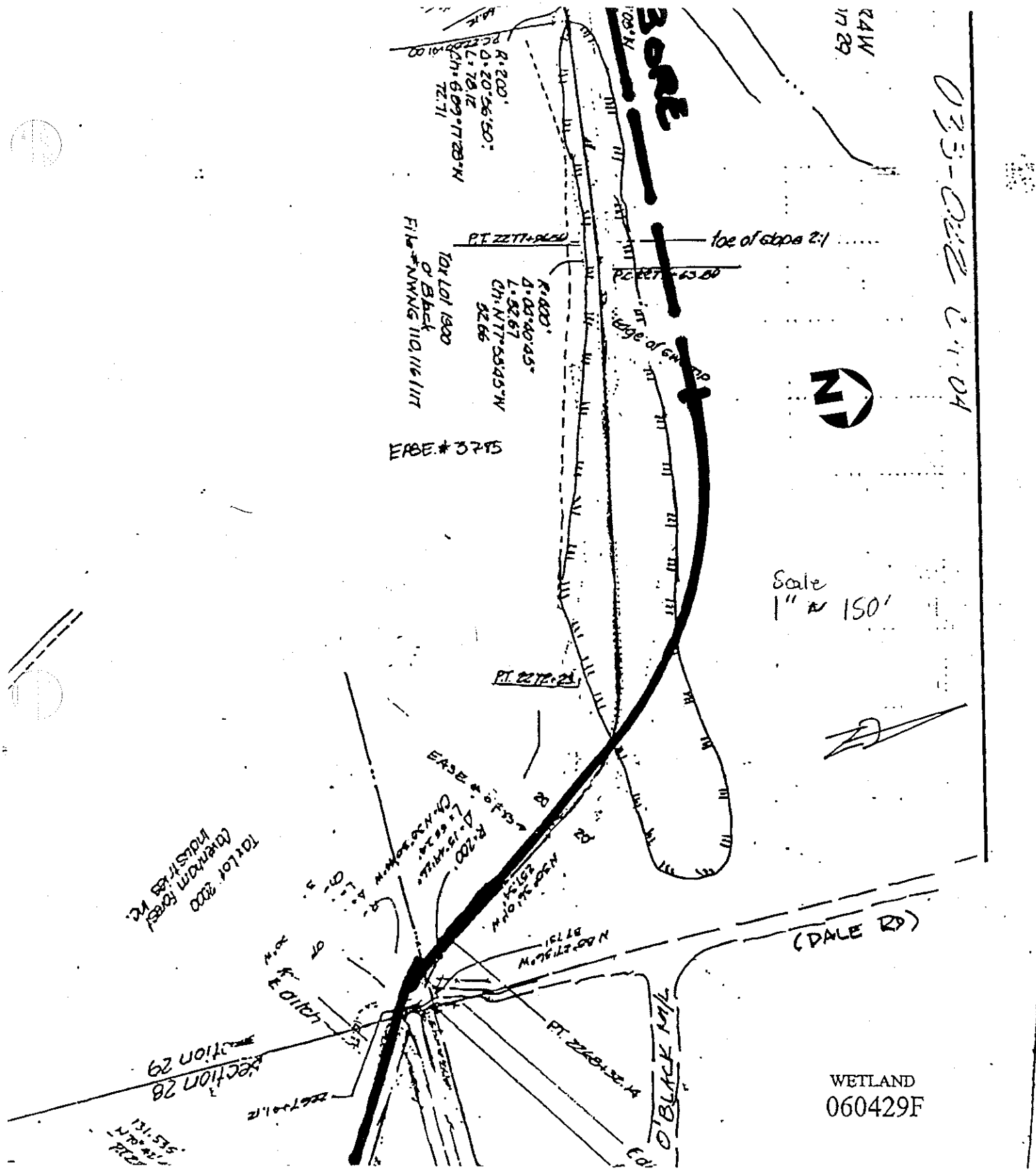

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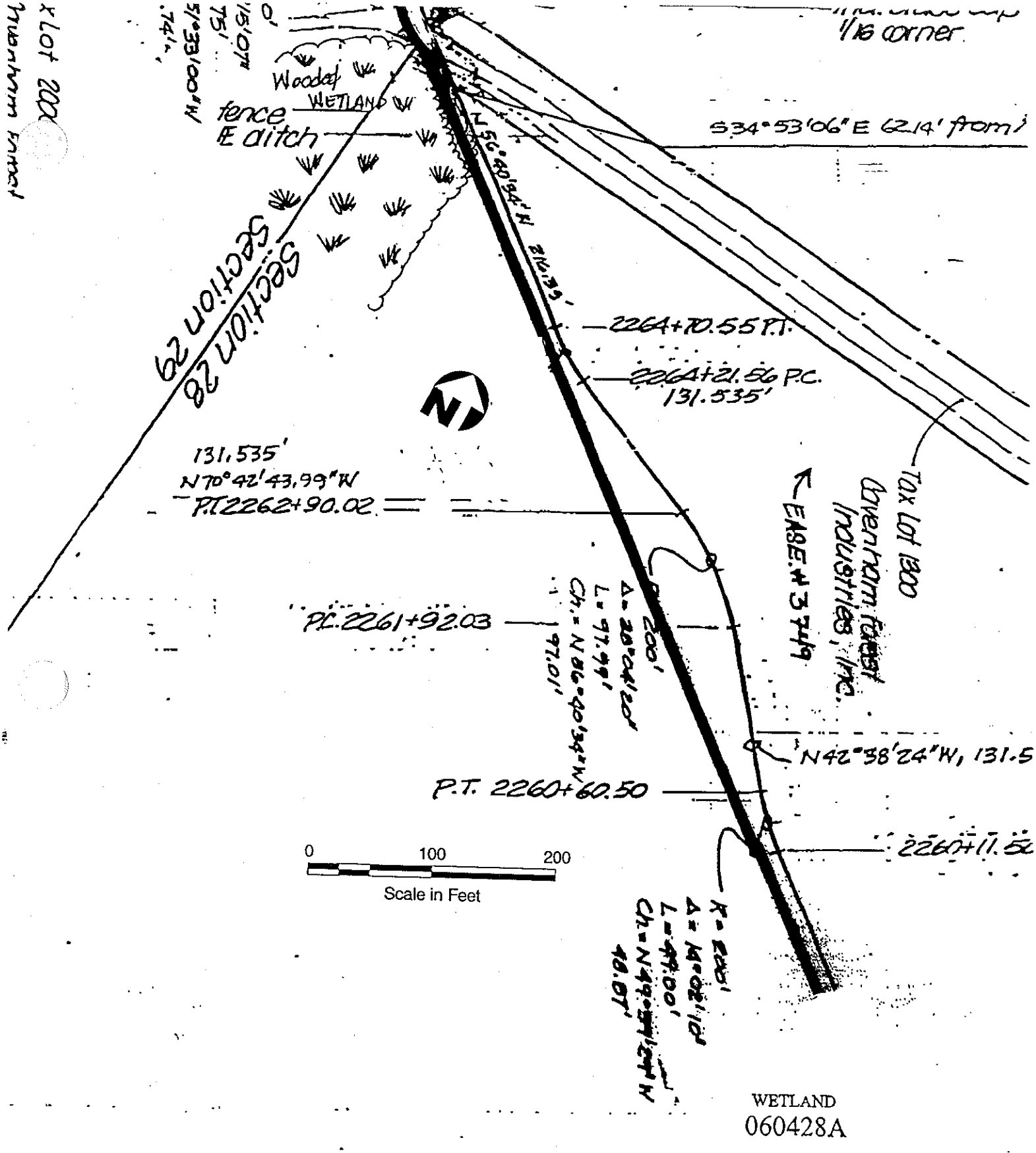

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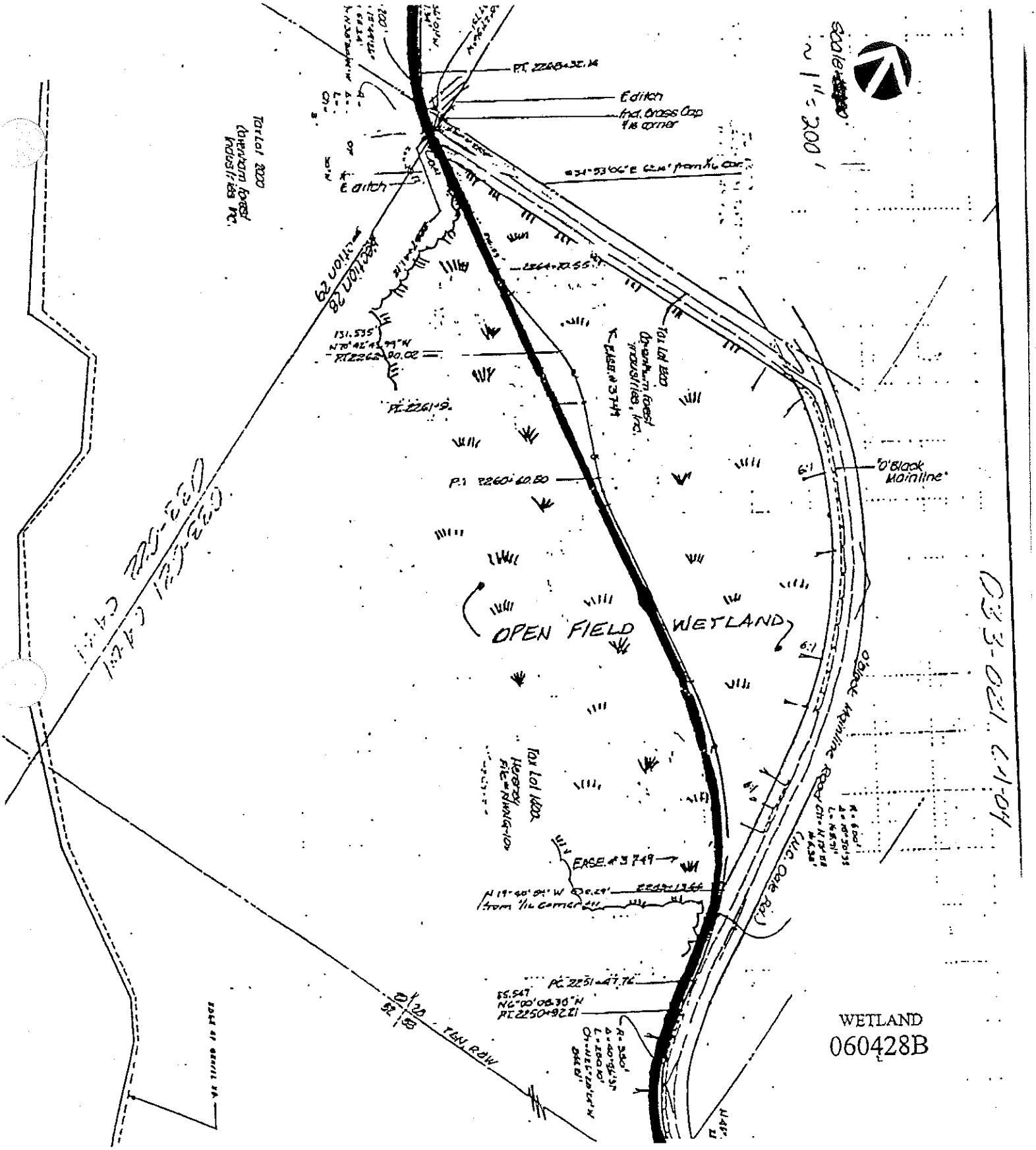

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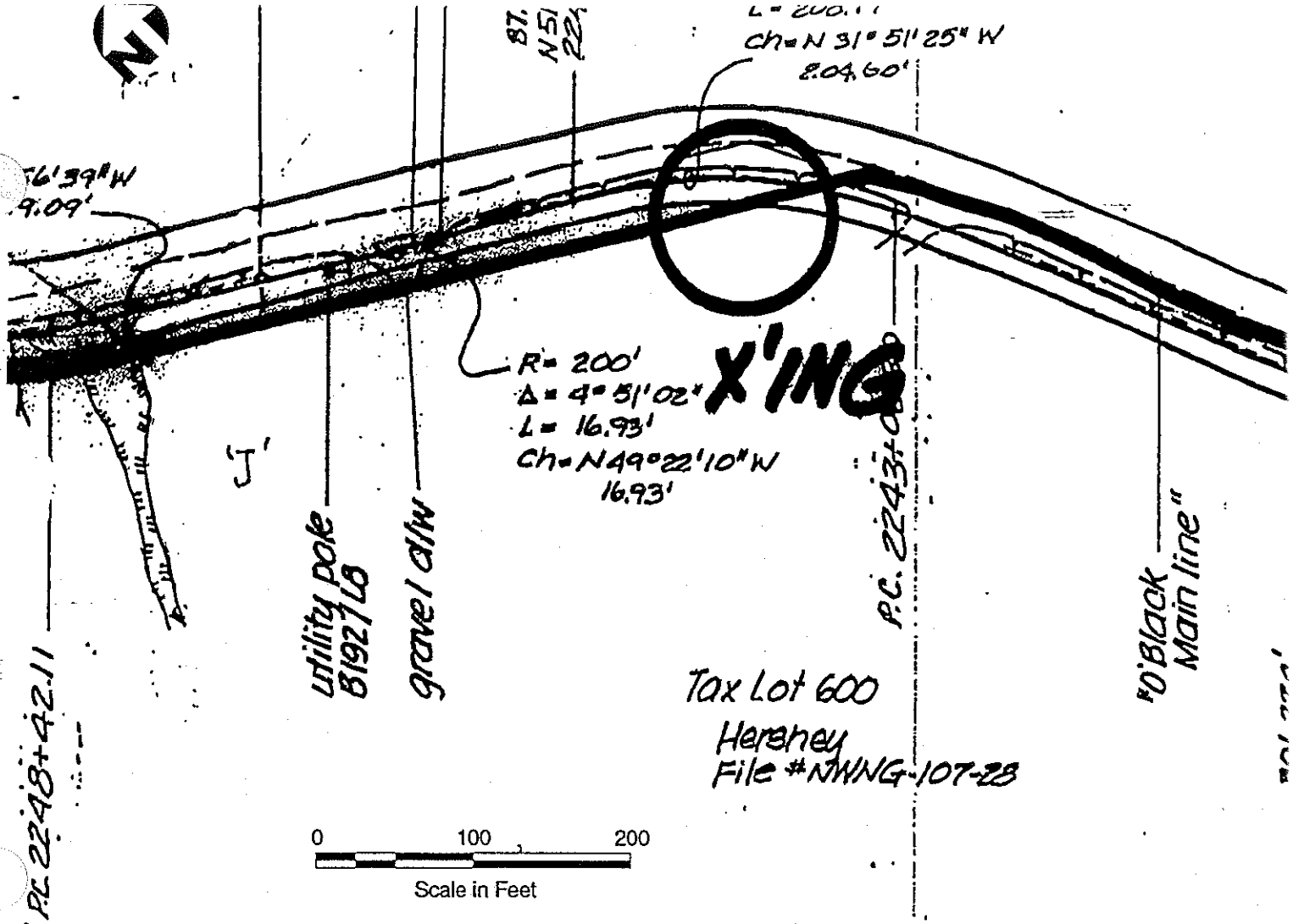

WETLAND
060433J

Map Source: Northwest Natural Gas, Wetland Report: Dames and Moore, Inc.

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09/11/98
APPLICATION BY: Northwest Natural Gas
COUNTIES OF: Columbia and Washington, OR

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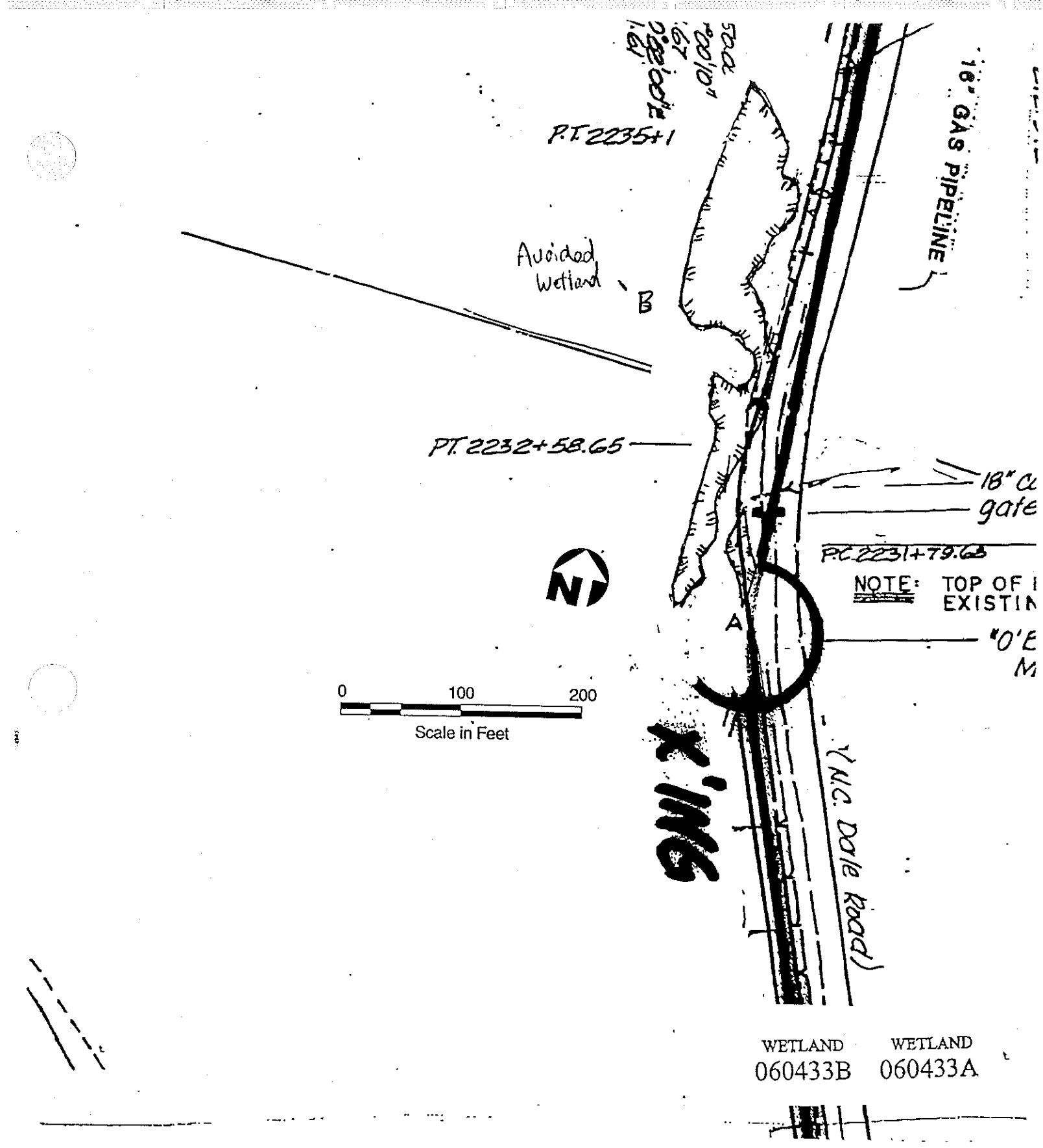

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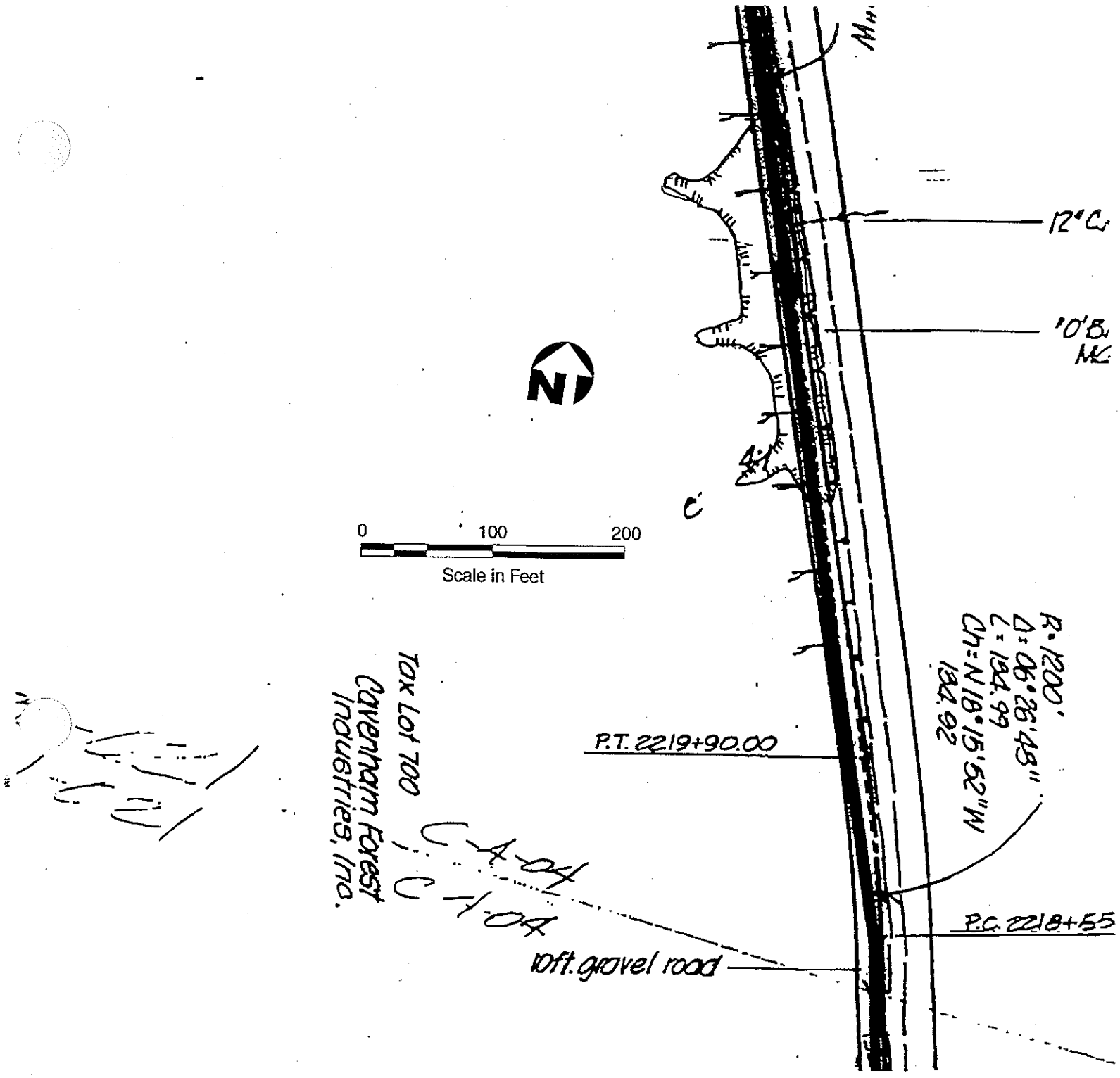

Map Source: Northwest Natural Gas, Wetland Report: Dames and Moore, Inc 060433C

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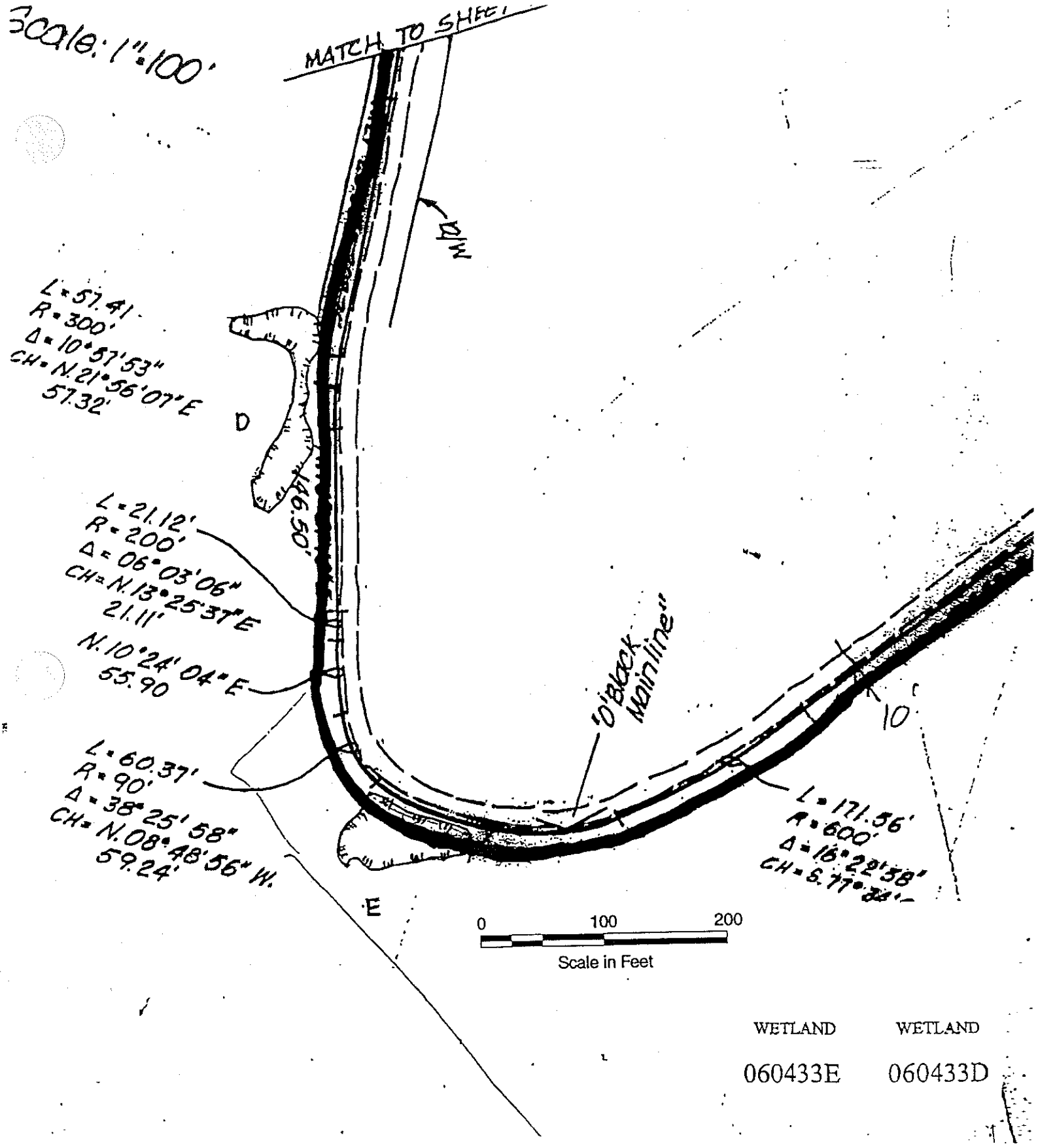

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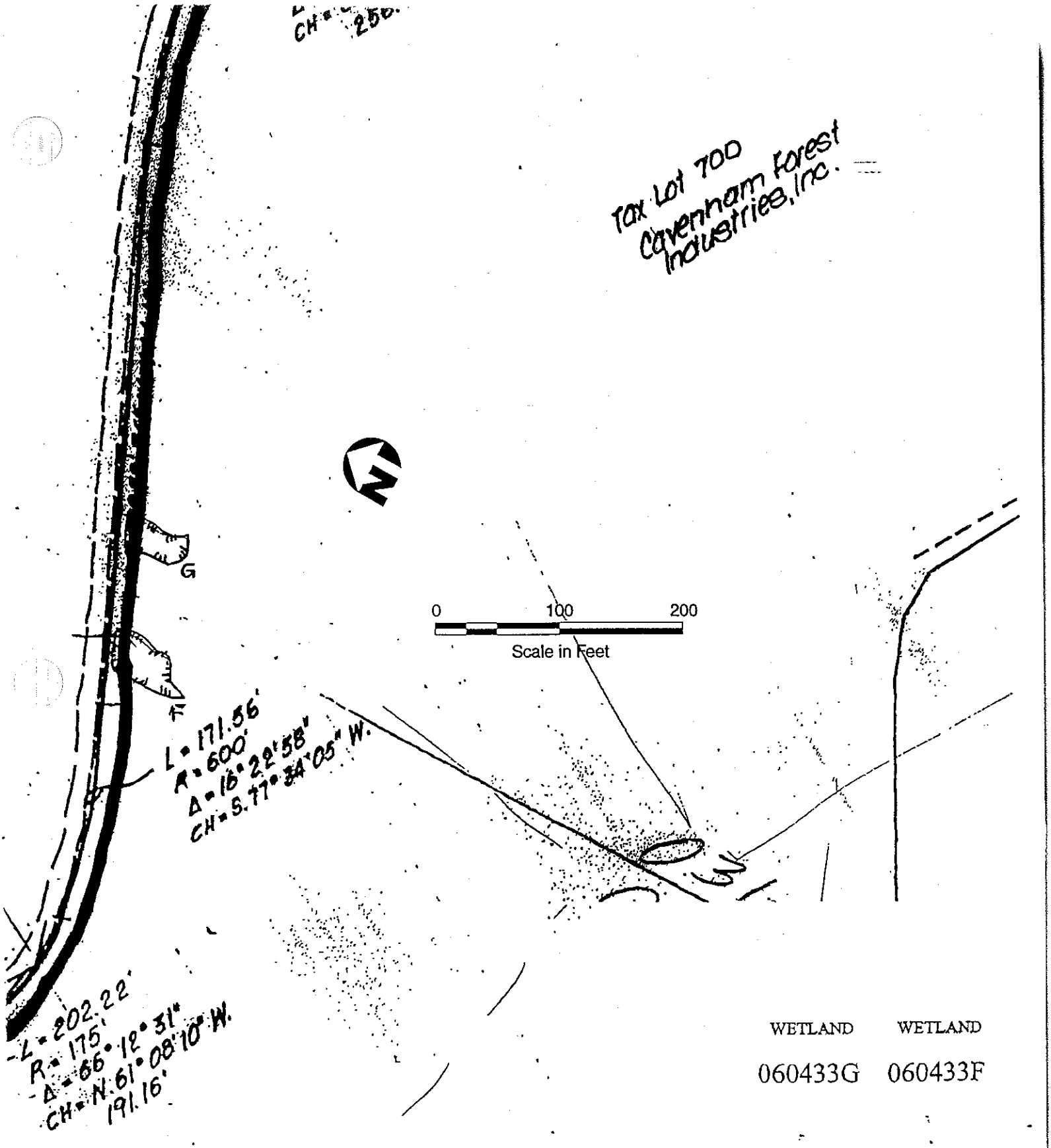

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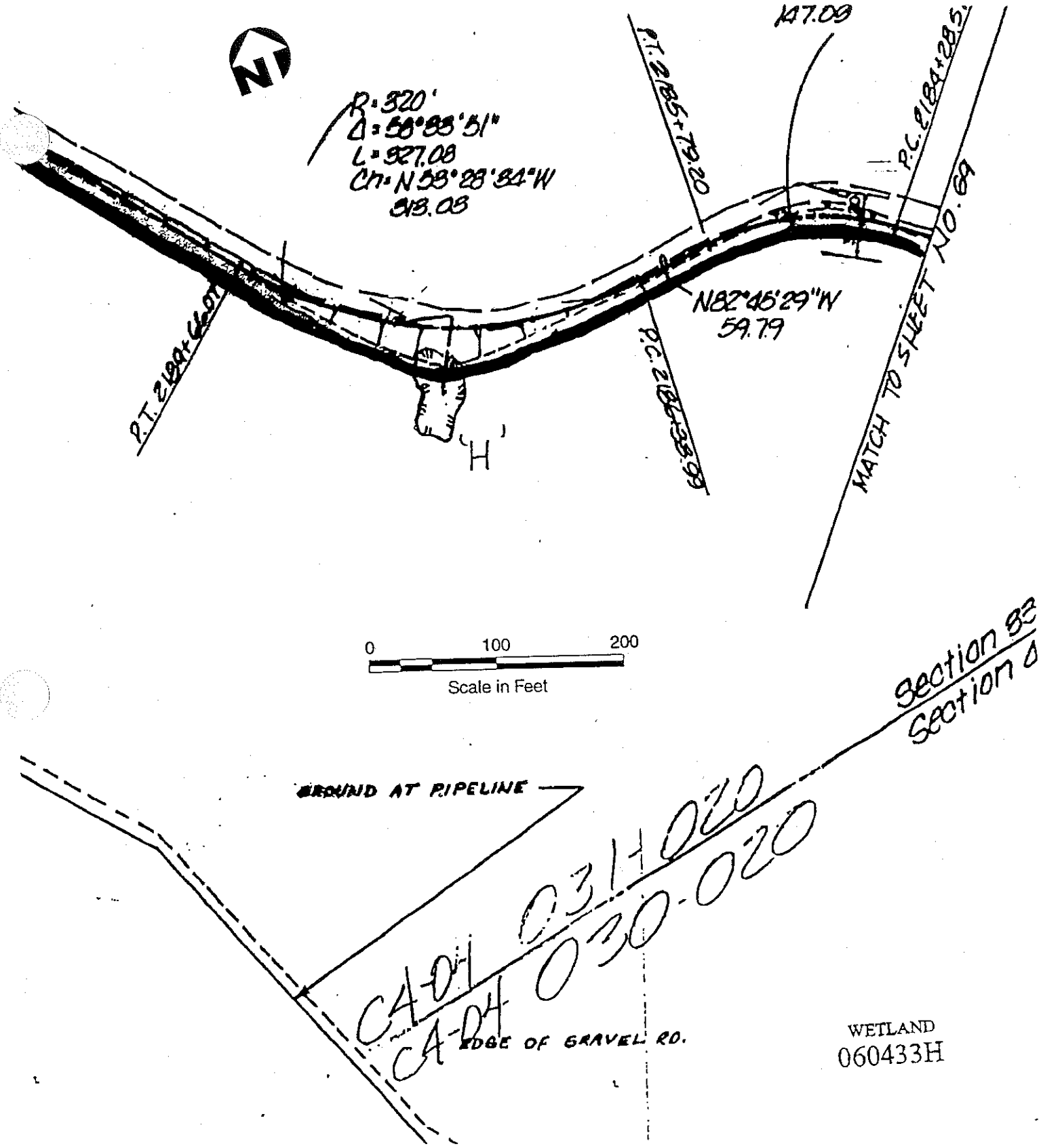

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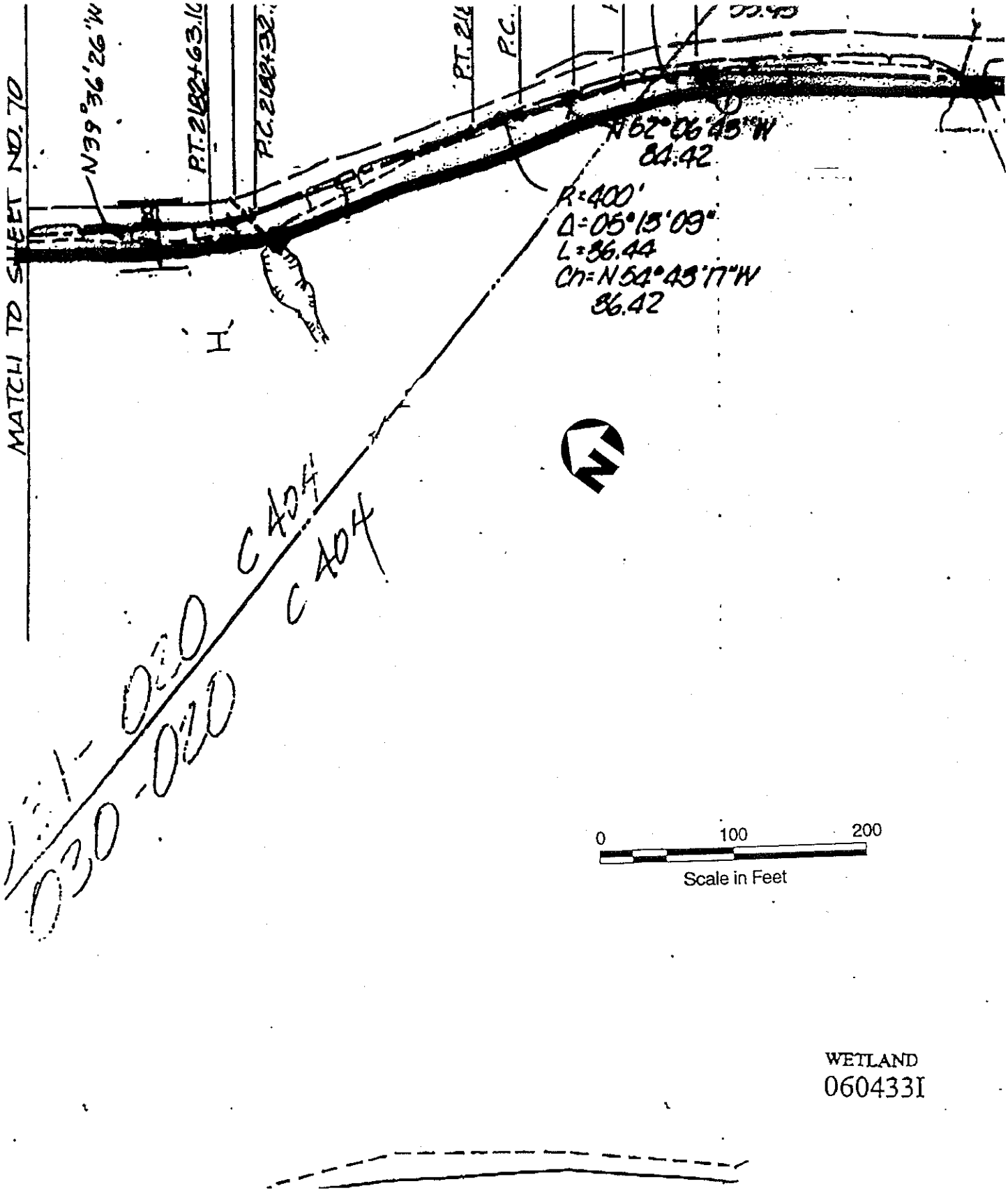

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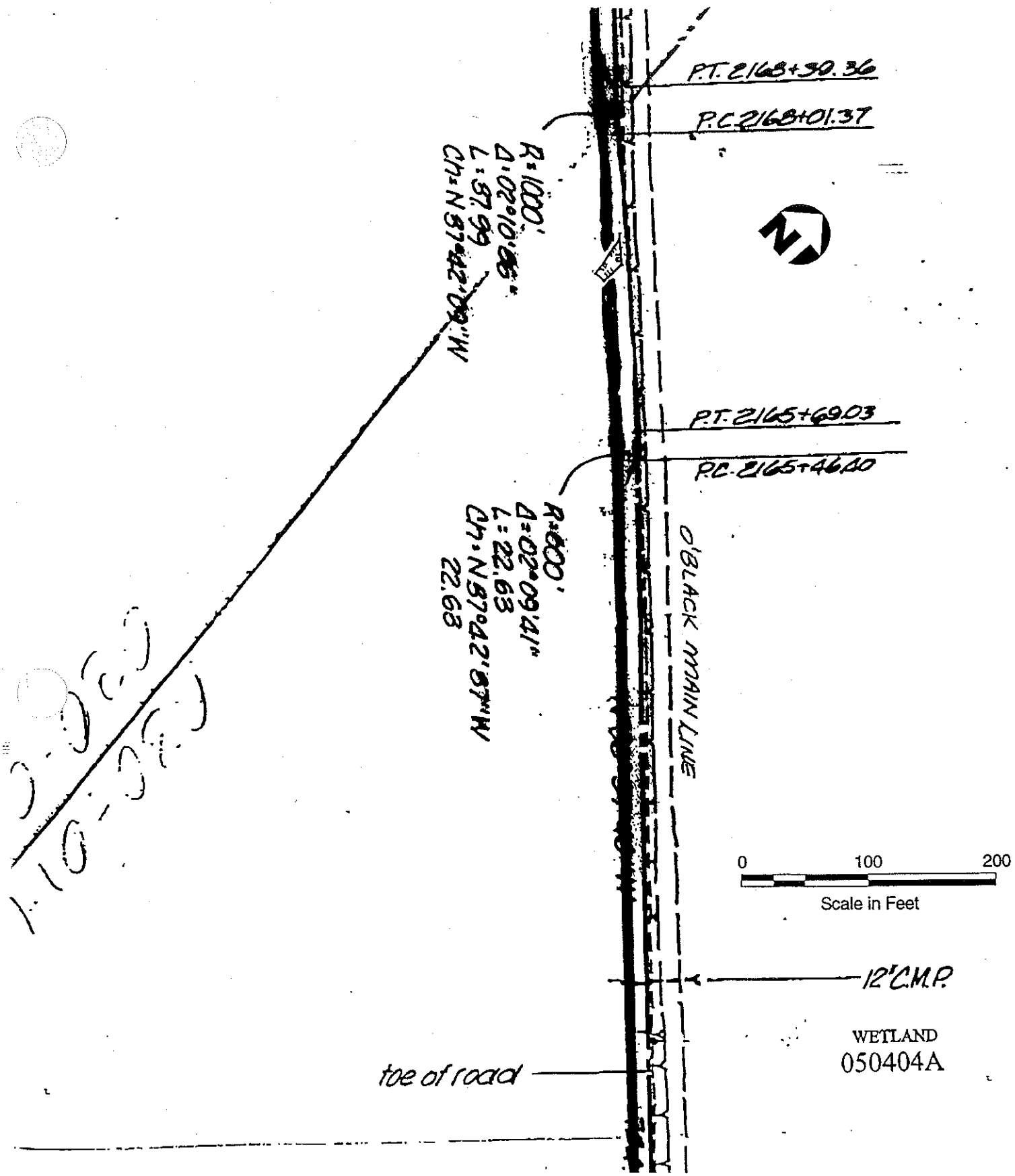

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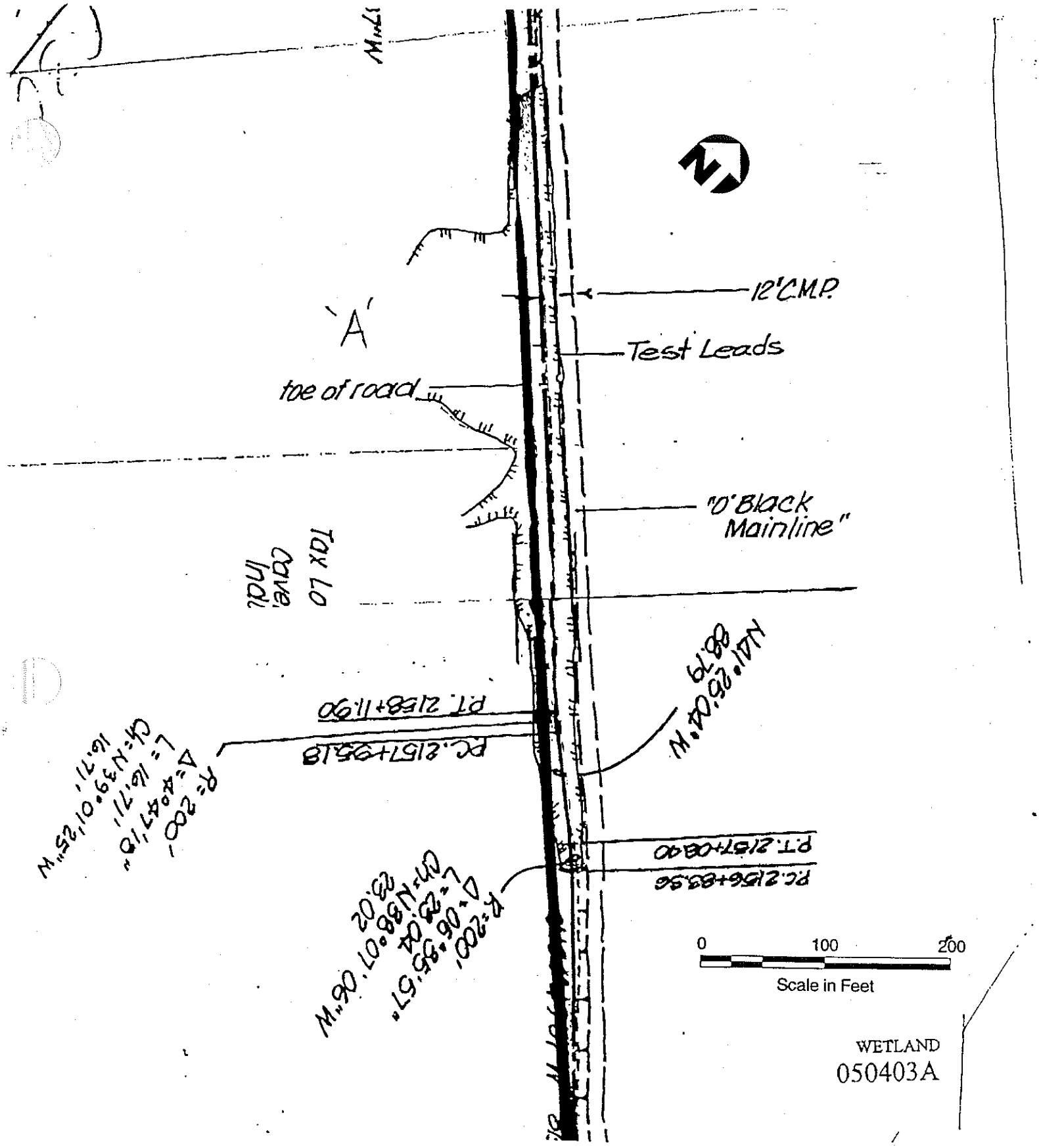

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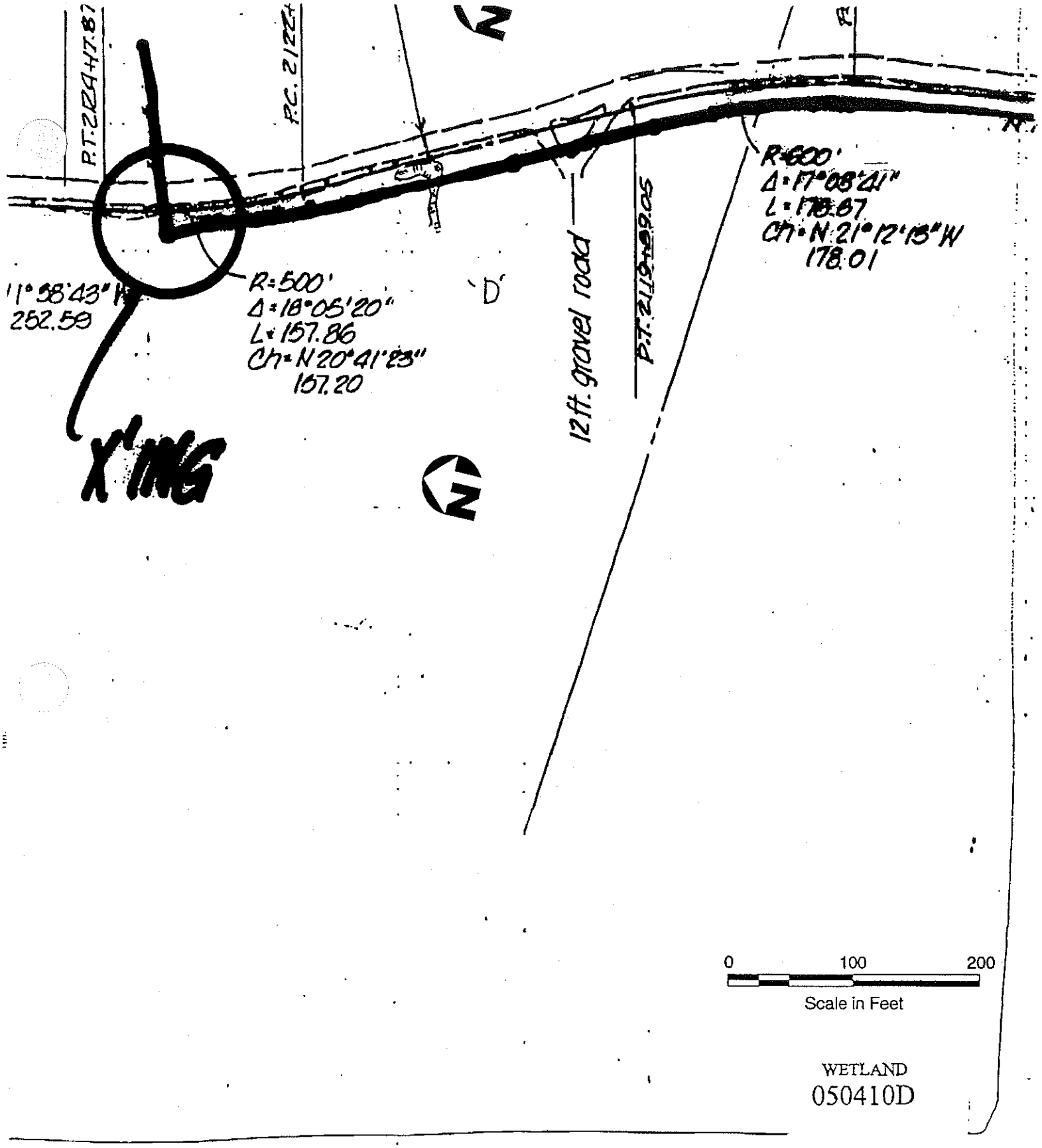

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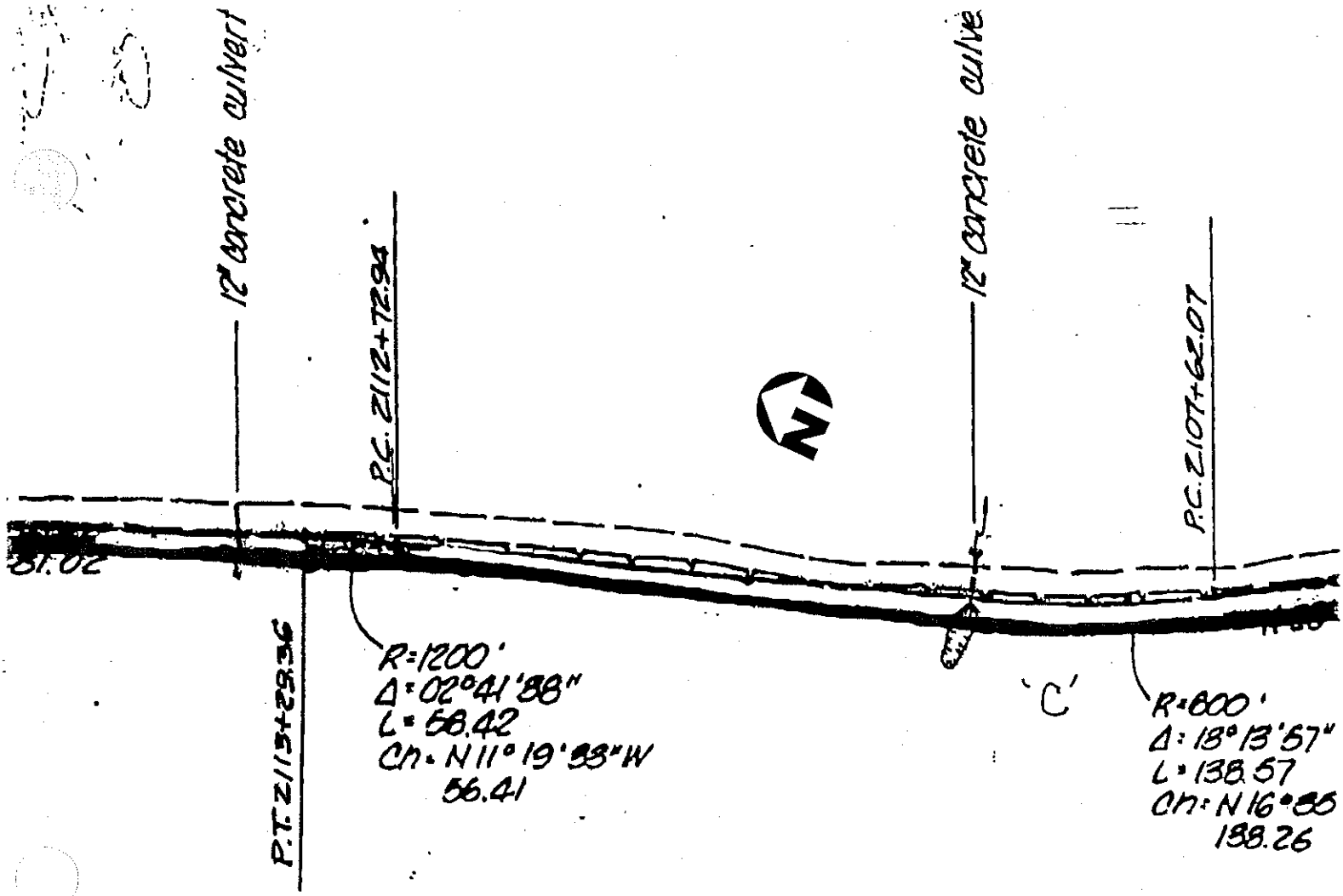

0 100 200

Scale in Feet

WETLAND
050410C

Map Source: Northwest Natural Gas, Wetland Report: Dames and Moore, Inc.

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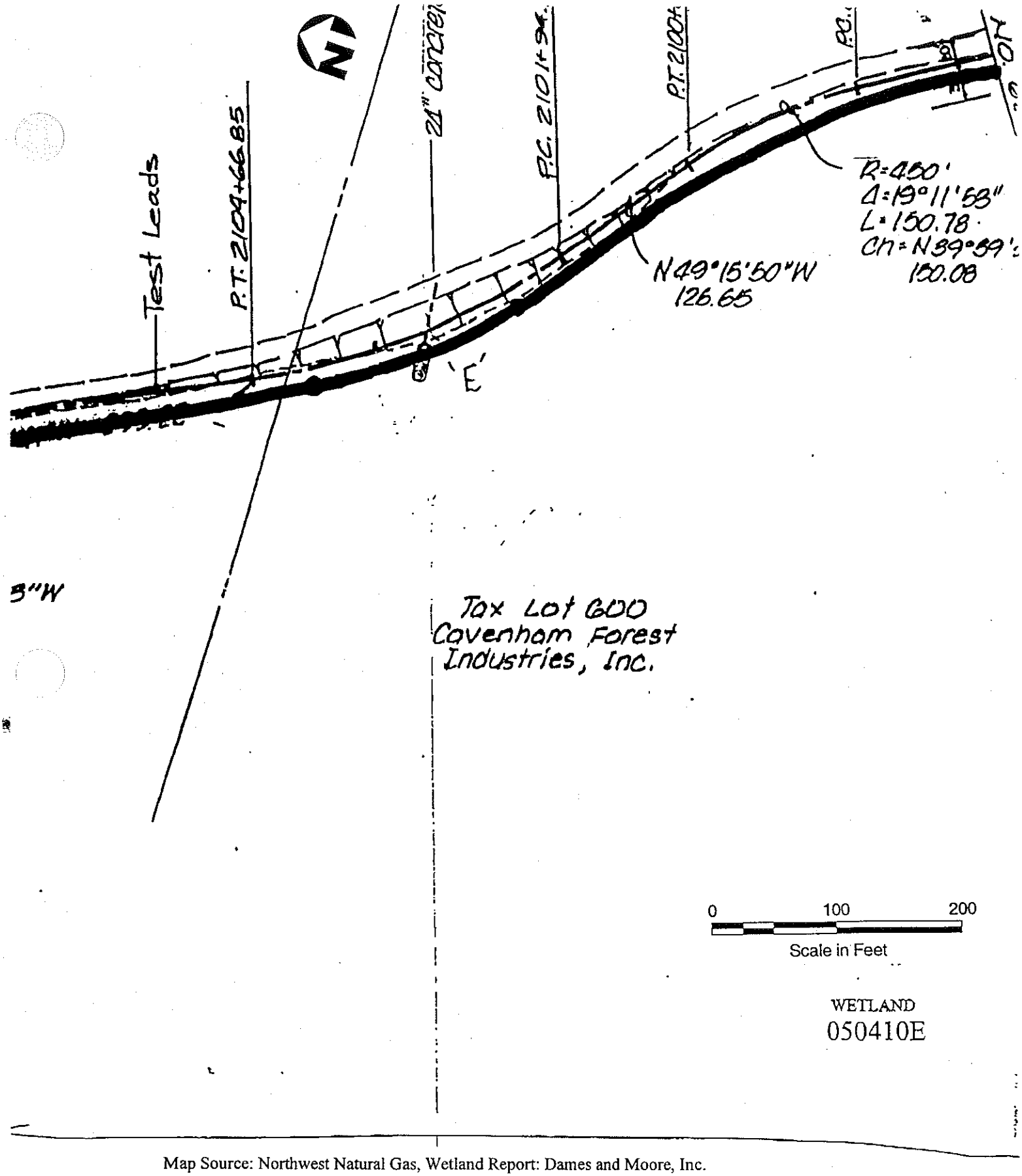

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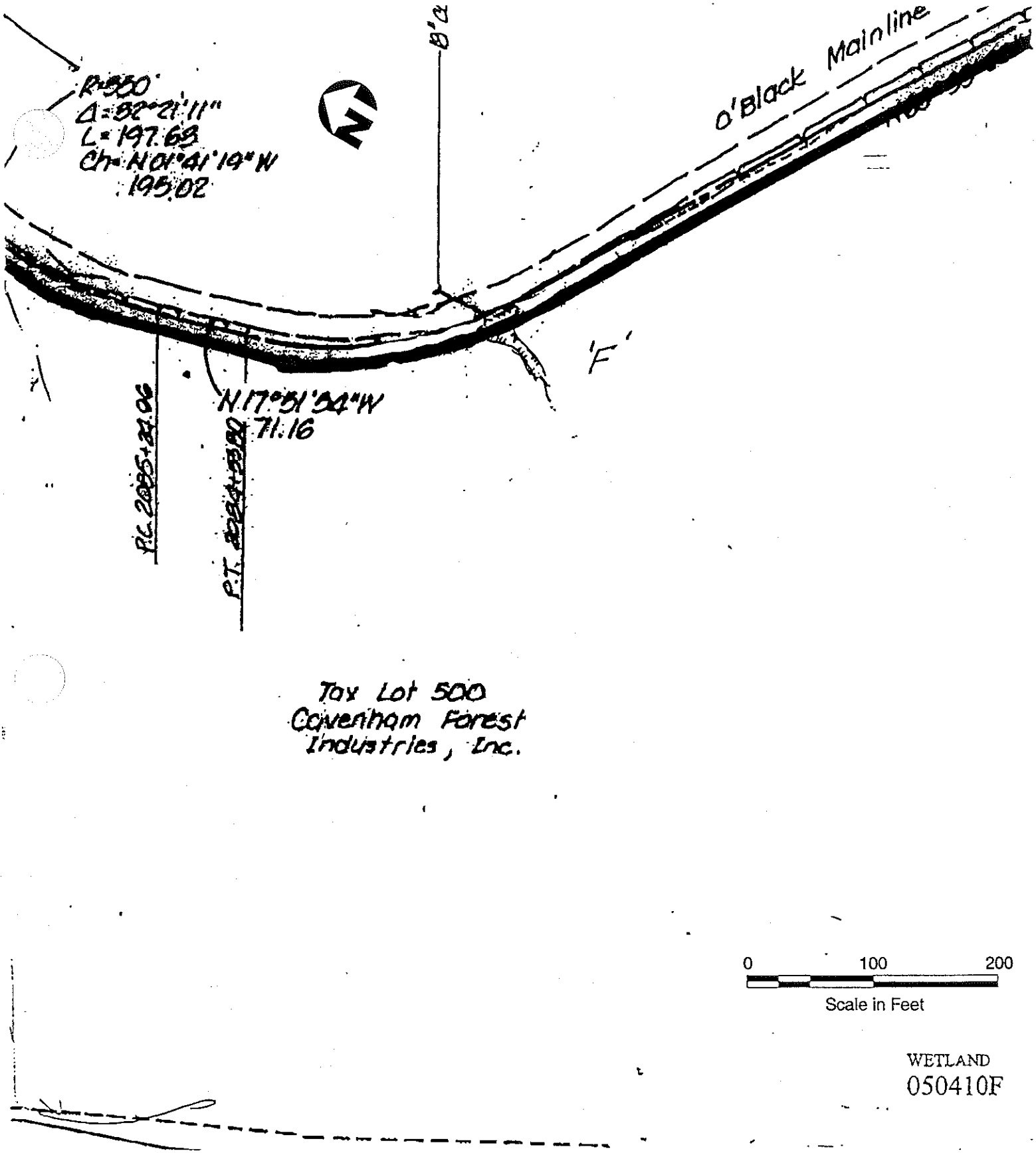

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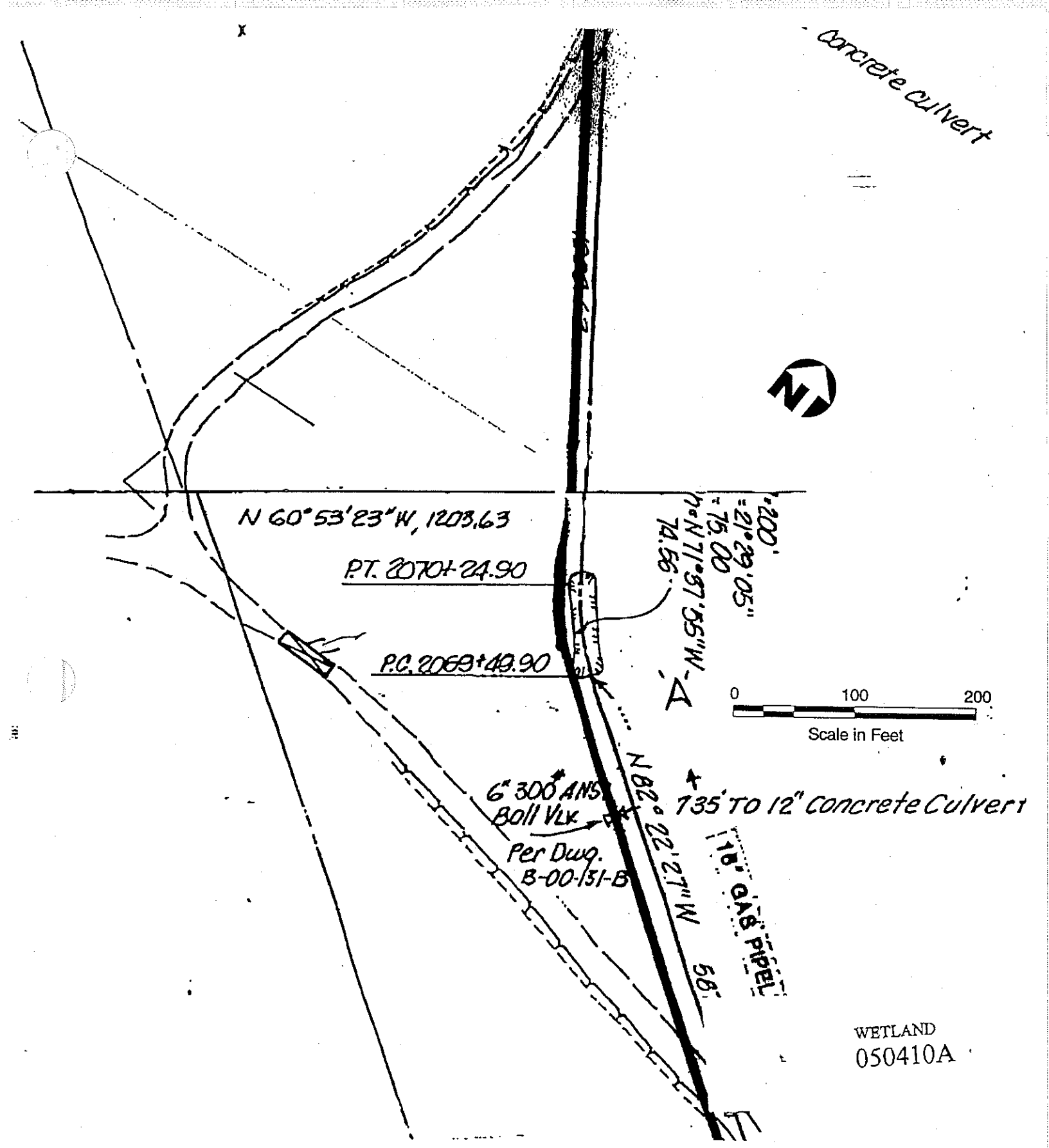

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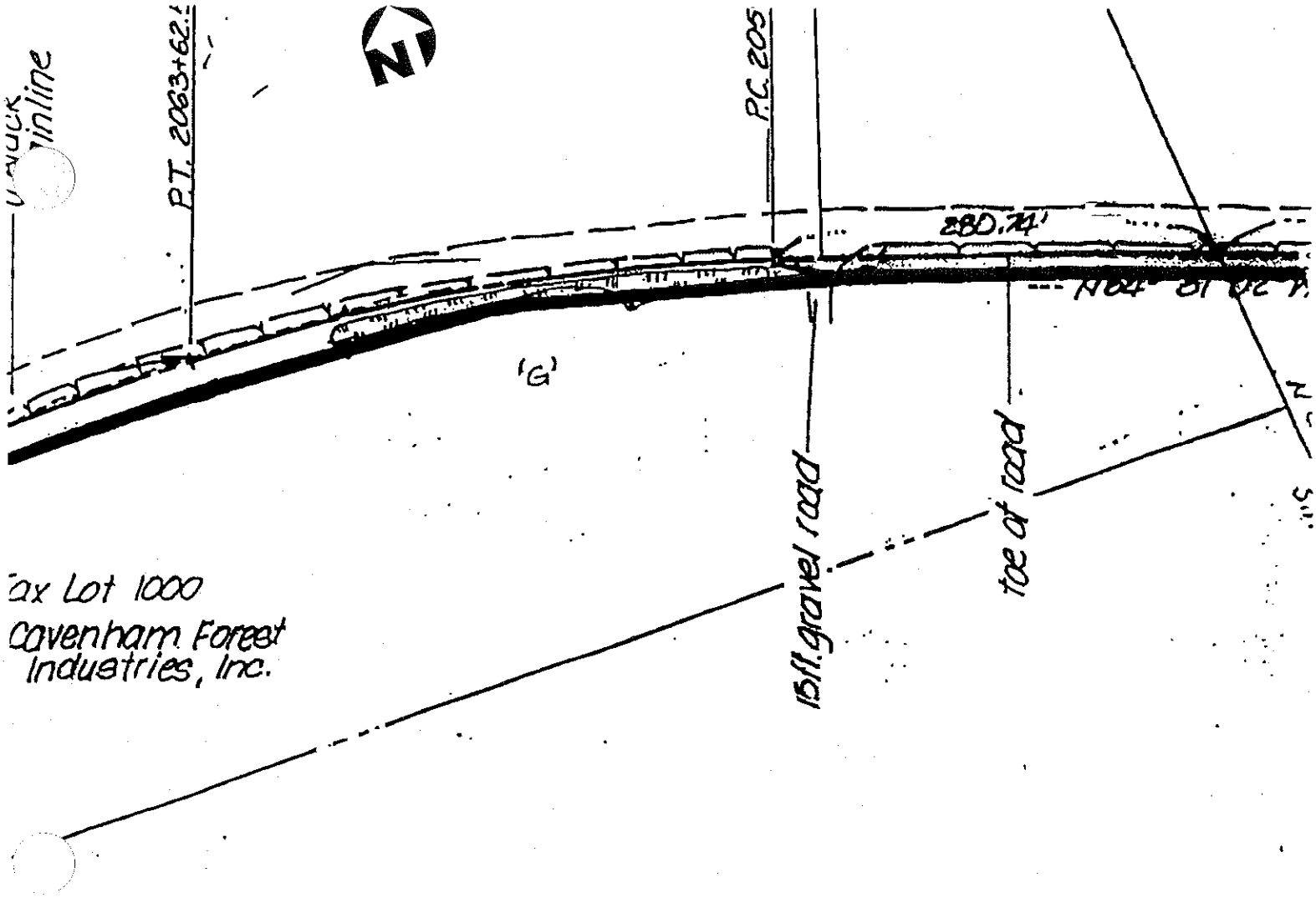

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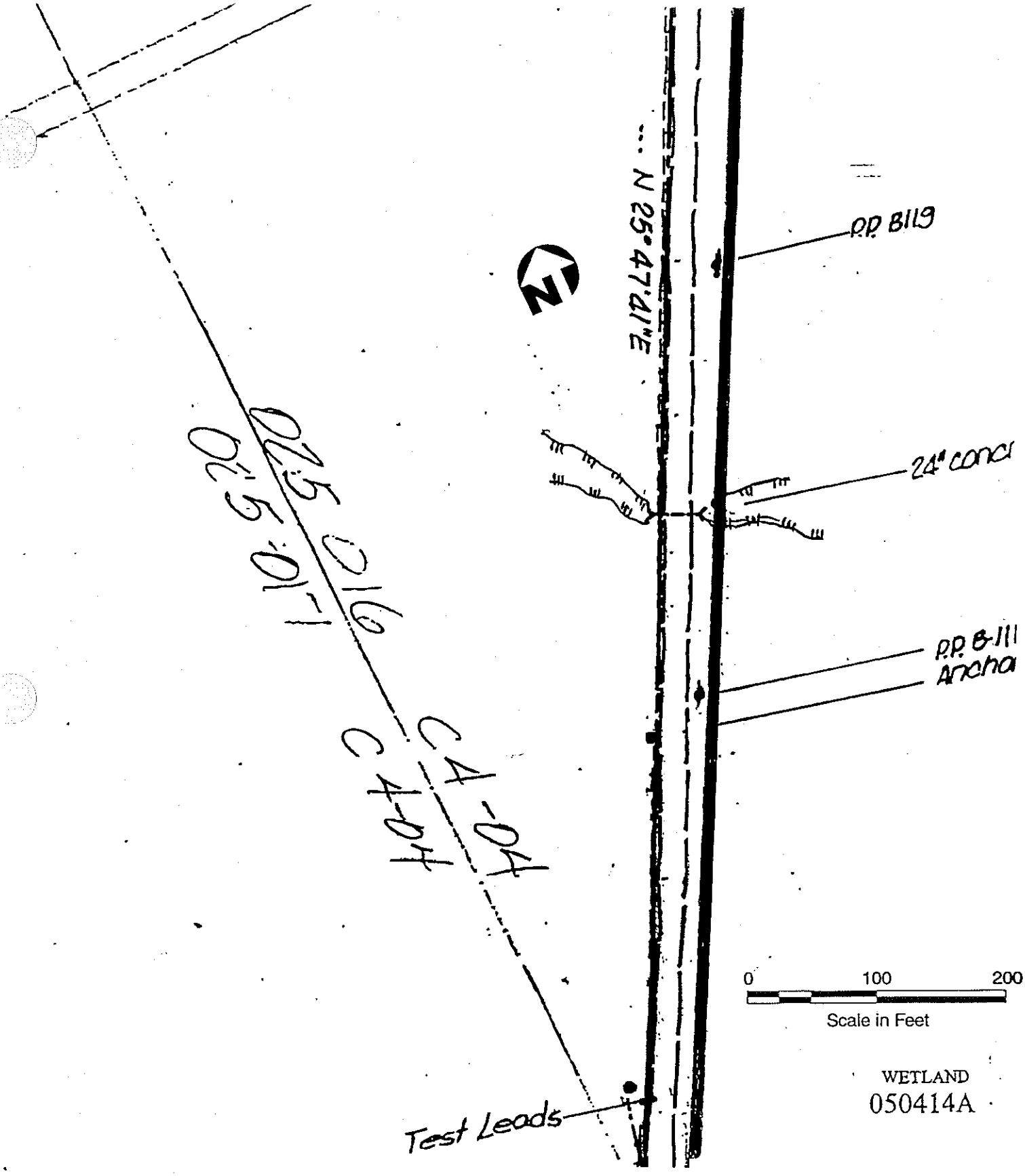

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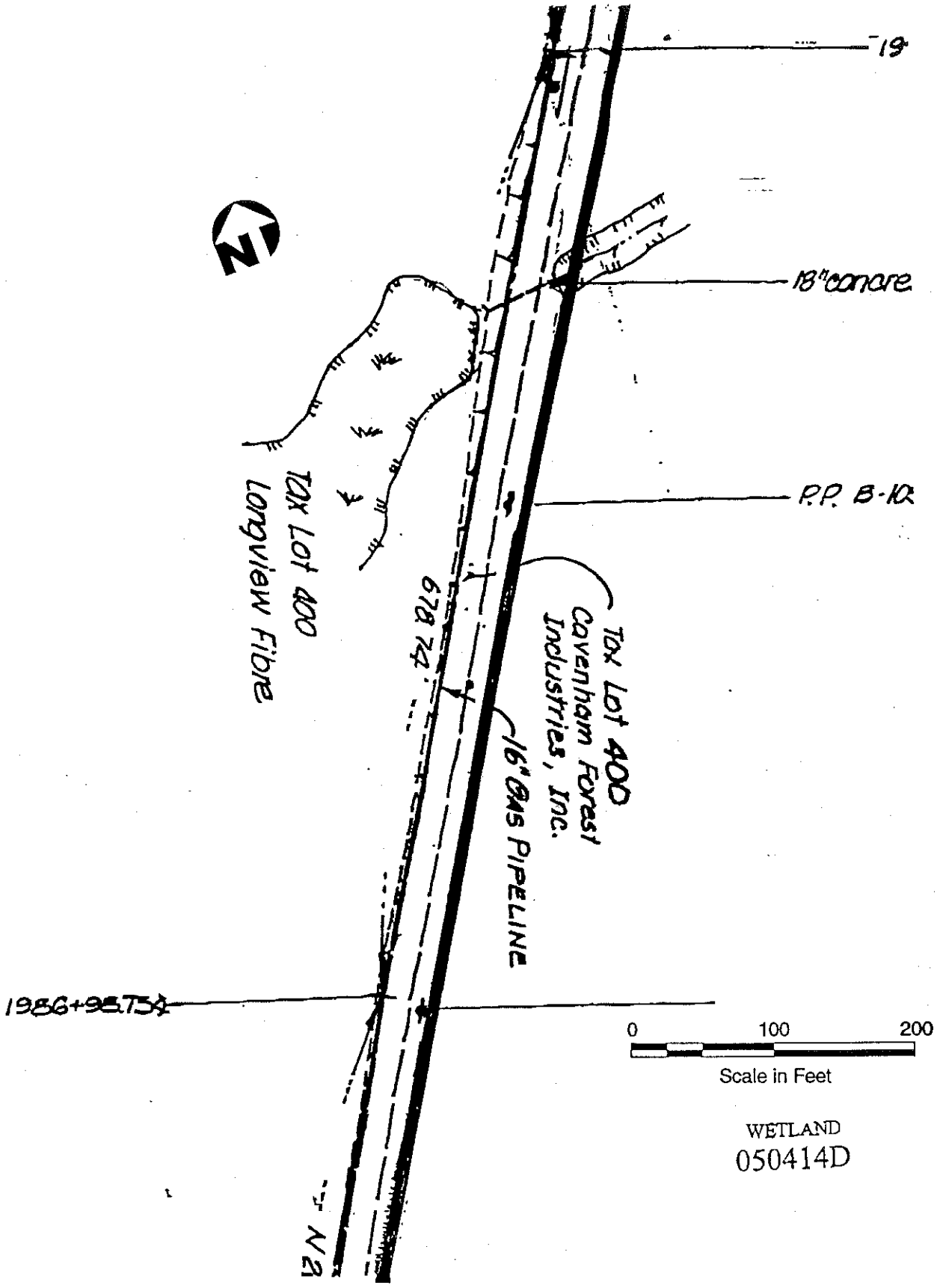

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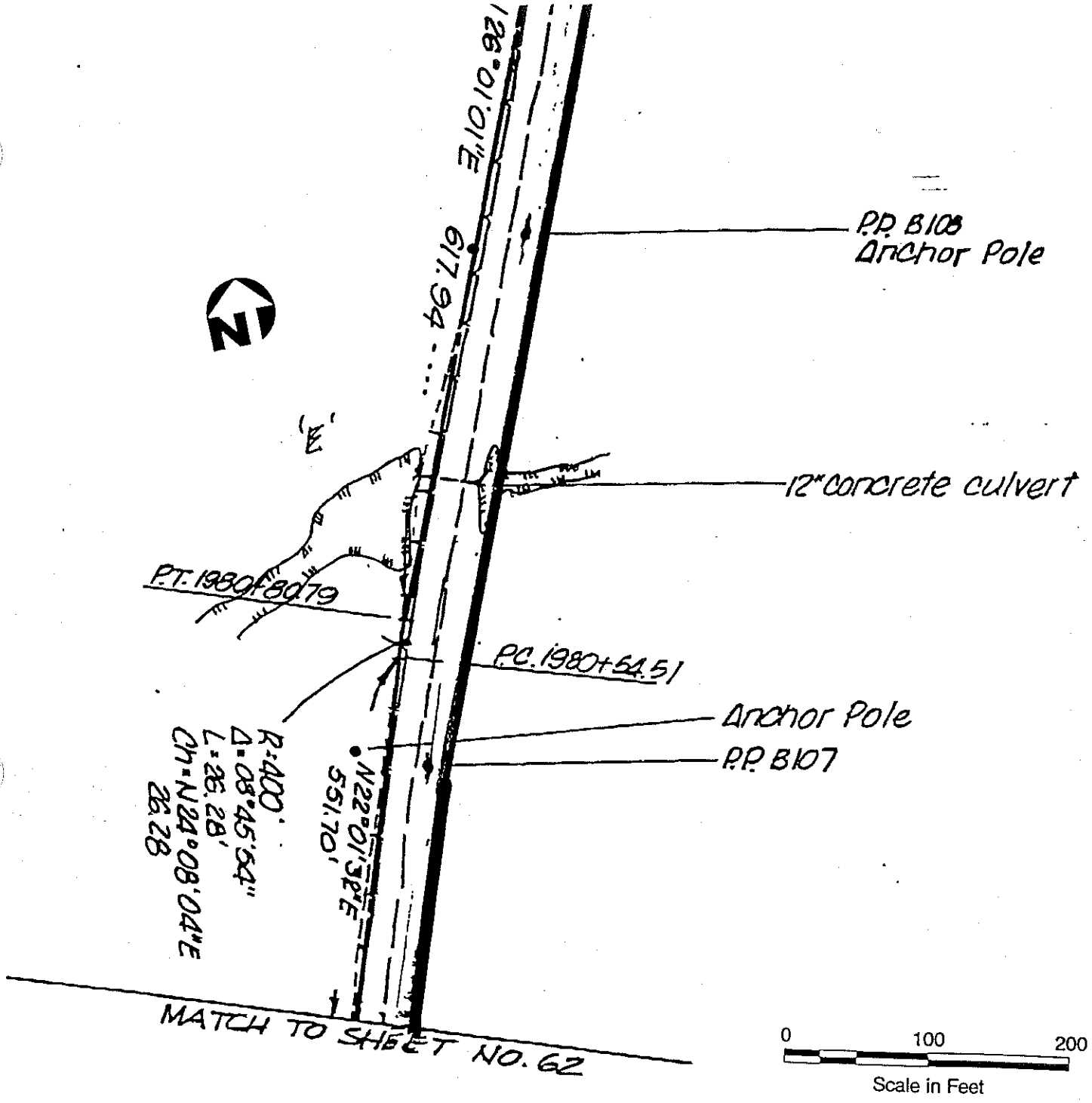

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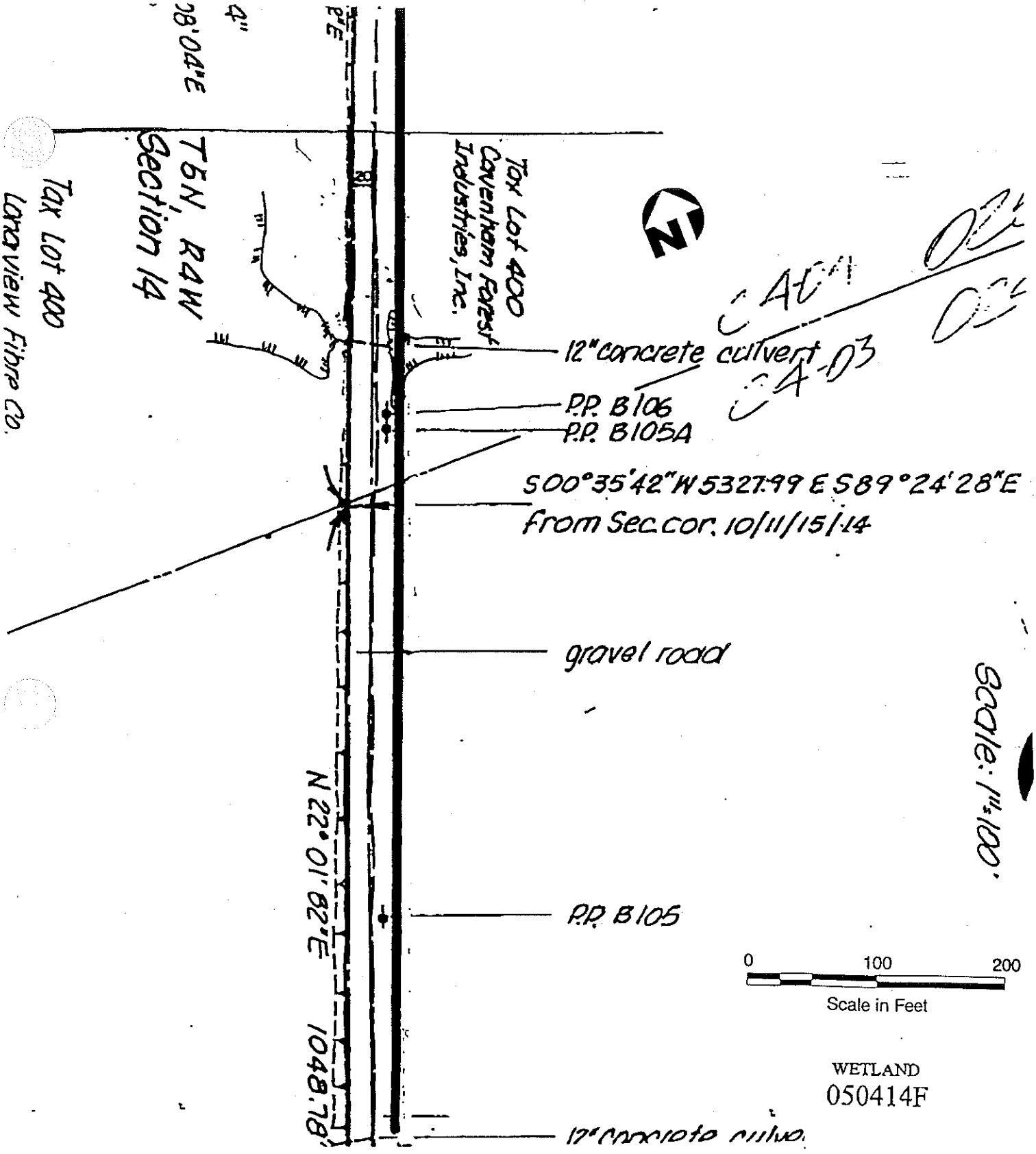

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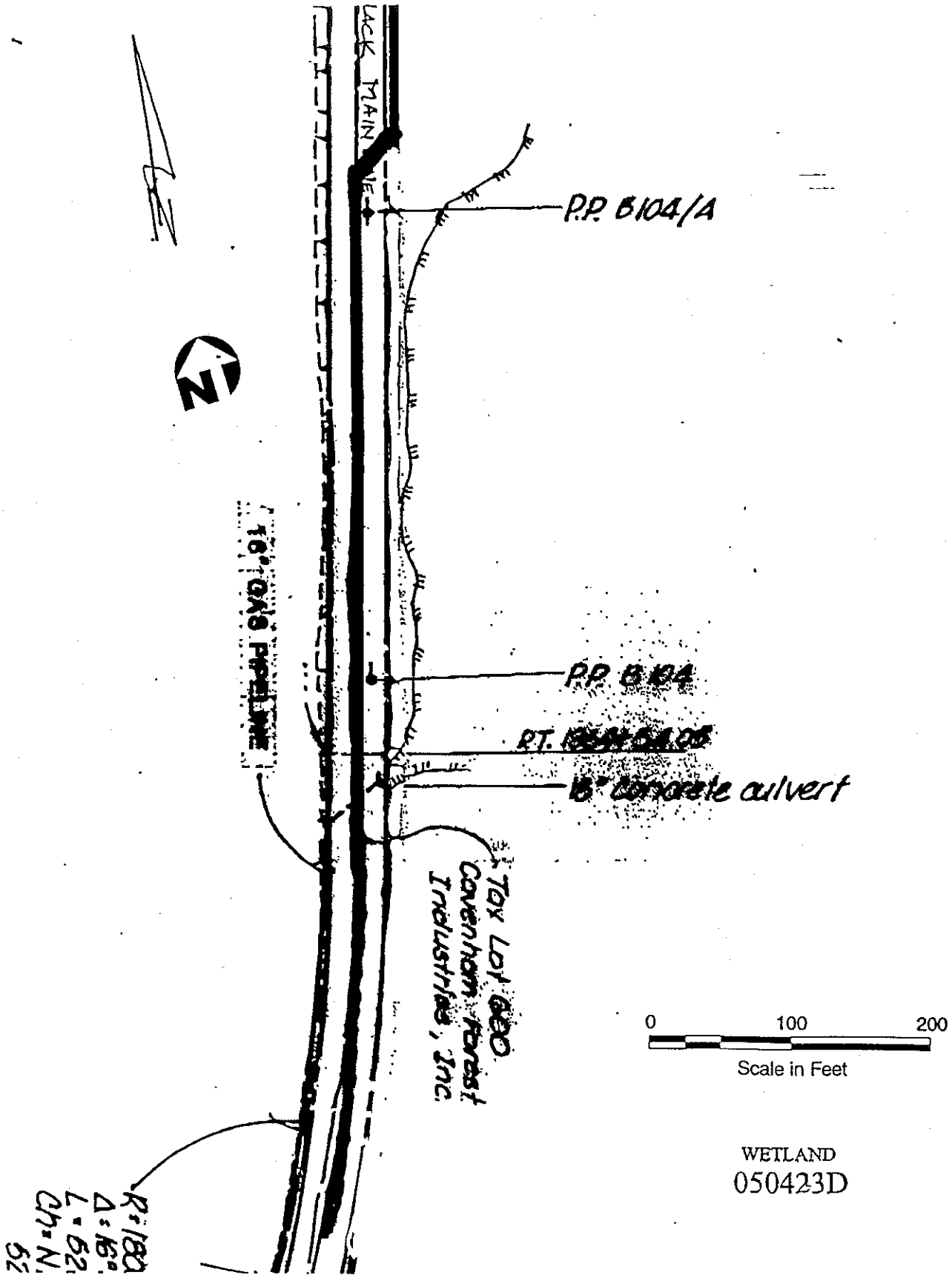

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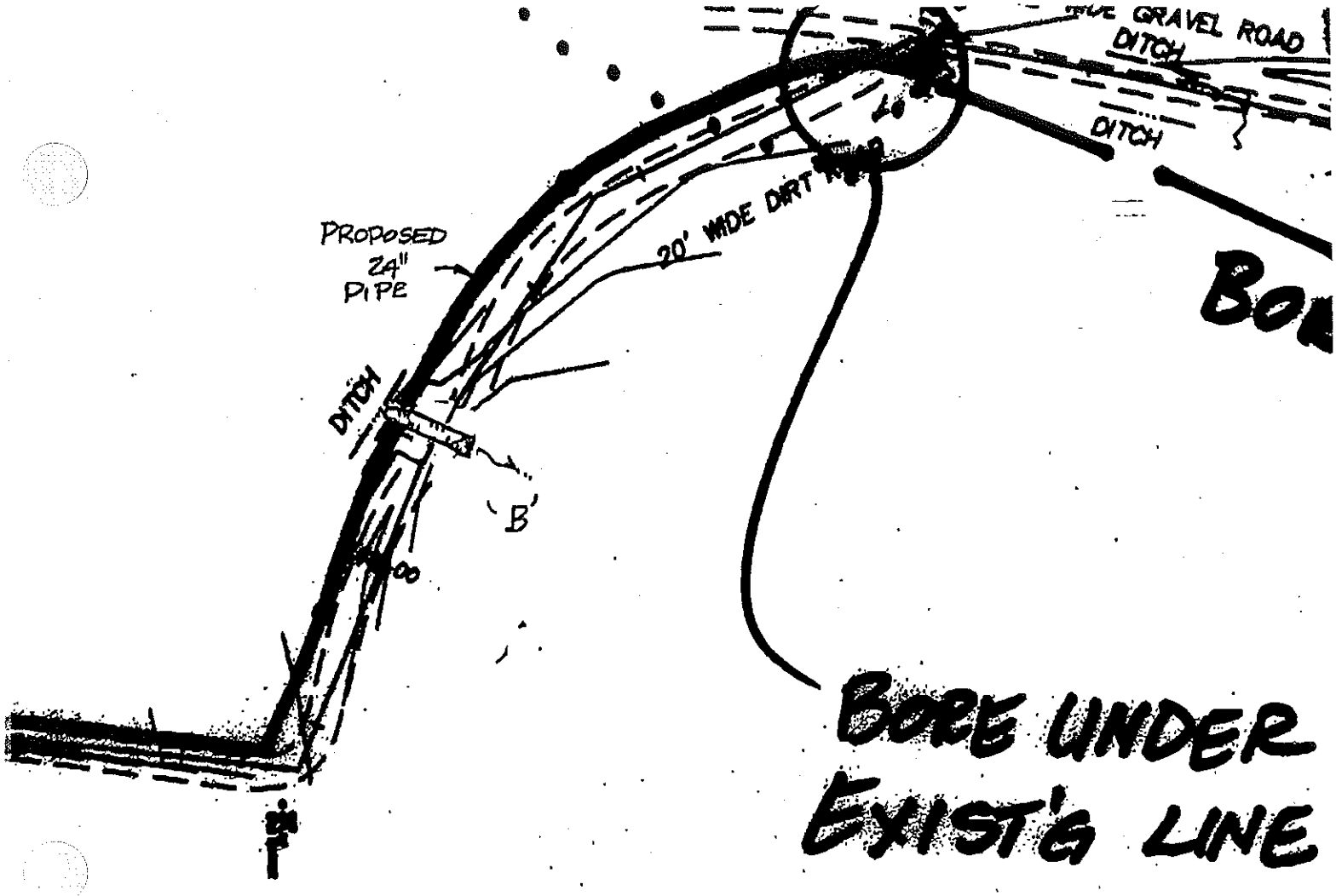

WETLAND
050436B

Map Source: Northwest Natural Gas, Wetland Report: Dames and Moore, Inc.

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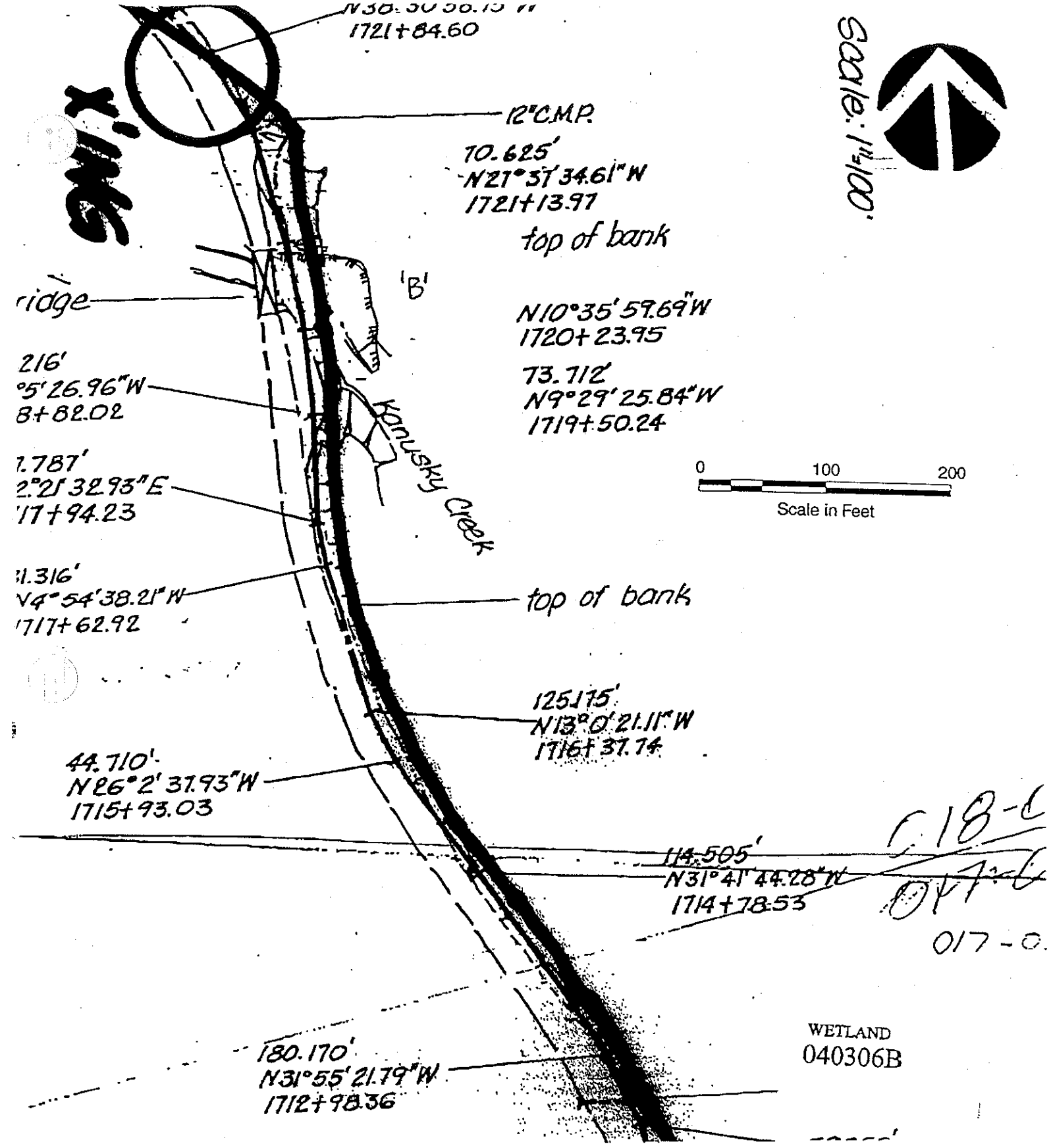

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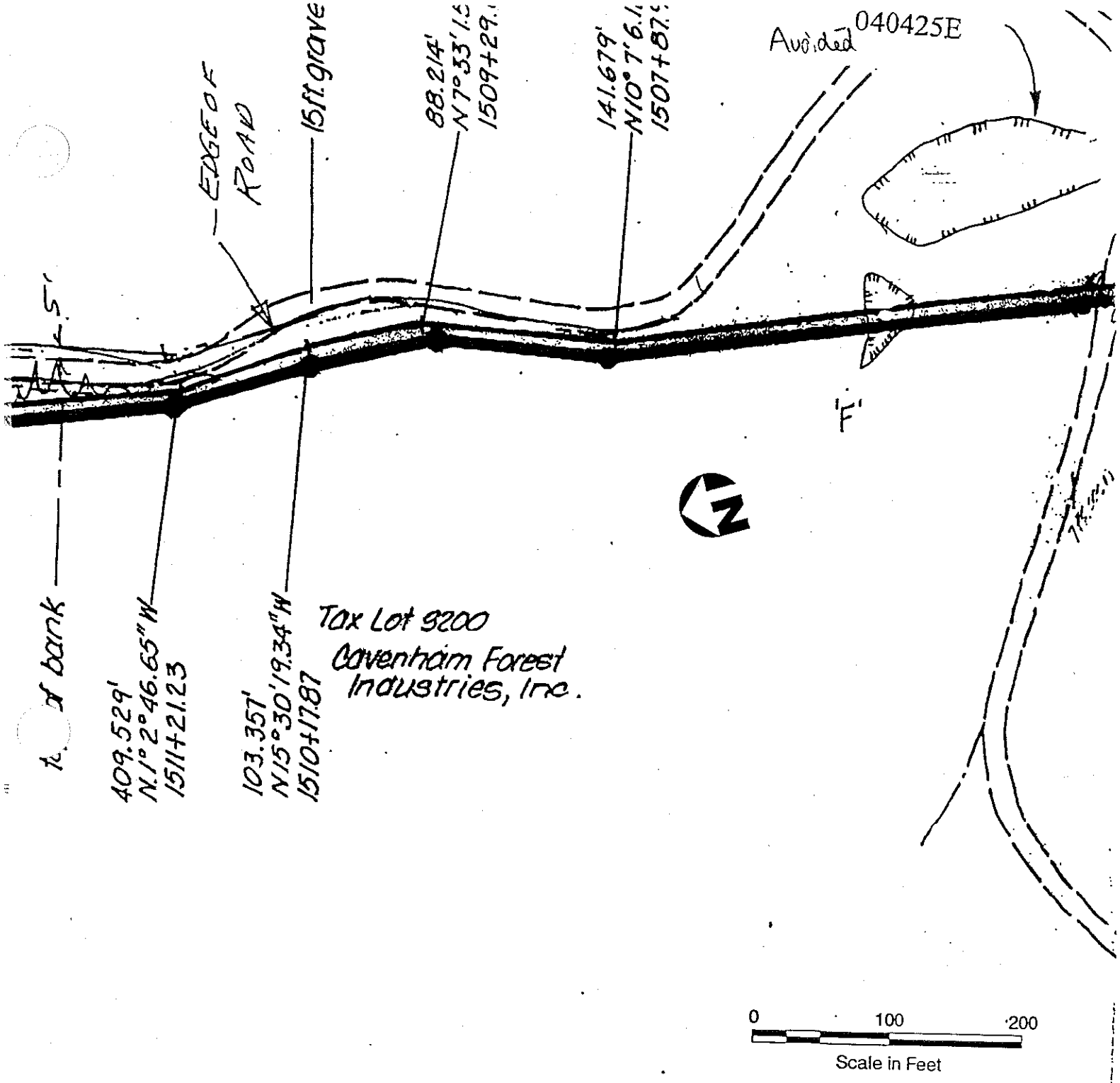

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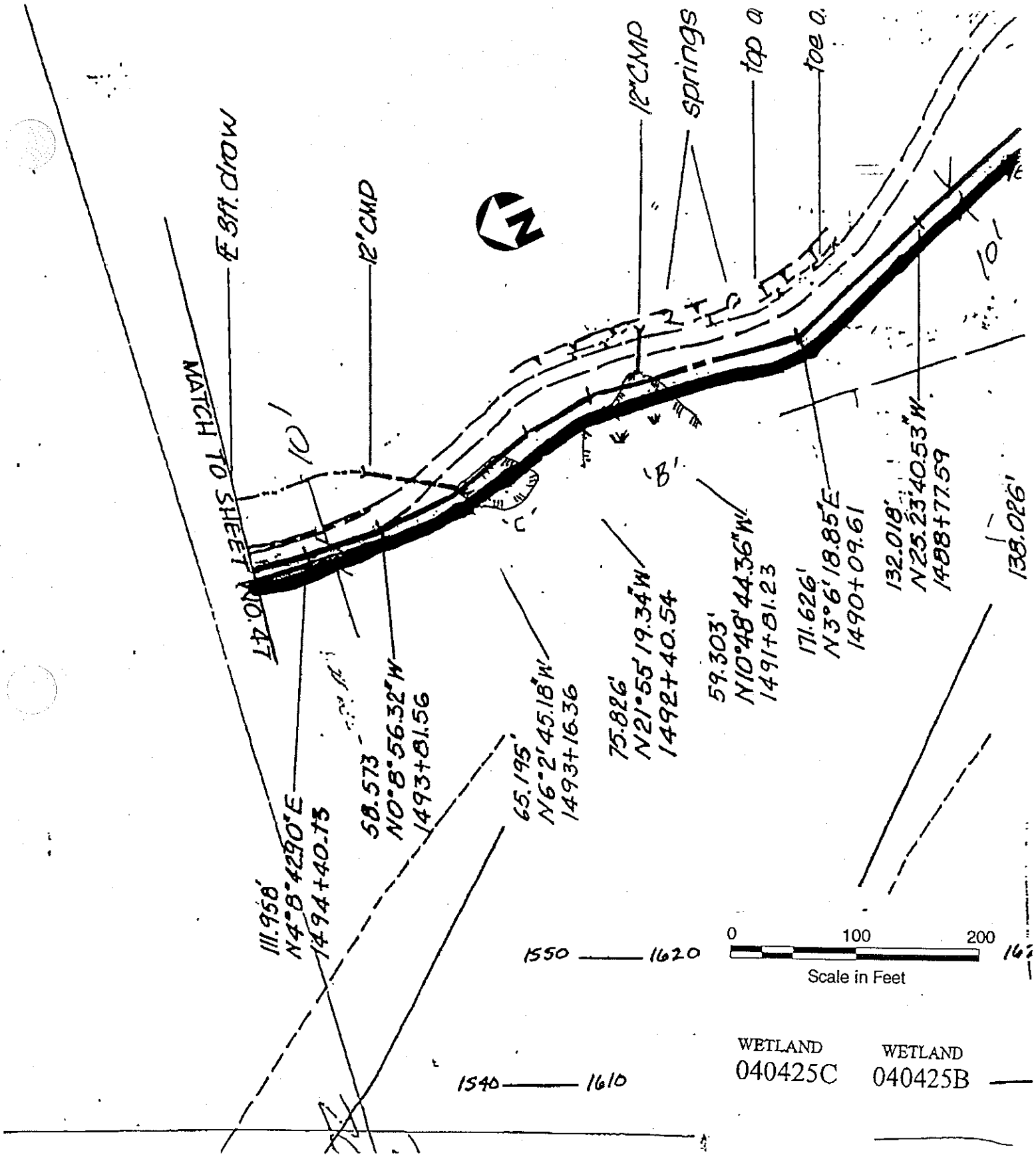

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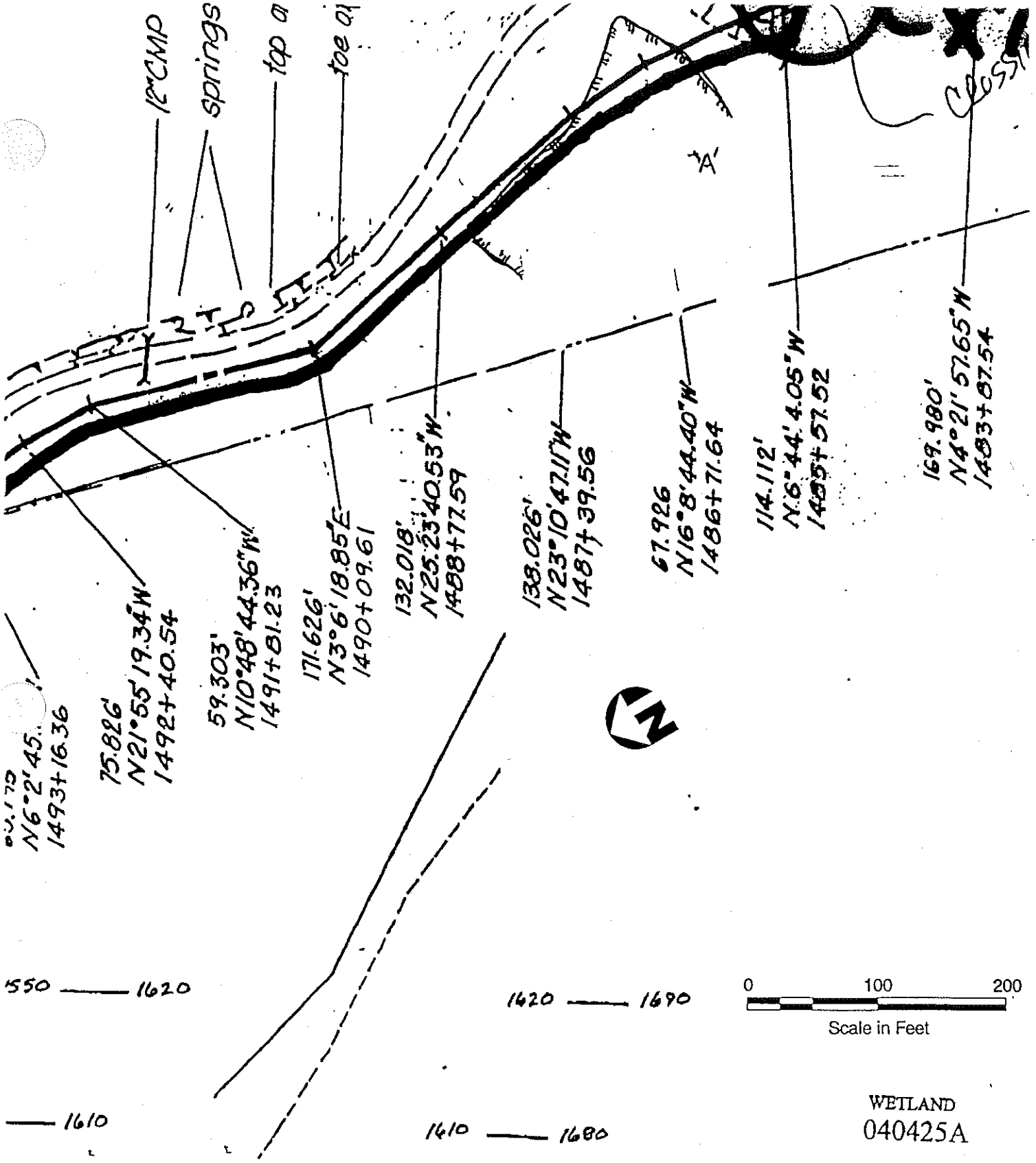

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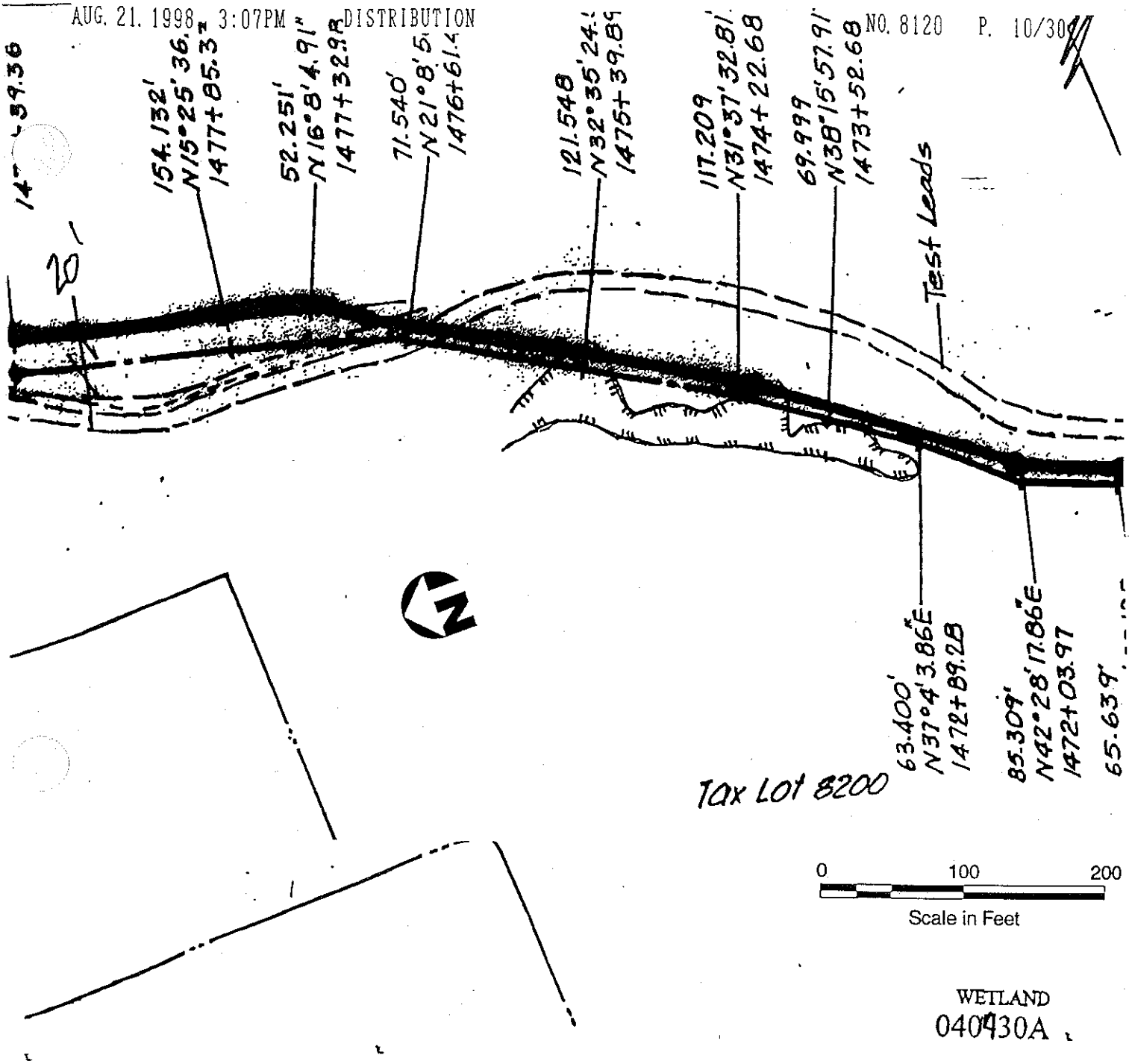
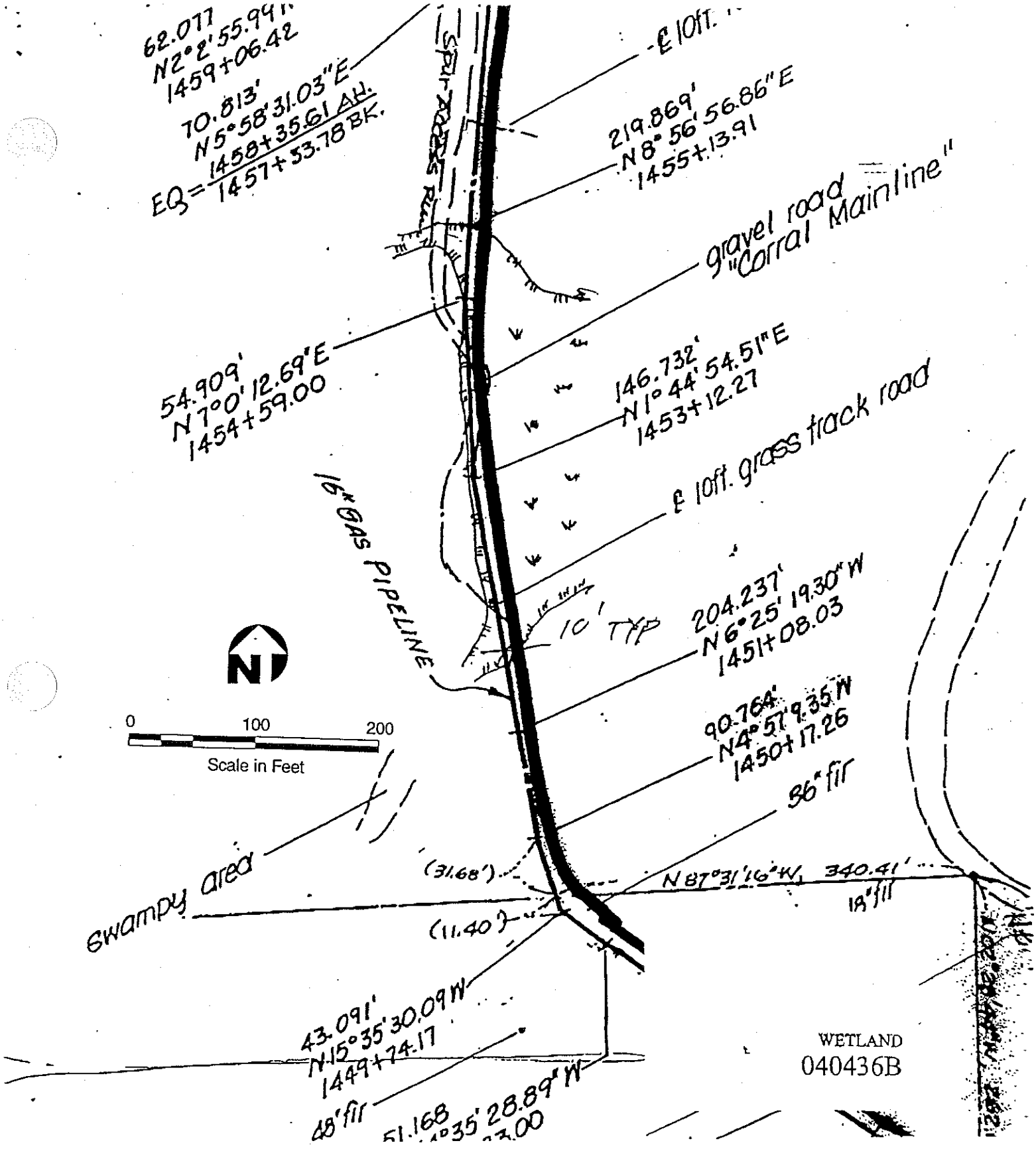
WETLAND SURVEY MAP



Map Source: Northwest Natural Gas, Wetland Report: Dames and Moore, Inc.

PURPOSE: Transport natural gas 09/11/98
ADJACENT PROPERTY OWNERS: Various APPLICATION BY: Northwest Natural Gas
PROPOSED: Excavation and fill for natural gas pipeline COUNTIES OF: Columbia and Washington, OR
IN: Wetlands and other waters of the U.S.

WETLAND SURVEY MAP



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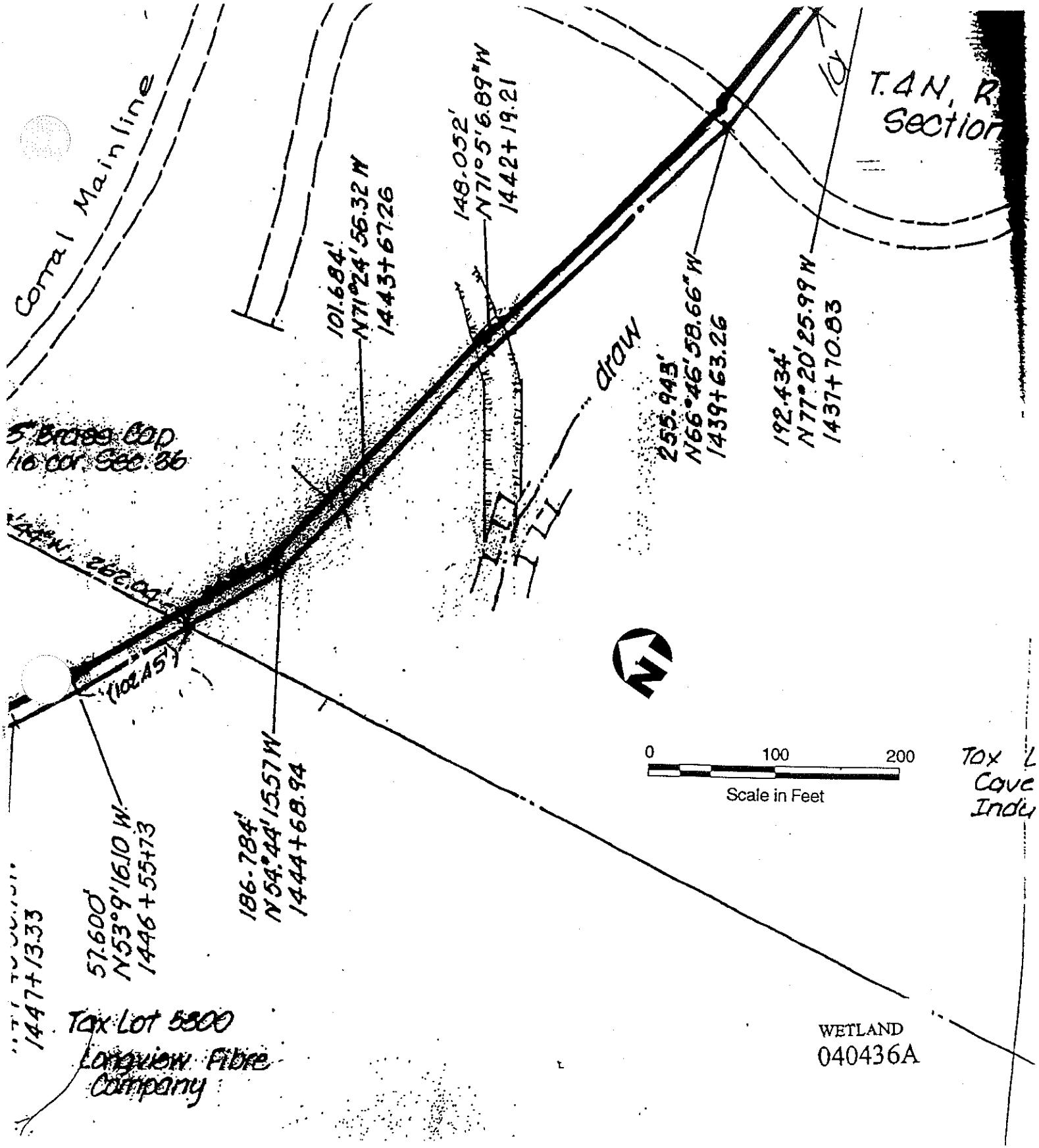

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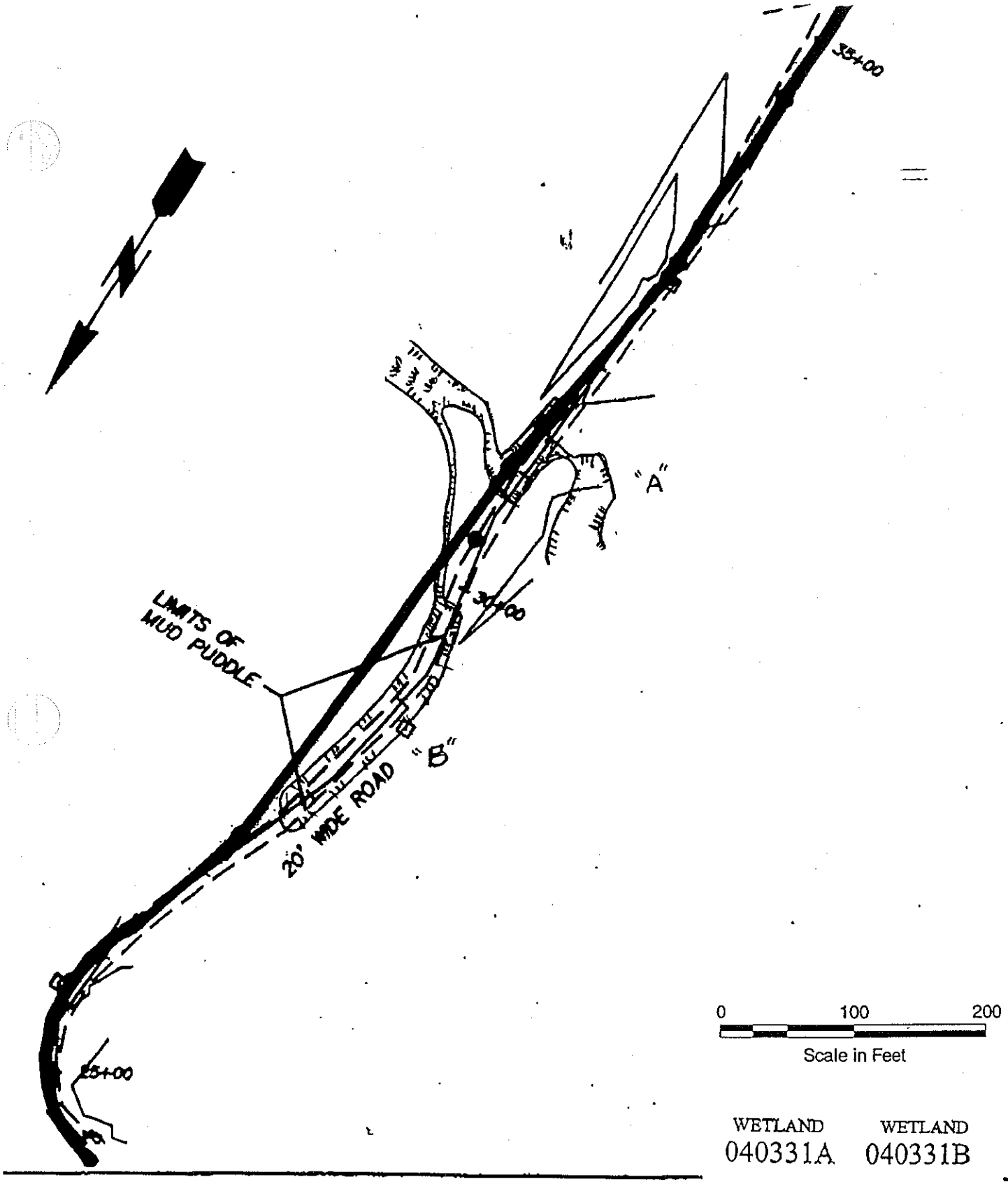

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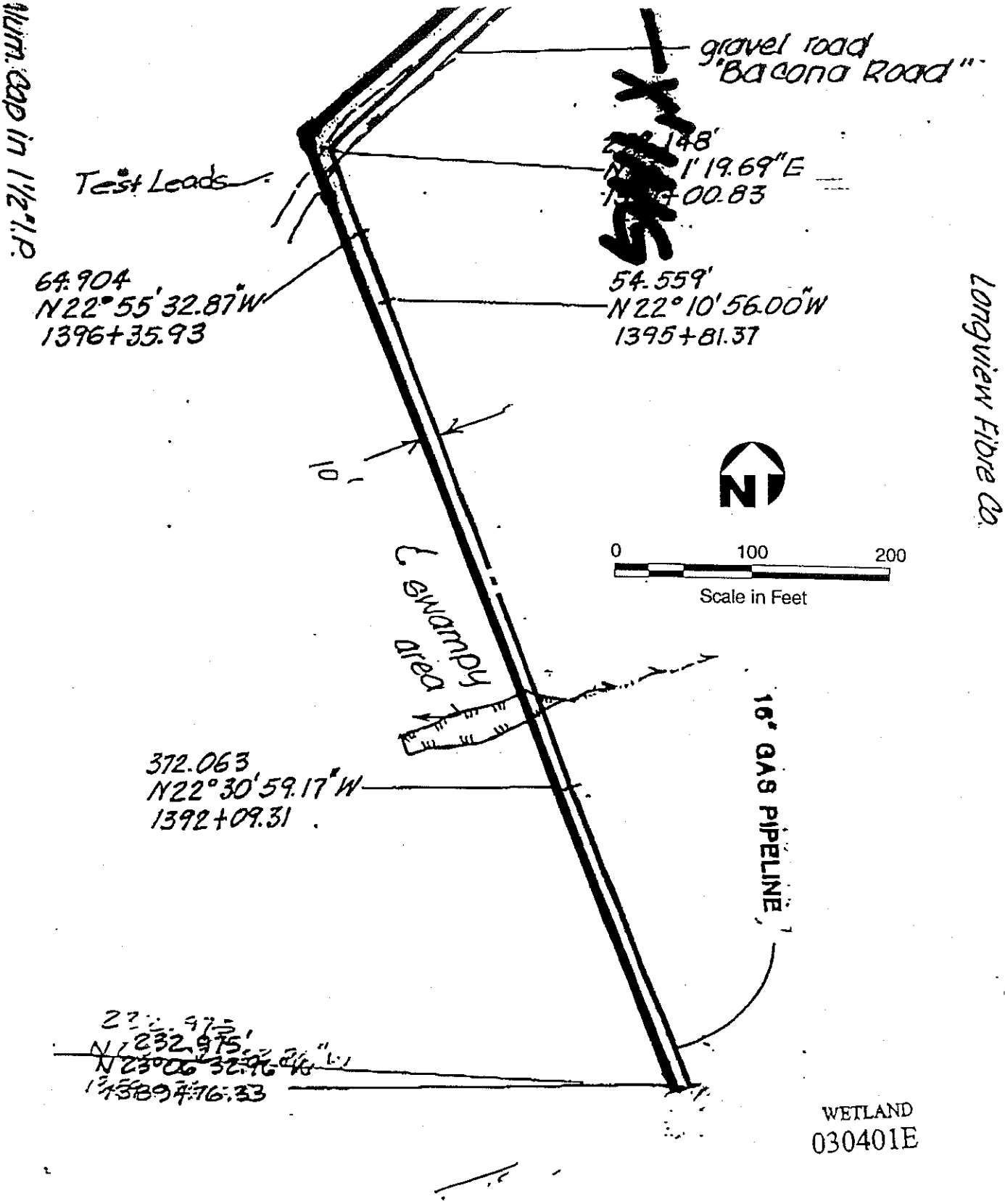
WETLAND SURVEY MAP



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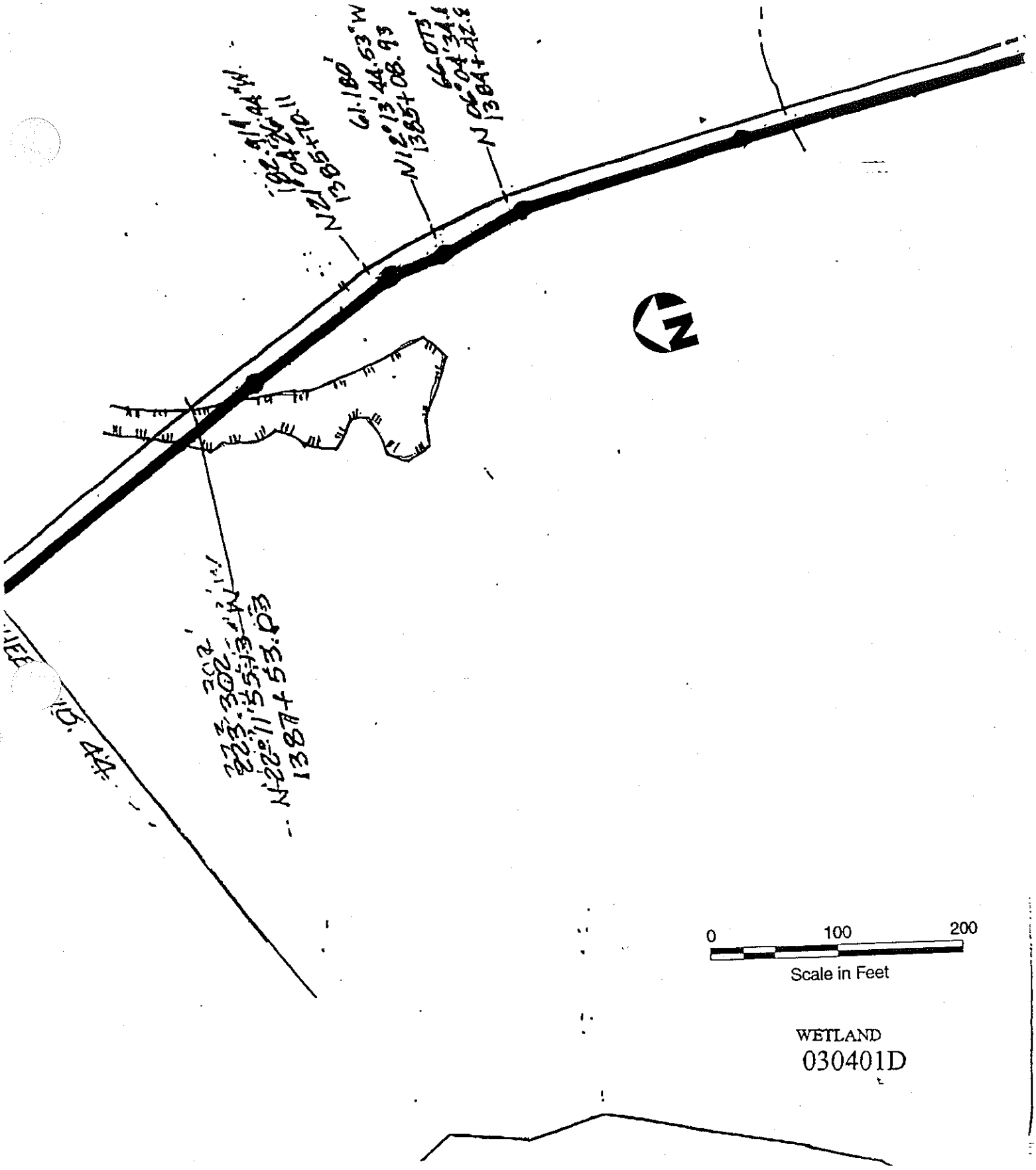

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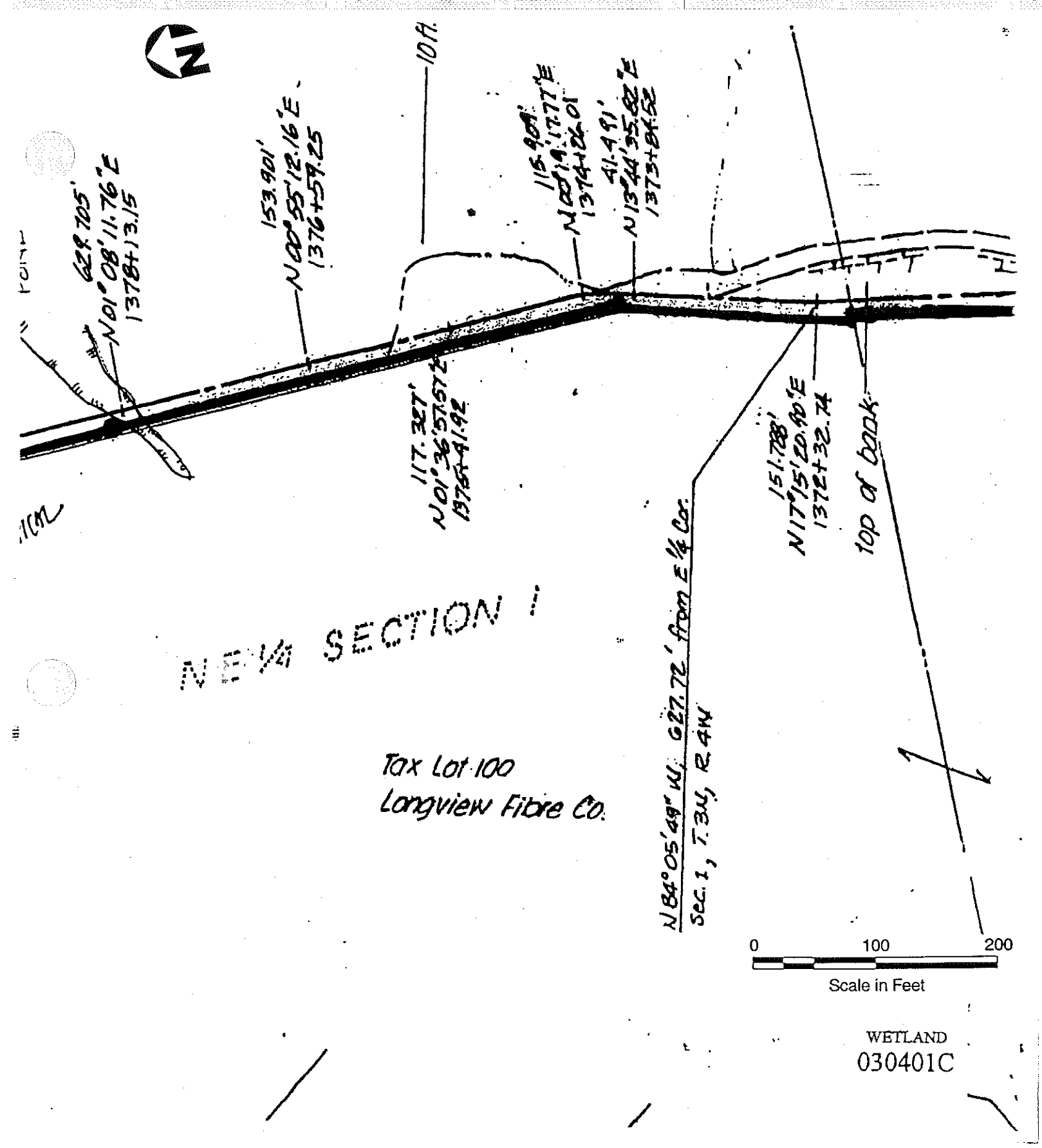

Map Source: Northwest Natural Gas, Wetland Report: Dames and Moore, Inc.

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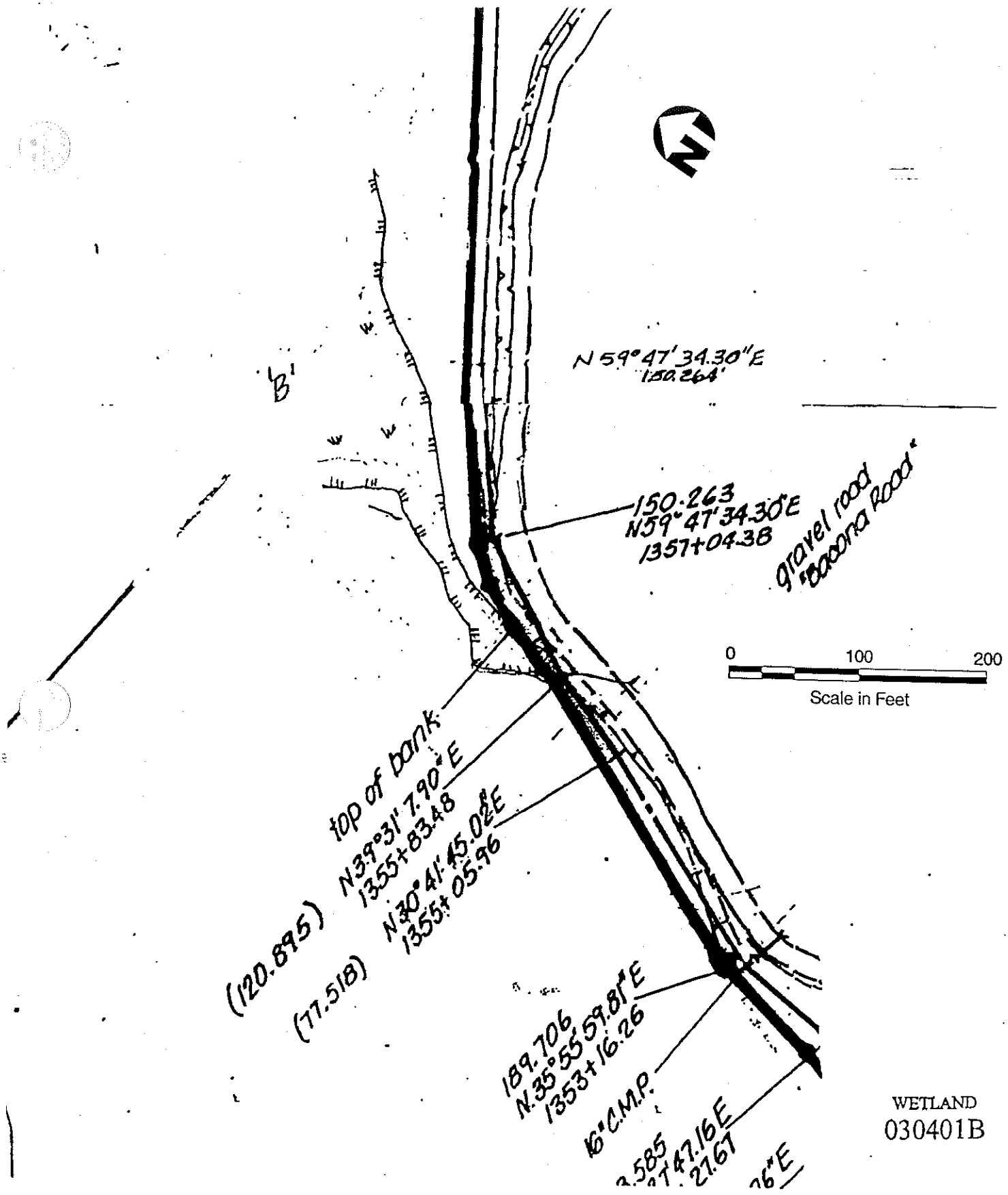
IN: Wetlands and other waters of the U.S.

WETLAND SURVEY MAP



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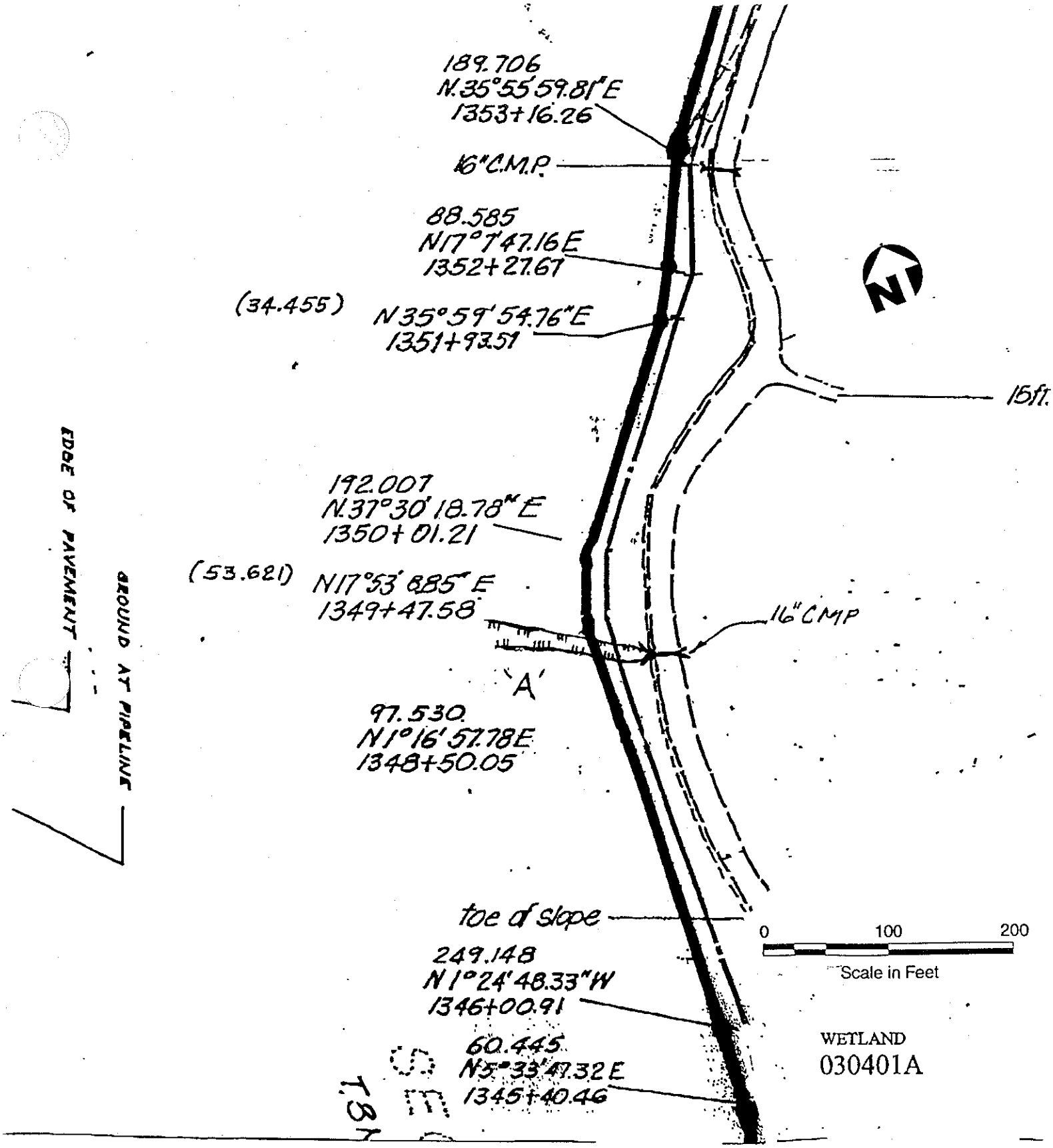
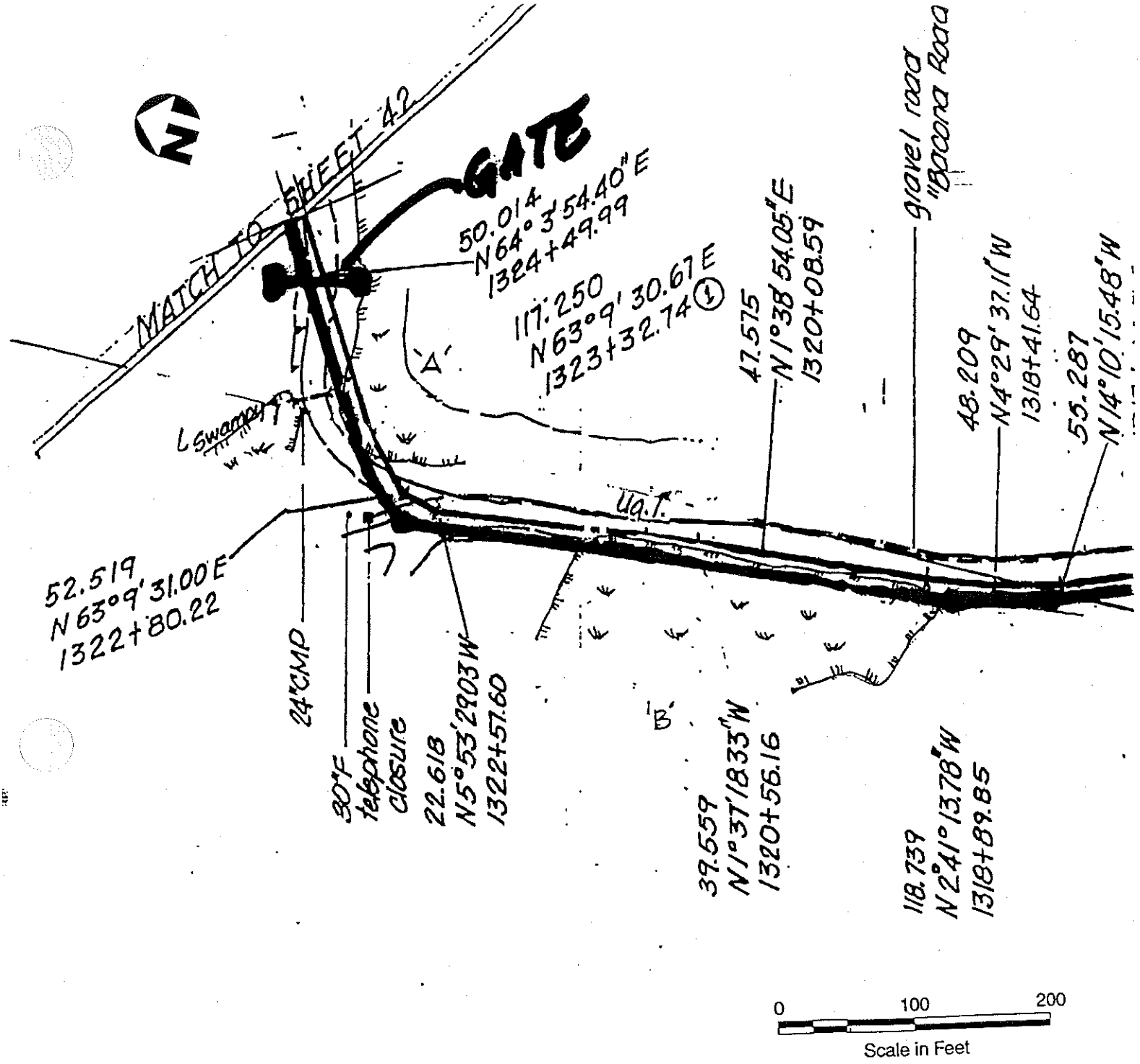


Map Source: Northwest Natural Gas, Wetland Report: Dames and Moore, Inc.

PURPOSE: Transport natural gas
ADJACENT PROPERTY OWNERS: Various
PROPOSED: Excavation and fill for natural gas pipeline
IN: Wetlands and other waters of the U.S.

09/11/98
APPLICATION BY: Northwest Natural Gas
COUNTIES OF: Columbia and Washington, OR

WETLAND SURVEY MAP



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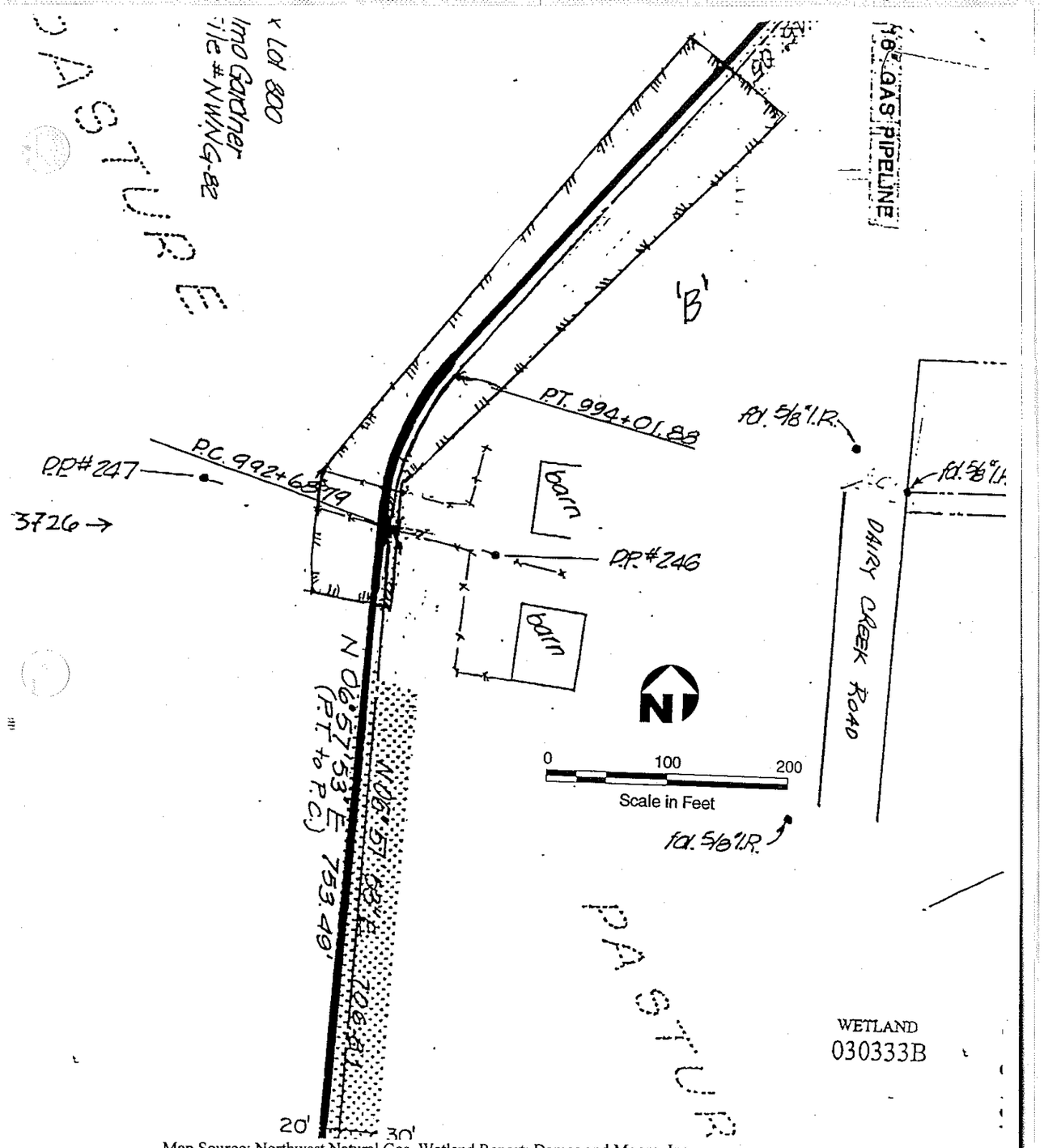

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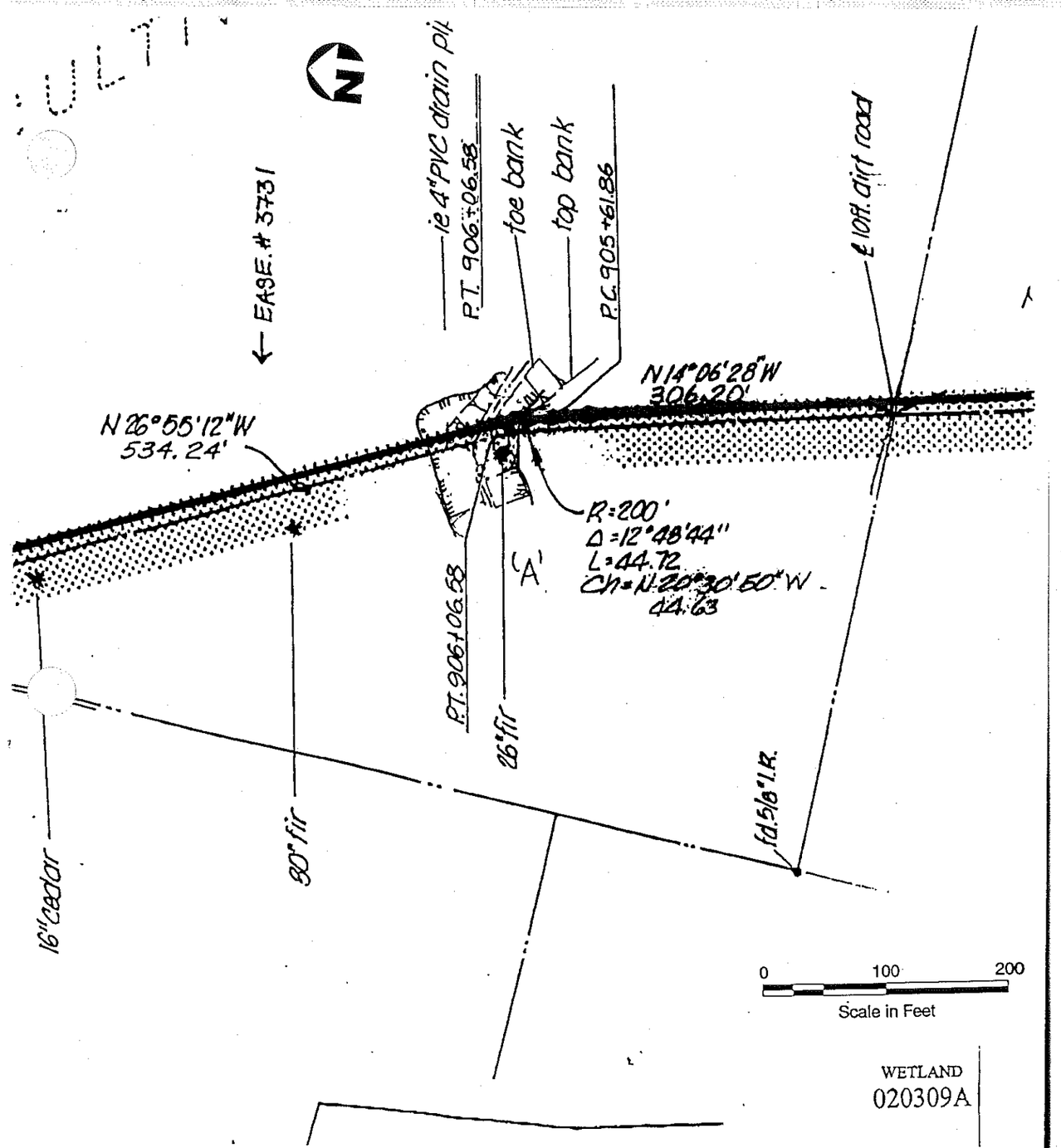

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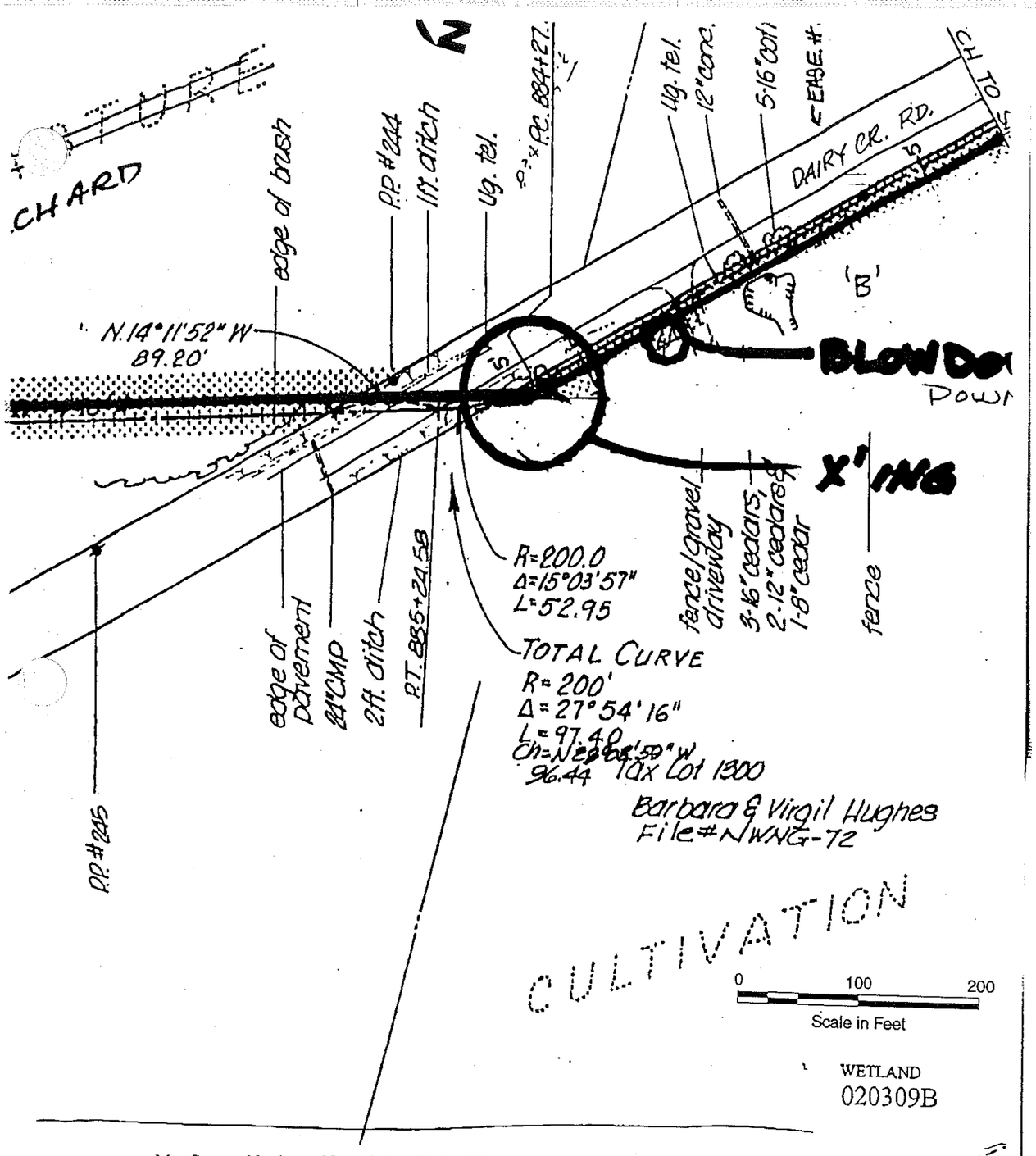

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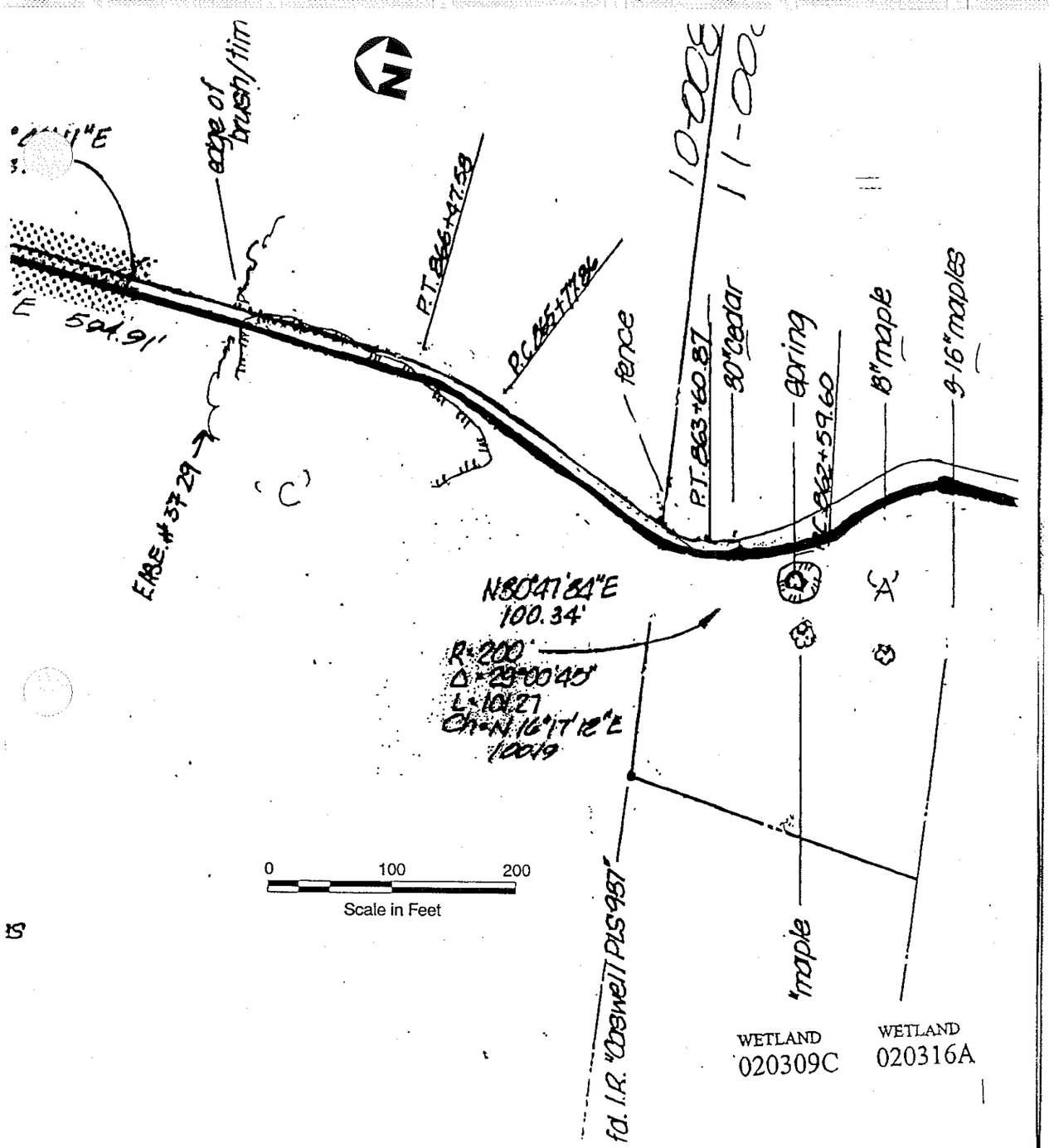

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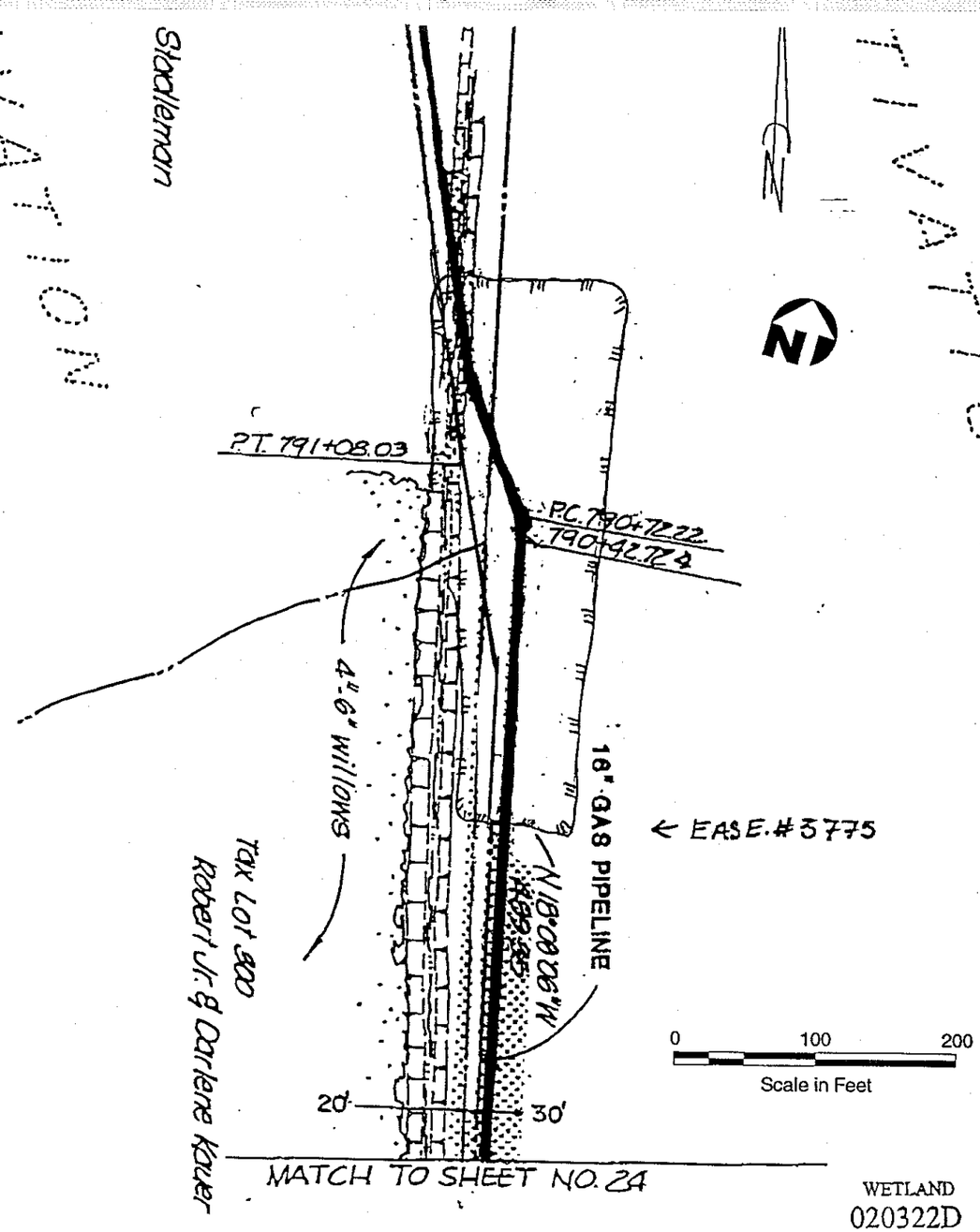

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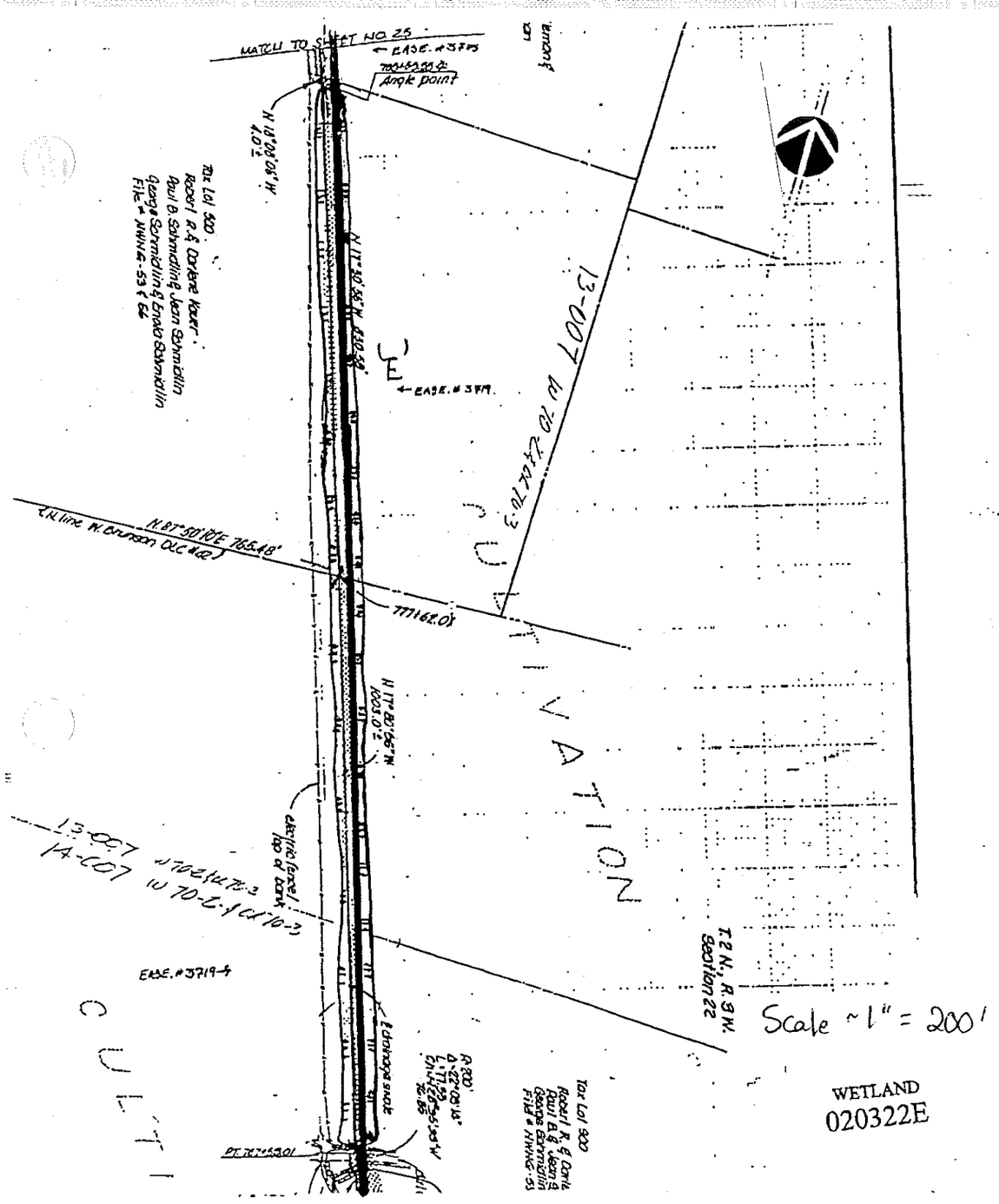

Map Source: Northwest Natural Gas, Wetland Report: Dames and Moore, Inc.

PURPOSE: Transport natural gas — 09/11/98
ADJACENT PROPERTY OWNERS: Various — APPLICATION BY: Northwest Natural Gas
PROPOSED: Excavation and fill for natural gas pipeline — COUNTIES OF: Columbia and Washington, OR
IN: Wetlands and other waters of the U.S.

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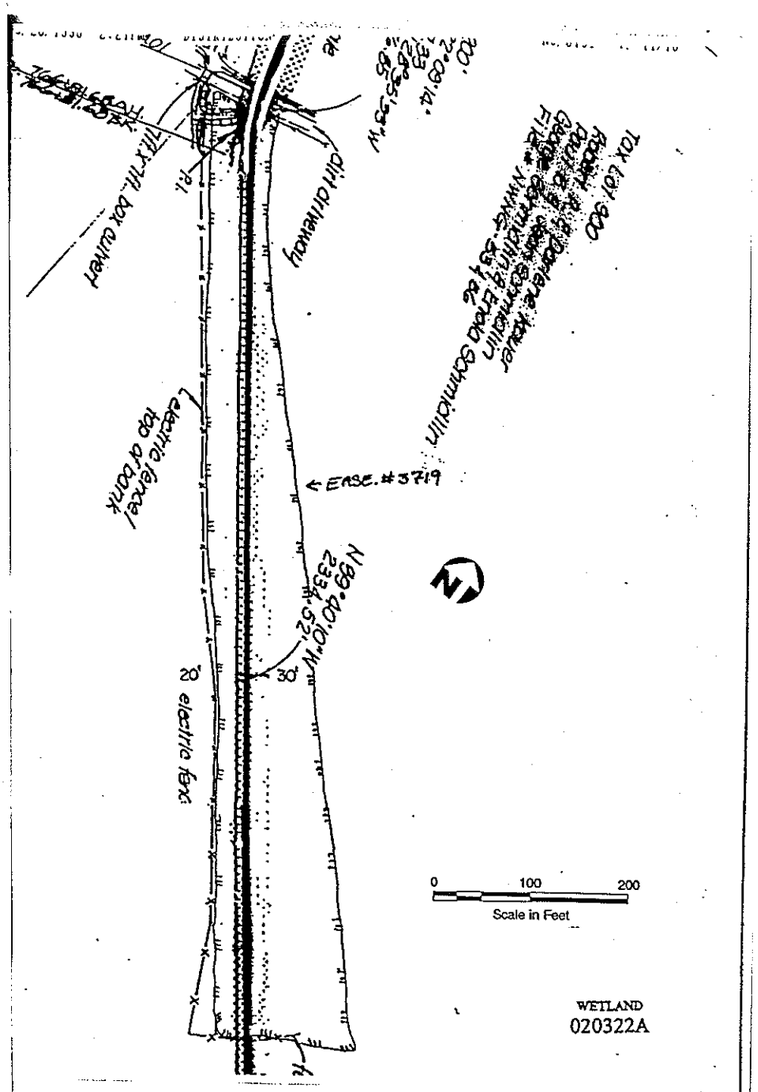
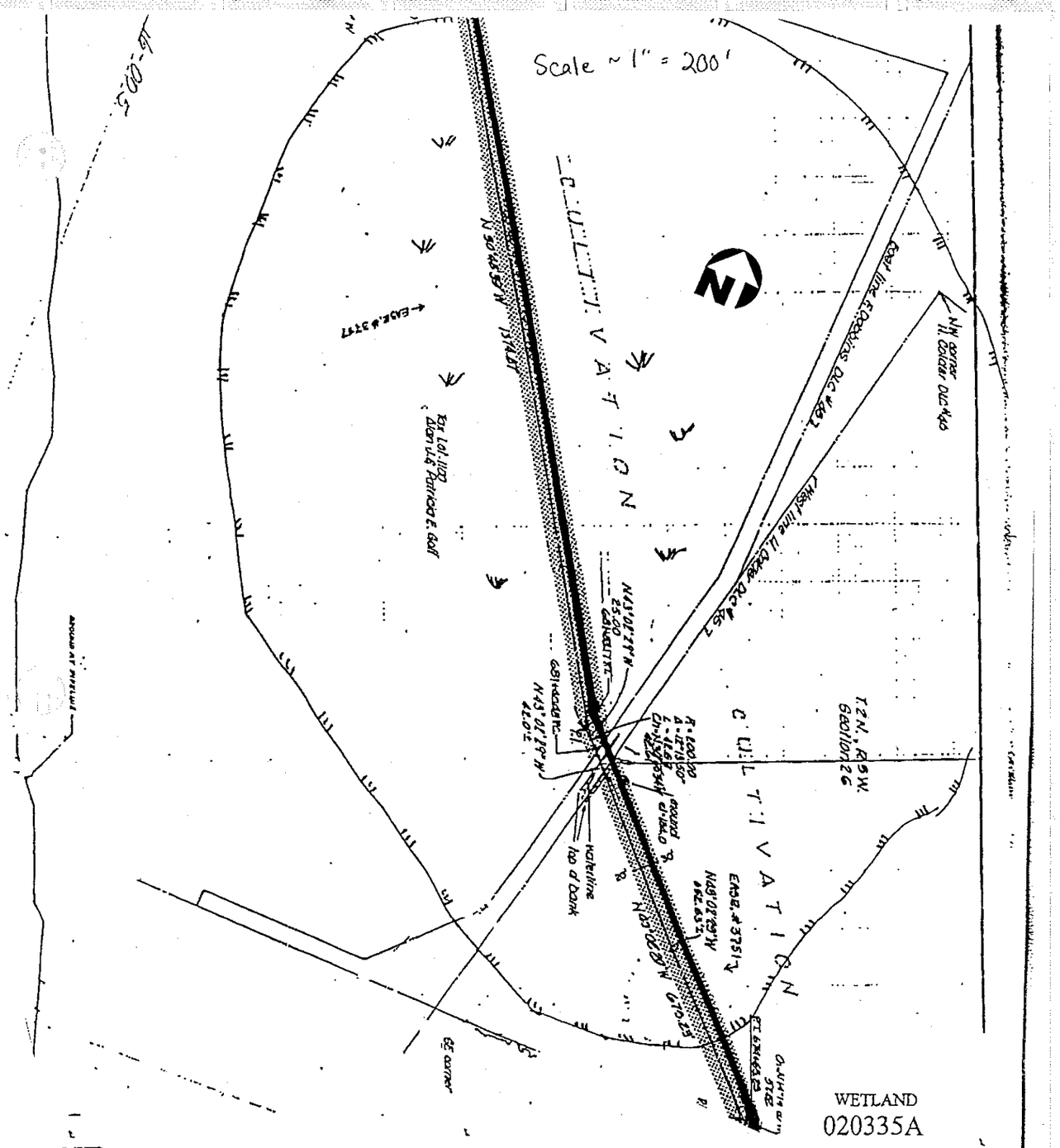


Map Source: Northwest Natural Gas, Wetland Report: Dames and Moore, Inc.

PURPOSE: Transport natural gas
ADJACENT PROPERTY OWNERS: Various
PROPOSED: Excavation and fill for natural gas pipeline
IN: Wetlands and other waters of the U.S.

09/11/98
APPLICATION BY: Northwest Natural Gas
COUNTIES OF: Columbia and Washington, OR

WETLAND SURVEY MAP



Map Source: Northwest Natural Gas, Wetland Report: Dames and Moore, Inc.

PURPOSE: Transport natural gas
ADJACENT PROPERTY OWNERS: Various
PROPOSED: Excavation and fill for natural gas pipeline
IN: Wetlands and other waters of the U.S.

09/11/98
APPLICATION BY: Northwest Natural Gas
COUNTIES OF: Columbia and Washington, OR

WETLAND SURVEY MAP

APPENDIX D

WETLAND FIELD DATA SHEETS

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): ZK, MT Transect/Area: 0605 11 A Plot: 1 Date: 7/15/98

Project/Site: NNG Pipeline State: OR County: Columbia

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?

Yes ~~X~~ No ___ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes ~~X~~ No ___ (If yes, explain) NNG ROW - cut + cleared

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Sairpus microcarpus	OBL	80	21.		
2. Glyceria borealis	OBL	20	22.		
3. Juncus effusus	FACW	20	23.		
4. Holcus lanatus	FAC	20	24.		
5. Sonchus (canada)	FACU	<5	26.		
6. Lemna minor	OBL	20	Trees		
7. Rumex crispus		<5	29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments

Percent of dominant species that are OBL, FACW and/or FAC 100 Is the hydrophytic criterion met? Yes X No___

SOILS

Soil Series Braun-Scapania silt loam 7D Is the soil on the hydric soils list? Yes___ No X

Is the soil: a Histosol? Yes__ No X Histic epipedon present? Yes__ No X Mottled? Yes X No__ Gleyed? Yes X No__

Depth	Matrix Color	Mottle Color	Texture
0-2"	10 yr 3/3		s/l loam
2-16	10 yr 5/1	10 yr 5/8	silt loam & rocks

Comments disturbed soil Is the hydric soils criterion met? Yes X No___

HYDROLOGY

Is the ground surface inundated? Yes X No___ Depth of standing water 0-2" → plot is just above a few inches away from stream

Is the soil saturated? Yes X No___ Depth to saturated soil 14 Depth to free-standing water in pit_____

Mark other field indicators of surface inundation or soil saturation:

___Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas

X Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines X Morphological plant adaptions

Comments Is the wetland hydrology criterion met? Yes X No___

Is the vegetation unit or plot wetland? Yes X No ___ Comments

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK Transect/Area: 060514G Plot: 1 Date: 7/15/98

Project/Site: NW 6 pipeline State: OR County: Columbia

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?

Yes X No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes X No ____ (If yes, explain) along current pipeline

DOMINANT VEGETATION

Herbs	I/S	% Cover
(1) Oenanthe sarmentosa	OBL	30
2. Carex obnupta	OBL	<5
(3) Carex sp.	>FAC	30
4. Phalaris arundinacea	FACW	30
5.		
6.		
7.		
8.		
9.		
10.		
11.		

Shrubs	I/S	% Cover
21. Spiraea douglasii	FACW	40
(22.) Salix lasiandra	FACW+	10
23.		
24.		
26.		
Trees		
29.		
30.		
19.		
20.		
21.		

Comments ____

Percent of dominant species that are OBL, FACW and/or FAC 100 Is the hydrophytic criterion met? Yes X No ___

SOILS

Soil Series Braun - Scapoose silt loam Is the soil on the hydric soils list? Yes ___ No X

Is the soil: a Histosol? Yes __ No X Histic epipedon present? Yes __ No X Mottled? Yes X No __ Gleyed? Yes X No __

Depth	Matrix Color	Mottle Color	Texture
0-12"	10YR 4/2 & some 10YR 5/1	7.5YR 5/8	silt loam & clay mixture cut probably
12-18"	10YR 2/1		silt loam

Comments the matrix of 0-12" is a real mix of colors Is the hydric soils criterion met? Yes X No ___

HYDROLOGY

Is the ground surface inundated? Yes ___ No X Depth of standing water ____

Is the soil saturated? Yes X No ___ Depth to saturated soil 5" Depth to free-standing water in pit ____

Mark other field indicators of surface inundation or soil saturation:

___Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas

X Wetland drainage patterns X Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions

Comments ____ Is the wetland hydrology criterion met? Yes X No ___

Is the vegetation unit or plot wetland? Yes X No ____ Comments ____

Wetland soils dominated by bracken fern, Chrysanthemum, oat grass, Prunella, Hiteus. Scotch broom, Rubus. Left defined wetland boundary

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK & MT Transect/Area: 050514C Plot: 1 Date: 7/15/97

Project/Site: NNG pipeline State: OR County: Columbia

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?

Yes X No _____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes _____ No X (If yes, explain)

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
(1) Hordeum jubatus	FAC	80	21.		
(2) Phalaris arundinacea	FACW	20	22.		
(3) Juncus effusus	FACW	40	23.		
4. Taraxacum officinale	FAC	<5	24.		
5. Carex sp.		10	26.		
6. Rumex sp		<5	Trees		
7.			(29) Malus fusca	FACW	10
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments _____

Percent of dominant species that are OBL, FACW and/or FAC 100 Is the hydrophytic criterion met? Yes X No____

SOILS

Soil Series Hapludalfs - Udifluvents complex (inclusions) Is the soil on the hydric soils list? Yes X No__

Is the soil: a Histosol? Yes__ No X Histic epipedon present? Yes__ No X Mottled? Yes X No__ Gleyed? Yes X No__

Depth	Matrix Color	Mottle Color	Texture
0-16"	10YR 4/1	10YR 5/6	silt loam

Comments_____ Is the hydric soils criterion met? Yes X No____

HYDROLOGY

Is the ground surface inundated? Yes___ No X Depth of standing water_____ but very moist

Is the soil saturated? Yes___ No X Depth to saturated soil_____ Depth to free-standing water in pit_____

Mark other field indicators of surface inundation or soil saturation:

X Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas

___Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions

Comments_____ Is the wetland hydrology criterion met? Yes X No___

Is the vegetation unit or plot wetland? Yes X No _____ Comments_____

Lwetland in west side of Lindgren Creek

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): UK MT Transect/Area: OGS 14C Plot: ___ Date: 7/ /03

Project/Site: NUS 2003 State: OR County: Clackamas

Routine Onsite Determination Method ___ **Or** Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?

Yes X No ___ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes ___ No X (If yes, explain)

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Holcus lanatus	FAC	100	21.		
2. Agrostis alba	FAC	60	22.		
3.			23.		
4.			24.		
5.			26.		
6.			Trees		
7.			29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments ___

Percent of dominant species that are OBL, FACW and/or FAC 100 Is the hydrophytic criterion met? Yes X No ___

SOILS

Soil Series Hapludalfs - Udifluvents complex inclusion Is the soil on the hydric soils list? Yes X No ___

Is the soil: a Histosol? Yes ___ No X Histic epipedon present? Yes ___ No X Mottled? Yes ___ No X Gleyed? Yes ___ No X

Depth	Matrix Color	Mottle Color	Texture
0-16"	10YR 4/2		silt loam
16-18"	10YR 4/6		silt loam

Comments No indicators Is the hydric soils criterion met? Yes ___ No X

HYDROLOGY

Is the ground surface inundated? Yes ___ No X Depth of standing water ___

Is the soil saturated? Yes ___ No X Depth to saturated soil ___ Depth to free-standing water in pit ___

Mark other field indicators of surface inundation or soil saturation:

___Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas

___Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions

Comments No indicators Is the wetland hydrology criterion met? Yes ___ No X

Is the vegetation unit or plot wetland? Yes ___ No X Comments No hydrology or soil indicators

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK [illegible] Transect/Area: 0[illegible]14C Plot: 3 Date: 7/15[illegible]

Project/Site: NNG [illegible] State: OR County: Columbia

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ____

****

Do normal environmental conditions exists at the plant community?

Yes X No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes ____ No X (If yes, explain) May be [illegible] existing NNG [illegible]

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Carex sp.	FACW	20	21. Salix sp. seedlings	FAC	80
2. Agrostis [illegible]	FAC	20	22.		
3. Holcus lanatus	FAC	5	23.		
4. Juncus [illegible]	FACW	20	24.		
5. Sonchus sp.		5-10	26.		
6. Festuca arundinacea		5-10	Trees		
7.			29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments Circled = dominant

Percent of dominant species that are OBL, FACW and/or FAC 100 Is the hydrophytic criterion met? Yes X No ____

SOILS

Soil Series Hapludalfs - Udifluvents Complex Is the soil on the hydric soils list? Yes X No ____ inclusions

Is the soil: a Histosol? Yes ____ No X Histic epipedon present? Yes ____ No X Mottled? Yes ____ No X Gleyed? Yes ____ No X

Depth	Matrix Color	Mottle Color	Texture
0-14"	10YR 4/4		silty sandy loam
14"-	10YR 3/3		silt loam w/a little sand

Comments Not indicators Is the hydric soils criterion met? Yes ____ No X

HYDROLOGY

Is the ground surface inundated? Yes ____ No X Depth of standing water ____

Is the soil saturated? Yes ____ No X Depth to saturated soil ____ Depth to free-standing water in pit ____

Mark other field indicators of surface inundation or soil saturation:

X Oxidized root zones Some ____ Water-stained leaves ____ Water marks ____ Surface scoured areas

____ Wetland drainage patterns ____ Water-borne sediment deposits ____ Drift lines ____ Morphological plant adaptions

Comments Not very strong indicators Is the wetland hydrology criterion met? Yes ____ No X

Is the vegetation unit or plot wetland? Yes ____ No X Comments No hydrology or soil ~~ca~~ indicators

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK, MT Transect/Area: 0605/4C Plot: 4 Date: 7/15/98

Project/Site: NNG Pipeline State: OR County: Columbia

Routine Onsite Determination Method X **Or** Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?

Yes X No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes X No ____ (If yes, explain) appears to have been cleared

DOMINANT VEGETATION

Herbs	I/S	% Cover
1. Scirpus microcarpus	OBL	20
2. Juncus effusus	FACW	30
3. Sonchus (asper?)	UPL	60
4. Agrostis sp.	>FAC	10
5.		
6.		
7.		
8.		
9.		
10.		
11.		

Shrubs	I/S	% Cover
21. Salix sp. (sitchensis)	>FACW	30
22. Rubus lacinatus		<5
23.		
24.		
26.		
Trees		
29.		
30.		
19.		
20.		
21.		

Comments circled = dominant

Percent of dominant species that are OBL, FACW and/or FAC 75 Is the hydrophytic criterion met? Yes X No ____

SOILS

Soil Series Hapludalfs - Udifluvents complex Is the soil on the hydric soils list? Yes X No ___ (mclaren)

Is the soil: a Histosol? Yes ___ No X Histic epipedon present? Yes ___ No X Mottled? Yes ___ No X Gleyed? Yes ___ No X

Depth	Matrix Color	Mottle Color	Texture
0-5	10 YR 3/3		sand loam
5+	10 YR 4/4		"

Comments problem sandy soil Is the hydric soils criterion met? Yes ____ No X

obvious horizontal organic streaks/stratification

HYDROLOGY

Is the ground surface inundated? Yes ___ No X Depth of standing water ____

Is the soil saturated? Yes ___ No X Depth to saturated soil ____ Depth to free-standing water in pit ____

Mark other field indicators of surface inundation or soil saturation:

X Oxidized root zones ___ Water-stained leaves ___ Water marks ___ Surface scoured areas

___ Wetland drainage patterns ___ Water-borne sediment deposits ___ Drift lines ___ Morphological plant adaptions

Comments ____ Is the wetland hydrology criterion met? Yes X No ___

Is the vegetation unit or plot wetland? Yes X No ____ Comments ignore problem soil

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK Transect/Area: [illegible]14C Plot: 5 Date: 7/15/98

Project/Site: NW G Pipeline State: OR County: Columbia

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ____

****

Do normal environmental conditions exists at the plant community?

Yes X No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes X No ____ (If yes, explain) Road [illegible] near NW G pipeline

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Rubus procerus	FACU	90%	21.		
2. Oenothera sarmentosa	OBL	50%	22.		
3. Phalaris arundinacea	FACW	10%	23.		
4.			24.		
5.			26.		
6.			Trees		
7.			29. Alnus rubra	FAC	10
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments ____

Percent of dominant species that are OBL, FACW and/or FAC 75 Is the hydrophytic criterion met? Yes X No ____

SOILS

Soil Series Hapludalfs - Udifluvents complex Is the soil on the hydric soils list? Yes X (inclusions) No ____

Is the soil: a Histosol? Yes ____ No X Histic epipedon present? Yes ____ No X Mottled? Yes ____ No X Gleyed? Yes ____ No X

Depth	Matrix Color	Mottle Color	Texture
0-1[illegible]	10YR 5/4		sandy loam - sand → sand

Comments strong layering Is the hydric soils criterion met? Yes X No ____

→ strong layering w/ organics

HYDROLOGY

Is the ground surface inundated? Yes ____ No ____ Depth of standing water ____

Is the soil saturated? Yes ____ No ____ Depth to saturated soil ____ Depth to free-standing water in pit ____

Mark other field indicators of surface inundation or soil saturation:

__Oxidized root zones __Water-stained leaves __Water marks __Surface scoured areas

X Wetland drainage patterns __Water-borne sediment deposits __Drift lines __Morphological plant adaptions

Comments layering in sandy soil & organic deposits Is the wetland hydrology criterion met? Yes X No ____

Is the vegetation unit or plot wetland? Yes X No ____ Comments ____

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK, MT Transect/Area: 060514D Plot: 1 Date: 7/14/98

Project/Site: NNG Pipeline State: OR County: Columbia

Routine Onsite Determination Method ____ Or Comprehensive Onsite Determination Method ____

****

Do normal environmental conditions exists at the plant community?

Yes X No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes X No ____ (If yes, explain) Ag field - recently plowed

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Phalaris arund.	FACW	60	21.		
2. Agrostis sp.	>FAC	30	22.		
3. Unknown grasses	?	20	23.		
4.			24.		
5.			26.		
6.			Trees		
7.			29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments going on leaf shape so veg ID may be wrong

Percent of dominant species that are OBL, FACW and/or FAC 100 Is the hydrophytic criterion met? Yes X No ____

SOILS

Soil Series Treharne silt loam Is the soil on the hydric soils list? Yes X No ____ (inclusions)

Is the soil: a Histosol? Yes ____ No X Histic epipedon present? Yes ____ No X Mottled? Yes ____ No X (weak) Gleyed? Yes ____ No X

Depth	Matrix Color	Mottle Color	Texture
0 - 16	10 YR 2/1	weak 5 YR 4/4	silt loam

Comments low chroma Is the hydric soils criterion met? Yes X No ____

HYDROLOGY

Is the ground surface inundated? Yes ____ No X Depth of standing water ____

Is the soil saturated? Yes ____ No X Depth to saturated soil ____ Depth to free-standing water in pit ____

Mark other field indicators of surface inundation or soil saturation:

X Oxidized root zones ____ Water-stained leaves ____ Water marks ____ Surface scoured areas

X Wetland drainage patterns ____ Water-borne sediment deposits ____ Drift lines ____ Morphological plant adaptions

Comments little swale - weak but criteria met Is the wetland hydrology criterion met? Yes X No ____

Is the vegetation unit or plot wetland? Yes X No ____ Comments ____

This is a narrow swale, the upland nearby is 10YR 3/2, without oxidized roots [illegible]

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): WK, MT Transect/Area: 060514 F Plot: 1 Date: 7/15/14

Project/Site: NNG Pipeline State: OR County: Columbia

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?

Yes X No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes X No ____ (If yes, explain) Hay field

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Phalaris arundinacea	FACW	30	21.		
2. Epilobium sp.	>FAC	30	22.		
3. Rorippa sp.	>FAC	20	23.		
4.			24.		
5.			26.		
6.			Trees		
7.			29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments

Percent of dominant species that are OBL, FACW and/or FAC 100 Is the hydrophytic criterion met? Yes X No ____

SOILS

Soil Series Treharne silt loam Is the soil on the hydric soils list? Yes X No ____

Is the soil: a Histosol? Yes ____ No X Histic epipedon present? Yes ____ No X Mottled? Yes X No ____ Gleyed? Yes X No ____

Depth	Matrix Color	Mottle Color	Texture
0-16"	10YR 2/1	2.5YR 6/8 - only some mottles in lower part	Silty clay loam

Comments Is the hydric soils criterion met? Yes X No ____

HYDROLOGY

Is the ground surface inundated? Yes ____ No X Depth of standing water ____

Is the soil saturated? Yes ____ No X Depth to saturated soil ____ Depth to free-standing water in pit ____

Mark other field indicators of surface inundation or soil saturation:

X Oxidized root zones ____ Water-stained leaves ____ Water marks X Surface scoured areas

X Wetland drainage patterns X Water-borne sediment deposits ____ Drift lines ____ Morphological plant adaptions

Comments Strong indicators Is the wetland hydrology criterion met? Yes X No ____

Is the vegetation unit or plot wetland? Yes X No ____ Comments ____

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK, MT Transect/Area: 060514A Plot: 1 Date: 7/9/98

Project/Site: NNG Pipeline State: OR County: Columbia

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?

Yes X No _____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes X No _____ (If yes, explain) impounded pasture

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Agrostis pedustris	FAW	70	21.		
2. Seedlings - unknown		<5	22.		
3.			23.		
4.			24.		
5.			26.		
6.			Trees		
7.			29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments _____

Percent of dominant species that are OBL, FACW and/or FAC 100 Is the hydrophytic criterion met? Yes X No ____

SOILS

Soil Series Trehar ne silt loam Is the soil on the hydric soils list? Yes X No__

Is the soil: a Histosol? Yes__ No X Histic epipedon present? Yes__ No X Mottled? Yes X No__ Gleyed? Yes X No__

Depth	Matrix Color	Mottle Color	Texture
0-16	5Y 4/1	7.5YR 4/6	Silt loam

Comments _____ Is the hydric soils criterion met? Yes X No ____

HYDROLOGY

Is the ground surface inundated? Yes___ No X Depth of standing water_____

Is the soil saturated? Yes X No___ Depth to saturated soil 10" Depth to free-standing water in pit 11"

Mark other field indicators of surface inundation or soil saturation:

X Oxidized root zones X Water-stained leaves ___Water marks X Surface scoured areas

X Wetland drainage patterns X Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions

Comments _____ Is the wetland hydrology criterion met? Yes X No___

Is the vegetation unit or plot wetland? Yes X No ____ Comments _____

Imp. wildlife area for ducks & other water related birds

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK, MT Transect/Area: 060514A Plot: area Date: 7/9/98

Project/Site: NNG Pipeline State: OR County: Columbia

Routine Onsite Determination Method ___ **Or** Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?

Yes X No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes X No ____ (If yes, explain) probably impounded due to road

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Carex obnupta			21. Spirea douglasii		
2. Lemna minor			22.		
3. Callitriche sp			23.		
4.			24.		
5.			26.		
6.			Trees		
7.			29. Salix lasiandra		
8.			30. Alnus rubra		
9.			19. Salix scouleri		
10.			20.		
11.			21.		

Comments _____

Percent of dominant species that are OBL, FACW and/or FAC____ Is the hydrophytic criterion met? Yes____ No____

humocks of vegetation

SOILS

Soil Series Natal silty clay loam & Trehame silt loam Is the soil on the hydric soils list? Yes X No__

Is the soil: a Histosol? Yes__ No__ Histic epipedon present? Yes__ No__ Mottled? Yes__ No__ Gleyed? Yes__ No__

Depth	Matrix Color	Mottle Color	Texture

Comments Not checked - water too deep Is the hydric soils criterion met? Yes____ No____

HYDROLOGY

Is the ground surface inundated? Yes X No___ Depth of standing water >6" (?)

Is the soil saturated? Yes X No___ Depth to saturated soil_____ Depth to free-standing water in pit_____

Mark other field indicators of surface inundation or soil saturation:

__Oxidized root zones X Water-stained leaves X Water marks __Surface scoured areas

X Wetland drainage patterns __Water-borne sediment deposits X Drift lines __Morphological plant adaptions

Comments open water Is the wetland hydrology criterion met? Yes___ No___

Is the vegetation unit or plot wetland? Yes X No ____ Comments_____

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK, MT Transect/Area: 060514A Plot: 2 Date: 7/9/98

Project/Site: NNG Pipeline State: OR County: Columbia

Routine Onsite Determination Method X **Or** Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?

Yes X No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes ____ No X (If yes, explain)

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Dactylis glomerata	FACU	10	21. Rubus procerus	FACU	10
2. Galium aparine	FACU	20	22.		
3. Agropyron repens	FAC-	50	23.		
4. Holcus lanatus	FACU	20	24.		
5. Urtica dioica	FAC+	10	26.		
6. Poa trivialis	FACW	5	Trees		
7.			29. Alnus rubra	FAC	20%
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments _____

Percent of dominant species that are OBL, FACW and/or FAC 25% Is the hydrophytic criterion met? Yes____ No X

SOILS

Soil Series Treharne silt loam Is the soil on the hydric soils list? Yes X No__

Is the soil: a Histosol? Yes__ No X Histic epipedon present? Yes__ No X Mottled? Yes__ No U Gleyed? Yes__ No X

Depth	Matrix Color	Mottle Color	Texture
3-14"	10YR 3/3		silt loam
14"	black organic layer		
14 - 17"	10YR 4/2		silt loam

Comments No indicators Is the hydric soils criterion met? Yes____ No X

HYDROLOGY

Is the ground surface inundated? Yes___ No X Depth of standing water_____

Is the soil saturated? Yes___ No X Depth to saturated soil_____ Depth to free-standing water in pit_____

Mark other field indicators of surface inundation or soil saturation:

___Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas

___Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions

Comments Moist but not saturated Is the wetland hydrology criterion met? Yes___ No X

Is the vegetation unit or plot wetland? Yes ____ No X Comments No indicators

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK, MT Transect/Area: 0605/4A Plot: 3 Date: 7/9/98

Project/Site: NNG Pipeline State: OR County: Columbia

Routine Onsite Determination Method X **Or** Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?

Yes X No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes X No ____ (If yes, explain) fallow field

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Ranunculus repens	FACW	50	21.		
2. Agrostis palustris	FACW	30	22.		
3. Festuca arundinacea	FAC-	20	23.		
4. Poa trivialis	FACW	10	24.		
5. Glyceria borealis	OBL	<5	26.		
6. Holcus lanatus	FAC	20	Trees		
7. Phalaris arundin.	FACW	<5	29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments Phalaris predominates elsewhere in patches nearby

Percent of dominant species that are OBL, FACW and/or FAC 80 Is the hydrophytic criterion met? Yes X No ___

SOILS

Soil Series Treharne silt loam Is the soil on the hydric soils list? Yes X No ___

Is the soil: a Histosol? Yes ___ No X Histic epipedon present? Yes ___ No X Mottled? Yes X No ___ Gleyed? Yes X No ___

Depth	Matrix Color	Mottle Color	Texture
0-16	5Y 4/1	7.5YR 4/6	silt loam

Comments ___ Is the hydric soils criterion met? Yes X No ___

HYDROLOGY

Is the ground surface inundated? Yes ___ No X Depth of standing water ___

Is the soil saturated? Yes ___ No X Depth to saturated soil ___ Depth to free-standing water in pit ___

Mark other field indicators of surface inundation or soil saturation:

X Oxidized root zones Strong ___ Water-stained leaves ___ Water marks ___ Surface scoured areas

___ Wetland drainage patterns ___ Water-borne sediment deposits ___ Drift lines ___ Morphological plant adaptions

Comments marginal hydrology Is the wetland hydrology criterion met? Yes ___ No ___

Is the vegetation unit or plot wetland? Yes X No ___ Comments but marginal

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK & MT Transect/Area: 060514A Plot: 4 Date: 7/9/98
Project/Site: NNG Pipeline State: OR County: Columbia
Intermediate-level Onsite Determination Method X Or Comprehensive Onsite Determination Method ___
****

Do normal environmental conditions exists at the plant community?
Yes X No ____ (If no, explain on back)
Has the vegetation, soils and/or hydrology been significantly disturbed?
Yes ____ No X (If yes, explain on back)

Appear to be a hay pasture

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Holcus ~~mollis~~ lanatus	FAC~~U~~	80	21.		
2. Agrostis stolonifera	FAC	85	22.		
3. Juncus effusus	FACW	10%	23.		
4.			24.		
5.			26.		
6.			Trees		
7.			29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments ____
Percent of dominant species that are OBL, FACW and/or FAC 100 Is the hydrophytic criterion met? Yes X No ~~X~~

but Juncus is rare dominant nearby

SOILS

Soil Series Tehama silt loam Is the soil on the hydric soils list? Yes X No__
Is the soil: a Histosol? Yes__ No X Histic epipedon present? Yes__ No X Mottled? Yes__ No__ Gleyed? Yes X No__

Depth	Matrix Color	Mottle Color	Texture
0 - 2"	5Y 4/1	10YR 6/8	silt loam
2 - 18"	5Y 4/1 75% 2.5Y 5/3	10YR 6/8	silt loam

Comments ____ Is the hydric soils criterion met? Yes X No____

HYDROLOGY

Is the ground surface inundated? Yes___ No___ Depth of standing water_____
Is the soil saturated? Yes___ No___ Depth to saturated soil_____ Depth to free-standing water in pit_____
Mark other field indicators of surface inundation or soil saturation:
X Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas
___Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions
Comments ____ Is the wetland hydrology criterion met? Yes X No___

Is the vegetation unit or plot wetland? Yes X No ____ Comments ____

Redwinged blackbird in marby reed canary grass

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK MT Transect/Area: 060514 A Plot: 5 Date: 7/9/98

Project/Site: NNG Pipeline State: OR County: Columbia

Routine Onsite Determination Method X **Or** Comprehensive Onsite Determination Method ____

****

Do normal environmental conditions exists at the plant community?

Yes X No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes X No ____ (If yes, explain) fallow

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Chrysanthemum leuc.	UPL	30	21.		
2. Anthoxanthum odorat.	UPL	50	22.		
3. Trifolium repens	UPL	30	23.		
4. Holcus lanatus	FAC	10	24.		
5. Agrostis stolonif	FAC	20	26.		
6.			Trees		
7.			29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments ____

Percent of dominant species that are OBL, FACW and/or FAC 40 Is the hydrophytic criterion met? Yes____ No X

SOILS

Soil Series Tucharne silt loam Is the soil on the hydric soils list? Yes X No__

Is the soil: a Histosol? Yes__ No X Histic epipedon present? Yes__ No X Mottled? Yes__ No X Gleyed? Yes__ No X

Depth	Matrix Color	Mottle Color	Texture
0-12	10 yr 3/2		Silt loam
12-16	2.5 y 4/4		" "

Comments____ Is the hydric soils criterion met? Yes____ No X

HYDROLOGY

Is the ground surface inundated? Yes__ No X Depth of standing water____

Is the soil saturated? Yes__ No X Depth to saturated soil____ Depth to free-standing water in pit____

Mark other field indicators of surface inundation or soil saturation:

__Oxidized root zones __Water-stained leaves __Water marks __Surface scoured areas

__Wetland drainage patterns __Water-borne sediment deposits __Drift lines __Morphological plant adaptions

Comments No indicators Is the wetland hydrology criterion met? Yes__ No X

Is the vegetation unit or plot wetland? Yes ____ No X Comments____

border

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK & MT Transect/Area: 060514B Plot: 1 Date: 7/9/90

Project/Site: NNG pipeline State: OR County: Columbia

Intermediate-level Onsite Determination Method X Or Comprehensive Onsite Determination Method ____

****

Do normal environmental conditions exists at the plant community?

Yes X No ____ (If no, explain on back)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes ____ No X (If yes, explain on back)

Hay pasture

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Anthoxanthum [illegible]	[illegible]	[illegible]	21.		
2. Chrysanthemum [illegible]	[illegible]	[illegible]	22.		
3. [illegible]	FACW	[illegible]	23.		
4. Holcus ~~[illegible]~~ lanatus	FAC	[illegible]	24.		
5. Agrostis [illegible]	FAC	[illegible]	26.		
6. ~~Phalaris arun~~			Trees		
7.			29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments ____

Percent of dominant species that are OBL, FACW and/or FAC 40 Is the hydrophytic criterion met? Yes ____ No X

SOILS

Soil Series Trehorne silt loam Is the soil on the hydric soils list? Yes X No ____

Is the soil: a Histosol? Yes ____ No X Histic epipedon present? Yes ____ No X Mottled? Yes ____ No X Gleyed? Yes ____ No X

Depth	Matrix Color	Mottle Color	Texture
0-6"	10YR 3/[illegible]		silt loam
6-12"	10YR 3/2		silt loam

Comments ____ Is the hydric soils criterion met? Yes ____ No X

HYDROLOGY

Is the ground surface inundated? Yes ____ No X Depth of standing water ____

Is the soil saturated? Yes ____ No X Depth to saturated soil ____ Depth to free-standing water in pit ____

Mark other field indicators of surface inundation or soil saturation:

___Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas

___Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions

Comments ____ Is the wetland hydrology criterion met? Yes ____ No X

Is the vegetation unit or plot wetland? Yes ____ No X Comments ____

[illegible]

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK, MT Transect/Area: 060514B Plot: 2 Date: 7/9/98
Project/Site: NNG Pipeline State: OR County: Columbia
~~Intermediate-level~~ Onsite Determination Method X Or Comprehensive Onsite Determination Method ___
****

Do normal environmental conditions exists at the plant community?
Yes X No ____ (If no, explain on back)
Has the vegetation, soils and/or hydrology been significantly disturbed?
Yes ____ No X (If yes, explain on back)

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Juncus effusus	FACW	<5	21.		
2. Eleocharis ovata	OBL	80	22.		
3. Agrostis palustris	FACW	10	23.		
4. Alopecurus geniculat.	OBL	20	24.		
5. Phalaris arund.	FACW	2-3	26.		
6. Glyceria borealis	OBL	<5	Trees		
7.			29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments
Percent of dominant species that are OBL, FACW and/or FAC 100 Is the hydrophytic criterion met? Yes X No ___

SOILS

Soil Series Tolman silt loam Is the soil on the hydric soils list? Yes X No__
Is the soil: a Histosol? Yes__ No X Histic epipedon present? Yes__ No X Mottled? Yes X No__ Gleyed? Yes X No__

Depth	Matrix Color	Mottle Color	Texture
0 - 8	5Y 4/1	7.5YR 5/8	silty clay loam
8-16	5Y 5/1	10YR 5/8	"

Comments Is the hydric soils criterion met? Yes X No____

HYDROLOGY

Is the ground surface inundated? Yes___ No X Depth of standing water_____
Is the soil saturated? Yes X No___ Depth to saturated soil 10" Depth to free-standing water in pit 14"
Mark other field indicators of surface inundation or soil saturation:
___Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas
X Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions
Comments Swale Is the wetland hydrology criterion met? Yes X No___

Is the vegetation unit or plot wetland? Yes X No ____ Comments
land owner told us it is ponded winter → spring
& only just dried up a couple of weeks ago.

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK, MT Transect/Area: 060524C Plot: 1 Date: 7/9/98

Project/Site: NNG Pipeline State: OR County: Columbia

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ____

****

Do normal environmental conditions exists at the plant community?

Yes X No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes ____ No X (If yes, explain) Same as 060524B

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Carex ~~sp.~~ jonesii	FACW	<5	21. Spirea douglasii	FACW	70
2. Ranunculus repens	FACW	<5	22.		
3. Veronica sp.	>FAC	<5	23.		
4. Galium trifidum	FACW+	<5	24.		
5.			26.		
6.			Trees Overstory		
7.			29. Fraxinus latif.	FACW	40+
8.			30. Salix scouler	FACW	5
9.			19.		
10.			20.		
11.			21.		

Comments circled = dominant

Percent of dominant species that are OBL, FACW and/or FAC 100 Is the hydrophytic criterion met? Yes X No ____

SOILS

Soil Series Trehanne silt loam Is the soil on the hydric soils list? Yes ____ No ____

Is the soil: a Histosol? Yes ____ No X Histic epipedon present? Yes ____ No X Mottled? Yes X No ____ Gleyed? Yes X No ____

Depth	Matrix Color	Mottle Color	Texture
0-8	10 YR 3/1		silt loam organic pieces
8-16	5Y 4/1	7.5YR 4/6	"

Comments ____ Is the hydric soils criterion met? Yes X No ____

HYDROLOGY

Is the ground surface inundated? Yes ____ No X Depth of standing water ____

Is the soil saturated? Yes ____ No X Depth to saturated soil ____ Depth to free-standing water in pit ____

Mark other field indicators of surface inundation or soil saturation:

__ Oxidized root zones __ Water-stained leaves __ Water marks X Surface scoured areas

X Wetland drainage patterns __ Water-borne sediment deposits X Drift lines algae __ Morphological plant adaptions

Comments slight depression Is the wetland hydrology criterion met? Yes X No ____

Is the vegetation unit or plot wetland? Yes X No ____ Comments ____

border - Ranunculus, spirea, Rosa but soil dry, no hydrology indicators; soil 10YR 5/2 w/ almost no mottles - weak mottles

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK, MT Transect/Area: 060429C Plot: 1 Date: 6/24/98

Project/Site: MNG Pipeline State: OR County: Columbia

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?
Yes X No ____ (If no, explain)
Has the vegetation, soils and/or hydrology been significantly disturbed?
Yes ____ No X (If yes, explain)

West bank/slope of creek coming thru center of Sect. 29 South to Hwy 47

DOMINANT VEGETATION

Herbs		I/S	% Cover
1.	Corydalis Scouleri	FAC+	20
2.	Poa palustris	FACW	10
3.	~~Phacelia (Pacific)~~		
4.	Hydrophyllum fendleri	(FAC)	10
5.			
6.			
7.			
8.			
9.			
10.			
11.			

Shrubs - overstory		I/S	% Cover
21.	Acer circinatum	FAC-	80
22.			
23.			
24.			
26.			
Trees			
29.			
30.			
19.			
20.			
21.			

Comments circled = dominant

Percent of dominant species that are OBL, FACW and/or FAC 66 Is the hydrophytic criterion met? Yes X No ___

SOILS

Soil Series Trehame silt loam inclusions Is the soil on the hydric soils list? Yes X No ___

Is the soil: a Histosol? Yes ___ No X Histic epipedon present? Yes ___ No X Mottled? Yes ___ No X Gleyed? Yes ___ No X

Depth	Matrix Color	Mottle Color	Texture
0-18	10YR3/3		silt loam

Comments ____ Is the hydric soils criterion met? Yes ____ No X

HYDROLOGY

Is the ground surface inundated? Yes ___ No X Depth of standing water 0

Is the soil saturated? Yes ___ No X Depth to saturated soil none Depth to free-standing water in pit none

Mark other field indicators of surface inundation or soil saturation:

___Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas

___Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions

Comments no indicators Is the wetland hydrology criterion met? Yes ___ No X

Is the vegetation unit or plot wetland? Yes ____ No X Comments ____

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK, MT Transect/Area: 060429C Plot: 2 Date: 6/24/98

Project/Site: NNG Pipeline State: OR County: Columbia

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?

Yes X No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes ____ No X (If yes, explain)

DOMINANT VEGETATION

Herbs		I/S	% Cover
1.	Poa palustris	FACW	40
2.	Pellinia grandiflora	NI	<5
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			

Shrubs		I/S	% Cover
21.			
22.			
23.			
24.			
26.			
Trees			
29.			
30.			
19.			
20.			
21.			

Comments Circled = dominant

Percent of dominant species that are OBL, FACW and/or FAC 100 Is the hydrophytic criterion met? Yes X No ____

SOILS

Soil Series Tehama silt loam inclusions Is the soil on the hydric soils list? Yes X No ___

Is the soil: a Histosol? Yes ___ No X Histic epipedon present? Yes ___ No X Mottled? Yes ___ No X Gleyed? Yes X No ___

Depth	Matrix Color	Mottle Color	Texture
0-18	10yr 3/2	10yr 3/1	Silt loam w/OM

Comments ____ Is the hydric soils criterion met? Yes ____ No X

HYDROLOGY

Is the ground surface inundated? Yes ~~X~~ No X Depth of standing water none

Is the soil saturated? Yes X No ___ Depth to saturated soil 0" Depth to free-standing water in pit 8"

Mark other field indicators of surface inundation or soil saturation:

___Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas

___Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions

Comments no other indicators Is the wetland hydrology criterion met? Yes ___ No X

Is the vegetation unit or plot wetland? Yes ____ No X Comments ____

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK, MT Transect/Area: 0604296 Plot: 3 Date: 6/24/98

Project/Site: NNG Pipeline State: OR County: Columbia

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?

Yes ✓ No X (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes X No ____ (If yes, explain) roadside ditch adj. to creek

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Hydrophyllum tenuipes	(FAC)	80	21.		
2. Stachys cooleya	FACW	10	22.		
3. Urtica dioica	FAC	<5	23.		
4.			24.		
5.			26.		
6.			Trees		
7.			29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments circled = dominant

Percent of dominant species that are OBL, FACW and/or FAC 100 Is the hydrophytic criterion met? Yes X No ___

SOILS

Soil Series Treharne silt loam Is the soil on the hydric soils list? Yes X (Industrial) No ___

Is the soil: a Histosol? Yes ___ No X Histic epipedon present? Yes ___ No X Mottled? Yes ___ No X Gleyed? Yes ___ No X

Depth	Matrix Color	Mottle Color	Texture
0-18"	10yr 3/3		silt loam

Comments ____ Is the hydric soils criterion met? Yes ____ No X

HYDROLOGY

Is the ground surface inundated? Yes ___ No X Depth of standing water ____

Is the soil saturated? Yes ___ No X Depth to saturated soil ____ Depth to free-standing water in pit ____

Mark other field indicators of surface inundation or soil saturation:

___Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas

___Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions

Comments NO indicators Is the wetland hydrology criterion met? Yes ___ No X

Is the vegetation unit or plot wetland? Yes ____ No: X Comments Soil & hydr. criteria not met

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): VK, MT Transect/Area: 060429C Plot: 4 Date: 6/24/98

Project/Site: ~~test~~ NNG Pipeline State: OR County: Columbia

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?

Yes X No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes ____ No X (If yes, explain)

DOMINANT VEGETATION

Herbs	I/S	% Cover
(1) Lysichitum americanum	OBL	10
(2) Oenanthe sarmentosa	OBL	20
3. Impatiens glandulif.	FACW	<5
4. Salvia cooleya	FACW	<5
5.		
6.		
7.		
8.		
9.		
10.		
11.		

Shrubs	I/S	% Cover
21. Acer circinatum	FAC-	<5
22.		
23.		
24.		
26.		

Trees overstory cover

(29.)	Acer macrophyllum	FACU	40+
30.			
19.			
20.			
21.			

Comments circled = dominant

Percent of dominant species that are OBL, FACW and/or FAC (66) Is the hydrophytic criterion met? Yes X No ___

SOILS

Soil Series Treharne silt loam Is the soil on the hydric soils list? Yes X No ___

Is the soil: a Histosol? Yes ___ No X Histic epipedon present? Yes ___ No X Mottled? Yes X No ___ Gleyed? Yes X No ___

Depth	Matrix Color	Mottle Color	Texture
0-1	10YR 4/1		Silty loam
1-16	5Y 4/1	7.5YR 4/6	Silty loam

Comments ___ Is the hydric soils criterion met? Yes X No ___

HYDROLOGY

Is the ground surface inundated? Yes ___ No X Depth of standing water ___

Is the soil saturated? Yes X No ___ Depth to saturated soil surface Depth to free-standing water in pit 8"

Mark other field indicators of surface inundation or soil saturation:

X Oxidized root zones ___ Water-stained leaves ___ Water marks X Surface scoured areas

X Wetland drainage patterns ___ Water-borne sediment deposits ___ Drift lines X Morphological plant adaptions

Comments ___ Is the wetland hydrology criterion met? Yes X No ___

Is the vegetation unit or plot wetland? Yes X No ____ Comments ___

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK, MT Transect/Area: 060429F Plot: 1 Date: 7/8/98

Project/Site: NNG Pipeline State: OR County: Columbia

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

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Do normal environmental conditions exists at the plant community? low area

Yes X No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes X No ____ (If yes, explain) cattle pasture & NNG ROW

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Glyceria borealis (Hong)	OBL	30	21.		
2. Alopecurus ~~geniculatus~~ geniculatus	(FACW) OBL	80	22.		
3.			23.		
4.			24.		
5.			26.		
6.			Trees		
7.			29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments

Percent of dominant species that are OBL, FACW and/or FAC 100 Is the hydrophytic criterion met? Yes X No ____

SOILS

Soil Series Natal silty clay loam Is the soil on the hydric soils list? Yes X No ____

Is the soil: a Histosol? Yes ____ No X Histic epipedon present? Yes ____ No X Mottled? Yes X No ____ Gleyed? Yes X No ____

Depth	Matrix Color	Mottle Color	Texture
1-4	5Y 4/1		Silty clay loam
4-16	5Y 5/1	7.5YR 4/6	silty loam

Comments ____ Is the hydric soils criterion met? Yes X No ____

HYDROLOGY

Is the ground surface inundated? Yes ____ No X Depth of standing water none

Is the soil saturated? Yes X No ____ Depth to saturated soil 1-4" Depth to free-standing water in pit none

Mark other field indicators of surface inundation or soil saturation:

X Oxidized root zones ____ Water-stained leaves ____ Water marks ____ Surface scoured areas

X Wetland drainage ~~patterns~~ basins X Water-borne sediment deposits ____ Drift lines ____ Morphological plant adaptions

Comments barely sufficient indicators Is the wetland hydrology criterion met? Yes X No ____

Is the vegetation unit or plot wetland? Yes X No ____ Comments ____

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LKeAT Transect/Area: 06629F Plot: 2 Date: 7/8/98

Project/Site: NNG pipeline State: OR County: Columbia

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

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Do normal environmental conditions exists at the plant community?

Yes X No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes X No ____ (If yes, explain) NNG pipeline & cattle pasture

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Alopecurus geniculatus	FACW	90%	21.		
2. Agrostis sp. (not palustris)	FAC	60%	22.		
3. Ranunculus repens	FACW	10%	23.		
4. Juncus effusus	FACW	65%	24.		
5.			26.		
6.			Trees		
7.			29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments ____

Percent of dominant species that are OBL, FACW and/or FAC 100 Is the hydrophytic criterion met? Yes X No ____

SOILS

Soil Series Natal silty clay loam Is the soil on the hydric soils list? Yes X No ____

Is the soil: a Histosol? Yes ____ No X Histic epipedon present? Yes ____ No X Mottled? Yes X No ____ Gleyed? Yes X No ____

Depth	Matrix Color	Mottle Color	Texture
0-5"	5YR 5/1	7.5YR 4/6 at top	silt loam at top
5"-16"	10YR 2/2		silt loam

Comments ____ Is the hydric soils criterion met? Yes ____ No X

HYDROLOGY

Is the ground surface inundated? Yes ____ No X Depth of standing water ____

Is the soil saturated? Yes ____ No X Depth to saturated soil ____ Depth to free-standing water in pit ____

Mark other field indicators of surface inundation or soil saturation:

___Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas

___Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions

Comments no indicators Is the wetland hydrology criterion met? Yes ____ No X

Is the vegetation unit or plot wetland? Yes ____ No X Comments insufficient soil hydrology indicators

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK, MT Transect/Area: 060429F Plot: 3 Date: 7/8/98

Project/Site: NNG Pipeline State: OR County: Columbia

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

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Do normal environmental conditions exists at the plant community?

Yes X No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed? & NNG ROW

Yes X No ____ (If yes, explain) cattle pasture - trampling creating bare patches

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Alopecurus geniculatus	FACW	50	21.		
2. ~~Alopecurus pratensis~~	FAC	<5	22.		
3. Phleum pratense			23.		
4.			24.		
5.			26.		
6.			Trees		
7.			29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments low cover - mostly bare patch

Percent of dominant species that are OBL, FACW and/or FAC 100 Is the hydrophytic criterion met? Yes X No ____

SOILS

Soil Series Natal silty clay loam Is the soil on the hydric soils list? Yes X No ___

Is the soil: a Histosol? Yes__ No X Histic epipedon present? Yes__ No X Mottled? Yes__ No X Gleyed? Yes__ No X

Depth	Matrix Color	Mottle Color	Texture
0-6	10YR 3/2		silt loam
6-16	10YR 4/2		silt loam

Comments ____ Is the hydric soils criterion met? Yes____ No X

HYDROLOGY

Is the ground surface inundated? Yes___ No X Depth of standing water none

Is the soil saturated? Yes___ No X Depth to saturated soil none Depth to free-standing water in pit none

Mark other field indicators of surface inundation or soil saturation:

X Oxidized root zones few ___Water-stained leaves ___Water marks X Surface scoured areas - possibly due to trampling

___Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions

Comments weak indicators Is the wetland hydrology criterion met? Yes___ No X

Is the vegetation unit or plot wetland? Yes ____ No X Comments ____

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK, MT Transect/Area: 060429F Plot: 4 Date: 7/8/98

Project/Site: NNG Pipeline State: OR County: Columbia

Routine Onsite Determination Method ___ Or Comprehensive Onsite Determination Method ___

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Do normal environmental conditions exists at the plant community?

Yes X No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes X No ____ (If yes, explain) cattle pasture & NNG ROW

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Juncus effusus	FACW	40	21.		
2. Alopecurus (small)	FACW	80	22.		
3. Agrostis sp.	>FAC	20	23.		
4.			24.		
5.			26.		
6.			Trees		
7.			29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments

Percent of dominant species that are OBL, FACW and/or FAC 100 of known spp Is the hydrophytic criterion met? Yes X No ____

SOILS

Soil Series Natal silty clay loam Is the soil on the hydric soils list? Yes X No ____

Is the soil: a Histosol? Yes ____ No X Histic epipedon present? Yes ____ No X Mottled? Yes ____ No X Gleyed? Yes X No ____

Depth	Matrix Color	Mottle Color	Texture
0-10	5Y 4/1	7.5YR 4/6	Silt loam
10-16	5Y 6/1		" "

Comments ____ Is the hydric soils criterion met? Yes X No ____

HYDROLOGY

Is the ground surface inundated? Yes ____ No X Depth of standing water ____

Is the soil saturated? Yes ____ No X Depth to saturated soil ____ Depth to free-standing water in pit ____

Mark other field indicators of surface inundation or soil saturation:

X Oxidized root zones, Barely ____ Water-stained leaves ____ Water marks ____ Surface scoured areas

X Wetland drainage patterns ____ Water-borne sediment deposits ____ Drift lines ____ Morphological plant adaptions

Comments Weak indicators - but barely makes it Is the wetland hydrology criterion met? Yes X No ____

Is the vegetation unit or plot wetland? Yes X No ____ Comments barely/marginal wetland

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK, MT Transect/Area: D604 28A Plot: 1 Date: 7/8/98

Project/Site: NN6 Pipeline State: OR County: Columbia

Routine Onsite Determination Method X **Or** Comprehensive Onsite Determination Method ___

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Do normal environmental conditions exists at the plant community?

Yes X No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes X No ____ (If yes, explain) rock fill on surface

DOMINANT VEGETATION

	Herbs	I/S	% Cover
1.	Ranunculus repens	FACW	60
2.	Poa palustris	FACW	40
3.	Juncus effusus	FACW	10
4.	Carex spp obnupta	OBL	<5
5.	Prunella vulgaris	UPL	<5
6.	Galium aparine	UPL	<5
7.			
8.			
9.			
10.			
11.			

	Shrubs overstory	I/S	% Cover
21.	Fraxinus latifolia	>FAC	10
22.	Rubus ursinus	UPL	30
23.	Rosa nisocarpa	FACW	<5
24.			
26.			
	Trees overstory		
29.	Fraxinus latifolia	>FAC	60
30.			
19.			
20.			
21.			

Comments ____

Percent of dominant species that are OBL, FACW and/or FAC 83% Is the hydrophytic criterion met? Yes X No ____

SOILS

Soil Series Kenusky silty clay loam Is the soil on the hydric soils list? Yes X No ____

Is the soil: a Histosol? Yes ____ No X Histic epipedon present? Yes ____ No X Mottled? Yes X No ____ Gleyed? Yes X No ____

Depth	Matrix Color	Mottle Color	Texture
0-10	10yr 3/1		Silt loam
10-16	10yr 5/1	10yr 5/8	Silty clay loam

Comments ____ Is the hydric soils criterion met? Yes X No ____

HYDROLOGY

Is the ground surface inundated? Yes ____ No X Depth of standing water ____

Is the soil saturated? Yes ____ No X Depth to saturated soil ____ Depth to free-standing water in pit ____

Mark other field indicators of surface inundation or soil saturation:

X Oxidized root zones ___ Water-stained leaves ___ Water marks ___ Surface scoured areas

___ Wetland drainage patterns X Water-borne sediment deposits ___ Drift lines ___ Morphological plant adaptions

Comments weak indicators Is the wetland hydrology criterion met? Yes ____ No X

Is the vegetation unit or plot wetland? Yes ____ No X Comments boundary plot

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK, MT Transect/Area: 060428B Plot: 1 Date: 7/8/98

Project/Site: NNG Pipeline State: OR County: Columbia

Routine Onsite Determination Method X **Or** Comprehensive Onsite Determination Method ___

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Do normal environmental conditions exists at the plant community?

Yes X No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes X No ____ (If yes, explain) cattle pasture - heavily grazed - many plant spp. unidentifiable

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
(1) Anthoxantum odor.	UPL	90	21.		
2. Holcus mollis	FACU	5	22.		
(3.) Lotus corniculatus	UPL	30	23.		
4. Juncus effusus	FACW	<5	24.		
5.			26.		
6.			Trees		
7.			29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments circled = dominant

Percent of dominant species that are OBL, FACW and/or FAC 0 Is the hydrophytic criterion met? Yes ____ No X

SOILS

Soil Series Konusky silty clay loam Is the soil on the hydric soils list? Yes X No__

Is the soil: a Histosol? Yes__ No X Histic epipedon present? Yes__ No X Mottled? Yes X No__ Gleyed? Yes X No__

Depth	Matrix Color	Mottle Color	Texture
0 - 6"	10yr 4/1		Silt loam
6 - 16	5y 6/1	7.5yr 4/6	"

Comments ____ Is the hydric soils criterion met? Yes X No____

HYDROLOGY

Is the ground surface inundated? Yes___ No X Depth of standing water_____

Is the soil saturated? Yes___ No X Depth to saturated soil_____ Depth to free-standing water in pit_____

Mark other field indicators of surface inundation or soil saturation:

X Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas

___Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions

Comments Weak indicators - insufficient Is the wetland hydrology criterion met? Yes___ No X

Is the vegetation unit or plot wetland? Yes ____ No X Comments Upland areas like this interspersed w/ wetlands in this pasture

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK, MT Transect/Area: 060428B Plot: 2 Date: 7/8/98

Project/Site: WNG Pipeline State: OR County: Columbia

Routine Onsite Determination Method X **Or** Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?

Yes X No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes X No ____ (If yes, explain) cattle pasture - current heavy grazing

DOMINANT VEGETATION

	Herbs	I/S	% Cover
1.	Carex obnupta	OBL	80
2.	Carex sp.	(>FAC)	<5
3.	Lotus corniculatus	UPL	<5
4.	Agrostis sp.	(≥FAC)	10
5.	Juncus effusus	FACW	<5
6.			
7.			
8.			
9.			
10.			
11.			

	Shrubs	I/S	% Cover
21.	Rosa pisocarpa	FAC	<5
22.			
23.			
24.			
26.			
	Trees		
29.			
30.			
19.			
20.			
21.			

Comments Carex obnupta only dominant

Percent of dominant species that are OBL, FACW and/or FAC 100 % of known spp. Is the hydrophytic criterion met? Yes____ No____

SOILS

Soil Series Konusky silty clay loam Is the soil on the hydric soils list? Yes X No__

Is the soil: a Histosol? Yes__ No X Histic epipedon present? Yes__ No X Mottled? Yes X No__ Gleyed? Yes X No__

Depth	Matrix Color	Mottle Color	Texture
0-5	10yr 3/1		Slt loam
5-16	5y 6/1	7.5yr 4/6	"

Comments____ Is the hydric soils criterion met? Yes X No____

HYDROLOGY

Is the ground surface inundated? Yes___ No X Depth of standing water_____

Is the soil saturated? Yes___ No X Depth to saturated soil_____ Depth to free-standing water in pit_____

Mark other field indicators of surface inundation or soil saturation:

X Oxidized root zones lots ~~Water-stained leaves~~ ___Water marks ___Surface scoured areas

___Wetland drainage patterns X Water-borne sediment deposits a little ___Drift lines ___Morphological plant adaptions

Comments weak but passable indicators Is the wetland hydrology criterion met? Yes___ No___

Is the vegetation unit or plot wetland? Yes X No ____ Comments_____

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK, MT Transect/Area: 060428B Plot: 4 Date: 7/8/98

Project/Site: WNG Pipline State: OR County: Columbia

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

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Do normal environmental conditions exists at the plant community?

Yes X No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes X No ____ (If yes, explain) cattle pasture - heavily grazed & trampled

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Festuca arundin.	FAC	30	21.		
2. Juncus effusus	FAC	10	22.		
3. Trifolium repens	FAC	20	23.		
4. Holcus lanatus	~~FACW~~ FAC	10	24.		
5. Anthoxanthum odor	~~UPL~~ FAC	40	26.		
6. Chrysanthemum leuc.	UPL	<5	Trees		
7. Agrostis tenuis	~~UPL~~ FAC	<5	29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments ____

Percent of dominant species that are OBL, FACW and/or FAC ~~40~~ 60 Is the hydrophytic criterion met? Yes X No X

SOILS

Soil Series Kenusky silty clay loam Is the soil on the hydric soils list? Yes X No ___

Is the soil: a Histosol? Yes ___ No X Histic epipedon present? Yes ___ No X Mottled? Yes ___ No X Gleyed? Yes X No ___

Depth	Matrix Color	Mottle Color	Texture
0-16	10 yr 2/1		silt loam

Comments ____ Is the hydric soils criterion met? Yes X No ____

HYDROLOGY

Is the ground surface inundated? Yes ___ No X Depth of standing water ____

Is the soil saturated? Yes ___ No X Depth to saturated soil ____ Depth to free-standing water in pit ____

Mark other field indicators of surface inundation or soil saturation:

___Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas

___Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions

Comments No indicators Is the wetland hydrology criterion met? Yes ___ No X

Is the vegetation unit or plot wetland? Yes ____ No X Comments No hydrology indicators

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): CKRMT Transect/Area: 060433J Plot: 1 Date: 7/9/95

Project/Site: NNG Pipeline State: OR County: Columbia

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?

Yes X No ___ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes X No ___ (If yes, explain) There are tire tracks through the middle and it is along the NNG pipeline route

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Scirpus microcarpus	OBL	60	21.		
2. Carex obnupta	OBL	10	22.		
3. Anthoxanthum odoratum	UPL	20	23.		
4. Holcus ~~mollis~~ lanatus	FAC~~W~~	20	24.		
5. Agrostis sp.	~~FAC~~	<5%	26.		
6. Lotis corniculatus	FAC	10	Trees		
7.			29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments ___

Percent of dominant species that are OBL, FACW and/or FAC 80 Is the hydrophytic criterion met? Yes X No ___

SOILS

Soil Series Kenusky silty clay loam Is the soil on the hydric soils list? Yes X No ___

Is the soil: a Histosol? Yes ___ No X Histic epipedon present? Yes ___ No X Mottled? Yes X No ___ Gleyed? Yes X No ___

Depth	Matrix Color	Mottle Color	Texture
0-4"	10YR 4/2		silty clay loam
4"-16"	10YR 4/1	10YR 3/6 weak	silty clay loam

Comments At 16" - A rocky layer Is the hydric soils criterion met? Yes X No ___

HYDROLOGY

Is the ground surface inundated? Yes ___ No X Depth of standing water ___

Is the soil saturated? Yes X No ___ Depth to saturated soil 2" Depth to free-standing water in pit ___

Mark other field indicators of surface inundation or soil saturation:

___ Oxidized root zones ___ Water-stained leaves ___ Water marks ___ Surface scoured areas

___ Wetland drainage patterns ___ Water-borne sediment deposits ___ Drift lines ___ Morphological plant adaptions

Comments ___ Is the wetland hydrology criterion met? Yes X No ___

Is the vegetation unit or plot wetland? Yes X No ___ Comments ___

Song sparrows, The upland is distinct with pasture grasses such as velvet grass & orchard grass

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK & MT Transect/Area: 060433J Plot: 2 Date: 7/9/

Project/Site: NNG Redline State: OR County: Columbia

Routine Onsite Determination Method X **Or** Comprehensive Onsite Determination Method ____

****

Do normal environmental conditions exists at the plant community?

Yes X No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes ____ No X (If yes, explain)

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Holcus mollis lanatus	FAC+	60%	21. Rosa pisocarpa	FAC	20%
2.			22.		
3.			23.		
4.			24.		
5.			26.		
6.			Trees		
7.			29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments ____

Percent of dominant species that are OBL, FACW and/or FAC 100 Is the hydrophytic criterion met? Yes X No ____

SOILS

Soil Series Konnsky silty clay loam Is the soil on the hydric soils list? Yes X No ____

Is the soil: a Histosol? Yes ____ No X Histic epipedon present? Yes ____ No X Mottled? Yes X No ____ Gleyed? Yes ____ No X

Depth	Matrix Color	Mottle Color	Texture
0-16"	10YR 4/2	7.5YR 3/4 weak	silt loam

Comments ____ Is the hydric soils criterion met? Yes X No ____ weak

HYDROLOGY

Is the ground surface inundated? Yes ____ No X Depth of standing water ____

Is the soil saturated? Yes ____ No X Depth to saturated soil ____ Depth to free-standing water in pit ____

Mark other field indicators of surface inundation or soil saturation:

X Oxidized root zones ____ Water-stained leaves ____ Water marks ____ Surface scoured areas

____ Wetland drainage patterns ____ Water-borne sediment deposits ____ Drift lines ____ Morphological plant adaptions

Comments Oxidized root not very prevalent weak indicators Is the wetland hydrology criterion met? Yes ____ No X

Is the vegetation unit or plot wetland? Yes ____ No X Comments marginal but hydrology not strong enough

Yellow Throats

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): DLF, LRK Transect/Area: 060433 Plot: 1 Date: 5-26-98

Project/Site: NNG State: OR County: Columbia

Routine ~~Intermediate level~~ Onsite Determination Method ✓ Or Comprehensive Onsite Determination Method ___

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Do normal environmental conditions exists at the plant community? Near logging road; along existing pipeline easement

Yes ✓ No ___ (If no, explain on back)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes ___ No ✓ (If yes, explain on back)

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Anthoxanthum odoratum	FACU	50	21. Rubus ursinus		<1
2. Phalaris arundinacea	FACW	20	22.		
3. Ranunculus repens	FAC	20	23.		
4. Lycopus uniflorus	FACW	10	24.		
5. Holcus lanatus		<5	26.		
6. Equisetum telmateia	FAC	10	Trees		
7. Claytonia sibirica		5	29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments

Percent of dominant species that are OBL, FACW and/or FAC___ Is the hydrophytic criterion met? Yes ✓ No___

SOILS

Soil Series Kenusky silty clay loam Is the soil on the hydric soils list? Yes ✓ No___

Is the soil: a Histosol? Yes___ No ✓ Histic epipedon present? Yes___ No ✓ Mottled? Yes ✓ No___ Gleyed? Yes ✓ No___

Depth	Matrix Color	Mottle Color	Texture
2-12	10YR 4/2		clay loam - gravelly
0-2	10YR 2/1	10YR 5/6	clay

Comments fill material; could not dig deeper (too many rocks); assume hydric soil characteristics have not formed in fill material Is the hydric soils criterion met? Yes___ No___

HYDROLOGY

Is the ground surface inundated? Yes___ No ✓ Depth of standing water___

Is the soil saturated? Yes ✓ No___ Depth to saturated soil 6" Depth to free-standing water in pit ~

Mark other field indicators of surface inundation or soil saturation:

___Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas

___Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions

Comments___ Is the wetland hydrology criterion met? Yes ✓ No___

Is the vegetation unit or plot wetland? Yes ✓ No ___ Comments___

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): DLF, LR K Transect/Area: 060433C Plot: 1 Date: 5/29/98

Project/Site: NNG State: OR County: Columbia

Routine Onsite Determination Method ✓ Or Comprehensive Onsite Determination Method ___

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Do normal environmental conditions exists at the plant community?

Yes ✓ No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes ____ No ✓ (If yes, explain)

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Galium aparine		<5	21. Acer circinatum	FAC-	45
2. Polystichum munitum		<5	22. Rubus ursinus	FACU	15
3. Carex deweyana	FACU	15	23.		
4. Claytonia sibirica	FAC	5	24.		
5. Dicentra formosa		<5	26.		
6. Stachys cooleyae		<5	Trees		
7. Carex obnupta		<5	29. Alnus rubra	FAC	40
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments _____

Percent of dominant species that are OBL, FACW and/or FAC 46% Is the hydrophytic criterion met? Yes ___ No ✓

SOILS

Soil Series Mayger silt loam inclusions Is the soil on the hydric soils list? Yes X No__

Is the soil: a Histosol? Yes X No__ Histic epipedon present? Yes X No__ Mottled? Yes X No__ Gleyed? Yes X No__

Depth	Matrix Color	Mottle Color	Texture
0 - 1/2			duff layer
1/2 - 7	10YR 2/1		organic
7 - 14	10YR 5/2	10YR 4/6	sandy loam

Comments _____ Is the hydric soils criterion met? Yes ✓ No____

HYDROLOGY

Is the ground surface inundated? Yes ✓ No___ Depth of standing water_____ open water adjacent to pit

Is the soil saturated? Yes ✓ No___ Depth to saturated soil surface Depth to free-standing water in pit_____

Mark other field indicators of surface inundation or soil saturation:

___Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas

___Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions

Comments_____ Is the wetland hydrology criterion met? Yes ✓ No___

Is the vegetation unit or plot wetland? Yes ✓ No ____ Comments_____

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): DF & LK Transect/Area: 060433C Plot: 2 Date: 5/29/98

Project/Site: NNG Pipeline State: OR County: Columbia

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

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Do normal environmental conditions exists at the plant community?

Yes X No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes X No ____ (If yes, explain) NNG pipe has been installed in vicinity

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Dicentra formosa	FACU	40%	21.		
2. Pteridium aquilinum	FACU	10%	22.		
3. Polystichum munitum	FACU	25%	23.		
4. Montia Sibirica		5%	24.		
5.		5%	26.		
6.			Trees		
7.			29. Acer circinatum	FAC-	100%
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments

Percent of dominant species that are OBL, FACW and/or FAC 0% Is the hydrophytic criterion met? Yes ___ No X

SOILS

Soil Series Mayger silt loam inclusions Is the soil on the hydric soils list? Yes X No ___

Is the soil: a Histosol? Yes ___ No X Histic epipedon present? Yes ___ No X Mottled? Yes X No ___ Gleyed? Yes ___ No X

Depth	Matrix Color	Mottle Color	Texture
0-8"	10YR 3/2		silt loam
8"-18"	10YR 4/2	10YR 6/8	silty clay loam

Comments Is the hydric soils criterion met? Yes ____ No X weak mottles

HYDROLOGY

Is the ground surface inundated? Yes ___ No X Depth of standing water ____

Is the soil saturated? Yes ___ No X Depth to saturated soil ____ Depth to free-standing water in pit ____

Mark other field indicators of surface inundation or soil saturation:

___Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas

___Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions

Comments Is the wetland hydrology criterion met? Yes ___ No X

Is the vegetation unit or plot wetland? Yes ____ No X Comments

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK, DF Transect/Area: 060433D Plot: 1 Date: 5/29/98

Project/Site: NNG Pipeline State: OR County: Columbia

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

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Do normal environmental conditions exists at the plant community?

Yes X No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed? Near NNG pipeline,

Yes X No ____ (If yes, explain)

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Stachys Cooleye	FACW	80%	21.		
2. Ranunculus repens	FACW	15%	22.		
3. Oenanthe sarmentosa	OBL	30%	23.		
4. Agrostis sp.	FAC	20%	24.		
5. Phalaris arundinacea	FACW	80%	26.		
6. Holcus lanatus	FAC	10%	**Trees**		
7.			29. Acer circinatum	FAC-	80%
8.			30. Alnus rubra	FAC	50%
9.			19.		
10.			20.		
11.			21.		

Comments _____

Percent of dominant species that are OBL, FACW and/or FAC 82% Is the hydrophytic criterion met? Yes X No ____

SOILS

Soil Series Mayger silt loam Inclusions Is the soil on the hydric soils list? Yes X No ____

Is the soil: a Histosol? Yes ____ No X Histic epipedon present? Yes X No ____ Mottled? Yes X No ____ Gleyed? Yes X No ____

Depth	Matrix Color	Mottle Color	Texture
0-3"	10YR 3/1		organic
3"-16"	10YR 5/1	7.5YR 5/8	clay

Comments _____ Is the hydric soils criterion met? Yes X No ____

HYDROLOGY

Is the ground surface inundated? Yes ____ No X Depth of standing water _____

Is the soil saturated? Yes X No ____ Depth to saturated soil 0" Depth to free-standing water in pit 8"

Mark other field indicators of surface inundation or soil saturation:

___Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas

___Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions

Comments _____ Is the wetland hydrology criterion met? Yes ____ No ____

Is the vegetation unit or plot wetland? Yes X No ____ Comments _____

Streamside wetland

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): DLF, LRK Transect/Area: 060433D Plot: 2 Date: 5/29/92

Project/Site: NWG State: OR County: Columbia

Routine Onsite Determination Method ✓ Or Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?

Yes ✓ No ___ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes ___ No ✓ (If yes, explain)

DOMINANT VEGETATION

Herbs	I/S	% Cover
1. Polystichum munitum	FACU	60
2. Galium aparine		10
3. Equisetum hlmatia		5
4. D		
5.		
6.		
7.		
8.		
9.		
10.		
11.		

Shrubs	I/S	% Cover
21. Acer circinatum	FAC-	40
22. Rosa sp.		5
23.		
24.		
26.		
Trees		
29. Pseudotsuga Menziesii	FACU	80
30. Acer macrophyllum	FACU	10
19.		
20.		
21.		

Comments

Percent of dominant species that are OBL, FACW and/or FAC 0 Is the hydrophytic criterion met? Yes ___ No ✓

SOILS

Soil Series Mayger silt loam inclusions Is the soil on the hydric soils list? Yes X No ___

Is the soil: a Histosol? Yes ___ No X Histic epipedon present? Yes ___ No X Mottled? Yes X No ___ Gleyed? Yes X No ___

Depth	Matrix Color	Mottle Color	Texture
0-1			forest duff layer
1-8	10YR 2/1		silt loam
8-14	10YR 5/2	10YR 4/6	clay loam

Comments Is the hydric soils criterion met? Yes ✓ No ___

HYDROLOGY

Is the ground surface inundated? Yes ___ No ✓ Depth of standing water ___

Is the soil saturated? Yes ___ No ✓ Depth to saturated soil ___ Depth to free-standing water in pit ___

Mark other field indicators of surface inundation or soil saturation:

___Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas

___Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions

Comments Is the wetland hydrology criterion met? Yes ___ No ✓

Is the vegetation unit or plot wetland? Yes ___ No ✓ Comments No veg or hydrology indicators

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): L.K & DF Transect/Area: 060433D Plot: 3 Date: 5/29/98

Project/Site: NNG Pipeline State: OR County: Columbia

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

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Do normal environmental conditions exists at the plant community?

Yes X No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes X No ____ (If yes, explain)

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Ranunculus repens	FACW	40%	21.		
2. Holcus lanatus		<5%	22.		
3. Anthoxanthum odoratum	FACU	100%	23.		
4. Veronica americana		<5%	24.		
5. Equisetum telmateia	FACW	10%	26.		
6.			Trees		
7.			29. Alnus rubra	FAC	50%
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments _____

Percent of dominant species that are OBL, FACW and/or FAC 25% Is the hydrophytic criterion met? Yes X No ____

SOILS

Soil Series Mayger silt loam Is the soil on the hydric soils list? Yes X No ___ inclusions

Is the soil: a Histosol? Yes ___ No X Histic epipedon present? Yes X No ___ Mottled? Yes X No ___ Gleyed? Yes X No ___

Depth	Matrix Color	Mottle Color	Texture
0-1"	10YR 3/1		organic
1"-16"	10YR 6/2	7.5YR 5/8	clay loam

Comments _____ Is the hydric soils criterion met? Yes X No ____

HYDROLOGY

Is the ground surface inundated? Yes X No ___ Depth of standing water <1"

Is the soil saturated? Yes X No ___ Depth to saturated soil 0" Depth to free-standing water in pit 1"

Mark other field indicators of surface inundation or soil saturation:

X Oxidized root zones ___ Water-stained leaves ___ Water marks ___ Surface scoured areas

___ Wetland drainage patterns ___ Water-borne sediment deposits ___ Drift lines ___ Morphological plant adaptions

Comments _____ Is the wetland hydrology criterion met? Yes X No ___

Is the vegetation unit or plot wetland? Yes X No ____ Comments _____

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): DF, LRK Transect/Area: 060433D Plot: 4 Date: 5/29/98

Project/Site: NWG State: OR County: Columbia

Routine Onsite Determination Method ✓ Or Comprehensive Onsite Determination Method ___

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Do normal environmental conditions exists at the plant community?

Yes ✓ No ___ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes ___ No ✓ (If yes, explain)

DOMINANT VEGETATION

Herbs	I/S	% Cover
1. Polystichum munitum	FACU	90
2. Equisetum telmateia		<5
3. Tiarella trifoliata		<5
4. Lonk. hert		<5
5.		
6.		
7.		
8.		
9.		
10.		
11.		

Shrubs	I/S	% Cover
21. Rubus ursinus		5
22. Tsuga heterophylla	FACU	10
23. Acer circinatum		5
24.		
26.		
Trees		
29. Tsuga heterophylla	FACU	60
30. Rhamnus purshiana	FAC-	10
19.		
20.		
21.		

Comments: ___

Percent of dominant species that are OBL, FACW and/or FAC 0 Is the hydrophytic criterion met? Yes ___ No ✓

SOILS

Soil Series Mayger Silt loam inclusions Is the soil on the hydric soils list? Yes X No ___

Is the soil: a Histosol? Yes ___ No X Histic epipedon present? Yes ___ No X Mottled? Yes ___ No X Gleyed? Yes ___ No X

Depth	Matrix Color	Mottle Color	Texture
0-1			duff layer
1-6	10YR 3/2		silt loam
6-12	10YR 3/2 + 10YR 3/4		

Comments: Soils in lower layer mixed together Is the hydric soils criterion met? Yes ___ No ✓

HYDROLOGY

Is the ground surface inundated? Yes ___ No ✓ Depth of standing water ___

Is the soil saturated? Yes ___ No ✓ Depth to saturated soil ___ Depth to free-standing water in pit ___

Mark other field indicators of surface inundation or soil saturation:

___Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas

___Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions

Comments: ___ Is the wetland hydrology criterion met? Yes ___ No ✓

Is the vegetation unit or plot wetland? Yes ___ No ✓ Comments: No indicators

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK & DF Transect/Area: 060433E Plot: 1 Date: 5/29/98

Project/Site: NNG pipeline State: OR County: Columbia

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

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Do normal environmental conditions exists at the plant community?

Yes X No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes X No ____ (If yes, explain) Roadside and along pipeline ROW

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Scirpus microcarpus	OBL	100%	21.		
2. Ranunculus repens	FACW	30%	22.		
3. Equisetum telmateia	FACW	20%	23.		
4. Anthoxanthum odoratum	FACU	80%	24.		
5.			26.		
6.			Trees		
7.			29. Alnus rubra saplings	FAC	80%
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments

Percent of dominant species that are OBL, FACW and/or FAC 80% Is the hydrophytic criterion met? Yes X No ____

SOILS

Soil Series Mayger silt loam inclusions Is the soil on the hydric soils list? Yes X No ___

Is the soil: a Histosol? Yes ___ No X Histic epipedon present? Yes ___ No X Mottled? Yes X No ___ Gleyed? Yes X No ___

Depth	Matrix Color	Mottle Color	Texture
0-7"	10YR 6/1	10YR 5/8	clay
7-14"	2.5Y 4/1	10YR 5/6	silty sandy loam

Comments Is the hydric soils criterion met? Yes X No ____

HYDROLOGY

Is the ground surface inundated? Yes ___ No X Depth of standing water ____

Is the soil saturated? Yes X No ___ Depth to saturated soil 0" Depth to free-standing water in pit ____

Mark other field indicators of surface inundation or soil saturation:

___Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas

___Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions

Comments Is the wetland hydrology criterion met? Yes X No ___

Is the vegetation unit or plot wetland? Yes X No ____ Comments

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK&PF Transect/Area: 060433F Plot: 1 Date: 5/29/98

Project/Site: NNG Pipeline State: OR County: Columbia

Routine Onsite Determination Method Y **Or** Comprehensive Onsite Determination Method ___

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Do normal environmental conditions exists at the plant community?
Yes X No ____ (If no, explain) wetland is adjacent to NNG pipeline

Has the vegetation, soils and/or hydrology been significantly disturbed?
Yes X No ____ (If yes, explain)

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Athyrium felix-femina	FAC	30%	21.		
2. mosses			22.		
3.			23.		
4.			24.		
5.			26.		
6.			Trees		
7.			29. Acer circinatum	FAC-	100%
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments

Percent of dominant species that are OBL, FACW and/or FAC 50% Is the hydrophytic criterion met? Yes ____ No X

SOILS

Soil Series Mayger silt loam inclusions Is the soil on the hydric soils list? Yes X No__

Is the soil: a Histosol? Yes__ No X Histic epipedon present? Yes__ No X Mottled? Yes__ No X Gleyed? Yes__ No X

Depth	Matrix Color	Mottle Color	Texture
0-14"	10YR 3/2		silty, sandy loam

Comments no indicators Is the hydric soils criterion met? Yes ____ No X

HYDROLOGY

Is the ground surface inundated? Yes___ No X Depth of standing water_____

Is the soil saturated? Yes X No___ Depth to saturated soil 0" Depth to free-standing water in pit 10"

Mark other field indicators of surface inundation or soil saturation:

___Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas

X Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions

Comments Is the wetland hydrology criterion met? Yes X No___

Is the vegetation unit or plot wetland? Yes X No ____ Comments Although veg & soils were not barely met; lots of downed logs w/ moss, little understory vegetation

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): DLF, LRK Transect/Area: 060433G Plot: 1 Date: 5/29/98

Project/Site: NNG State: OR County: Columbia

Routine Onsite Determination Method ✓ Or Comprehensive Onsite Determination Method ___

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Do normal environmental conditions exists at the plant community?

Yes ✓ No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes ____ No ✓ (If yes, explain)

DOMINANT VEGETATION

Herbs	I/S	% Cover
1. Polystichum munitum	FACU	10
2. Stachys cooleyae	FACW	10
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		

Shrubs	I/S	% Cover
21. Acer macrophyllum	FACU	90
22. Rhamnus purshiana		<5
23.		
24.		
26.		
Trees		
29. Ulmus rubra	FAC	15
30. Pseudotsuga menziesii	FACU	60
19.		
20.		
21.		

Comments most vegetation on hummocks - very little vegetation in areas of open water

Percent of dominant species that are OBL, FACW and/or FAC 40% Is the hydrophytic criterion met? Yes ____ No X

SOILS

Soil Series Mayger silt loam inclusions Is the soil on the hydric soils list? Yes X No ___

Is the soil: a Histosol? Yes ___ No X Histic epipedon present? Yes ___ No X Mottled? Yes ___ No X Gleyed? Yes ___ No X

Depth	Matrix Color	Mottle Color	Texture
0-14	10YR 3/2		silty sand loam - small gravel

Comments assumed due to hydrology Is the hydric soils criterion met? Yes ✓ No ____

HYDROLOGY

Is the ground surface inundated? Yes ✓ No ___ Depth of standing water 1"

Is the soil saturated? Yes ✓ No ___ Depth to saturated soil surface Depth to free-standing water in pit surface

Mark other field indicators of surface inundation or soil saturation:

___Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas

___Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions

Comments ____ Is the wetland hydrology criterion met? Yes ✓ No ___

Is the vegetation unit or plot wetland? Yes ✓ No ____ Comments The vegetation criteria was not met because the plants were on hummocks.

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK & MT Transect/Area: 060433H Plot: 1 Date: 6/22/98

Project/Site: NNG Pipeline State: OR County: Columbia

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

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Do normal environmental conditions exists at the plant community?

Yes ✓ No ___ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes ✓ No ___ (If yes, explain) near road & pipeline

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Oxalis tritiillea	FAC+	50%	21. Rubus spectabilis	FAC	40%
2. Tulmeia grandiflorum	FAC+	20%	22.		
3. Poa palustris	FACW	40%	23.		
4. Bromus sp		30%	24.		
5. Carex deweyana	FACW	30%	26.		
6.			Trees overstory cover		
7.			29. Alnus rubra	FAC	50%
8.			30. Rhamnus purshiana	FAC-	40%
9.			19.		
10.			20.		
11.			21.		

Comments ___

Percent of dominant species that are OBL, FACW and/or FAC ~70 Is the hydrophytic criterion met? Yes X No ___

SOILS

Soil Series Mayger silt loam Is the soil on the hydric soils list? Yes X No ___ inclusions

Is the soil: a Histosol? Yes ___ No X Histic epipedon present? Yes ___ No X Mottled? Yes X No ___ Gleyed? Yes X No ___

Depth	Matrix Color	Mottle Color	Texture
0 – 4"	7.5YR 5/4		silt loam
4" – 6"	10YR 5/4		silty-chopey loam
6" – 16"	10YR 4/1	10YR 4/6	silt loam

Comments ___ Is the hydric soils criterion met? Yes X No ___

HYDROLOGY

Is the ground surface inundated? Yes ___ No X Depth of standing water ___

Is the soil saturated? Yes X No ___ Depth to saturated soil 18" Depth to free-standing water in pit ___

Mark other field indicators of surface inundation or soil saturation:

X Oxidized root zones ___ Water-stained leaves ___ Water marks ___ Surface scoured areas

X Wetland drainage patterns ___ Water-borne sediment deposits ___ Drift lines X Morphological plant adaptions

Comments ___ Is the wetland hydrology criterion met? Yes ___ No ___

Is the vegetation unit or plot wetland? Yes X No ___ Comments ___

Streamside wetland with thick undergrowth of salmonberry

Oxalis, Carex & Bromus young Cat cane

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK & MT Transect/Area: 060433H Plot: 2 Date: 6/22/98

Project/Site: NNG Pipeline State: OR County: Columbia

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?

Yes X No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes X No ____ (If yes, explain)

DOMINANT VEGETATION

	Herbs	I/S	% Cover
(1)	Polystichum munitum	FACU	70%
2.	mosses		50%
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			

	Shrubs	I/S	% Cover
(21)	Rubus spectabilis	FAC	30%
22.	Vaccinium parvifolium		5%
23.			
24.			
26.			
	Trees		
(29)	Tsuga heterophylla	FACU	100%
30.			
19.			
20.			
21.			

Comments circled = dominants

Percent of dominant species that are OBL, FACW and/or FAC 33 Is the hydrophytic criterion met? Yes ___ No X

SOILS

Soil Series Mayger silt loam inclusions Is the soil on the hydric soils list? Yes X No ___

Is the soil: a Histosol? Yes ___ No X Histic epipedon present? Yes ___ No X Mottled? Yes ___ No X Gleyed? Yes ___ No X

Depth	Matrix Color	Mottle Color	Texture
0-6"			organic
6-18"	2.5Y 5/3		silt loam

Comments ___ Is the hydric soils criterion met? Yes ___ No X

HYDROLOGY

Is the ground surface inundated? Yes ___ No X Depth of standing water ___

Is the soil saturated? Yes ___ No X Depth to saturated soil ___ Depth to free-standing water in pit ___

Mark other field indicators of surface inundation or soil saturation:

___Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas

___Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions

Comments ___ Is the wetland hydrology criterion met? Yes ___ No ___

Is the vegetation unit or plot wetland? Yes ___ No X Comments ___

steep slope

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK, MT Transect/Area: 060433I Plot: 1 Date: 6/22/98

Project/Site: NNG Pipeline State: OR County: Columbia

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

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Do normal environmental conditions exists at the plant community?

Yes X No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes X No ____ (If yes, explain) hydrology - backed up due to road crossing

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
(1.) Glyceria borealis *	OBL	90	21.		
(2.) E. Equisetum telm.	FACW	20	22.		
(3.) Juncus effusus	FACW	20	23.		
4. Carex deweyana	FACU	5	24.		
5. Ranunculus repens	FACW	5	26.		
6. Holcus lanatus	FACU	10	Trees		
7. Poa palustris	FAC	5	29.		
8. Stachys cooleyae	FACW	5	30.		
9.			19.		
10.			20.		
11.			21.		

Comments Glyceria in stream & remaining species on edge where soil sample taken

Percent of dominant species that are OBL, FACW and/or FAC 100 Is the hydrophytic criterion met? Yes X No ___

Circled = dominant *also Puccinellia pauciflora (OBL)

SOILS

Soil Series Mayger silt loam Is the soil on the hydric soils list? Yes X (inclusion) No ___

Is the soil: a Histosol? Yes ___ No X Histic epipedon present? Yes ___ No X Mottled? Yes X No ___ Gleyed? Yes X No ___

Depth	Matrix Color	Mottle Color	Texture
0-18" (mixed)	5Y 4/1 / 5Y 5/1	7.5YR 5/8	Clay

Comments ____ Is the hydric soils criterion met? Yes X No ___

HYDROLOGY

Is the ground surface inundated? Yes X No ___ Depth of standing water Surface

Is the soil saturated? Yes X No ___ Depth to saturated soil 0" Depth to free-standing water in pit 1"

Mark other field indicators of surface inundation or soil saturation:

___Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas

X Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions

Comments ____ Is the wetland hydrology criterion met? Yes X No ___

Is the vegetation unit or plot wetland? Yes X No ____ Comments ____

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK, MT Transect/Area: 060433I Plot: 2 Date: 6/22/98

Project/Site: NNG Pipeline State: OR County: Columbia

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ____

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Do normal environmental conditions exists at the plant community?

Yes X No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes X No ____ (If yes, explain) hydrology - roadside ditch leading into stream possibly a roadside cut - subsurface soil now surface

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Equisetum telm.	FACW	30	21.		
2. Veronica americana	OBL	20	22.		
3. Poa palustris	FAC	5	23.		
4. Holcus lanatus	FAC	40	24.		
5. Juncus effusus	FACW	10	26.		
6. Scirpus microcarpus	OBL	5	Trees		
7. Glyceria spp.	OBL	10	29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments Scirpus in a small patch (~10' diameter)

Percent of dominant species that are OBL, FACW and/or FAC 100 Is the hydrophytic criterion met? Yes X No ____

circled = dominant

SOILS

Soil Series Mayger silt loam Is the soil on the hydric soils list? Yes X No ____ (inclusion)

Is the soil: a Histosol? Yes ____ No X Histic epipedon present? Yes ____ No X Mottled? Yes X No ____ Gleyed? Yes X No ____

Depth	Matrix Color	Mottle Color	Texture
0-18	5Y 5/1	7.5 YR 5/8	clay

Comments ____ Is the hydric soils criterion met? Yes X No ____

HYDROLOGY

Is the ground surface inundated? Yes X No ____ Depth of standing water surface

Is the soil saturated? Yes X No ____ Depth to saturated soil 0" Depth to free-standing water in pit ____

Mark other field indicators of surface inundation or soil saturation:

____ Oxidized root zones ____ Water-stained leaves ____ Water marks ____ Surface scoured areas

____ Wetland drainage patterns ____ Water-borne sediment deposits ____ Drift lines ____ Morphological plant adaptions

Comments ____ Is the wetland hydrology criterion met? Yes X No ____

Is the vegetation unit or plot wetland? Yes X No ____ Comments ____

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK, MT Transect/Area: 060433I Plot: 3 Date: 6/22/98

Project/Site: NNG Pipeline State: OR County: Columbia

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

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Do normal environmental conditions exists at the plant community?

Yes X No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes X No ____ (If yes, explain) appears cleared of trees/shrubs & possibly a road cut area - subsurface soil now at surface

DOMINANT VEGETATION

Herbs	I/S	% Cover
(1) Holcus lanatus	FAC	20
(2) Agropyron repens	FAC-	30
(3) Equisetum telm.	FACW	30
(4) Prunella vulgaris	FACU+	20
5.		
6.		
7.		
8.		
9.		
10.		
11.		

Shrubs	I/S	% Cover
(21.) Rubus spectabilis	FAC+	30
22. Alnus rubra	FAC	10
23.		
24.		
26.		
Trees		
29. Alnus rubra	FAC	0-80
30. Canopy cover		
19. Voted offsite		
20.		
21.		

Comments ____

Percent of dominant species that are OBL, FACW and/or FAC 60% Is the hydrophytic criterion met? Yes X No ___

SOILS

Soil Series Major silt loam inclusions Is the soil on the hydric soils list? Yes X No ___

Is the soil: a Histosol? Yes ___ No X Histic epipedon present? Yes ___ No X Mottled? Yes X No ___ Gleyed? Yes X No ___

Depth	Matrix Color	Mottle Color	Texture
Same	as plot #2		

Comments ____ Is the hydric soils criterion met? Yes X No ___

HYDROLOGY

Is the ground surface inundated? Yes ___ No X Depth of standing water none

Is the soil saturated? Yes ___ No X Depth to saturated soil none Depth to free-standing water in pit 0

Mark other field indicators of surface inundation or soil saturation:

___Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas

___Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions

Comments no indicators - hillside Is the wetland hydrology criterion met? Yes ___ No X

Is the vegetation unit or plot wetland? Yes ___ No X Comments hydrology criteria not met

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LKB MT Transect/Area: 0504041 Plot: 1 Date: 6/22/98

Project/Site: NNG Pipeline State: OR County: Columbia

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

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Do normal environmental conditions exists at the plant community?
Yes X No ____ (If no, explain) The area has been cut & filled for the pipeline

Has the vegetation, soils and/or hydrology been significantly disturbed?
Yes X No ____ (If yes, explain)

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Ranunculus repens	FACW	20%	21.		
2. Scirpus microcarpus	OBL	60%	22.		
3. Equisetum telmateia	FACW	10%	23.		
4. Poacinellea pancifora	OBL	30%	24.		
5.			26.		
6.			Trees		
7.			29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments

Percent of dominant species that are OBL, FACW and/or FAC 100 Is the hydrophytic criterion met? Yes X No___

SOILS

Soil Series Glohm silt loam Inclusions Is the soil on the hydric soils list? Yes X No__

Is the soil: a Histosol? Yes__ No X Histic epipedon present? Yes__ No X Mottled? Yes X No__ Gleyed? Yes X No__

Depth	Matrix Color	Mottle Color	Texture
0"-10"	10YR 4/2		sandy loam
10"-18"	10B 7/1 & 2.5YR 6/3	2.5YR 5/8	clay

Comments Is the hydric soils criterion met? Yes X No___

Streamside wetland

HYDROLOGY

Is the ground surface inundated? Yes___ No X Depth of standing water_____

Is the soil saturated? Yes X No___ Depth to saturated soil 0" Depth to free-standing water in pit 18"

Mark other field indicators of surface inundation or soil saturation:

___Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas
X Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions

Comments Is the wetland hydrology criterion met? Yes X No___

Is the vegetation unit or plot wetland? Yes X No ____ Comments

The plot is near the road. The Forest is dominated by Douglas Fir next to the stream.

Marked 032

WETLAND DELINEATION FIELD DATA FORM 0486598 + 5087839

Field Investigator(s): LK, MT Transect/Area: 050403A Plot: 1 Date: 6/22/98

Project/Site: NN Gas Pipeline State: OR County: Columbia

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?

Yes X No ___ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes ___ No X (If yes, explain)

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Glyceria grandis	OBL	5	21. Rubus spectabilis	FAC*	10
2. Stachys cooleya	FACW	5	22. Acer circinatum (overhanging)	FAC-*	40
3.			23.		
4. Carex obnupta	OBL	<5	24.		
5. nearby, locally abundant			26.		
6. in a small patch			Trees		
7.			29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments ~~(* not in flower)~~ circled = dominant (*I/S questionable - these spp. are more often found in vpla

Percent of dominant species that are OBL, FACW and/or FAC 50% Is the hydrophytic criterion met? Yes ___ No X

↳ I dont agree w/ I/S, I believe they are FACW

SOILS

Soil Series Mayger silt loam Is the soil on the hydric soils list? Yes X No ___ inclusions

Is the soil: a Histosol? Yes ___ No ___ Histic epipedon present? Yes ___ No ___ Mottled? Yes X No ___ Gleyed? Yes ___ No ___

Depth	Matrix Color	Mottle Color	Texture
0-4"	10YR 3/2		silt loam / high OM
4-18"	10YR 5/2	weak 10YR 5/8	clay loam

Comments weak indicators though Is the hydric soils criterion met? Yes X No ___

HYDROLOGY

Is the ground surface inundated? Yes ___ No X Depth of standing water 10"

Is the soil saturated? Yes X No ___ Depth to saturated soil 0" Depth to free-standing water in pit 13"

Mark other field indicators of surface inundation or soil saturation:

___ Oxidized root zones ___ Water-stained leaves ___ Water marks X Surface scoured areas

___ Wetland drainage patterns ___ Water-borne sediment deposits ___ Drift lines ___ Morphological plant adaptions

Comments ___ Is the wetland hydrology criterion met? Yes X No ___

Is the vegetation unit or plot wetland? Yes ___ No X Comments transition area - near wetland boundary

1

0480598+508783

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK, MT Transect/Area: 050403A Plot: 2 Date: 6/22/94

Project/Site: NNG Pipeline State: OR County: Columbia

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

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Do normal environmental conditions exists at the plant community?

Yes X No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes X No ____ (If yes, explain) possibly cleared area adj. to road

DOMINANT VEGETATION

	Herbs	I/S	% Cover		Shrubs	I/S	% Cover
1.	Juncus effusus	FACW	100	21.	Rubus laciniatus	UPL	<5
2.	Stachys cooleyae	FACW	<5	22.	Rubus spectabilis	FAC	<5
3.	Epilobium watsonii	FACW	<5	23.			
4.	Veronica americana	OBL	<5	24.			
5.	deer fern		<5	26.			
6.				Trees			
7.				29.			
8.				30.			
9.				19.			
10.				20.			
11.				21.			

Comments circled = dominant

Percent of dominant species that are OBL, FACW and/or FAC 100% Is the hydrophytic criterion met? Yes X No ___

SOILS

Soil Series Mayger silt loam inclusions Is the soil on the hydric soils list? Yes X No ___

Is the soil: a Histosol? Yes ___ No X Histic epipedon present? Yes ___ No X Mottled? Yes X No ___ Gleyed? Yes X No ___

Depth	Matrix Color	Mottle Color	Texture
0" - 12"	10YR 4/1		Clay loam
12" - 18"	10YR 5/1	10YR 6/6	Clay loam
		5YR 7/1	

Comments ____ Is the hydric soils criterion met? Yes X No ___

HYDROLOGY

Is the ground surface inundated? Yes ___ No X Depth of standing water ____

Is the soil saturated? Yes X No ___ Depth to saturated soil 2" Depth to free-standing water in pit ____

Mark other field indicators of surface inundation or soil saturation:

X Oxidized root zones ___ Water-stained leaves ___ Water marks ___ Surface scoured areas

___ Wetland drainage patterns ___ Water-borne sediment deposits ___ Drift lines ___ Morphological plant adaptions

Comments ____ Is the wetland hydrology criterion met? Yes ___ No ___

Is the vegetation unit or plot wetland? Yes X No ___ Comments ____

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK, MT Transect/Area: 05 04 03 A Plot: 3 Date: 6/22/98

Project/Site: NN Gas Pipeline State: OR County: Columbia

Routine Onsite Determination Method ___ Or Comprehensive Onsite Determination Method ___

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Do normal environmental conditions exists at the plant community?

Yes X No _____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes _____ No X (If yes, explain)

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
(1) Juncus effusus	FACW	40	21.		
2. Luzula campestris	UPL	5	22.		
3. Chrysanthemum leucanthemum	UPL	5	23.		
(4) Hypochaeris radicata	UPL	10	24.		
5. Juncus bufonius	FACW	5	26.		
6. Carex deweyana	FACU	<5	Trees		
7. Holcus lanatus	FAC	5	29.		
8. Prunella vulgaris	FACU	<5	30.		
9. Vicia sativa	UPL	<5	19.		
10. Glyceria sp.	OBL	<5	20.		
11. Epilobium watsonii	FACW	<5	21.		

Comments circled = only dominants

Percent of dominant species that are OBL, FACW and/or FAC 50% Is the hydrophytic criterion met? Yes ___ No X

SOILS

Soil Series Malgo silt loam Is the soil on the hydric soils list? Yes X No ___

Is the soil: a Histosol? Yes ___ No X Histic epipedon present? Yes ___ No X Mottled? Yes X No ___ Gleyed? Yes X No ___

Depth	Matrix Color	Mottle Color	Texture
0-5"	10yR 6/1	10yR 5/8	clay loam bit not in lower layer
5-18"	10yR 3/4		

Comments weak indicators Is the hydric soils criterion met? Yes ___ No X

HYDROLOGY

Is the ground surface inundated? Yes ___ No X Depth of standing water none

Is the soil saturated? Yes ___ No X Depth to saturated soil 0" Depth to free-standing water in pit 0"

Mark other field indicators of surface inundation or soil saturation:

X Oxidized root zones ___ Water-stained leaves ___ Water marks ___ Surface scoured areas

___ Wetland drainage patterns ___ Water-borne sediment deposits ___ Drift lines ___ Morphological plant adaptions

Comments weak indicators Is the wetland hydrology criterion met? Yes ___ No X

Is the vegetation unit or plot wetland? Yes ___ No X Comments no hydrology & veg indicators & weak soil

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK, MT Transect/Area: 050403A Plot: 4 Date: 6/22/98

Project/Site: NNG Pipeline State: OR County: Columbia

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

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Do normal environmental conditions exists at the plant community? Forested wetland

Yes X No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes ____ No X (If yes, explain)

DOMINANT VEGETATION

Herbs	I/S	% Cover
1. Typha latifolia	OBL	25
2. Puccinellia paucifloru	OBL	20
3. Salix seedlings	>FACW	10
4. Carex obnupta	OBL	20
5. Scirpus microcarpus	OBL	<5
6. Glyceria borealis	OBL	10
7. Mimulus guttatus	OBL	<5
8. Polystichum munitum	FACU	5
9.		
10.		
11.		

Shrubs	I/S	% Cover
21. Rubus spectabilis	FAC	<5
22. Ribes (gooseberry)	FAC?	<5
23.		
24.		
26.		

Trees overstory cover		
29. Salix spp.	>FACW	80
30.		
19.		
20.		
21.		

Comments circled = dominant

Percent of dominant species that are OBL, FACW and/or FAC 100 Is the hydrophytic criterion met? Yes X No ___

SOILS

Soil Series Mayger silt loam inclusions Is the soil on the hydric soils list? Yes X No ___

Is the soil: a Histosol? Yes ___ No X Histic epipedon present? Yes ___ No X Mottled? Yes ___ No X Gleyed? Yes ___ No X

Depth	Matrix Color	Mottle Color	Texture
0-18"	10 YR 3/1		High OM / silt loam

Comments ___ Is the hydric soils criterion met? Yes X No ___

HYDROLOGY

Is the ground surface inundated? Yes ___ No X Depth of standing water ___

Is the soil saturated? Yes X No ___ Depth to saturated soil Surface Depth to free-standing water in pit ___

Mark other field indicators of surface inundation or soil saturation:

___ Oxidized root zones ___ Water-stained leaves ___ Water marks ___ Surface scoured areas

X Wetland drainage patterns ___ Water-borne sediment deposits ___ Drift lines X Morphological plant adaptions

Comments ___ Is the wetland hydrology criterion met? Yes X No ___

Is the vegetation unit or plot wetland? Yes X No ___ Comments ___

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): MT Transect/Area: 050410D Plot: 1 Date: 6/23/98

Project/Site: NNG Pipeline State: OR County: Columbia

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

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Do normal environmental conditions exists at the plant community? clearcut & pipeline corridor

Yes X No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes X No ____ (If yes, explain)

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Scirpus microcarpus	OBL	40	21.		
2. Phalaris arundinacea	FACW	40	22.		
3. Equisetum telmat.	FAC	<5	23.		
4.			24.		
5.			26.		
6.			Trees		
7.			29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments Circled = dominants

Percent of dominant species that are OBL, FACW and/or FAC 100 Is the hydrophytic criterion met? Yes X No ____

SOILS

Soil Series Scaponia - Braun silt loam Is the soil on the hydric soils list? Yes ___ No X

Is the soil: a Histosol? Yes ___ No X Histic epipedon present? Yes ___ No X Mottled? Yes X No ___ Gleyed? Yes X No ___

Depth	Matrix Color	Mottle Color	Texture
0-16"	10 yr 6/1	10YR 6/6 & (mottles & clay lenses)	loamy clay

Comments ____ Is the hydric soils criterion met? Yes X No ____

HYDROLOGY

Is the ground surface inundated? Yes X No ___ Depth of standing water 0-1"

Is the soil saturated? Yes X No ___ Depth to saturated soil Surface Depth to free-standing water in pit 12"

Mark other field indicators of surface inundation or soil saturation:

X Oxidized root zones ___ Water-stained leaves ___ Water marks ___ Surface scoured areas

___ Wetland drainage patterns ___ Water-borne sediment deposits ___ Drift lines X Morphological plant adaptions

Comments ____ Is the wetland hydrology criterion met? Yes X No ___

Is the vegetation unit or plot wetland? Yes X No ____ Comments ____

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): MT Transect/Area: 050410 D Plot: 2 Date: 6/23/98

Project/Site: NNG Pipeline State: OR County: Columbia

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

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Do normal environmental conditions exists at the plant community?

Yes X No ___ (If no, explain) See plot # 1

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes X No ___ (If yes, explain)

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Phalaris arundinacea	FACW	90-100	21.		
2.			22.		
3.			23.		
4.			24.		
5.			26.		
6.			Trees		
7.			29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments

Percent of dominant species that are OBL, FACW and/or FAC 100 Is the hydrophytic criterion met? Yes X No ___

SOILS

Soil Series Scapoose - Braun silt loam Is the soil on the hydric soils list? Yes ___ No X

Is the soil: a Histosol? Yes ___ No X Histic epipedon present? Yes ___ No X Mottled? Yes ___ No X Gleyed? Yes ___ No X

Depth	Matrix Color	Mottle Color	Texture
0-4	10YR3/3, 10YR3/1, etc-mixture		
4-?	rocky - cannot dig in		

Comments fill material Is the hydric soils criterion met? Yes ___ No ___ ?

HYDROLOGY

Is the ground surface inundated? Yes ___ No X Depth of standing water ___

Is the soil saturated? Yes ___ No X Depth to saturated soil ___ Depth to free-standing water in pit ___

Mark other field indicators of surface inundation or soil saturation:

___Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas

___Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions

Comments no indicators observed. but cannot dig >4" Is the wetland hydrology criterion met? Yes ___ No X (probably)

Is the vegetation unit or plot wetland? Yes ___ No X Comments

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): MT Transect/Area: 050410D Plot: 3 Date: 6/23/98

Project/Site: WNG Pipeline State: OR County: Columbia

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?
Yes X No ____ (If no, explain) See p67 #1

Has the vegetation, soils and/or hydrology been significantly disturbed?
Yes X No ____ (If yes, explain)

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Tellima grandiflora	NI	40	21. Acer circinatum	FAC-	20
2. Equisetum telmateia	FACW	30	22. Sambucus racemosa	FACU	5
3. Streptopus californica	FACW-	10	23. Cornus stolonifera	FACW	<5
4. Phalaris arundinacea	FACW	<5	24.		
5. Epilobium watsonii	FACW	<5	26.		
6. Urtica dioica	FACW	<5	Trees		
7.			29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments ____

Percent of dominant species that are OBL, FACW and/or FAC 60 (of known species) Is the hydrophytic criterion met? Yes X No ___

SOILS

Soil Series Scaponia - Braun silt loam Is the soil on the hydric soils list? Yes ___ No X

Is the soil: a Histosol? Yes__ No X Histic epipedon present? Yes__ No X Mottled? Yes__ No X Gleyed? Yes X No__

Depth	Matrix Color	Mottle Color	Texture
0-14	10YR 6/1	10YR 6/6	clay loam

Comments ____ Is the hydric soils criterion met? Yes X No ____

HYDROLOGY

Is the ground surface inundated? Yes X No ___ Depth of standing water 1"

Is the soil saturated? Yes X No ___ Depth to saturated soil ____ Depth to free-standing water in pit ____

Mark other field indicators of surface inundation or soil saturation:

___Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas

___Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions

Comments ____ Is the wetland hydrology criterion met? Yes X No ___

Is the vegetation unit or plot wetland? Yes X No ____ Comments ____

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): MT Transect/Area: 050410 C Plot: 1 Date: 6/23/98

Project/Site: NNG Pipeline State: OR County: Columbia

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?

Yes X No ___ (If no, explain) adj to clearcut

Has the vegetation, soils and/or hydrology been significantly disturbed? + 1M gas ROW

Yes ___ No X ___ (If yes, explain)

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Scirpus microcarpus	OBL	70	21.		
2. Holcus lanatus	FAC	20	22.		
3. Impatiens granditera	FACW	20	23.		
4.			24.		
5.			26.		
6.			Trees		
7.			29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments

Percent of dominant species that are OBL, FACW and/or FAC 100 Is the hydrophytic criterion met? Yes X No ___

SOILS

Soil Series Scaponia - Brown silt loam Is the soil on the hydric soils list? Yes ___ No X

Is the soil: a Histosol? Yes ___ No X Histic epipedon present? Yes ___ No X Mottled? Yes ___ No X Gleyed? Yes X No ___

Depth	Matrix Color	Mottle Color	Texture
0-16"	10 yr 5/1	(Weak-contrast)	loamy-sandy-clayey

Comments Is the hydric soils criterion met? Yes X No ___

HYDROLOGY

Is the ground surface inundated? Yes X No ___ Depth of standing water 0-2"

Is the soil saturated? Yes X No ___ Depth to saturated soil Surface Depth to free-standing water in pit 5"

Mark other field indicators of surface inundation or soil saturation:

___Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas

X Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines X Morphological plant adaptions

Comments small drainage ~ 1' wide Is the wetland hydrology criterion met? Yes X No ___

Is the vegetation unit or plot wetland? Yes X No ___ Comments

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): MT Transect/Area: 0504/10C Plot: 2 Date: 6/23/98

Project/Site: NNNG Pipeline State: OR County: Columbia

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?
Yes X No ___ (If no, explain) See Plot #1

Has the vegetation, soils and/or hydrology been significantly disturbed?
Yes X No ___ (If yes, explain)

DOMINANT VEGETATION

Herbs	I/S	% Cover
1. Urtica dioica	FAC	20
2. ~~Sambucus racemosa~~		
3. Epilobium watsonii	FACW	30
4. Cirsium vulgaris	FACU	20
5. Unkn. Herb		<5
6.		
7.		
8.		
9.		
10.		
11.		

Shrubs	I/S	% Cover
21. Sambucus racemosa	FACU	30
22.		
23.		
24.		
26.		
Trees		
29.		
30.		
19.		
20.		
21.		

Comments

Percent of dominant species that are OBL, FACW and/or FAC 50 Is the hydrophytic criterion met? Yes ___ No X

SOILS

Soil Series Scapoose - Braun silt loam Is the soil on the hydric soils list? Yes ___ No X

Is the soil: a Histosol? Yes__ No__ Histic epipedon present? Yes__ No__ Mottled? Yes__ No__ Gleyed? Yes__ No__

Depth	Matrix Color	Mottle Color	Texture
0-16"	Same as Plot		

Comments Is the hydric soils criterion met? Yes X No ___

HYDROLOGY

Is the ground surface inundated? Yes X No___ Depth of standing water 3"

Is the soil saturated? Yes X No___ Depth to saturated soil 0" Depth to free-standing water in pit surface

Mark other field indicators of surface inundation or soil saturation:

___Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas

X Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions

Comments Is the wetland hydrology criterion met? Yes___ No___

Is the vegetation unit or plot wetland? Yes ___ No X Comments veg criteria not met

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): MT Transect/Area: 050+10 E Plot: 1 Date: 6/23/98

Project/Site: NNG Pipeline State: OR County: Columbia

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?

Yes X No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes ____ No X (If yes, explain)

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Oxalis trifilliflora	FAC	20	21. Rubus spectabs	FAC	20
2. Tolmea menz	FAC	30	22. Rubus parviflorus	FACU	20
3. Carex deviana		10	23.		
4. Poa palustris		10	24.		
5. Urtica diocia		5	26.		
6. Pteridium aquilinum		10	Trees		
7.			29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments circled = dominants

Percent of dominant species that are OBL, FACW and/or FAC 75 Is the hydrophytic criterion met? Yes X No ___

SOILS

Soil Series Scapoita - Braun silt loam Is the soil on the hydric soils list? Yes ___ No X

Is the soil: a Histosol? Yes ___ No X Histic epipedon present? Yes ___ No X Mottled? Yes ___ No X Gleyed? Yes X No ___

Depth	Matrix Color	Mottle Color	Texture
0-2"	7.5 yr 4/3		Sandy loam
2-14"	10 yr R 3/1		Sandy loam + rocks
14"+	no soil		rocky bed

Comments ____ Is the hydric soils criterion met? Yes X No ___

HYDROLOGY

Is the ground surface inundated? Yes ___ No X Depth of standing water ____

Is the soil saturated? Yes X No ___ Depth to saturated soil 0" Depth to free-standing water in pit 5"

Mark other field indicators of surface inundation or soil saturation:

___Oxidized root zones ___Water-stained leaves ___Water marks X Surface scoured areas

X Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions

Comments ____ Is the wetland hydrology criterion met? Yes X No ___

Is the vegetation unit or plot wetland? Yes X No ___ Comments ____

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK, MT Transect/Area: 050410F Plot: 2 Date: 6/23/98

Project/Site: NNG Pipeline State: OR County: Columbia

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community? gas pipeline ROW

Yes X No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes X No ____ (If yes, explain)

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Phalaris arundin.	FAC	80	21. Rubus spectabilis	FAC	<5
2. Equisetum telmatia	FAC	10	22.		
3. Poa triviales	FACW	5	23.		
4.			24.		
5.			26.		
6.			Trees		
7.			29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments Dominants are circled

Percent of dominant species that are OBL, FACW and/or FAC 100 Is the hydrophytic criterion met? Yes X No ___

SOILS

Soil Series Mayger silt loam inclusions Is the soil on the hydric soils list? Yes X No ___

Is the soil: a Histosol? Yes ___ No X Histic epipedon present? Yes ___ No X Mottled? Yes X No ___ Gleyed? Yes X No ___

Depth	Matrix Color	Mottle Color	Texture
0-18"	5Y 4/1	7.5YR 5/8	Silty clay loam

Comments ___ Is the hydric soils criterion met? Yes X No ___

HYDROLOGY

Is the ground surface inundated? Yes ___ No X Depth of standing water ___

Is the soil saturated? Yes X No ___ Depth to saturated soil surface Depth to free-standing water in pit 0"

Mark other field indicators of surface inundation or soil saturation:

X Oxidized root zones ___ Water-stained leaves ___ Water marks ___ Surface scoured areas

___ Wetland drainage patterns ___ Water-borne sediment deposits ___ Drift lines ___ Morphological plant adaptions

Comments ___ Is the wetland hydrology criterion met? Yes X No ___

Is the vegetation unit or plot wetland? Yes X No ___ Comments ___

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK, MT Transect/Area: 050410 F Plot: 3 Date: 6/23/98

Project/Site: NNG Pipeline State: OR County: Columbia

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?

Yes X No _____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes _____ No X (If yes, explain)

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
(1) Oxalis trillifolia	~~FAC~~	10	(21.) Rubus spectabilis	FAC	40
(2.) Tellima grand.	NI	30	22.		
3. Glecoma hederacea	<FAC	≤5	23.		
4.			24.		
5.			26.		
6.			Trees		
7.			29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments Circled = dominants

Percent of dominant species that are OBL, FACW and/or FAC 66% Is the hydrophytic criterion met? Yes X No ___

SOILS

Soil Series Mayger silt loam inclusions Is the soil on the hydric soils list? Yes X No ___

Is the soil: a Histosol? Yes ___ No X Histic epipedon present? Yes ___ No X Mottled? Yes X No ___ Gleyed? Yes X No ___

Depth	Matrix Color	Mottle Color	Texture
0-3"	10yr 3/1	7.5yr 5/8 (3-5% layer)	silty sandy loam
0-18"	5GY 4/1		silt loam

Comments _____ Is the hydric soils criterion met? Yes X No ___

HYDROLOGY

Is the ground surface inundated? Yes ___ No X Depth of standing water none

Is the soil saturated? Yes X No ___ Depth to saturated soil 6" Depth to free-standing water in pit 12" level of stream

Mark other field indicators of surface inundation or soil saturation:

X Oxidized root zones ___ Water-stained leaves ___ Water marks ___ Surface scoured areas

X Wetland drainage patterns ___ Water-borne sediment deposits ___ Drift lines ___ Morphological plant adaptions

Comments _____ Is the wetland hydrology criterion met? Yes X No ___

Is the vegetation unit or plot wetland? Yes X No _____ Comments _____

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK Transect/Area: 0504/0F Plot: 1 Date: 6/23/98

Project/Site: NNG Pipeline State: OR County: Columbia

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?

Yes X No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed? Along pipeline route, but the soil does not appear to be significant disturbed

Yes X No ____ (If yes, explain)

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Polystichum munitum	FACU	15%	21. Sambucus racemosa	FACU	10%
2. Equisetum telmateia	FACW	20%	22.		
3. Pteridium aquilinum	FACU	10%	23.		
4. Phalaris arundinacea	FACW	10%	24.		
5.			26.		
6.			Trees		
7.			29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments

Percent of dominant species that are OBL, FACW and/or FAC ___ Is the hydrophytic criterion met? Yes ____ No X

SOILS

Soil Series Mayger silt loam Inclusion Is the soil on the hydric soils list? Yes X No ___

Is the soil: a Histosol? Yes ___ No X Histic epipedon present? Yes ___ No X Mottled? Yes X No ___ Gleyed? Yes ___ No X

Depth	Matrix Color	Mottle Color	Texture
0-7"	10YR 3/2		silt loam
7-18"	10YR 5/3	10YR 6/8	silt loam w/gravel

Comments Mottles were weak and near Is the hydric soils criterion met? Yes ____ No X

HYDROLOGY

Is the ground surface inundated? Yes ___ No X Depth of standing water ____

Is the soil saturated? Yes ___ No X Depth to saturated soil ____ Depth to free-standing water in pit ____

Mark other field indicators of surface inundation or soil saturation:

___Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas

___Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions

Comments No indicators Is the wetland hydrology criterion met? Yes ___ No X

Is the vegetation unit or plot wetland? Yes ____ No X Comments ____

Streamside - mapped as an intermittent stream

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK Transect/Area: 050410A Plot: 1 Date: 6/23/98

Project/Site: NNG Pipeline State: OR County: Columbia

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?

Yes X No ____ (If no, explain) The site of the moister area is where the area was cut for the gas pipeline

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes X No ____ (If yes, explain)

DOMINANT VEGETATION

	Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1	Scirpus microcarpus	OBL	100%	21.		
2.	Equisetum telmateia	FACW	10%	22.		
3.				23.		
4.				24.		
5.				26.		
6.				Trees		
7.				29.		
8.				30.		
9.				19.		
10.				20.		
11.				21.		

Comments ____

Percent of dominant species that are OBL, FACW and/or FAC 100 Is the hydrophytic criterion met? Yes X No ____

SOILS

Soil Series Trehame silt loam inclusions Is the soil on the hydric soils list? Yes X No ____

Is the soil: a Histosol? Yes ____ No X Histic epipedon present? Yes ____ No X Mottled? Yes X No ____ Gleyed? Yes ____ No X

Depth	Matrix Color	Mottle Color	Texture
0-5"	10YR 3/2	10. ~	silty clayey loam weak mottles but some gley matl
5"-18"	10YR 3/3	7.5YR 4/6	silt loam
		10YR 4/0 grey	

Comments Weak indicators Is the hydric soils criterion met? Yes ____ No X

HYDROLOGY

Is the ground surface inundated? Yes ____ No X Depth of standing water ____

Is the soil saturated? Yes ____ No X Depth to saturated soil ____ Depth to free-standing water in pit ____

Mark other field indicators of surface inundation or soil saturation:

X Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas

___Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions

Comments Weak indicators Is the wetland hydrology criterion met? Yes ____ No X

Is the vegetation unit or plot wetland? Yes ____ No X Comments soil & hydrology indicators are not strong enough to call it wetland

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK Transect/Area: 050410A Plot: 2 Date: 6/23/98

Project/Site: NN 6 Pipeline State: OR County: Columbia

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?

Yes X No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes X No ____ (If yes, explain) Pipeline has cut this area, probably creating this Scirpus wetland

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Scirpus microcarpus	OBL	90%	21.		
2. Juncus effusus	FACW	90%	22.		
3. Myosotis laxa	OBL	5%	23.		
4.			24.		
5.			26.		
6.			Trees		
7.			29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments Circled = dominants.

Percent of dominant species that are OBL, FACW and/or FAC 100% Is the hydrophytic criterion met? Yes X No ___

SOILS

Soil Series Trehame silt loam (inclusion) Is the soil on the hydric soils list? Yes X No ___

Is the soil: a Histosol? Yes ___ No X Histic epipedon present? Yes ___ No X Mottled? Yes X No ___ Gleyed? Yes ___ No X

Depth	Matrix Color	Mottle Color	Texture
0-7"	10YR 3/1	7.5YR 6/8	silty clay loam
7-15"	10YR 3/2		silt loam

Comments ___ Is the hydric soils criterion met? Yes X No ___

The soil has a chroma of 1 here & the mottles are bright.

HYDROLOGY

Is the ground surface inundated? Yes ___ No X Depth of standing water ___

Is the soil saturated? Yes X No ___ Depth to saturated soil 4" Depth to free-standing water in pit ___

Mark other field indicators of surface inundation or soil saturation:

X Oxidized root zones ___ Water-stained leaves ___ Water marks X Surface scoured areas

X Wetland drainage patterns ___ Water-borne sediment deposits ___ Drift lines ___ Morphological plant adaptions

Comments ___ Is the wetland hydrology criterion met? Yes X No ___

Is the vegetation unit or plot wetland? Yes X No ___ Comments ___

This is the lowest spot in this pipeline swath through the mature douglas fir forest. The surrounding forest is not wetland at all

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK & MT Transect/Area: 0504106 Plot: 1 Date: 7/7/98

Project/Site: NNG Pipeline State: OR County: Columbia

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?
Yes X No ____ (If no, explain)
Has the vegetation, soils and/or hydrology been significantly disturbed?
Yes X No ____ (If yes, explain)

adj. to pipeline corridor — probably compacted fill soil.

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Scirpus microcarpus	OBL	60+	21.		
2. Equisetum telmatia	FACW	20	22.		
3. Phalaris arundinacea		<5	23.		
4. Myosotis		<5	24.		
5. Glyceria		<5	26.		
6.			Trees		
7.			29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments circled = dominant

Percent of dominant species that are OBL, FACW and/or FAC 100 Is the hydrophytic criterion met? Yes X No ___

SOILS

Soil Series Mayger silt loam (inclusions) Is the soil on the hydric soils list? Yes X No ___

Is the soil: a Histosol? Yes ___ No X Histic epipedon present? Yes ___ No X Mottled? Yes X No ___ Gleyed? Yes X No ___

Depth	Matrix Color	Mottle Color	Texture
0-3	10 YR 5/3		Sandy-gravelly fill
3-18	5 Y 4/1	7.5 YR 5/8	sand, gravel, muck, clay

Comments ___ Is the hydric soils criterion met? Yes X No ___

HYDROLOGY

Is the ground surface inundated? Yes X No ___ Depth of standing water 0-2"
Is the soil saturated? Yes X No ___ Depth to saturated soil surface Depth to free-standing water in pit surface
Mark other field indicators of surface inundation or soil saturation:
___Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas
___Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines X Morphological plant adaptions
Comments ___ Is the wetland hydrology criterion met? Yes X No ___

Is the vegetation unit or plot wetland? Yes X No ____ Comments ___

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK, MT Transect/Area: 050410G Plot: 2 Date: 7/7/98

Project/Site: NNG Pipeline State: OR County: Columbia

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?
Yes X No ____ (If no, explain) berm adj. to pipeline corridor

Has the vegetation, soils and/or hydrology been significantly disturbed?
Yes X No ____ (If yes, explain)

DOMINANT VEGETATION

Herbs	I/S	% Cover
1. Galium aparine	UPL	20
2. Unknow herbs	?	50
3. + grasses		
4. Tolmia	NI(FAC-)	10
5. Equisetum telmatia	FACW	10
6.		
7.		
8.		
9.		
10.		
11.		

Shrubs	I/S	% Cover
21. Rubus spectab	FAC	30
22. Salal	UPL	20
23.		
24.		
26.		
Trees Overstory		
29. Alnus rubra	FAC	80
30.		
19.		
20.		
21.		

Comments Unknown species - too young to ID - not common wetland spp.

Percent of dominant species that are OBL, FACW and/or FAC 50 of known spp. Is the hydrophytic criterion met? Yes ___ No X

SOILS

Soil Series Mayger silt loam Is the soil on the hydric soils list? Yes X (Inclusions) No ___

Is the soil: a Histosol? Yes ___ No X Histic epipedon present? Yes ___ No X Mottled? Yes X No ___ Gleyed? Yes ___ No X

Depth	Matrix Color	Mottle Color	Texture
0-16	10YR 5/2	7.5 YR 5/8	Sandy silty loam w/clay

Comments ___ Is the hydric soils criterion met? Yes X No ___

HYDROLOGY

Is the ground surface inundated? Yes ___ No X Depth of standing water None

Is the soil saturated? Yes ___ No X Depth to saturated soil 0" Depth to free-standing water in pit None

Mark other field indicators of surface inundation or soil saturation:

___Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas

___Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions

Comments No indicators - hillside Is the wetland hydrology criterion met? Yes ___ No X

Is the vegetation unit or plot wetland? Yes ___ No X Comments boundary

Marginal/transition but non-wetland

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK, MT Transect/Area: 05-114A Plot: 1 Date: 7/7/90

Project/Site: NNG pipeline State: OR County: Columbia

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ____

****

Do normal environmental conditions exists at the plant community?

Yes X No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes X No ____ (If yes, explain) Along '89 NNG pipeline

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Stachys cooleyae	FACW	40%	21.		
2. Scirpus microcarpus	OBL	50%	22.		
3. Urtica dioica	FACT	10%	23.		
4. Equisetum telemateia	FACW	10%	24.		
5. Glyceria		<5	26.		
6. Galium aparine		<5	Trees		
7.			29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments ____

Percent of dominant species that are OBL, FACW and/or FAC 100% Is the hydrophytic criterion met? Yes X No ____

SOILS

Soil Series Eilertsen silt loam Is the soil on the hydric soils list? Yes X No ____ inclusions

Is the soil: a Histosol? Yes ____ No X Histic epipedon present? Yes ____ No X Mottled? Yes ____ No X Gleyed? Yes X No ____

Depth	Matrix Color	Mottle Color	Texture
0-10"	2.5Y 5/3		Sandy loam
10"-18"	10Y 4/1		silty sandy loam

Comments ____ Is the hydric soils criterion met? Yes X No ____

the upland border is dry & not gleyed & the veg. changes to Holcus, Sonchus 2.5Y 4/4

HYDROLOGY

Is the ground surface inundated? Yes ____ No X Depth of standing water ____

Is the soil saturated? Yes X No ____ Depth to saturated soil 6" Depth to free-standing water in pit ____

Mark other field indicators of surface inundation or soil saturation:

___Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas

___Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions

Comments ____ Is the wetland hydrology criterion met? Yes ____ No ____

Is the vegetation unit or plot wetland? Yes X No ____ Comments ____

seeboard

streamside wetled - Forested, only ~10' on either side is emergent

[illegible]

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): CK, MT Transect/Area: OSOW14A Plot: 2 Date: 7/7/98

Project/Site: NNG pipeline State: OR County: Columbia

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?

Yes X No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes X No ____ (If yes, explain)

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
(1) Sonchus sp	<FAC	20%	(21) Rubus ursinus	FACW	10%
(2) Scirpus microcarpus	OBL	20%	22.		
(3) Holcus lanatus	FAC	10%	23.		
4. Poa pratensis		<5	24.		
(5) Stachys cooleae	FACW	30%	26.		
(6) Ech N/seattleanum/evegatum NL		10%	Trees		
7. Rce			29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments

Percent of dominant species that are OBL, FACW and/or FAC 50 Is the hydrophytic criterion met? Yes ____ No X

SOILS

Soil Series Wilkerson silt loam inclusions Is the soil on the hydric soils list? Yes X No ___

Is the soil: a Histosol? Yes__ No X Histic epipedon present? Yes__ No X Mottled? Yes__ No X Gleyed? Yes__ No X

Depth	Matrix Color	Mottle Color	Texture
0-16"	2.5Y 4/4		silt loam

Comments Is the hydric soils criterion met? Yes ____ No X

HYDROLOGY

Is the ground surface inundated? Yes___ No X Depth of standing water_____

Is the soil saturated? Yes___ No X Depth to saturated soil_____ Depth to free-standing water in pit_____

Mark other field indicators of surface inundation or soil saturation:

___Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas

___Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions

Comments Is the wetland hydrology criterion met? Yes___ No X

Is the vegetation unit or plot wetland? Yes ____ No X Comments

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK & MT Transect/Area: 050414A Plot: 3 Date: 7/7/98

Project/Site: NNG Pipeline State: OR County: Columbia

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?

Yes X No _____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes _____ No X (If yes, explain)

DOMINANT VEGETATION

Herbs	I/S	% Cover
1. Cinna latifolia	FACW	30%
2. Oenanthe sarmentosa	OBL	10%
3. Stachys cooleyae	FACW	50%
4. Hydrophyllum tenuipes	>FAC	30%
5.		
6.		
7.		
8.		
9.		
10.		
11.		

Shrubs	I/S	% Cover
21. Rubus spectabilis	FAC+	20%
22.		
23.		
24.		
26.		
Trees		
29.		
30.		
19.		
20.		
21.		

Comments _____

Percent of dominant species that are OBL, FACW and/or FAC 100% Is the hydrophytic criterion met? Yes X No ___

The top clay layer may have allowed the dominance of wetland plants here

SOILS

Soil Series Eilertsen silt loam Is the soil on the hydric soils list? Yes X (inclusion) No ___

Is the soil: a Histosol? Yes ___ No X Histic epipedon present? Yes ___ No X Mottled? Yes X No ___ Gleyed? Yes ___ No X

Depth	Matrix Color	Mottle Color	Texture
0-3"	10YR 5/1 & 5/2	10YR 5/6	clay loam
3-12"	10YR 3/2		silt loam
12-18"	2.5Y 4/2	7.5YR 4/4	silt loam

Comments _____ Is the hydric soils criterion met? Yes X No ___

HYDROLOGY

Is the ground surface inundated? Yes ___ No X Depth of standing water _____

Is the soil saturated? Yes ___ No X Depth to saturated soil None Depth to free-standing water in pit _____

Mark other field indicators of surface inundation or soil saturation:

___Oxidized root zones X Water-stained leaves ___Water marks ___Surface scoured areas

X Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions

Comments _____ Is the wetland hydrology criterion met? Yes X No ___

Is the vegetation unit or plot wetland? Yes X No ___ Comments _____

low area near stream

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK, MT Transect/Area: 05014A Plot: 4 Date: 7/7/98

Project/Site: NNG Pipeline State: OR County: Columbia

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?

Yes X No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes ____ No X (If yes, explain)

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Cinna latifolia	FACW	5	(21) Rubus parviflorus	FAC	5
2. Glecoma		5	22.		
3.			23.		
4.			24.		
5.			26.		
6.			Trees overstory cover		
7.			(29) Alnus rubra	FAC	90
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments low cover - scoured

Percent of dominant species that are OBL, FACW and/or FAC 100 Is the hydrophytic criterion met? Yes X No ____

SOILS

Soil Series Eilertsen silt loam inclusions Is the soil on the hydric soils list? Yes X No ____

Is the soil: a Histosol? Yes ____ No X Histic epipedon present? Yes ____ No X Mottled? Yes X No ____ Gleyed? Yes ____ No X

Depth	Matrix Color	Mottle Color	Texture
0-10	10YR 5/1 & 10YR 5/2		Silty sandy loam
10-18"	2.5Y 4/2	some 7.5YR 4/4	silt loam

Comments ____ Is the hydric soils criterion met? Yes X No ____

HYDROLOGY

Is the ground surface inundated? Yes ____ No X Depth of standing water none

Is the soil saturated? Yes ____ No X Depth to saturated soil none Depth to free-standing water in pit ____

Mark other field indicators of surface inundation or soil saturation:

___Oxidized root zones X Water-stained leaves ___Water marks X Surface scoured areas

X Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions

Comments Sufficient indicators Is the wetland hydrology criterion met? Yes X No ____

Is the vegetation unit or plot wetland? Yes X No ____ Comments ____

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK, MT Transect/Area: 050414D Plot: 1 Date: 7/8/98

Project/Site: NNG Pipeline State: OR County: Columbia

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community? appears to be an excavated area or bermed from adj. wetland
Yes X No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?
Yes X No ____ (If yes, explain)

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Phalaris arundin.	FAC	80	21.		
2. Juncus effusus		5	22.		
3. Agrostis tenuis		10	23.		
4. Glyceria (long)		<5	24.		
5. Carex sp		<5	26.		
6. Rumex crispus		<5	Trees		
7.			29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments

Percent of dominant species that are OBL, FACW and/or FAC 100 Is the hydrophytic criterion met? Yes X No ____

SOILS

Soil Series Natal silty clay loam Is the soil on the hydric soils list? Yes X No ____

Is the soil: a Histosol? Yes ____ No X Histic epipedon present? Yes ____ No X Mottled? Yes ____ No X Gleyed? Yes ____ No X

Depth	Matrix Color	Mottle Color	Texture
0-5	10YR 3/2	7.5yr 4/6	silty clay loam
5-18	10YR 3/2		silty clay loam

Comments ____ Is the hydric soils criterion met? Yes ____ No X

HYDROLOGY

Is the ground surface inundated? Yes ____ No X Depth of standing water ____

Is the soil saturated? Yes ____ No X Depth to saturated soil ____ Depth to free-standing water in pit ____

Mark other field indicators of surface inundation or soil saturation: slight depression

X Oxidized root zones ___ Water-stained leaves ___ Water marks ___ Surface scoured areas

___ Wetland drainage patterns ___ Water-borne sediment deposits ___ Drift lines ___ Morphological plant adaptions

Comments insufficient indicators Is the wetland hydrology criterion met? Yes ____ No ____

Is the vegetation unit or plot wetland? Yes ____ No X Comments ____

other unrecorded plots along the pipeline route also did not have sufficient soils + hydrology to indicate wetland

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LF, MT Transect/Area: 050414D Plot: 2 Date: 7/8/98

Project/Site: NNG Pipeline State: OR County: Columbia

Routine Onsite Determination Method X **Or** Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?

Yes X No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes ____ No X (If yes, explain)

DOMINANT VEGETATION

Herbs	I/S	% Cover
1. Phalaris arund.	FAC	80
2. Carex obnupta	OBL	30
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		

Shrubs	I/S	% Cover
21. Rosa pisocarpa	FACW+	5
22. Spirea douglasii		<5
23.		
24.		
26.		
Trees		
29. Fraxinus latifolia		<5
30.		
19.		
20.		
21.		

Comments circled=dominant Carex - short petioles

Percent of dominant species that are OBL, FACW and/or FAC 100 Is the hydrophytic criterion met? Yes X No ____

SOILS

Soil Series Natal silty clay loam Is the soil on the hydric soils list? Yes X No ___

Is the soil: a Histosol? Yes ___ No X Histic epipedon present? Yes ___ No X Mottled? Yes X No ___ Gleyed? Yes X No ___

Depth	Matrix Color	Mottle Color	Texture
0-16	7.5YR 2/0 & 10YR 4/1	7.5YR 4/6	clay silty loam

Comments ____ Is the hydric soils criterion met? Yes X No ____

HYDROLOGY

Is the ground surface inundated? Yes ___ No X Depth of standing water ____

Is the soil saturated? Yes X No ___ Depth to saturated soil Surface Depth to free-standing water in pit 10

Mark other field indicators of surface inundation or soil saturation:

X Oxidized root zones ___ Water-stained leaves ___ Water marks ___ Surface scoured areas

___ Wetland drainage patterns X Water-borne sediment deposits ___ Drift lines ___ Morphological plant adaptions

Comments ____ Is the wetland hydrology criterion met? Yes X No ___

Is the vegetation unit or plot wetland? Yes X No ____ Comments ____

Site adj. to a narrow stream within a low area of emergent FW marsh

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK & MT Transect/Area: OSWH4 D Plot: 3 Date: 7/5/95

Project/Site: NNG Pipeline State: OR County: Columbia

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?

Yes X No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes ____ No X (If yes, explain)

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Carex obnupta	OBL	40%	21. Rosa pisocarpa	FACW	30%
2. Polystichum munitum	FACU	10%	22.		
3. Rubus ursinus	FACU	40%	23.		
4.			24.		
5.			26.		
6.			Trees		
7.			29. Salix sp	FACW	20%
8.			30. Alnus rubra	FAC	80%
9.			19.		
10.			20.		
11.			21.		

Comments ____

Percent of dominant species that are OBL, FACW and/or FAC 80 Is the hydrophytic criterion met? Yes X No ____

SOILS

Soil Series Natal silty clay loam Is the soil on the hydric soils list? Yes X No ____

Is the soil: a Histosol? Yes ____ No X Histic epipedon present? Yes ____ No X Mottled? Yes X No ____ Gleyed? Yes X No ____

Depth	Matrix Color	Mottle Color	Texture
0-12"	2.5Y 2.5/1		silt loam
12"-18"	2.5Y 5/1	10YR 6/8	clay loam
		1 strong	

Comments ____ Is the hydric soils criterion met? Yes X No ____

HYDROLOGY

Is the ground surface inundated? Yes ____ No X Depth of standing water ____

Is the soil saturated? Yes ____ No X Depth to saturated soil ____ Depth to free-standing water in pit ____

Mark other field indicators of surface inundation or soil saturation:

X Oxidized root zones ____ Water-stained leaves ____ Water marks ____ Surface scoured areas

____ Wetland drainage patterns X Water-borne sediment deposits ____ Drift lines ____ Morphological plant adaptions

Comments ____ Is the wetland hydrology criterion met? Yes X No ____

Is the vegetation unit or plot wetland? Yes X No ____ Comments ____

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LKJMT Transect/Area: 050414D Plot: 4 Date: 07/8/98

Project/Site: NNG pipeline State: OR County: Columbia

Routine Onsite Determination Method ____ **Or** Comprehensive Onsite Determination Method ____

****

Do normal environmental conditions exists at the plant community?

Yes X No _____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes _____ No X (If yes, explain)

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Oxalis sp.		05%	21.		
2. Hydrophyllum tenuipes		10%	22.		
(3.) Dermathe sarmentosa	OBL	20%	23.		
4. Tolmeia menziesii		10%	24.		
(5.) Circaea alpina	FACt	20%	26.		
6. Poa palustris		05%	Trees		
(7.) Carex obnupta		20%	(29.) Alnus rubra	FAC	100%
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments _____

Percent of dominant species that are OBL, FACW and/or FAC____ Is the hydrophytic criterion met? Yes X No____

SOILS

Soil Series Natal silty clay loam Is the soil on the hydric soils list? Yes X No__

Is the soil: a Histosol? Yes__ No X Histic epipedon present? Yes__ No__ Mottled? Yes__ No X Gleyed? Yes__ No X

Depth	Matrix Color	Mottle Color	Texture
0-16"	2.5Y 3/2		silt loam

Comments_____ Is the hydric soils criterion met? Yes____ No X

HYDROLOGY

Is the ground surface inundated? Yes___ No X Depth of standing water_____

Is the soil saturated? Yes___ No X Depth to saturated soil_____ Depth to free-standing water in pit_____

Mark other field indicators of surface inundation or soil saturation:

___Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas

___Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions

Comments_____ Is the wetland hydrology criterion met? Yes___ No X

Is the vegetation unit or plot wetland? Yes ____ No X Comments insufficient hydrology & soil indicate

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK WTT Transect/Area: OS0414E Plot: 1 Date: 7/8/98

Project/Site: NNG State: OR County: Columbia

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?

Yes X No ___ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes ___ No X (If yes, explain) But Along NNG pipeline route

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Juncus effusus	FACW	80%	21.		
2. Scirpus microcarpus	OBL	20%	22.		
3. Geranium sanguinea		5%	23.		
4. Holcus arundinacea		<5%	24.		
5. Rubus ursinus		<5%	26.		
6. Sonchus asperum		<5%	Trees		
7. Galium aparine		5%	29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments ___

Percent of dominant species that are OBL, FACW and/or FAC 100 Is the hydrophytic criterion met? Yes X No ___

SOILS

Soil Series Natal silty clay loam Is the soil on the hydric soils list? Yes X No ___

Is the soil: a Histosol? Yes ___ No X Histic epipedon present? Yes ___ No X Mottled? Yes ___ No X Gleyed? Yes X No ___

Depth	Matrix Color	Mottle Color	Texture
0-3"	10YR 4/4		Clay loam
3"-16	10YR 3/1		Clay silt loam

Comments ___ Is the hydric soils criterion met? Yes X No ___

HYDROLOGY

Is the ground surface inundated? Yes ___ No ___ Depth of standing water ___

Is the soil saturated? Yes X No ___ Depth to saturated soil 10" Depth to free-standing water in pit 14"

Mark other field indicators of surface inundation or soil saturation:

X Oxidized root zones ___ Water-stained leaves ___ Water marks ___ Surface scoured areas

___ Wetland drainage patterns ___ Water-borne sediment deposits ___ Drift lines ___ Morphological plant adaptions

Comments ___ Is the wetland hydrology criterion met? Yes X No ___

Is the vegetation unit or plot wetland? Yes X No ___ Comments ___

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LCB MT Transect/Area: 050414F Plot: 1 Date: 7/8/98

Project/Site: NNG Apeline State: OR County: Columbia

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?

Yes X No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes X No ___ (If yes, explain) NNG pipeline corridor

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Phalaris arundinacea	FACW	80%	21. Spiraea douglasii	FACW	20%
2. Juncus effusus	FACW	<5%	22.		
3. Carex obnupta	OBL	10%	23.		
4.			24.		
5.			26.		
6.			Trees		
7.			29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments

Percent of dominant species that are OBL, FACW and/or FAC 100 Is the hydrophytic criterion met? Yes X No ___

SOILS

Soil Series Natal silty clay loam Is the soil on the hydric soils list? Yes X No ___

Is the soil: a Histosol? Yes ___ No X Histic epipedon present? Yes ___ No X Mottled? Yes X No ___ Gleyed? Yes X No ___

Depth	Matrix Color	Mottle Color	Texture
0-4"	10YR 2/1		silt loam
4"-16"	10YR 4/1	10YR 5/8 strong	silt loam

Comments ___ Is the hydric soils criterion met? Yes ___ No ___

HYDROLOGY

Is the ground surface inundated? Yes ___ No X Depth of standing water ___

Is the soil saturated? Yes ___ No X Depth to saturated soil ___ Depth to free-standing water in pit ___

Mark other field indicators of surface inundation or soil saturation:

X Oxidized root zones ___ Water-stained leaves ___ Water marks ___ Surface scoured areas

___ Wetland drainage patterns X Water-borne sediment deposits ___ Drift lines ___ Morphological plant adaptions

Comments ___ Is the wetland hydrology criterion met? Yes X No ___ just barely?

Is the vegetation unit or plot wetland? Yes X No ___ Comments ___

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK Transect/Area: 050423D Plot: 1 Date: 8/18/98

Project/Site: NNG pipeline State: OR County: Columbia

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?

Yes X No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes X No ____ (If yes, explain) The plot is near the road, the road is bermed

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Phalaris arundinacea	FACW	100%	21.		
2. Urtica dioica		5%	22.		
3. Rubus procerus		10%	23.		
4.			24.		
5.			26.		
6.			Trees		
7.			29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments

Percent of dominant species that are OBL, FACW and/or FAC 100% Is the hydrophytic criterion met? Yes X No ____

Spirea & willows are present further from the road Scirpus microcarpus is present closer to the road

SOILS

Soil Series Natal silty clay loam Is the soil on the hydric soils list? Yes ___ No ___

Is the soil: a Histosol? Yes ___ No X Histic epipedon present? Yes ___ No X Mottled? Yes ___ No X Gleyed? Yes X No ___

Depth	Matrix Color	Mottle Color	Texture
0-14"	10YR 3/1		silt loam
14-16"	10YR 3/1		clay loam

Comments Is the hydric soils criterion met? Yes X No ____

HYDROLOGY

Is the ground surface inundated? Yes ___ No X Depth of standing water ____

Is the soil saturated? Yes ___ No X Depth to saturated soil ____ Depth to free-standing water in pit ____

Mark other field indicators of surface inundation or soil saturation:

strong X Oxidized root zones ___ Water-stained leaves ___ Water marks ___ Surface scoured areas

X Wetland drainage patterns ___ Water-borne sediment deposits ___ Drift lines ___ Morphological plant adaptions

Comments Is the wetland hydrology criterion met? Yes ___ No ___

Is the vegetation unit or plot wetland? Yes X No ____ Comments clear upland border of douglas fir trees

this wetland was measured by the surveyor, not flagged

The plot is ~ 30' north of power pole # 47' off the road

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK & MT Transect/Area: 050436B Plot: 1 Date: 7/14/98

Project/Site: NNG pipeline State: OR County: Columbia

Routine Onsite Determination Method ____ **Or** Comprehensive Onsite Determination Method ____

****

Do normal environmental conditions exists at the plant community?

Yes X No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes X No ____ (If yes, explain) Along agpast lead corridor

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	OBL % Cover
1. Phalaris arundinacea	FACW	90	21. Salix seedlings	FACW	10
2. Oenanthe sarmentosa	OBL	30	22.		
3. Juncus effusus	FACW	20	23.		
4.			24.		
5.			26.		
6.			Trees		
7.			29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments

Percent of dominant species that are OBL, FACW and/or FAC 100 Is the hydrophytic criterion met? Yes X No ____

SOILS

Soil Series Glohm silt loam Is the soil on the hydric soils list? Yes X No ____ Including

Is the soil: a Histosol? Yes ____ No X Histic epipedon present? Yes ____ No X Mottled? Yes X No ____ Gleyed? Yes X No ____

Depth	Matrix Color	Mottle Color	Texture
0 - 18"	10 YR 4/1	10YR 6/6	Clay loam round cobbles

Comments Is the hydric soils criterion met? Yes X No ____

sulfur smell

HYDROLOGY

Is the ground surface inundated? Yes X No ____ Depth of standing water 0"

Is the soil saturated? Yes X No ____ Depth to saturated soil 0" Depth to free-standing water in pit 0"

Mark other field indicators of surface inundation or soil saturation:

X Oxidized root zones ____ Water-stained leaves ____ Water marks ____ Surface scoured areas

X Wetland drainage patterns X Water-borne sediment deposits ____ Drift lines ____ Morphological plant adaptions

Comments Is the wetland hydrology criterion met? Yes X No ____

Is the vegetation unit or plot wetland? Yes X No ____ Comments The upland is steep sided with Phalaris see pbt 2

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK Transect/Area: OS0436B Plot: 2 Date: 7/14/98

Project/Site: NN 6 pipeline State: OR County: Columbia

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?

Yes X No _____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes X No _____ (If yes, explain) Along old road bed

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Phalaris arundinacea	FACW	80	21.		
2. Agropyron repens	FAC-	10	22.		
3. Dactylis glomerata	FACU	10	23.		
4. Sonchus sp		<5	24.		
5. Holcus lanatus	FAC	10	26.		
6. Agrostis stolonifera	FAC	10	Trees		
7.			29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments _____

Percent of dominant species that are OBL, FACW and/or FAC ___ Is the hydrophytic criterion met? Yes X No ___

SOILS

Soil Series Glohm silt loam inclusions Is the soil on the hydric soils list? Yes X No ___

Is the soil: a Histosol? Yes ___ No X Histic epipedon present? Yes ___ No X Mottled? Yes X No ___ Gleyed? Yes ___ No X

Depth	Matrix Color	Mottle Color	Texture
0-14"	10YR 3/3		Silt loam
14"-16"	10YR 4/2	10YR 5/6- very weak	

Comments _____ Is the hydric soils criterion met? Yes ___ No X

HYDROLOGY

Is the ground surface inundated? Yes ___ No X Depth of standing water _____

Is the soil saturated? Yes ___ No X Depth to saturated soil _____ Depth to free-standing water in pit _____

Mark other field indicators of surface inundation or soil saturation:

___Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas

___Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions

Comments _____ Is the wetland hydrology criterion met? Yes ___ No X

Is the vegetation unit or plot wetland? Yes ___ No X Comments _____

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): DLF Transect/Area: west side Creek 040306B Plot: 1 Date: 4/24/98
Project/Site: NNC State: OR County: Columbia
Intermediate-level Onsite Determination Method ____ **Or** Comprehensive Onsite Determination Method ____
****

Do normal environmental conditions exists at the plant community? Plot in maintained pipeline easement
Yes ✓ No ✓ (If no, explain on back)
Has the vegetation, soils and/or hydrology been significantly disturbed?
Yes ____ No ✓ (If yes, explain on back)

DOMINANT VEGETATION

Herbs	I/S	% Cover
1. Scirpus microcarpus	OBL	40
2. Urtica dioica	FAC	10
3. Phalaris arundinacea	FACW	40
4. Equisetum telmateia		5
5. Pottasites frigidus	FACW	10
6.		
7.		
8.		
9.		
10.		
11.		

Shrubs	I/S	% Cover
21. Rubus ursinus		5
22.		
23.		
24.		
26.		
Trees		
29.		
30.		
19.		
20.		
21.		

Comments _____
Percent of dominant species that are OBL, FACW and/or FAC 100 Is the hydrophytic criterion met? Yes ✓ No ____

SOILS

Soil Series Hapludalfs - Udifluvents complex (inclusions) Is the soil on the hydric soils list? Yes X No ____
Is the soil: a Histosol? Yes ____ No ____ Histic epipedon present? Yes ____ No ____ Mottled? Yes ____ No ____ Gleyed? Yes ____ No ____

Depth	Matrix Color	Mottle Color	Texture
0-12	2.5Y 3/2		silt loam
12-15	2.5Y 4/2	10YR5/8	silty clay loam

Comments assumed Is the hydric soils criterion met? Yes ✓ No ____

HYDROLOGY

Is the ground surface inundated? Yes ____ No ✓ Depth of standing water ____
Is the soil saturated? Yes ____ No ____ Depth to saturated soil 14" Depth to free-standing water in pit ____
Mark other field indicators of surface inundation or soil saturation:
✓ Oxidized root zones (in lower layer) ____ Water-stained leaves ____ Water marks ____ Surface scoured areas
____ Wetland drainage patterns ____ Water-borne sediment deposits ____ Drift lines ____ Morphological plant adaptions
Comments ____ Is the wetland hydrology criterion met? Yes ✓ No ____

Is the vegetation unit or plot wetland? Yes ✓ No ____ Comments ____
associated with Kennedy Creek

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK Transect/Area: 040306 B Plot: 2 Date: 4/24/98

Project/Site: NNG Pipeline State: OR County: Columbia

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ____

****

Do normal environmental conditions exists at the plant community?

Yes X No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed? In the pipeline easement

Yes X No ____ (If yes, explain)

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Equisetum tetemateia	FACW	70%	21.		
2. Holcus lanatus	FAC	20%	22.		
3. Rubus procera	FACU	20%	23.		
4. Hydrophyllum tenuipes	NL	15%	24.		
5.			26.		
6. Chrysanthemum leucanemum	NL	<5%	Trees		
7.			29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments ____

Percent of dominant species that are OBL, FACW and/or FAC 50% Is the hydrophytic criterion met? Yes X No ____

SOILS

Soil Series Hapludalfs - Udifluvents complex Is the soil on the hydric soils list? Yes X (inclusions) No ____

Is the soil: a Histosol? Yes ____ No X Histic epipedon present? Yes ____ No X Mottled? Yes ____ No X Gleyed? Yes ____ No X

Depth	Matrix Color	Mottle Color	Texture
0-16"	10YR 4/6		sandy loam

Comments ____ Is the hydric soils criterion met? Yes ____ No X

HYDROLOGY

Is the ground surface inundated? Yes ____ No X Depth of standing water ____

Is the soil saturated? Yes ____ No X Depth to saturated soil ____ Depth to free-standing water in pit ____

Mark other field indicators of surface inundation or soil saturation:

__Oxidized root zones __Water-stained leaves __Water marks __Surface scoured areas

__Wetland drainage patterns __Water-borne sediment deposits __Drift lines __Morphological plant adaptions

Comments ____ Is the wetland hydrology criterion met? Yes ____ No X

Is the vegetation unit or plot wetland? Yes ____ No X Comments ____

* 040425F has similar soils but is in disturbed corridor

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK, DF Transect/Area: 040425E Plot: 1 Date: 5/8/98

Project/Site: NNG Pipeline State: OR County: Columbia

Routine Onsite Determination Method X **Or** Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?
Yes X No X (If no, explain) Pipeline to the west
Has the vegetation, soils and/or hydrology been significantly disturbed?
Yes X No ____ (If yes, explain)

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Stachys Cooleyae	FACW	30%	21. Rubus spectabilis	FAC+	5%
2. Scirpus microcarpus	OBL	30%	22.		
3. *Holcus lanatus	FAC	5%	23.		
4. Equisetum telmateia	FACW	10%	24.		
5. Phalaris arundinacea	FACW	30%	26.		
6. Athyrium felix-femina	FAC	10%	Trees		
7. Oenanthe sarmentosa	OBL	5%	29. Alnus rubra	FAC	70%
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments
Percent of dominant species that are OBL, FACW and/or FAC 100% Is the hydrophytic criterion met? Yes X No ____

SOILS

Soil Series Scapoose - Braun silt loam, 30-60% north slopes Is the soil on the hydric soils list? Yes ___ No X
Is the soil: a Histosol? Yes ___ No X Histic epipedon present? Yes ___ No X Mottled? Yes X No ___ Gleyed? Yes X No ___

Depth	Matrix Color	Mottle Color	Texture
0-17"	10YR 4/2	10YR 5/8	silt loam
17-18"	N4/	10YR 5/8	silt loam

Comments Is the hydric soils criterion met? Yes X No ____

HYDROLOGY

Is the ground surface inundated? Yes ___ No X Depth of standing water ____
Is the soil saturated? Yes X No ___ Depth to saturated soil 0" Depth to free-standing water in pit ____
Mark other field indicators of surface inundation or soil saturation:
X Oxidized root zones ___ Water-stained leaves ___ Water marks ___ Surface scoured areas
___ Wetland drainage patterns ___ Water-borne sediment deposits ___ Drift lines ___ Morphological plant adaptions
Comments Is the wetland hydrology criterion met? Yes ___ No ___

Is the vegetation unit or plot wetland? Yes X No ____ Comments ____

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK & DF Transect/Area: 040425 E Plot: 2 Date: 5/8/98

Project/Site: NNG Pipeline State: OR County: Columbia

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ____

****

Do normal environmental conditions exists at the plant community?
Yes X No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?
Yes X No ____ (If yes, explain)

Along the mainline pipe and fill material is present in soil

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Holcus lanatus	FAC	90%	21. Rubus leucodermis	NL	5%
2. Equisetum arvense	FAC	30%	22.		
3. Phalaris arundinacea	FACW	10%	23.		
4. Cirsium Vulgare	FACU	5%	24.		
5. Chrysanthemum leucanthemum	NL	20%	26.		
6. Lycopus uniflorus	OBL	20%	Trees		
7.			29. Alnus rubra - saplings	FAC	30%
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments ____

Percent of dominant species that are OBL, FACW and/or FAC 71% Is the hydrophytic criterion met? Yes X No ____

SOILS

Soil Series Scaponia-Braun silt loam, 30-60% north slopes Is the soil on the hydric soils list? Yes ___ No X

Is the soil: a Histosol? Yes ___ No X Histic epipedon present? Yes ___ No X Mottled? Yes X No ___ Gleyed? Yes ___ No X

Depth	Matrix Color	Mottle Color	Texture
0-18"	10YR 3/2 & 10YR 5/3 - 10YR 3/1 - mix		silt loam & gravelly
		10YR 4/6 - mottles - very few	

Comments ____ Is the hydric soils criterion met? Yes ____ No X

soils jumbled together

HYDROLOGY

Is the ground surface inundated? Yes ___ No X Depth of standing water ____

Is the soil saturated? Yes ___ No X Depth to saturated soil ____ Depth to free-standing water in pit ____

Mark other field indicators of surface inundation or soil saturation:

___Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas

___Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions

Comments ____ Is the wetland hydrology criterion met? Yes ___ No X

Is the vegetation unit or plot wetland? Yes ____ No X Comments ____

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK Transect/Area: 040425C Plot: 1 Date: 4/22/98

Project/Site: NNG Pipeline State: OR County: Columbia

Routine Onsite Determination Method X **Or** Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?

Yes X No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed? A pipeline was installed in this area about 10 years ago

Yes X No ____ (If yes, explain)

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Scirpus sp.	OBL or FACW	20%	21. Alnus rubra	FAC	20
2. Veronica americana	OBL	10%	22. Holodiscus discolor	NL	20
3. Oenanthe sarmentosa	OBL	10%	23.		
4. Rumex occidentalis	FACW+	5%	24.		
5.			26.		
6.			Trees		
7.			29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments

Percent of dominant species that are OBL, FACW and/or FAC 83% Is the hydrophytic criterion met? Yes X No ____

SOILS

Soil Series Talap loam, 3-30% slopes Is the soil on the hydric soils list? Yes ___ No X

Is the soil: a Histosol? Yes X No__ Histic epipedon present? Yes__ No__ Mottled? Yes X No__ Gleyed? Yes__ No X

Depth	Matrix Color	Mottle Color	Texture
0-16"	10YR 3/3	7.5YR 5/8	Organic soil with gravel rubbles

Comments Is the hydric soils criterion met? Yes X No ____

HYDROLOGY

Is the ground surface inundated? Yes X No___ Depth of standing water 1"

Is the soil saturated? Yes X No___ Depth to saturated soil_____ Depth to free-standing water in pit_____

Mark other field indicators of surface inundation or soil saturation:

X Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas

X Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines X Morphological plant adaptions

Comments Is the wetland hydrology criterion met? Yes X No___

Is the vegetation unit or plot wetland? Yes X No ____ Comments A stream runs through this wetland

No upland plot here

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): DLF Transect/Area: 040425B Plot: 1 Date: 4/22/98

Project/Site: NNG State: OR County: Columbia

Routine Intermediate-level Onsite Determination Method ✓ Or Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community? Pipeline easement

Yes ✓ No ___ (If no, explain on back)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes ✓ No ___ (If yes, explain on back)

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Scirpus microcarpus	OBL	60	21.		
2. Deschampsia cespitosa		25	22.		
3. Equisetum arvense		15	23.		
4. Potentilla fruticosa		5	24.		
5. Trifolium pratense		5	26.		
6. Hordeum lanatus		5	Trees		
7. Grass sp		5	29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments

Percent of dominant species that are OBL, FACW and/or FAC 100 Is the hydrophytic criterion met? Yes ✓ No ___

SOILS

Soil Series Scapoose - Braun silt loam Is the soil on the hydric soils list? Yes ___ No X

Is the soil: a Histosol? Yes ___ No ✓ Histic epipedon present? Yes ___ No ✓ Mottled? Yes ✓ No ___ Gleyed? Yes ___ No X

Depth	Matrix Color	Mottle Color	Texture
0-10	10YR 3/2	10YR 3/6	Sandy clay loam

Comments Is the hydric soils criterion met? Yes ✓ No ___

HYDROLOGY

Is the ground surface inundated? Yes ✓ No ___ Depth of standing water up to 1"

Is the soil saturated? Yes ✓ No ___ Depth to saturated soil ___ Depth to free-standing water in pit ___

Mark other field indicators of surface inundation or soil saturation:

___Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas

✓ Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions

Comments Side slope seep Is the wetland hydrology criterion met? Yes ✓ No ___

Is the vegetation unit or plot wetland? Yes ✓ No ___ Comments

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): DLF Transect/Area: 040425A Plot: 1 Date: 4/22/98
Project/Site: NNG State: OR County: Columbia
Routine ~~Intermediate-level~~ Onsite Determination Method ✓ Or Comprehensive Onsite Determination Method ____
****

Do normal environmental conditions exists at the plant community?
Yes ✓ No ____ (If no, explain on back)
Has the vegetation, soils and/or hydrology been significantly disturbed?
Yes ✓ No ____ (If yes, explain on back)

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Oxalis oregana	NL	60	21. Rubus spectabilis	FAC	70
2. Dicentra formosa	FACU	10	22.		
3. Claytonia siberica		<5	23.		
4. Polystichum munitum	FACU	50	24.		
5. Artemisia sp.	NSPP	20	26.		
6. Holcus lanatus		5	Trees		
7.			29. Alnus rubra	FAC	100
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments ____
Percent of dominant species that are OBL, FACW and/or FAC____ Is the hydrophytic criterion met? Yes____ No ✓

SOILS

Soil Series Scaponia-Braun silt loam Is the soil on the hydric soils list? Yes___ No X
Is the soil: a Histosol? Yes__ No X Histic epipedon present? Yes__ No X Mottled? Yes__ No X Gleyed? Yes__ No X

Depth	Matrix Color	Mottle Color	Texture
0-1/2			duff layer
1/2-2	10YR 2/2		silty sand loam
2-13	10YR 3/3		sandy silt loam

Comments could not dig deeper - too many roots Is the hydric soils criterion met? Yes____ No ✓

HYDROLOGY

Is the ground surface inundated? Yes___ No ✓ Depth of standing water____
Is the soil saturated? Yes___ No ✓ Depth to saturated soil____ Depth to free-standing water in pit____
Mark other field indicators of surface inundation or soil saturation:
___Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas
___Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions
Comments____ Is the wetland hydrology criterion met? Yes___ No ✓

Is the vegetation unit or plot wetland? Yes ____ No ✓ Comments____

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): DCF Transect/Area: 040425 A Plot: 2 Date: 4/22/98
Project/Site: NNG State: OR County: Columbia
Routine Intermediate-level Onsite Determination Method ✓ Or Comprehensive Onsite Determination Method ___
****
Do normal environmental conditions exists at the plant community? Pipeline easement
Yes ✓ No ___ (If no, explain on back)
Has the vegetation, soils and/or hydrology been significantly disturbed?
Yes ✓ No ___ (If yes, explain on back)

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Lysichitum americanum	OBL	25	21.		
2. Scirpus microcarpos	OBL	85	22.		
3. Rorripa sp.	OBL	5	23.		
4. Chrysosplenium glechomaefolium	OBL	50	24.		
5. Stachys cookeyae		<5	26.		
6.			Trees		
7.			29.		
8.			30.		
			19.		
10.			20.		
11.			21.		

Comments
Percent of dominant species that are OBL, FACW and/or FAC 100 Is the hydrophytic criterion met? Yes ✓ No ___

SOILS

Soil Series Scapoose - Braun silt loam Is the soil on the hydric soils list? Yes ___ No X
Is the soil: a Histosol? Yes X No ___ Histic epipedon present? Yes ✓ No ___ Mottled? Yes ___ No X Gleyed? Yes ___ No X

Depth	Matrix Color	Mottle Color	Texture
0-8			organic

Comments Is the hydric soils criterion met? Yes ✓ No ___

HYDROLOGY

Is the ground surface inundated? Yes ✓ No ___ Depth of standing water up to 1"
Is the soil saturated? Yes ✓ No ___ Depth to saturated soil surface Depth to free-standing water in pit ___
Mark other field indicators of surface inundation or soil saturation:
___ Oxidized root zones ___ Water-stained leaves ___ Water marks ___ Surface scoured areas
✓ Wetland drainage patterns ___ Water-borne sediment deposits ___ Drift lines ___ Morphological plant adaptions
Comments Is the wetland hydrology criterion met? Yes ✓ No ___

Is the vegetation unit or plot wetland? Yes ✓ No ___ Comments

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): DLF Transect/Area: 040330A Plot: 1 Date: 4/22/98
Project/Site: NNG State: OK County: Columbia
NOTIN ~~Intermediate-level~~ Onsite Determination Method ✓ Or Comprehensive Onsite Determination Method ___
****

Do normal environmental conditions exists at the plant community? Existing pipeline easement - swath of herbaceous vegetation between forest
Yes ✓ No ___ (If no, explain on back)
Has the vegetation, soils and/or hydrology been significantly disturbed?
Yes ✓ No ___ (If yes, explain on back)

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Scirpus microcarpus	OBL	10	21. Alnus rubra		5
2. Veronica americanum		5	22.		
3. Holcus lanatus	FAC	20	23.		
4. Trifolium repens	FAC	10	24.		
5. Chrysethemum leucathemum		<1	26.		
6. Equisetum arvense	FAC	10	Trees		
7. Salix sp.	NSPP	10	29.		
8. Rumex acetosella		<1	30.		
9. Lupine sp		<5	19.		
10. Grass sp		5	20.		
11. Epilobium ciliatum		5	21.		

Comments
Percent of dominant species that are OBL, FACW and/or FAC 100 Is the hydrophytic criterion met? Yes ✓ No ___

SOILS

Soil Series Scappoose - Braun silt loam Is the soil on the hydric soils list? Yes ___ No X
Is the soil: a Histosol? Yes ___ No X Histic epipedon present? Yes ___ No X Mottled? Yes X No ___ Gleyed? Yes X No ___

Depth	Matrix Color	Mottle Color	Texture
0-8	10YR 3/1		gravelly sandy silt loam
8-14	10YR 3/1	10YR 3/6	silt loam

Comments Is the hydric soils criterion met? Yes ✓ No ___

HYDROLOGY

Is the ground surface inundated? Yes ✓ No ___ Depth of standing water <1"
Is the soil saturated? Yes ✓ No ___ Depth to saturated soil surface Depth to free-standing water in pit 14"
Mark other field indicators of surface inundation or soil saturation:
___ Oxidized root zones ___ Water-stained leaves ___ Water marks ___ Surface scoured areas
✓ Wetland drainage patterns ___ Water-borne sediment deposits ___ Drift lines ___ Morphological plant adaptions
Comments Water flowing down side slope - Is the wetland hydrology criterion met? Yes ✓ No ___
Steep flat. Water seeping in pit at 7".
Is the vegetation unit or plot wetland? Yes ✓ No ___ Comments

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): DLF Transect/Area: D40330A Plot: 2 Date: 4/22/98
Project/Site: NNG State: OR County: Columbia
Routine ~~Intermediate level~~ Onsite Determination Method ✓ **Or** Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community? Pipeline easement is maintained - swath of herbaceous vegetation between coniferous forest
Yes ✓ No ___ (If no, explain on back)
Has the vegetation, soils and/or hydrology been significantly disturbed?
Yes ✓ No ___ (If yes, explain on back)

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Agrostis alba	FAC	40	21.		
2. Holcus lanatus	FAC	20	22.		
3. grass sp. (Agropyron?)	NBPP	10	23.		
4. Poa sp	NBPP	10	24.		
5. composite		5	26.		
6. Cirsium arvense		5	Trees		
7. Prunella vulgaris		1	29.		
8. Trifolium repens		<5	30.		
9. Trifolium platense		<5	19.		
10. Plantago lanceolata		<5	20.		
11. Polystichum munitum		5	21.		
Juncus sp.		5			

Comments
Percent of dominant species that are OBL, FACW and/or FAC 100 Is the hydrophytic criterion met? Yes ___ No ✓
↳ but most species were upland →

SOILS

Soil Series Scapania - Braun silt loam Is the soil on the hydric soils list? Yes ___ No X
Is the soil: a Histosol? Yes ___ No X Histic epipedon present? Yes ___ No X Mottled? Yes X No ___ Gleyed? Yes X No ___

Depth	Matrix Color	Mottle Color	Texture
0-10	10YR 2/1		gravelly silt loam
10-16	10YR 3/2	7.5YR 5/8	gravelly silt loam

Comments Is the hydric soils criterion met? Yes ✓ No ___

HYDROLOGY

Is the ground surface inundated? Yes ___ No ✓ Depth of standing water ___
Is the soil saturated? Yes ___ No ✓ Depth to saturated soil ___ Depth to free-standing water in pit ___
Mark other field indicators of surface inundation or soil saturation:
___Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas
___Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions
Comments Water seeping into pit at 16" Is the wetland hydrology criterion met? Yes ___ No ✓

Is the vegetation unit or plot wetland? Yes ___ No ✓ Comments ___

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK Transect/Area: 040436B Plot: 1 Date: 4/22/98

Project/Site: NNG Pipeline State: OR County: Columbia

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?

Yes X No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes X No ____ (If yes, explain) see 040436A

Go back

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Juncus effusus	FACW	50%	21.		
2. Chrysosplenium glechomaefolium	OBL	50%	22.		
3. Holcus lanatus	FAC	~20%	23.		
4. Rumex occidentalis	FACW+	10%	24.		
5. Epilobium ciliatum	FACW-	5%	26.		
6.			Trees		
7.			29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments

Percent of dominant species that are OBL, FACW and/or FAC 100 Is the hydrophytic criterion met? Yes X No ____

SOILS

Soil Series Tolany loam Is the soil on the hydric soils list? Yes ___ No X

Is the soil: a Histosol? Yes __ No X Histic epipedon present? Yes __ No X Mottled? Yes X No __ Gleyed? Yes X No __

Depth	Matrix Color	Mottle Color	Texture
0-2"	10YR 2-2	7.5YR 5-8	silt loam
2-4"	7.5YR 5-0	7.5YR 5-6	silt loam
4"-16"	10YR 2-1		silt loam with gravel

Comments Is the hydric soils criterion met? Yes X No ____

HYDROLOGY

Is the ground surface inundated? Yes ___ No X Depth of standing water ____

Is the soil saturated? Yes X No ___ Depth to saturated soil surface Depth to free-standing water in pit 5"

Mark other field indicators of surface inundation or soil saturation:

X Oxidized root zones ___ Water-stained leaves ___ Water marks X Surface scoured areas

X Wetland drainage patterns ___ Water-borne sediment deposits ___ Drift lines X Morphological plant adaptions

Comments Is the wetland hydrology criterion met? Yes X No ___

Is the vegetation unit or plot wetland? Yes X No ____ Comments

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK Transect/Area: 040436B Plot: 2 Date: 4/22/98

Project/Site: NNG Pipeline State: OR County: Columbia

Routine Onsite Determination Method X **Or** Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?

Yes X No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes X No ____ (If yes, explain) see 040436A

DOMINANT VEGETATION

Herbs	I/S	% Cover
(1) Hdcus lanatus	FAC	20
(2) Hypochaeris radicata	FACU	20
(3) Lolium perenne	FACU	20
4. Juncus effusus	FACW	<5%
(5) Trifolium repens	FAC	40%
(long leaf) 6. Plantago lanceolata	FAC	10
7.		
8.		
9.		
10.		
11.		

Shrubs	I/S	% Cover
21.		
22.		
23.		
24.		
26.		
Trees		
29.		
30.		
19.		
20.		
21.		

Comments ____

Percent of dominant species that are OBL, FACW and/or FAC 50 Is the hydrophytic criterion met? Yes ___ No X

SOILS

Soil Series Tolany loam Is the soil on the hydric soils list? Yes ___ No X

Is the soil: a Histosol? Yes ___ No X Histic epipedon present? Yes ___ No X Mottled? Yes ___ No X Gleyed? Yes ___ No X

Depth	Matrix Color	Mottle Color	Texture
0-14"	10YR 3/3		Silt loam

Comments ____ Is the hydric soils criterion met? Yes ___ No X

HYDROLOGY

Is the ground surface inundated? Yes ___ No X Depth of standing water ____

Is the soil saturated? Yes ___ No X Depth to saturated soil ____ Depth to free-standing water in pit ____

Mark other field indicators of surface inundation or soil saturation:

___Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas

___Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions

Comments ____ Is the wetland hydrology criterion met? Yes ___ No X

Is the vegetation unit or plot wetland? Yes ___ No X Comments No indicators

No upland plot

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK Transect/Area: 0404 36A Plot: 1 Date: 4/22/98

Project/Site: NWG Pipeline State: OR County: Columbia

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?

Yes X No ___ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes X No ___ (If yes, explain) A natural gas pipeline was installed immediately downstream of this plot about 10 years ago;

* Go back to this wetland

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Lysichiton americanum	OBL	50%	21. Rubus spectabilis	FAC	40%
2. → disappeared - 7/16/98			22.		
3. Scoe		20%	23.		
4. Scirpus microcarpus		10%	24.		
5. Chrysosplenium glechomaefolium	OBL	20%	26.		
6. Equisetum telemateia	FACW	10%	Trees		
7.			29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments ___

Percent of dominant species that are OBL, FACW and/or FAC 100 Is the hydrophytic criterion met? Yes X No ___

SOILS

Soil Series Tolany loam Is the soil on the hydric soils list? Yes ___ No X

Is the soil: a Histosol? Yes X No ___ Histic epipedon present? Yes ___ No X Mottled? Yes ___ No X Gleyed? Yes ___ No X

Depth	Matrix Color	Mottle Color	Texture
0-16"	10YR 3/3		organic - mucky gravel

Comments ___ Is the hydric soils criterion met? Yes X No ___

HYDROLOGY

Is the ground surface inundated? Yes X No ___ Depth of standing water 0-3"

Is the soil saturated? Yes X No ___ Depth to saturated soil ___ Depth to free-standing water in pit ___

Mark other field indicators of surface inundation or soil saturation:

___ Oxidized root zones ___ Water-stained leaves ___ Water marks ___ Surface scoured areas

X Wetland drainage patterns ___ Water-borne sediment deposits ___ Drift lines X Morphological plant adaptions

Comments ___ Is the wetland hydrology criterion met? Yes X No ___

Is the vegetation unit or plot wetland? Yes X No ___ Comments tributary to Coal Creek

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): CK Transect/Area: 040331B Plot: 1 Date: 8/18/98

Project/Site: NNG State: OR County: Columbia

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?

Yes X No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes X No ____ (If yes, explain) the channel is surrounded by clear cuts

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Oenanth sarmentosa	OBL	80%	21.		
2. Petasites frigidus		25	22.		
3. Stachys cooleyae		5	23.		
4.			24.		
5.			26.		
6.			Trees		
7.			29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments

Percent of dominant species that are OBL, FACW and/or FAC 100 Is the hydrophytic criterion met? Yes X No ____

SOILS

Soil Series Tolany loam Is the soil on the hydric soils list? Yes ___ No X

Is the soil: a Histosol? Yes ___ No X Histic epipedon present? Yes ___ No X Mottled? Yes X No ___ Gleyed? Yes X No ___

Depth	Matrix Color	Mottle Color	Texture
0-2"	10YR 2/2		silt loam
2-16"	10YR 5/1	7.5YR 5/8	silt loam

Comments Is the hydric soils criterion met? Yes X No ____

HYDROLOGY

Is the ground surface inundated? Yes ___ No X Depth of standing water ____

Is the soil saturated? Yes ___ No X Depth to saturated soil ____ Depth to free-standing water in pit ____

Mark other field indicators of surface inundation or soil saturation:

X Oxidized root zones ___ Water-stained leaves ___ Water marks ___ Surface scoured areas

X Wetland drainage patterns ___ Water-borne sediment deposits ___ Drift lines ___ Morphological plant adaptions

Comments Is the wetland hydrology criterion met? Yes X No ___ barely

Is the vegetation unit or plot wetland? Yes X No ____ Comments

Red alder on sides 5' wide channel

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK Transect/Area: 040331A Plot: 1 Date: 8/18/98

Project/Site: NNG State: OR County: Columbia

Routine Onsite Determination Method X **Or** Comprehensive Onsite Determination Method ____

****

Do normal environmental conditions exists at the plant community?

Yes X No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes X No ____ (If yes, explain) Along a compacted road

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Centunculus minimus? sp?	FACW	90%	21.		
2. Juncus bufonius	FACW	10%	22.		
3. Juncus ensifolius	FACW	15%	23.		
4.			24.		
5.			26.		
6.			Trees		
7.			29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments _____

Percent of dominant species that are OBL, FACW and/or FAC 100 Is the hydrophytic criterion met? Yes X No ____

SOILS

Soil Series Tolalp loam Is the soil on the hydric soils list? Yes ___ No X

Is the soil: a Histosol? Yes__ No X Histic epipedon present? Yes__ No X Mottled? Yes X No__ Gleyed? Yes X No__

Depth	Matrix Color	Mottle Color	Texture
0-5"	10YR 3/2		clay
5-16"	10YR 5/1	7.5YR 5/8	silt loam

Comments ____ Is the hydric soils criterion met? Yes____ No____

HYDROLOGY

Is the ground surface inundated? Yes X No___ Depth of standing water 2"

Is the soil saturated? Yes X No___ Depth to saturated soil 0" Depth to free-standing water in pit —

Mark other field indicators of surface inundation or soil saturation:

X Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas

___Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions

Comments ____ Is the wetland hydrology criterion met? Yes___ No___

Is the vegetation unit or plot wetland? Yes X No ____ Comments small road wetland connected to springs

Pacific frogs 400' from P in road

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): ZK, MT Transect/Area: 030701E Plot: 1 Date: 7/13/98

Project/Site: NNG Pipeline State: OR like D County: Washington

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?

Yes X No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes X No ____ (If yes, explain) 10-20 yr. old clearcut + pipeline ROW

DOMINANT VEGETATION

	Herbs	I/S	% Cover
1.	Lysichiram americanum	OBL	<5
2.	Oenanthe sarmentosa	OBL	50
3.	Pedicularis		<5
4.	Stachys cooleya		<5
5.	Athyrium filix-femina	FAC	20
6.	Claytonia sibirica		<5
7.			
8.			
9.			
10.			
11.			

	Shrubs	I/S	% Cover
21.	Rubus spec.	FAC	40
22.			
23.			
24.			
26.			
	Trees		
29.	Salix lasiandra		<5
30.	Alnus rubra	FAC	90
19.			
20.			
21.			

Comments Lysichiton, Pedicularis & Stachys vary from (0 - <5%). Salix by road

Percent of dominant species that are OBL, FACW and/or FAC 100 Is the hydrophytic criterion met? Yes X No ____

SOILS

Soil Series Melby silt loam, 2-30% slopes Is the soil on the hydric soils list? Yes ___ No X

Is the soil: a Histosol? Yes __ No X Histic epipedon present? Yes __ No X Mottled? Yes __ No X Gleyed? Yes X No __

Depth	Matrix Color	Mottle Color	Texture
0-16	10 yr 3/1		Silt loam - high OM

Comments ____ Is the hydric soils criterion met? Yes X No ____

HYDROLOGY

Is the ground surface inundated? Yes ___ No X Depth of standing water ____

Is the soil saturated? Yes X No ___ Depth to saturated soil Surface (cm) Depth to free-standing water in pit 8

Mark other field indicators of surface inundation or soil saturation:

__Oxidized root zones __Water-stained leaves __Water marks __Surface scoured areas

X Wetland drainage patterns (channel) X Water-borne sediment deposits __Drift lines __Morphological plant adaptions

Comments ____ Is the wetland hydrology criterion met? Yes X No ___

Is the vegetation unit or plot wetland? Yes X No ____ Comments ____

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK, MT Transect/Area: 0304/01D Plot: 1 Date: 7/13/98

Project/Site: NWG Pipeline State: OR County: Washington

Routine ~~Intermediate~~-level Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?

Yes X No ____ (If no, explain on back)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes X No ____ (If yes, explain on back) ~10 yr. old clearcut + adj. to pipeline ROW

DOMINANT VEGETATION

	Herbs	I/S	% Cover		Shrubs	I/S	% Cover
1.	Scirpus microcarpus	OBL	<5	21.	Rubus spectabilis	FAC	90
2.	Glyceria elata	OBL	<5	22.			
3.	Lysichium americanum	OBL	<5	23.			
4.				24.			
5.				26.			
6.				Trees overstory			
7.				29.	Alnus rubra	~~FAC~~	100
8.				30.	Salix lasiandra		<5
9.				19.			
10.				20.			
11.				21.			

Comments _____

Percent of dominant species that are OBL, FACW and/or FAC 100 Is the hydrophytic criterion met? Yes X No ____

SOILS

Soil Series Olyic silt loam, 5-30% slopes Is the soil on the hydric soils list? Yes ___ No X

Is the soil: a Histosol? Yes X No ___ Histic epipedon present? Yes ___ No X Mottled? Yes ___ No X Gleyed? Yes ___ No X

Depth	Matrix Color	Mottle Color	Texture
0-16			peat - organic

Comments lots of logs - hard to dig Is the hydric soils criterion met? Yes X No ____

HYDROLOGY

Is the ground surface inundated? Yes ___ No X Depth of standing water _____

Is the soil saturated? Yes X No ___ Depth to saturated soil _____ Depth to free-standing water in pit _____

Mark other field indicators of surface inundation or soil saturation:

___Oxidized root zones X Water-stained leaves ___Water marks ___Surface scoured areas

X Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions

Comments _____ Is the wetland hydrology criterion met? Yes X No ___

Is the vegetation unit or plot wetland? Yes X No ____ Comments _____

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK, NT Transect/Area: 030401.D Plot: 2 Date: 7/13/98

Project/Site: NNG pipeline State: OR County: Wash

routine ~~Intermediate~~-level Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?

Yes X No ____ (If no, explain on back)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes X No ____ (If yes, explain on back) ~10 yr. old clearcut

DOMINANT VEGETATION

	Herbs	I/S	% Cover
1.	Polystichum munitum	FACU	<5
2.	Blechnum spicant	FACW	<5
3.	Athyrium filix-femina	FAC	<5
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			

	Shrubs	I/S	% Cover
21.	Gaultheria shallon	FACU	30
22.	Physocarpus capitatus	FACW-	<5
23.			
24.			
26.			

	Trees	I/S	% Cover
29.	Alnus rubra	FAC	20
30.	Pseudotsuga menz	FACU	70
19.			
20.			
21.			

Comments _____

Percent of dominant species that are OBL, FACW and/or FAC 33 Is the hydrophytic criterion met? Yes ____ No X

SOILS

Soil Series Olyic silt loam, 5-30% slopes Is the soil on the hydric soils list? Yes ___ No X

Is the soil: a Histosol? Yes ___ No X Histic epipedon present? Yes ___ No X Mottled? Yes X No ___ Gleyed? Yes ___ No X

Depth	Matrix Color	Mottle Color	Texture
0-4	10yr 3/2		silt loam
4-16	10yr 5/2	10yr 5/8	silt loam

Comments _____ Is the hydric soils criterion met? Yes X No ____

HYDROLOGY

Is the ground surface inundated? Yes ___ No X Depth of standing water _____

Is the soil saturated? Yes ___ No X Depth to saturated soil _____ Depth to free-standing water in pit _____

Mark other field indicators of surface inundation or soil saturation:

X Oxidized root zones Some ___ Water-stained leaves ___ Water marks ___ Surface scoured areas

___ Wetland drainage patterns ___ Water-borne sediment deposits ___ Drift lines ___ Morphological plant adaptions

Comments On slope - insufficient indicators Is the wetland hydrology criterion met? Yes ___ No ___

Is the vegetation unit or plot wetland? Yes ____ No X Comments border

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK RMT Transect/Area: [illegible] Plot: 1 Date: 7/13/9[illegible]

Project/Site: [illegible] State: OR County: Wash

~~Intermediate~~ Routine-level Onsite Determination Method X Or Comprehensive Onsite Determination Method ____

****

Do normal environmental conditions exists at the plant community?

Yes X No ____ (If no, explain on back)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes X No ____ (If yes, explain on back)

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Phalaris arundinacea	FACW	50	21. Oplopanax horridus	FAC+	40
2. Oenanthe sarmentosa	OBL	30	22.		
3.			23.		
4.			24.		
5.			26.		
6.			Trees		
7.			29. Pseudotsuga menziesii	FACU	40
8.			30. Alnus rubra	FAC	60
9.			19.		
10.			20.		
11.			21.		

Comments ____

Percent of dominant species that are OBL, FACW and/or FAC____ Is the hydrophytic criterion met? Yes X No ____

SOILS

Soil Series olyic silt loam 5-30% slopes Is the soil on the hydric soils list? Yes___ No X

Is the soil: a Histosol? Yes__ No X Histic epipedon present? Yes__ No X Mottled? Yes X No__ Gleyed? Yes X No__

Depth	Matrix Color	Mottle Color	Texture
0-10"	10YR 3/2		silt loam
10-10"	10YR 4/1	7.5YR 4/6	silt loam w/ some clay
		5G 5/5	

Comments ____ Is the hydric soils criterion met? Yes X No____

HYDROLOGY

Is the ground surface inundated? Yes___ No X Depth of standing water____

Is the soil saturated? Yes X No___ Depth to saturated soil 0" Depth to free-standing water in pit____

Mark other field indicators of surface inundation or soil saturation:

___Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas

___Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions

Comments ____ Is the wetland hydrology criterion met? Yes___ No___

Is the vegetation unit or plot wetland? Yes X No ____ Comments ____

There is some water parsley & skunk cabbage in this forested drainage

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): MT, LK Transect/Area: 030401B Plot: 1 Date: 7/13/98

Project/Site: NNG Pipeline State: OR County: Washington

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?

Yes X No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes ____ No X (If yes, explain)

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Oenanthe sarm.	OBL	30	21.		
2. Urtica dioica	FAC+	50	22.		
3. Phalaris arund	FACW	30	23.		
4.			24.		
5.			26.		
6.			Trees overstory cover		
7.			29. Alnus rubra	FAC	90
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments ____

Percent of dominant species that are OBL, FACW and/or FAC 100 Is the hydrophytic criterion met? Yes X No ____

SOILS

Soil Series Olyic silt loam Is the soil on the hydric soils list? Yes ___ No X

Is the soil: a Histosol? Yes __ No X Histic epipedon present? Yes __ No X Mottled? Yes X No __ Gleyed? Yes X No __

Depth	Matrix Color	Mottle Color	Texture
0-3			high OM silt loam
3-18	5Y 4/1		silty clay loam
	mixed w/ 7.5YR 5/8 pieces		clayey

Comments ____ Is the hydric soils criterion met? Yes X No ____

HYDROLOGY

Is the ground surface inundated? Yes ___ No X Depth of standing water ____

Is the soil saturated? Yes X No ___ Depth to saturated soil 0" Depth to free-standing water in pit 4"

Mark other field indicators of surface inundation or soil saturation:

___Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas

___Wetland drainage patterns X Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions

Comments ____ Is the wetland hydrology criterion met? Yes X No ___

Is the vegetation unit or plot wetland? Yes X No ____ Comments ____

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK & MT Transect/Area: 030618 Plot: 2 Date: 7/13/98

Project/Site: NNG pipeline State: OR County: Wash

Route ~~Intermediate~~-level Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?

Yes X No ____ (If no, explain on back)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes ____ No X (If yes, explain on back)

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Phalaris arundinacea	FACW	95	21.		
2. Lythrum dioica	FACW	10	22.		
3. Mentha sibirica	FAC	30	23.		
4. Pteridium aquilinum	FACU	05	24.		
5.			26.		
6.			Trees		
7.			29. Alnus rubra	FAC	95
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments

Percent of dominant species that are OBL, FACW and/or FAC 100 Is the hydrophytic criterion met? Yes X No ____

SOILS

Soil Series Olyic silt loam Is the soil on the hydric soils list? Yes ___ No X

Is the soil: a Histosol? Yes X No ___ Histic epipedon present? Yes ___ No X Mottled? Yes ___ No X Gleyed? Yes ___ No X

Depth	Matrix Color	Mottle Color	Texture
0-16"	10YR 4/2	heavy oxidized roots & weak mottling 5YR 5/6	silty clay loam

Comments weak indicators Is the hydric soils criterion met? Yes X No ___

HYDROLOGY

Is the ground surface inundated? Yes ___ No X Depth of standing water ____

Is the soil saturated? Yes ___ No X Depth to saturated soil ____ Depth to free-standing water in pit ____

Mark other field indicators of surface inundation or soil saturation:

X Oxidized root zones ___ Water-stained leaves ___ Water marks ___ Surface scoured areas

___ Wetland drainage patterns ___ Water-borne sediment deposits ___ Drift lines ___ Morphological plant adaptions

Comments weak indicators - only oxidized Is the wetland hydrology criterion met? Yes ___ No X

Is the vegetation unit or plot wetland? Yes ____ No X (not) Comments Border plot

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): Lk, MT Transect/Area: 030401B Plot: 3 Date: 7/13/98

Project/Site: NING pipeline State: OR County: Clatsop, Wash.

Routine Onsite Determination Method ___ Or Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?

Yes X No _____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes _____ No X (If yes, explain)

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Elymus glaucus	FACU	80	21.		
2.			22.		
3. Claytonia sibirica	FAC	30	23.		
4. Saxifraga nuttallii	OBL	40	24.		
5. Circaea alpina	FAC+	<5	26.		
6.			Trees		
7.			29. Alnus rubra	FAC	95
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments _____

Percent of dominant species that are OBL, FACW and/or FAC 75 Is the hydrophytic criterion met? Yes X No ___

SOILS

Soil Series Olyic silt loam Is the soil on the hydric soils list? Yes ___ No X

Is the soil: a Histosol? Yes ___ No X Histic epipedon present? Yes ___ No X Mottled? Yes X No ___ Gleyed? Yes ___ No X

Depth	Matrix Color	Mottle Color	Texture
0-16"	2.5Y 3/2	5YR 5/6	silt loam

Comments _____ Is the hydric soils criterion met? Yes X No ___

HYDROLOGY

Is the ground surface inundated? Yes ___ No X Depth of standing water _____

Is the soil saturated? Yes ___ No X Depth to saturated soil _____ Depth to free-standing water in pit _____

Mark other field indicators of surface inundation or soil saturation:

___Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas

___Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions

Comments no indicators Is the wetland hydrology criterion met? Yes ___ No ___

Is the vegetation unit or plot wetland? Yes ___ No X Comments No hydrology

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): CK & MT Transect/Area: 03040 IA Plot: 1 Date: 7/13/98

Project/Site: NWG pipeline State: OR County: Washington

Routine Onsite Determination Method ____ Or Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?

Yes X No _____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes X No _____ (If yes, explain) NWG pipeline

DOMINANT VEGETATION

Herbs	I/S	% Cover
1. Oenanthe sarmentosa	OBL	45
2. Phalaris arundinacea	FACW	30
3. Glyceria elata	FACW+	5
4. Equisetum telmateia	FACW	<5
5.		
6.		
7.		
8.		
9.		
10.		
11.		

Shrubs	I/S	% Cover
21. Rubus spectabilis	FAC	10
22.		
23.		
24.		
26.		
Trees		
29. Alnus rubra	FAC	20
30.		
19.		
20.		
21.		

Comments _____

Percent of dominant species that are OBL, FACW and/or FAC 100 Is the hydrophytic criterion met? Yes X No____

SOILS

Soil Series Melby silt loam 2-30% slope Is the soil on the hydric soils list? Yes___ No X

Is the soil: a Histosol? Yes__ No X Histic epipedon present? Yes__ No X Mottled? Yes X No__ Gleyed? Yes X No__

Depth	Matrix Color	Mottle Color	Texture
0-6"	7.5YR 4/2	7.5YR 6/6	silty clay loam
6"-16"	10YR 4/1	7.5YR 6/6	silty clay loam w/ some gravel

Comments_____ Is the hydric soils criterion met? Yes X No____

HYDROLOGY

Is the ground surface inundated? Yes___ No X Depth of standing water_____

Is the soil saturated? Yes X No___ Depth to saturated soil 0" Depth to free-standing water in pit 12"

Mark other field indicators of surface inundation or soil saturation:

___Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas

___Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions

Comments_____ Is the wetland hydrology criterion met? Yes X No___

Is the vegetation unit or plot wetland? Yes X No ____ Comments Steep slopes bordered by salmonberry & no evidence of hydrology - no plot 2

one foot from the center of the drainage

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK, MT Transect/Area: 030412A Plot: 1 Date: 7/13/98

Project/Site: NNG Pipeline State: OR County: Washington

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?

Yes X No ___ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes X No ___ (If yes, explain) adj. to gravel roads & in pipeline ROW

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Phalaris arund.	FACW	100	21.		
2. Equisetum telm.	FACW	<5	22.		
3. Stachys cooleya	FACW	<5	23.		
4.			24.		
5.			26.		
6.			Trees		
7.			29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments ___

Percent of dominant species that are OBL, FACW and/or FAC 100 Is the hydrophytic criterion met? Yes X No ___

SOILS

Soil Series Melby silt loam 2-30% Is the soil on the hydric soils list? Yes ___ No X

Is the soil: a Histosol? Yes ___ No X Histic epipedon present? Yes ___ No X Mottled? Yes X No ___ Gleyed? Yes X No ___

Depth	Matrix Color	Mottle Color	Texture
0-4	10 yr 5/3		high OM silt loam
4-18	5y 4/1	7.5 yr 5/8	silt loam w/gravel

Comments ___ Is the hydric soils criterion met? Yes X No ___

HYDROLOGY

Is the ground surface inundated? Yes ___ No X Depth of standing water ___

Is the soil saturated? Yes X No ___ Depth to saturated soil 0" Depth to free-standing water in pit ___

Mark other field indicators of surface inundation or soil saturation:

X Oxidized root zones ___ Water-stained leaves ___ Water marks ___ Surface scoured areas

X Wetland drainage patterns (ditches) ___ Water-borne sediment deposits ___ Drift lines ___ Morphological plant adaptions

Comments ___ Is the wetland hydrology criterion met? Yes X No ___

Is the vegetation unit or plot wetland? Yes X No ___ Comments ___

border @ roadside

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK, MT Transect/Area: 030412A Plot: 2 Date: 7/13/98

Project/Site: NNG Pipeline State: OR County: Columbia

Routine Onsite Determination Method X **Or** Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?
Yes X No ____ (If no, explain) , just above drainage channel on slope

Has the vegetation, soils and/or hydrology been significantly disturbed?
Yes X No ____ (If yes, explain) adj. to roads - hard to tell if/how much has been disturbed

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Phalaris arund.		100	21.		
2. Equisetum telm.		10	22.		
3. Polystichum munit		<5	23.		
4.			24.		
5.			26.		
6.			Trees		
7.			29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments ____

Percent of dominant species that are OBL, FACW and/or FAC 100 Is the hydrophytic criterion met? Yes X No ____

SOILS

Soil Series Mulkey silt loam Is the soil on the hydric soils list? Yes ___ No X

Is the soil: a Histosol? Yes ___ No X Histic epipedon present? Yes ___ No X Mottled? Yes ___ No X Gleyed? Yes ___ No X

Depth	Matrix Color	Mottle Color	Texture
0-4	10 yr 5/4		silt loam
4-18	10 yr 3/2		"

Comments ____ Is the hydric soils criterion met? Yes ____ No X

HYDROLOGY

Is the ground surface inundated? Yes ___ No X Depth of standing water ____

Is the soil saturated? Yes X No X Depth to saturated soil 18" Depth to free-standing water in pit ____

Mark other field indicators of surface inundation or soil saturation: ↳ too deep for wetland

X Oxidized root zones ___ Water-stained leaves ___ Water marks ___ Surface scoured areas

___ Wetland drainage patterns ___ Water-borne sediment deposits ___ Drift lines ___ Morphological plant adaptions

Comments insufficient evidence Is the wetland hydrology criterion met? Yes ___ No X

Is the vegetation unit or plot wetland? Yes ____ No X Comments Wetland boundary Upland

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK, MT Transect/Area: 030412B Plot: 1 Date: 7/13/98

Project/Site: NNG pipeline State: OR County: Washington

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?

Yes X No ___ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes X No ___ (If yes, explain) clear cut - not replanted yet

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Phalaris arund.	FACW	90	21. Rubus ursinus		20
2. Epilobium watsonii	FACW	<5	22.		
3. Stachys cooleya	FACW	10	23.		
4.			24.		
5.			26.		
6.			Trees		
7.			29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments

Percent of dominant species that are OBL, FACW and/or FAC 66 Is the hydrophytic criterion met? Yes X No ___

SOILS

Soil Series Malby silt loam Is the soil on the hydric soils list? Yes ___ No X

Is the soil: a Histosol? Yes ___ No X Histic epipedon present? Yes ___ No X Mottled? Yes X No ___ Gleyed? Yes X No ___

Depth	Matrix Color	Mottle Color	Texture
0-6	5YR 4/1		silt loam
6-16	5YR 6/1	7.5YR 5/6	silt loam
0-1			organic matter

Comments Is the hydric soils criterion met? Yes X No ___

HYDROLOGY

Is the ground surface inundated? Yes ___ No X Depth of standing water ___

Is the soil saturated? Yes ___ No X Depth to saturated soil ___ Depth to free-standing water in pit ___

Mark other field indicators of surface inundation or soil saturation:

X Oxidized root zones ___ Water-stained leaves ___ Water marks ___ Surface scoured areas

X Wetland drainage patterns ___ Water-borne sediment deposits ___ Drift lines ___ Morphological plant adaptions

Comments moist soil throughout pit Is the wetland hydrology criterion met? Yes X No ___

low area on either side of intermittent stream

Is the vegetation unit or plot wetland? Yes X No ___ Comments PEM disturbed, seasonal

upland boundary - Soil orange silt loam w/gray clay inclusions

phalaris dominated but also w/ upland spp. (see back)

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK & DF Transect/Area: 030333B Plot: 1 Date: 5/28/98

Project/Site: NNG pipeline State: OR County: Washington

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?

Yes X No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed? Farming

Yes X No ____ (If yes, explain)

DOMINANT VEGETATION – Plowed field no veg.

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1.			21.		
2.			22.		
3.			23.		
4.			24.		
5.			26.		
6.			Trees		
7.			29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments ____

Percent of dominant species that are OBL, FACW and/or FAC____ Is the hydrophytic criterion met? Yes____ No____ NA

SOILS

Soil Series McBee silty clay loam including Is the soil on the hydric soils list? Yes X No__

Is the soil: a Histosol? Yes__ No__ Histic epipedon present? Yes__ No__ Mottled? Yes X No__ Gleyed? Yes__ No X

Depth	Matrix Color	Mottle Color	Texture
0-14"	5Y 2.5/1	10YR 3/4	silt loam

Comments Concretions the same color as the mottles Is the hydric soils criterion met? Yes X No____

HYDROLOGY ~~and~~

Is the ground surface inundated? Yes___ No X Depth of standing water____

Is the soil saturated? Yes X No___ Depth to saturated soil 0" Depth to free-standing water in pit 3"

Mark other field indicators of surface inundation or soil saturation:

X Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas

___Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions

Comments adjacent areas have standing water Is the wetland hydrology criterion met? Yes___ No___

Is the vegetation unit or plot wetland? Yes X No ____ Comments____

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): DF Transect/Area: 020309A Plot: 1 Date: 5/7/98

Project/Site: NNG State: OK County: Washington

Routine ~~Intermediate-level~~ Onsite Determination Method ✓ Or Comprehensive Onsite Determination Method ____

****

Do normal environmental conditions exists at the plant community? Pipeline easement

Yes ✓ No ____ (If no, explain on back)

Has the vegetation, soils and/or hydrology been significantly disturbed? Soils mixed together

Yes ✓ No ____ (If yes, explain on back)

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Equisetum arvense		5	21. Rubus discolor	FACW	50
2. Apocynum cannabinii	FACW	40	22. Rubus ursinus	FACW	60
3. Tellima grandiflora		<5	23.		
4. Carex arcta	OBL	<5	24.		
5. Medicago sp.	NSPP	40	26.		
6.			Trees		
7.			29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments ____

Percent of dominant species that are OBL, FACW and/or FAC 50 Is the hydrophytic criterion met? Yes____ No ✓

SOILS

In drums

Soil Series Woodburn silt loam 3-7% Is the soil on the hydric soils list? Yes ^ No__

Is the soil: a Histosol? Yes__ No ✓ Histic epipedon present? Yes__ No ✓ Mottled? Yes ✓ No__ Gleyed? Yes ✓ No__

Depth	Matrix Color	Mottle Color	Texture
0-10	10YR 3/2 + N6/	10YR 4/6	silt loam + clay

Comments ____ Is the hydric soils criterion met? Yes ✓ No____

HYDROLOGY

Is the ground surface inundated? Yes___ No ✓ Depth of standing water____

Is the soil saturated? Yes ✓ No___ Depth to saturated soil 8" Depth to free-standing water in pit____

Mark other field indicators of surface inundation or soil saturation:

___Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas

___Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions

Comments near stream channel Is the wetland hydrology criterion met? Yes ✓ No___

Is the vegetation unit or plot wetland? Yes ✓ No ____ Comments area has been disturbed— assumed to be wetland based on soil + hydrology

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK & DF Transect/Area: 020309A Plot: 2 Date: 5/7/98

Project/Site: NNG Pipeline State: OR County: Washington

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?
Yes X No ___ (If no, explain) The plot is along the existing pipeline route

Has the vegetation, soils and/or hydrology been significantly disturbed?
Yes X No ___ (If yes, explain)

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Equisetum hyemale	FACW	5%	21. Rubus procerus	FACU	20%
2. Melica sp.	FAC or FACU	5%	22. Rubus parviflorus	FAC-	20%
3. Holcus lanatus	FAC	<5%	23. Rubus lacinatus	FACU	10%
4.			24.		
5.			26.		
6.			Trees		
7.			29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments

Percent of dominant species that are OBL, FACW and/or FAC 40% Is the hydrophytic criterion met? Yes ___ No X

SOILS

Soil Series Wood burn silt loam 3-7 % slope Is the soil on the hydric soils list? Yes X No ___

Is the soil: a Histosol? Yes ___ No ___ Histic epipedon present? Yes ___ No ___ Mottled? Yes ___ No X Gleyed? Yes ___ No X

Depth	Matrix Color	Mottle Color	Texture
0-14"	10YR 4/4		silt loam weak 1 low
14-16"	10YR 6/2	7.5YR 4/6	silt loam w/ gravel

Comments weak mottles indicators Is the hydric soils criterion met? Yes ___ No X

HYDROLOGY

Is the ground surface inundated? Yes ___ No X Depth of standing water ___

Is the soil saturated? Yes ___ No X Depth to saturated soil ___ Depth to free-standing water in pit ___

Mark other field indicators of surface inundation or soil saturation:

___Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas

___Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions

Comments ___ Is the wetland hydrology criterion met? Yes ___ No X

Is the vegetation unit or plot wetland? Yes ___ No X Comments ___

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): DE & LK Transect/Area: 020309B Plot: 1 Date: 5/7/98

Project/Site: NNG Pipeline State: OR County: Washington

Routine Onsite Determination Method X **Or** Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?

Yes X No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes X No ____ (If yes, explain) Dairy Creek Flood is adjacent to this wetland

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Phalaris arundinacea	FACW	100%	21. Rubus procerus	FACU	5%
2.			22.		
3.			23.		
4.			24.		
5.			26.		
6.			Trees		
7.			29. Populus balsamifera	FAC	30%
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments ____

Percent of dominant species that are OBL, FACW and/or FAC 67% Is the hydrophytic criterion met? Yes X No ____

SOILS

Soil Series Amity silt loam inclusions Is the soil on the hydric soils list? Yes X No ___

Is the soil: a Histosol? Yes ___ No X Histic epipedon present? Yes ___ No X Mottled? Yes X No ___ Gleyed? Yes ___ No X

Depth	Matrix Color	Mottle Color	Texture
0-14"	10YR 3/2	10YR 3/4	clay loam

Comments ____ Is the hydric soils criterion met? Yes X No ____

HYDROLOGY

Is the ground surface inundated? Yes ___ No X Depth of standing water ____

Is the soil saturated? Yes X No ___ Depth to saturated soil 9" Depth to free-standing water in pit ____

Mark other field indicators of surface inundation or soil saturation:

___Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas

SD X Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions

Comments ____ Is the wetland hydrology criterion met? Yes ___ No ___

Is the vegetation unit or plot wetland? Yes X No ____ Comments ____

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): CK BF Transect/Area: 020309B Plot: 2 Date: 5/7/98

Project/Site: NNG pipeline State: OR County: Columbia

Routine Onsite Determination Method X **Or** Comprehensive Onsite Determination Method ____

****

Do normal environmental conditions exists at the plant community?

Yes X No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed? between a road & a pipeline

Yes X No ____ (If yes, explain)

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Phalaris arundinacea	FACW	80	21. Rubus discolor	FACU	25
2.			22.		
3.			23.		
4.			24.		
5.			26.		
6.			Trees		
7.			29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments ____

Percent of dominant species that are OBL, FACW and/or FAC 50% Is the hydrophytic criterion met? Yes ✓ No ____

SOILS

Soil Series Amity silt loam inclusions Is the soil on the hydric soils list? Yes X No ____

Is the soil: a Histosol? Yes ____ No ✓ Histic epipedon present? Yes ____ No X Mottled? Yes X No ____ Gleyed? Yes ____ No X

Depth	Matrix Color	Mottle Color	Texture
0-16	10YR 4/3	10YR 4/6	Silt loam

Comments ____ Is the hydric soils criterion met? Yes ____ No ✓

HYDROLOGY

Is the ground surface inundated? Yes ____ No ✓ Depth of standing water ____

Is the soil saturated? Yes ____ No ✓ Depth to saturated soil ____ Depth to free-standing water in pit ____

Mark other field indicators of surface inundation or soil saturation:

___Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas

___Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions

Comments ____ Is the wetland hydrology criterion met? Yes ____ No ✓

Is the vegetation unit or plot wetland? Yes ____ No X Comments ____

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK & MT Transect/Area: 0203096 Plot: 1 Date: 7/10/98
Project/Site: NNG Probe State: OR County: Washington
Intermediate-level Onsite Determination Method X Or Comprehensive Onsite Determination Method ____
****

Do normal environmental conditions exists at the plant community?
Yes X No ____ (If no, explain on back)
Has the vegetation, soils and/or hydrology been significantly disturbed?
Yes ____ No X (If yes, explain on back)

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Phalaris arundinacea	FACW	100	21. Ribes procerus	FAC U	25
2.			22.		
3.			23.		
4.			24.		
5.			26.		
6.			Trees		
7.			29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments
Percent of dominant species that are OBL, FACW and/or FAC 100 Is the hydrophytic criterion met? Yes X No ____

SOILS

Soil Series Woodburn silt loam including Is the soil on the hydric soils list? Yes X No ____
Is the soil: a Histosol? Yes ____ No X Histic epipedon present? Yes ____ No X Mottled? Yes X No ____ Gleyed? Yes X No ____

Depth	Matrix Color	Mottle Color	Texture
0-10"	5Y 3/2		silty clay loam with some gravel
10"-16"	5GY 6/1	10YR 6/6 strong	clay

Comments Is the hydric soils criterion met? Yes X No ____

HYDROLOGY

Is the ground surface inundated? Yes ____ No X Depth of standing water ____
Is the soil saturated? Yes X No ____ Depth to saturated soil 4"-10" Depth to free-standing water in pit ____
Mark other field indicators of surface inundation or soil saturation: but not below in the clay layer
____Oxidized root zones ____Water-stained leaves ____Water marks ____Surface scoured areas
____Wetland drainage patterns X Water-borne sediment deposits Some ____Drift lines ____Morphological plant adaptions
Comments weak indicators but probably Is the wetland hydrology criterion met? Yes X No ____
holds water just below the surface
Is the vegetation unit or plot wetland? Yes X No ____ Comments ____

to either side there are Oregon ash trees
Yellowthroats

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK & MT Transect/Area: 020309 C Plot: 2 Date: 7/10/98

Project/Site: NNG Pipeline State: OR County: Columbia

Routine Onsite Determination Method ___ **Or** Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?

Yes X No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes ____ No X (If yes, explain)

DOMINANT VEGETATION

Herbs	I/S	% Cover
1. Stachys cooleya	FACW	70
2. Carex deweyana		30
3. Poa trivialis		15
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		

Shrubs	I/S	% Cover
21. Rosa pisocarpus		<5
22. Physocarpus		<5
23. Rubus ursinus		<5
24.		
26.		
Trees overstory cover + rooted in area		
29. Fraxinus latifolia		80
30.		
19.		
20.		
21.		

Comments Ribes or Physocarpus flws capitate/umbellate, 3-carpeled fruits, alt. lvs

Percent of dominant species that are OBL, FACW and/or FAC 75 Is the hydrophytic criterion met? Yes X No ____

Poa - stoloniferous, ~4dm tall, coarse, few flwd, w/clusters

SOILS

Soil Series Woodburn silt loam Is the soil on the hydric soils list? Yes X No__

Is the soil: a Histosol? Yes__ No X Histic epipedon present? Yes__ No X Mottled? Yes X No__ Gleyed? Yes X No__

Depth	Matrix Color	Mottle Color	Texture
0-14	5 yr 4/1	2.5 yr 4/6	silt loam
14-18	5 y 6/1	10 yr 2 5/8	silty clay loam

Comments ____ Is the hydric soils criterion met? Yes X No____

HYDROLOGY

Is the ground surface inundated? Yes___ No X Depth of standing water____

Is the soil saturated? Yes X No___ Depth to saturated soil 12" Depth to free-standing water in pit____

Mark other field indicators of surface inundation or soil saturation:

___Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas

___Wetland drainage patterns X Water-borne sediment deposits (some) ___Drift lines ___Morphological plant adaptions

Comments Wetl indicators—probably doesn't have surface water, but at least saturated soil Is the wetland hydrology criterion met? Yes X No___

Is the vegetation unit or plot wetland? Yes X No ____ Comments____

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): L16, MT Transect/Area: 020309C Plot: 3 Date: 7/10/98

Project/Site: NNG Pipeline State: OR County: Washington

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?

Yes X No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes X No ____ (If yes, explain) adj. to an ag field

DOMINANT VEGETATION

lvs 3, whitish stem - possibly dwarf sp.

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Stachys ajugoides	FACW	30	21. Rubus ursinus	UPL	50
2. Hordeum mollis	FACU	10	22.		
3. Tolmiea menz	FAC	10	23.		
4. Poa sp.		5	24.		
5. Pteridium	FACU	10	26.		
6.			Trees – overstory – rooted here		
7.			29. Fraxinus latifolia	FAC	20
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments ____

Percent of dominant species that are OBL, FACW and/or FAC 50 Is the hydrophytic criterion met? Yes____ No X

SOILS

Soil Series Woodburn silt loam Is the soil on the hydric soils list? Yes X No__

Is the soil: a Histosol? Yes__ No X Histic epipedon present? Yes__ No X Mottled? Yes__ No X Gleyed? Yes__ No X

Depth	Matrix Color	Mottle Color	Texture
0-4	5YR 4/1		silt loam
4-16	10YR 5/3 or 5/4		" "

Comments ____ Is the hydric soils criterion met? Yes X No____

HYDROLOGY

Is the ground surface inundated? Yes___ No X Depth of standing water____

Is the soil saturated? Yes X No___ Depth to saturated soil 14 Depth to free-standing water in pit____

Mark other field indicators of surface inundation or soil saturation:

___Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas

___Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions

Comments insufficient indicators Is the wetland hydrology criterion met? Yes___ No X

Is the vegetation unit or plot wetland? Yes ____ No X Comments ____

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): WT, LK Transect/Area: 020316A Plot: 1 Date: 7/10/98

Project/Site: NN6 Pipeline State: OR County: Washington

Routine Onsite Determination Method X **Or** Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?

Yes X No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes X No ____ (If yes, explain) cattle or horse pasture & pipeline ROW heavily compacted very small wet depression ~20' diameter

DOMINANT VEGETATION

Herbs	I/S	% Cover
1. Poa pratensis	FACW	90
2. Ranunculus repens		<5
3. Unk. herb		<5
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		

Shrubs	I/S	% Cover
21.		
22.		
23.		
24.		
26.		

Trees		
29. Acer macrophyllum		
30. Fraxinus latifolia		
19. Pseudotsuga menz		
20.		
21.		

nearby but not in plot

Comments unknown - Yellow composite - weed

Percent of dominant species that are OBL, FACW and/or FAC 100 Is the hydrophytic criterion met? Yes X No ___

SOILS

Soil Series Woodburn silt loam Is the soil on the hydric soils list? Yes X No ___ including

Is the soil: a Histosol? Yes ___ No X Histic epipedon present? Yes ___ No X Mottled? Yes ___ No X Gleyed? Yes ___ No X

Depth	Matrix Color	Mottle Color	Texture
0-4	10YR 4/2		Silt loam
4-16	10YR 5/3		"

Comments ___ Is the hydric soils criterion met? Yes ___ No X

HYDROLOGY

Is the ground surface inundated? Yes ___ No X Depth of standing water ___

Is the soil saturated? Yes ___ No X Depth to saturated soil ___ Depth to free-standing water in pit ___

Mark other field indicators of surface inundation or soil saturation:

___Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas

___Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions

Comments No indicators Is the wetland hydrology criterion met? Yes ___ No X

Is the vegetation unit or plot wetland? Yes ___ No X Comments ___

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): MT, LK Transect/Area: 020316A Plot: 2 Date: 7/10/98

Project/Site: NNG Pipeline State: OR County: Washington

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?

Yes X No ____ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes X No ____ (If yes, explain) same as plot 1

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Poa palustris	FACW	40	21.		
2. Juncus effusus	FACW	40	22.		
3. Glechoma (Re-finite)		<5	23.		
4. Potentilla (horse)		<5	24.		
5. Lady fern		<5	26.		
6. Holcus lanatus	FAC	10	Trees		
7. Unknown herb		<5	29.		
8. Fragaria sp.		<5	30.		
9.			19.		
10.			20.		
11.			21.		

Comments _____

Percent of dominant species that are OBL, FACW and/or FAC 80 Is the hydrophytic criterion met? Yes X No____

SOILS

Soil Series Woodburn silt loam Is the soil on the hydric soils list? Yes X (inclusion) No__

Is the soil: a Histosol? Yes__ No X Histic epipedon present? Yes__ No X Mottled? Yes X No__ Gleyed? Yes__ No X

Depth	Matrix Color	Mottle Color	Texture
0-6	10 yr 4/1		silt loam
6-16	10 yr 5/2	7.5 yr 4/6	n

Comments _____ Is the hydric soils criterion met? Yes X No____

HYDROLOGY

Is the ground surface inundated? Yes___ No X Depth of standing water_____

Is the soil saturated? Yes___ No X Depth to saturated soil_____ Depth to free-standing water in pit_____

Mark other field indicators of surface inundation or soil saturation:

X Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas

___Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions

Comments weak indicators - marginal Is the wetland hydrology criterion met? Yes X No___

Is the vegetation unit or plot wetland? Yes X No ____ Comments barely meets wetland criteria

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): DLF, LRK Transect/Area: 020322D Plot: 1 Date: 5/28/98

Project/Site: UNG State: OR County: Washington

Routine Onsite Determination Method ✓ Or Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community? along pipeline easement adjacent to willow farm

Yes ✓ No ___ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes ✓ No ___ (If yes, explain)

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Phalaris arundinacea	FACW	100	21.		
2.			22.		
3.			23.		
4.			24.		
5.			26.		
6.			Trees		
7.			29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments ___

Percent of dominant species that are OBL, FACW and/or FAC 100 Is the hydrophytic criterion met? Yes ✓ No ___

SOILS

Soil Series Wapato silty clay loam Is the soil on the hydric soils list? Yes X No ___

Is the soil: a Histosol? Yes ___ No ✓ Histic epipedon present? Yes ___ No ✓ Mottled? Yes X No ___ Gleyed? Yes X No ___

Depth	Matrix Color	Mottle Color	Texture
0-6	10YR 3/3	7.5YR 4/6	clay loam
6-12	10YR 5/2	7.5YR 5/8	clay loam
12-18	10YR 3/1	7.5YR 5/8	clay loam

Comments ___ Is the hydric soils criterion met? Yes ✓ No ___

HYDROLOGY

Is the ground surface inundated? Yes ___ No ✓ Depth of standing water ___ : ___

Is the soil saturated? Yes ✓ No ___ Depth to saturated soil ___ Depth to free-standing water in pit ___

Mark other field indicators of surface inundation or soil saturation:

✓ Oxidized root zones ___ Water-stained leaves ___ Water marks ___ Surface scoured areas

___ Wetland drainage patterns ___ Water-borne sediment deposits ___ Drift lines ___ Morphological plant adaptions

Comments adjacent to stream Is the wetland hydrology criterion met? Yes ✓ No ___

Is the vegetation unit or plot wetland? Yes ✓ No ___ Comments ___

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): DLF LRK Transect/Area: 020322D Plot: 2 Date: 5/28/98

Project/Site: NNG State: OR County: Washington

Routine Onsite Determination Method ✓ Or Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community? Ag land
Yes ✓ No ___ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?
Yes ✓ No ___ (If yes, explain)

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Trifolium pratense	FACU	20	21.		
2. Agrostis alba	FAC	10	22.		
3. Lolium multiflorum	NL	60	23.		
4. Plantago lanceolata		5	24.		
5. Geranium dissectum		<5	26.		
6. Myosotis laxa		5	Trees		
7. Phalaris arundinacea		5	29.		
8. Lupinus sp.		<5	30.		
9. Juncus effusus		5	19.		
10. Rumex occidentalis		<5	20.		
11.			21.		

Comments

Percent of dominant species that are OBL, FACW and/or FAC 50 Is the hydrophytic criterion met? Yes ___ No ✓

SOILS

Soil Series Wapato silty clay loam Is the soil on the hydric soils list? Yes ✓ No ___
Is the soil: a Histosol? Yes ___ No ✓ Histic epipedon present? Yes ___ No ✓ Mottled? Yes ✓ No ___ Gleyed? Yes ✓ No ___

Depth	Matrix Color	Mottle Color	Texture
0-3	10YR 3/2	7.5YR 5/8	clay loam
3-18	10YR 4/1	7.5YR 5/8	clay loam

Comments Is the hydric soils criterion met? Yes ✓ No ___

HYDROLOGY

Is the ground surface inundated? Yes ___ No ✓ Depth of standing water ___
Is the soil saturated? Yes ✓ No ___ Depth to saturated soil 3" Depth to free-standing water in pit ___
Mark other field indicators of surface inundation or soil saturation:
✓ Oxidized root zones ___ Water-stained leaves ___ Water marks ___ Surface scoured areas
___ Wetland drainage patterns ___ Water-borne sediment deposits ___ Drift lines ___ Morphological plant adaptions
Comments Is the wetland hydrology criterion met? Yes ✓ No ___

Is the vegetation unit or plot wetland? Yes ✓ No ___ Comments

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): DLF LRK Transect/Area: 020322D Plot: 3 Date: 5/28/98

Project/Site: NNG State: OR County: Washington

Routine Onsite Determination Method ✓ Or Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community? Pasture

Yes ✓ No ___ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes ✓ No ___ (If yes, explain)

DOMINANT VEGETATION

Herbs	I/S	% Cover
1. Sonchus arvensis	FACU	30
2. Rumex acetosella		5
3. Holcus lanatus		5
4. Bromus sp.		<5
5. Agrostis alba	FAC	15
6. Plantago lanceolata	FAC	15
7. Daucus carota		<5
8. Rumex occidentalis	FACW	30
9. thistle		<5
10. Lolium multiflorum	NL	25
11. Cirsium vulgare	FACU	10

50/20 rule

Shrubs	I/S	% Cover
21.		
22.		
23.		
24.		
26.		
Trees		
29.		
30.		
19.		
20.		
21.		

Comments

Percent of dominant species that are OBL, FACW and/or FAC 33 Is the hydrophytic criterion met? Yes ___ No ✓

SOILS

Soil Series Wapato silty clay loam Is the soil on the hydric soils list? Yes ✓ No ___

Is the soil: a Histosol? Yes ___ No ✓ Histic epipedon present? Yes ___ No ✓ Mottled? Yes ✓ No ___ Gleyed? Yes ___ No ✓

Depth	Matrix Color	Mottle Color	Texture
0-10	10YR 3/3	7.5YR 4/6	clay loam
10-18	10YR 5/2	7.5YR 4/6	silty sandy loam

Comments Is the hydric soils criterion met? Yes ✓ No ___

HYDROLOGY

Is the ground surface inundated? Yes ___ No ✓ Depth of standing water ___

Is the soil saturated? Yes ___ No ✓ Depth to saturated soil ___ Depth to free-standing water in pit ___

Mark other field indicators of surface inundation or soil saturation:

___Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas

___Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions

Comments Is the wetland hydrology criterion met? Yes ___ No ✓

Is the vegetation unit or plot wetland? Yes ___ No ✓ Comments

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): DLF LRK Transect/Area: 020322E Plot: 1 Date: 05/28/98

Project/Site: NNG State: OR County: Washington

Routine Onsite Determination Method ✓ Or Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community? Pasture

Yes ✓ No ___ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes ✓ No ___ (If yes, explain)

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Trifolium pratense	FACU	10	21.		
2. Lolium multiflorum	NL	35	22.		
3. Agrostis tenuis	FAC	35	23.		
4. grass spp.	NSPP	10	24.		
5. Trifolium repens	FAC	10	26.		
6.			Trees		
7.			29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments grass spp mowed & chewed down by cattle — difficult to i.d.

Percent of dominant species that are OBL, FACW and/or FAC___ Is the hydrophytic criterion met? Yes___ No___

SOILS

Soil Series Wapato silty clay loam Is the soil on the hydric soils list? Yes ✓ No___

Is the soil: a Histosol? Yes__ No ✓ Histic epipedon present? Yes__ No ✓ Mottled? Yes ✓ No__ Gleyed? Yes ✓ No__

Depth	Matrix Color	Mottle Color	Texture
0-11	10YR 3/2		clay loam
11-18	10YR 4/1	7.5YR 4/6	clay loam

Comments___ Is the hydric soils criterion met? Yes ✓ No___

HYDROLOGY

Is the ground surface inundated? Yes___ No___ Depth of standing water___

Is the soil saturated? Yes ✓ No___ Depth to saturated soil Surface Depth to free-standing water in pit___

Mark other field indicators of surface inundation or soil saturation:

___Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas

___Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions

Comments area inundated to 5" near plot Is the wetland hydrology criterion met? Yes ✓ No___

Is the vegetation unit or plot wetland? Yes ✓ No ___ Comments hydrology was used predominantly as veg. was difficult to identify

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK, DF Transect/Area: 0203 22A (in sec.) Plot: 1 Date: 5/27/98

Project/Site: NNG pipeline State: OR County: Washington

Routine Onsite Determination Method x Or Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?

Yes ✓ No ___ (If no, explain)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes ✓ No ___ (If yes, explain) hay pasture

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Agrostis alba	FAC	100%	21.		
2. Trifolium repens	FAC	70%	22.		
3. Phleum pratense	FAC-	20%	23.		
4.			24.		
5.			26.		
6.			Trees		
7.			29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments

Percent of dominant species that are OBL, FACW and/or FAC 67% Is the hydrophytic criterion met? Yes X No___

SOILS

Soil Series Napato silty clay loam Is the soil on the hydric soils list? Yes ✓ No___

Is the soil: a Histosol? Yes___ No ✓ Histic epipedon present? Yes___ No ✓ Mottled? Yes ✓ No___ Gleyed? Yes___ No ✓

Depth	Matrix Color	Mottle Color	Texture
0-10"	10YR 3/2		clay loam
10"-18"	10YR 3/2	7.5YR 3/4	clay loam

Comments Top layer may have been disked Is the hydric soils criterion met? Yes X No___

HYDROLOGY

Is the ground surface inundated? Yes___ No X Depth of standing water___ water seeping in at 13"

Is the soil saturated? Yes X No___ Depth to saturated soil 8" Depth to free-standing water in pit 15"

Mark other field indicators of surface inundation or soil saturation:

___Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas

___Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions

Comments Floodplain Is the wetland hydrology criterion met? Yes X No___

Is the vegetation unit or plot wetland? Yes X No ___ Comments

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): LK, DF Transect/Area: 020322A Plot: 2 Date: 5/27/98

Project/Site: NNG Pipeline State: OR County: Washington

Routine Onsite Determination Method X Or Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?
Yes X No ___ (If no, explain)
Has the vegetation, soils and/or hydrology been significantly disturbed?
Yes X No ___ (If yes, explain)

this is grazing pasture which has likely been disked

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Medicago Sativa	FNL	85%	21.		
2. Agropyron repens	FAC-	30%	22.		
3. Festuca arundinacea	FAC-	15%	23.		
4.			24.		
5.			26.		
6.			Trees		
7.			29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments

Percent of dominant species that are OBL, FACW and/or FAC 100 Is the hydrophytic criterion met? Yes ___ No X

SOILS

Soil Series Wapato silty clay loam Is the soil on the hydric soils list? Yes ✓ No ___
Is the soil: a Histosol? Yes ___ No ✓ Histic epipedon present? Yes ___ No ✓ Mottled? Yes ✓ No ___ Gleyed? Yes ___ No ✓

Depth	Matrix Color	Mottle Color	Texture
0-14"	10YR 3/2		Clay loam
14"-16"	10YR 3/2	5YR 5/8	Clay loam

Comments Is the hydric soils criterion met? Yes ___ No X
weak mottles blow

HYDROLOGY

Is the ground surface inundated? Yes ___ No X Depth of standing water ___
Is the soil saturated? Yes ___ No X Depth to saturated soil ___ Depth to free-standing water in pit ___
Mark other field indicators of surface inundation or soil saturation:
___Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas
___Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions
Comments Is the wetland hydrology criterion met? Yes ___ No ___

Is the vegetation unit or plot wetland? Yes ___ No X Comments

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): DLF Transect/Area: 0203 35A Plot: 1 Date: 5/7/98

Project/Site: NNG State: OR County: Washington

Barbara ~~Intermediate level~~ Onsite Determination Method ✓ Or Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community? Cropland

Yes ✓ No ___ (If no, explain on back)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes ✓ No ___ (If yes, explain on back)

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1.			21.		
2.			22.		
3.			23.		
4.			24.		
5.			26.		
6.			Trees		
7.			29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments Bean crop growing

Percent of dominant species that are OBL, FACW and/or FAC___ Is the hydrophytic criterion met? Yes___ No___

SOILS

Soil Series Wapato silty clay loam Is the soil on the hydric soils list? Yes ✓ No___

Is the soil: a Histosol? Yes___ No ✓ Histic epipedon present? Yes___ No ✓ Mottled? Yes ✓ No___ Gleyed? Yes ✓ No___

Depth	Matrix Color	Mottle Color	Texture
0-10	10YR 4/1	7.5YR 4/4	Silty clay loam

Comments___ Is the hydric soils criterion met? Yes ✓ No___

HYDROLOGY

Is the ground surface inundated? Yes___ No ✓ Depth of standing water___

Is the soil saturated? Yes___ No ✓ Depth to saturated soil___ Depth to free-standing water in pit___

Mark other field indicators of surface inundation or soil saturation:

✓ Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas

___Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions

Comments___ Is the wetland hydrology criterion met? Yes ✓ No___

Is the vegetation unit or plot wetland? Yes ✓ No ___ Comments___

No upland plot recorded – same as above except no oxidized root zones

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): DLF, LRK Transect/Area: 020335A Plot: 2 Date: 5/27/98
Project/Site: NNG State: OR County: Washington
Rosalin ~~Intermediate level On~~site Determination Method ✓ Or Comprehensive Onsite Determination Method ___
****

Do normal environmental conditions exists at the plant community? Ag land - weedy spp. present
Yes ✓ No ___ (If no, explain on back)
Has the vegetation, soils and/or hydrology been significantly disturbed?
Yes ✓ No ___ (If yes, explain on back)

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Gnaphlium palustre		<5	21.		
2. Phalaris arundinacea		<5	22.		
3. Plantago major		<5	23.		
4. Epilobium ciliatum		<5	24.		
5. Juncus bufonius		10	26.		
6. Veronica peregrina	OBL	50	Trees		
7. composite		<5	29.		
8. Plantago lanceolata		<5	30.		
9. Trifolium pratense		<5	19.		
10. Senecio jacobaea		1	20.		
11. Myositis laxa		1	21.		
Comments: Plagiobothrys scouleri ~~Medicago sativa~~		1			

Percent of dominant species that are OBL, FACW and/or FAC 100 Is the hydrophytic criterion met? Yes ✓ No ___

SOILS

Soil Series Wapato silty clay loam Is the soil on the hydric soils list? Yes ✓ No ___
Is the soil: a Histosol? Yes ___ No ✓ Histic epipedon present? Yes ___ No ✓ Mottled? Yes ___ No ✓ Gleyed? Yes ___ No ✓

Depth	Matrix Color	Mottle Color	Texture
0-4	10YR 4/3		silty sandy loam
4-18	10YR 4/4		sandy loam

Comments ___ Is the hydric soils criterion met? Yes ___ No ✓

HYDROLOGY

Is the ground surface inundated? Yes ___ No ✓ Depth of standing water ___
Is the soil saturated? Yes ___ No ✓ Depth to saturated soil ___ Depth to free-standing water in pit ___
Mark other field indicators of surface inundation or soil saturation:
___Oxidized root zones ___Water-stained leaves ___Water marks ___Surface scoured areas
___Wetland drainage patterns ___Water-borne sediment deposits ___Drift lines ___Morphological plant adaptions
Comments ___ Is the wetland hydrology criterion met? Yes ___ No ✓

Is the vegetation unit or plot wetland? Yes ___ No ✓ Comments insufficient soil & hydrology indicators

WETLAND DELINEATION FIELD DATA FORM

Field Investigator(s): DLF, LRK Transect/Area: 020335A Plot: 3 Date: 5/27/98

Project/Site: NNG State: OR County: Washington

Routine Onsite Determination Method ✓ Or Comprehensive Onsite Determination Method ___

****

Do normal environmental conditions exists at the plant community?
Yes ✓ No ____ (If no, explain)
Has the vegetation, soils and/or hydrology been significantly disturbed?
Yes ✓ No ____ (If yes, explain)

Ag area – new growth of weedy spp.

DOMINANT VEGETATION

Herbs	I/S	% Cover	Shrubs	I/S	% Cover
1. Gnaphlium paludose	FAC	40	21.		
2. Phalaris arundinacea		<5	22.		
3. Unk. mustard	NSPP	10	23.		
4. Veronica peregrina		5	24.		
5. Juncus bufonius		<5	26.		
6.			Trees		
7.			29.		
8.			30.		
9.			19.		
10.			20.		
11.			21.		

Comments
Percent of dominant species that are OBL, FACW and/or FAC 100 Is the hydrophytic criterion met? Yes ✓ No ____

SOILS

Soil Series Wapato silty clay loam Is the soil on the hydric soils list? Yes ✓ No ____
Is the soil: a Histosol? Yes ____ No ✓ Histic epipedon present? Yes ____ No ✓ Mottled? Yes ✓ No ____ Gleyed? Yes ✓ No ____

Depth	Matrix Color	Mottle Color	Texture
0-10	10YR 3/2	5YR 5/8	silt loam
10-18	10YR 5/1	5YR 5/8	silt loam

Comments Soils may have been disked in upper layer Is the hydric soils criterion met? Yes ✓ No ____

HYDROLOGY

Is the ground surface inundated? Yes ____ No ✓ Depth of standing water ____
Is the soil saturated? Yes ✓ No ____ Depth to saturated soil 12" Depth to free-standing water in pit ____
Mark other field indicators of surface inundation or soil saturation:
✓ Oxidized root zones ___ Water-stained leaves ___ Water marks ___ Surface scoured areas
___ Wetland drainage patterns ___ Water-borne sediment deposits ___ Drift lines ___ Morphological plant adaptions
Comments ____ Is the wetland hydrology criterion met? Yes ✓ No ____

Is the vegetation unit or plot wetland? Yes ✓ No ____ Comments ____

APPENDIX B

DEQ USE ONLY – REGIONAL OFFICE	APPLICATION FOR WATER POLLUTION CONTROL FACILITIES PERMIT (WPCF-N) STATE OF OREGON (Attach additional sheets if necessary.)	DEQ USE ONLY – BUSINESS OFFICE
Received:		Date Received:
Application No.:		Amount Received:
File No.:		Check No.:
EPA No.:		Deposit No.:
Mail ID #2/#9:		NOTES:
Hydrocode:		
DOC Conf.:		

A. REFERENCE INFORMATION

1. NW Natural
Legal Name of Applicant
South Mist Feeder Loop 24"
Facility Name

2. 220 NW Second Ave.
Mailing Address
Portland (City) Oregon (State) 97209 (Zip)

3. Michael J. Hayward
Responsible Official
Senior Environmental Specialist
Title
220 NW Second Ave. (503) 226-4211
Address or Location Phone Ext.4327

4. Sandra K. Hart
Alternate Responsible Official
Manager, Risk, Environmental and Land
Title
220 NW Second Ave. (503) 226-4211
Address or Location Phone

5. Facility Location if **different** from Mailing Address: One mile NNW of Mist to North Plaines

6. Enter Site Location by **Latitude** and **Longitude**:

LATITUDE			LONGITUDE		
1. Deg.	2. Min.	3. Sec.	1. Deg.	2. Min.	3. Sec.
45/45	54/36	9/27	123/123	9/00	2/32

B. GENERAL DESCRIPTION OF FACILITY

Briefly summarize the proposed facility and primary method of wastewater treatment and disposal.

See attached description

C. REQUIRED EXHIBIT

As EXHIBIT A, attach two (2) 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. Specific items contained in the report should include:

1. A complete description of the proposal.
2. The location of the project and adjacent facilities and waterways.
3. Schedule for development.
4. Schematic diagrams of industrial processes, waste streams, and treatment and disposal facilities.
5. Disposal of solid waste and sludges.
6. Groundwater information.
7. Evaluation of groundwater and surface water impacts.

D. LAND USE APPROVAL

LAND USE COMPATIBILITY STATEMENT: is attached ☐ is coming ☐ N/A ☐

E. OTHER PERMITS

Attach a list of other permits issued or applied for.

F. FEES — MUST ACCOMPANY THIS APPLICATION

Filing Fee	$ 50.00
Processing Fee	6280.00
Compliance Determination Fee	1180.00
TOTAL	$ 7510.00

I HEREBY CERTIFY THAT THE INFORMATION CONTAINED IN THIS APPLICATION IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

[signature] Sr. VP Public Affairs/General Counsel
Signature of Legally Authorized Representative (See Instructions) Title Date

Exhibit A

Description

A total of 38 miles of 24 inch diameter gas pipeline will be installed to connect NW Natural's underground gas storage facility located approximately 1.5 miles north northwest of Mist to its distribution system located near North Plains. Before the pipeline can be placed into operation, it must be hydrostatically pressure tested to insure integrity.

The hydrostatic test consists of pumping water into the pipeline until the pressure reaches the desired level, holding that pressure for a period of time, removing the water, and disposing of the water in a proper manner. The water for this project will be collected from the Nehalem River, just north of the town of Pittsburg. About 4,200,000 gallons of water will be required for the hydrostatic test. The water will be discharged into a containment area created from straw bales to reduce any turbidity.

Location

The water will be discharged at two locations. Approximately 2,200,000 gallons of water will be discharged onto a river terrace in the floodplain on the north side of the Nehalem River, about 500 feet from the point where the water will be pumped from the river. This location is approximately 1000 feet north of the town of Pittsburg. The legal description of the location is: SW ¼ of the NW ¼ of Sec. 23 T5N R4W.

Approximately 2,000,000 gallons of water will be discharged into Lind Reservoir near Mountaindale, approximately 4000 feet north of Highway 26 and about 2,000 feet north northwest of North Plains. The legal description of the location is: SW ¼ of the SW ¼ of the governmental section 36 T4N R3W.

The pipeline construction is scheduled to begin in April 1999 and be completed near the end of October 1999. The water discharge will take place near the end of the construction period, near the middle of September.

Schematics

Enclosed are maps and air photos of the areas where the hydrostatic test waters will be discharged and the location of the straw bales that will be used to reduce discharge velocities for erosion control and for the control of turbidity. As stated above, approximately 2,200,000 gallons of water will be discharged onto a river terrace in the Nehalem River flood plain. Approximately 2,000,000 gallons will be discharged through an existing 6 inch water line and into Lind Reservoir. The water will pass through straw bales before entering the reservoir. Also enclosed

is a copy of analytical results of a past hydrostatic test, samples taken of waters from the water source and at time of discharge.

Storage and Disposal of Sludges

There will be no sludges produced from the hydrostatic test.

Groundwater Information

Climatic information – Please see enclosed climatic information for Vernonia, Oregon and Hillsboro, Oregon. The information was gathered from the National Weather Service and NOAA. These two locations are the nearest climatic data recording stations to the discharge sites.

Topography and Soil Profile - Figures 1 and 2 show the planned discharge locations. The Pittsburg disposal point is located on a river terrace near elevation 600 feet. The Lind Reservoir disposal point is located on the edge of a broad alluvial basin near elevation 200 feet. Both planned disposal points have gentle slopes and are moderately well-drained. Except for the submerged north bank of Lind Reservoir, all of the soils within the two discharge areas have slopes flatter than 3 percent.

The Pittsburg disposal point is underlain by McNulty silt loam, a well-drained, very deep soil unit found on flood plains. Typically, the soil is silt loam and loam to a depth of 32 inches. The upper 8 inches of the substratum are sandy loam and the lower part to a depth of 60 inches or more is silt loam. The percolation rate of this soil is reported to be 0.6 to 2.0 inches per hour. The hazard of water erosion is moderate in barren areas of the McNulty soil.

The Treharne silt loam underlies the Nehalem River floodplain downslope of the disposal point. This unit is described as a deep, moderately well drained soil found on terraces of major streams in the Coast Range. The predominant texture is silt loam to a depth of 15 inches and silty clay loam below. The permeability of this unit is reported to be 0.6 to 2.0 inches per hour. The hazard of water erosion is slight.

The Lind Reservoir disposal point is underlain by Willamette silt loam and Woodburn silt loam soils. These soils consist of moderately well drained to well drained deposits that formed in old alluvium on low, broad valley terraces. Both units include silt loam and silty clay loam to a depth of 28 to 30 inches. The subsoil consists of silt loam to silty clay loam 15 to 17 inches thick. The percolation rate of these two soils is 0.6 to 2.0 inches per hour. The hazard of erosion for both materials is slight.

The central portion of the Lind Reservoir bottom is reportedly underlain by Verboort silty clay loam. This unit is found in narrow, irregularly shaped, concave areas along drainageways. The texture of this deposit is typically silty clay loam 19 inches thick over light clay and silty clay loam. The percolation rate of this soil is 0.2 to 0.6 inches per hour. The hazard of erosion is slight. This unit is entirely submerged in the planned disposal area, and should not be affected by the discharge water.

Flooding and Erosion Potential - The Pittsburg site is underlain by deep, well-drained soil with a relatively high infiltration rate. Consequently, it is our opinion that the rate of release can be controlled such that flooding will not occur. Similarly, the site has well established grassy vegetation and is not susceptible to erosion during a controlled water discharge.

Water released at the Lind Reservoir site is intended to flow into the reservoir. Consequently, flooding is not a concern at this site. The erosion potential during that release will be mitigated by controlling the discharge rate and by placing straw bales to slow the sheet flow velocity.

The water turbidity will be measured using field equipment as it is pumped from the Nehalem River and at the discharge points. Straw bales will be placed as necessary to confirm that the released water is not significantly more turbid than the intake water.

Groundwater Aquifer Characteristics - Previous subsurface explorations of the general site area and well logs from the surrounding areas indicate that the Pittsburg site is not underlain by a groundwater aquifer or water-bearing formational unit. Groundwater levels reported in the well logs from near Pittsburg vary widely, but typically correspond to the top of the gray claystone (Keasey and Pittsburg Bluff formations primarily) that underlies both sites. The lack of an aquifer is confirmed by the very low flow rates shown on the well reports.

Based on our understanding of geologic conditions near the Pittsburg discharge location, it is our opinion that groundwater consists primarily of near-surface infiltration water trapped on top of the relatively impermeable claystone. Consequently, the Nehalem River and Crooked Creek provide hydraulic barriers to horizontal flow because the flow channels extend down to the top of the impermeable claystone.

The Lind Reservoir discharge point is located on the north perimeter of the Tualatin Basin aquifer. The aquifer is generally described as an unconfined unit comprised of fine-grained young alluvium associated with the Willamette silt geologic unit. The silt has relatively low transmissivity, and water yields are

typically slow. Discontinuous sand lenses present below depths of 100 to 200 feet have higher transmissivity than the predominantly silty aquifer matrix.

Geologic maps and well logs indicate that bedrock consists of basalt of the Columbia River group. The depth to bedrock varies depending on the position within the basin, but typically is 200 to 250 feet within ½ mile of the Lind Reservoir discharge location.

Groundwater depths in shallow wells near the site are typically 10 to 12 feet. Wells with capacity greater than 15 gallons per minute are typically completed in the basalt at depths of 400 to 450 feet. Wells that do not encounter basalt or do not extend down to the basalt typically have yields less than 10 gallons per minute.

Well and Spring Locations - The Oregon Water Resources Department has records of 10 active domestic water supply wells that could be located within ½ mile of the planned Pittsburg discharge location. We did not find records of any recorded springs in the database. Although the exact well locations are difficult to determine, all of the wells appear to be associated with a residence. Our review of site maps, aerial photographs, and our site reconnaissance indicate that all of the residences in the Pittsburg area are located south of the Nehalem River. Consequently, we conclude that all of the wells are also located south of the river. The discharge area is located on the north side of the river, effectively isolating the discharge water from the water wells. In this view, it is our opinion that the planned discharge water will not influence the domestic water wells located near the site.

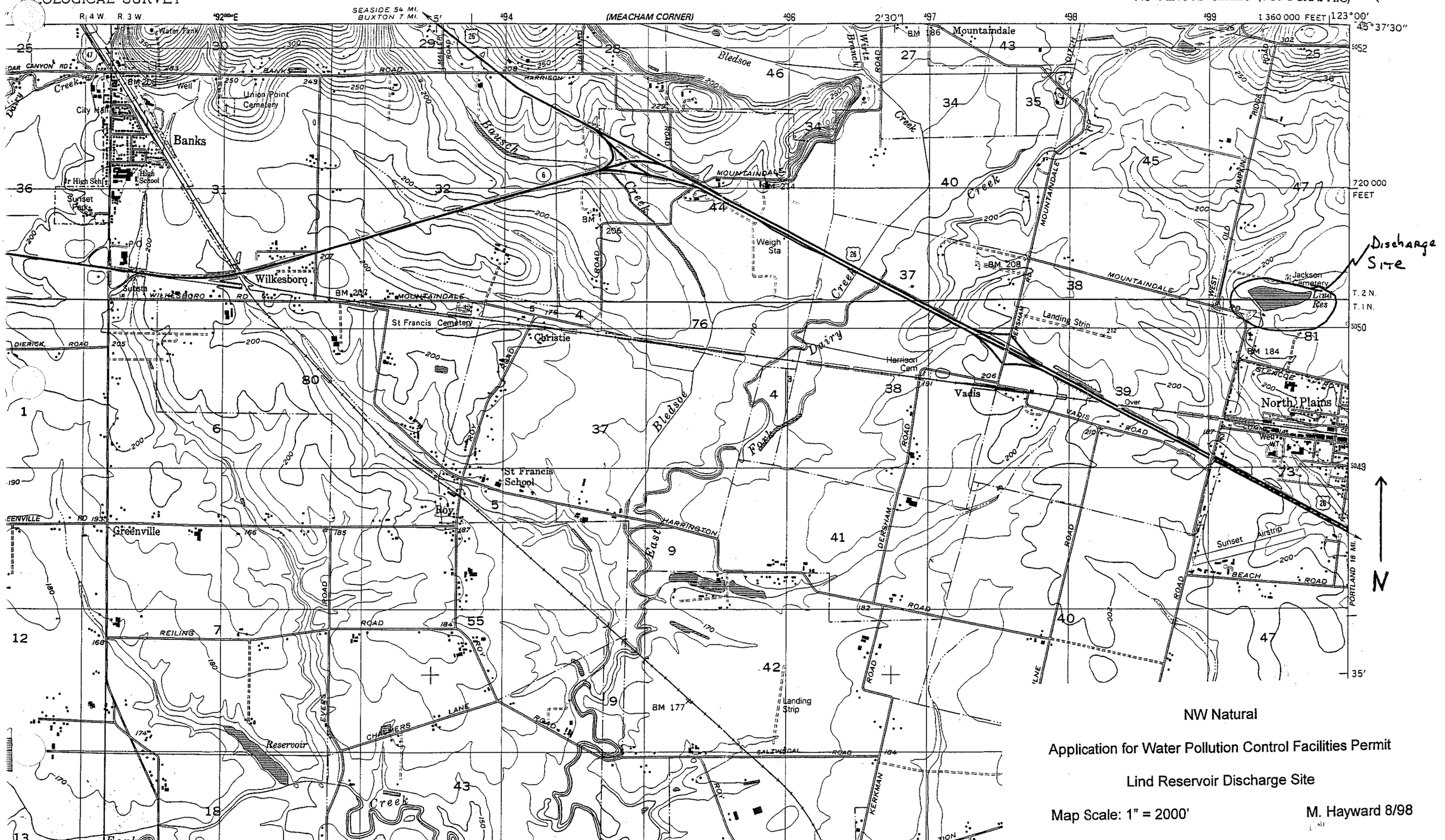
The Oregon Water resources Department database has records for seven groundwater wells within ½ mile of the Lind Reservoir site. There are no records of springs near the site. The planned discharge at this location will be onto the ground surface with sheet flow into the reservoir. The existing wells are not located between the reservoir and the discharge point. Consequently, it is our opinion that the planned discharge water will not influence the recorded water wells near the site.

Protecting Surface and Groundwaters

An enclosure of straw bales will be constructed in both locations to receive discharge waters. The straw bales will reduce water velocity for erosion control while filtering to reduce water turbidity. Water discharge rates will be controlled by valving. No solvents or oils are used in the manufacturing, coating, or installation of the pipeline.

UNITED STATES
PARTMENT OF THE INTERIOR
EOLOGICAL SURVEY

FOREST GROVE QUADRANGLE
OREGON–WASHINGTON CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)



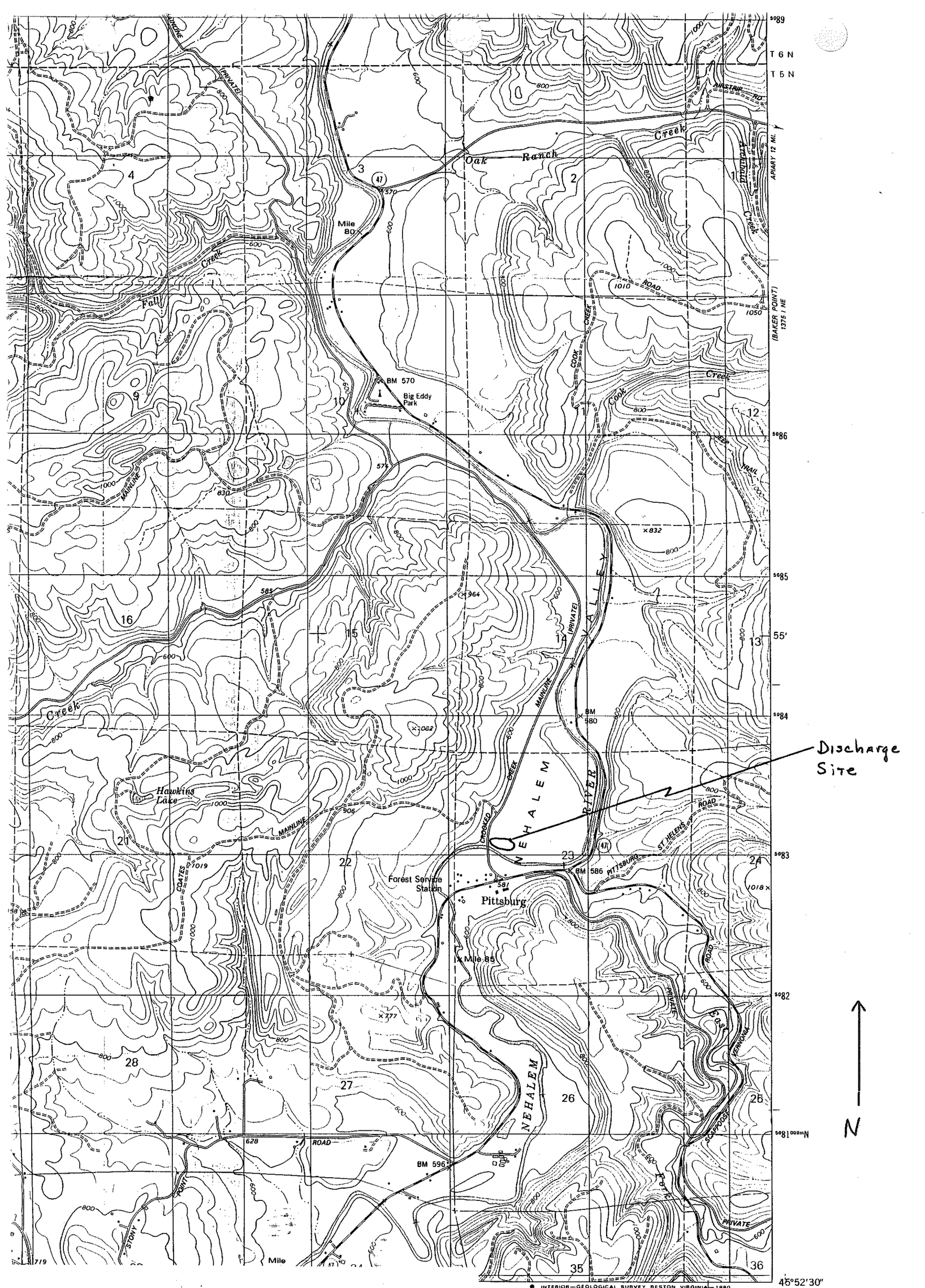
NW Natural

Application for Water Pollution Control Facilities Permit

Lind Reservoir Discharge Site

Map Scale: 1" = 2000'

M. Hayward 8/98



NW Natural

Application for Water Pollution Control Facilities Permit

Pittsburg Discharge Site

Map Scale: 1" = 2000'

M. Hayward 8/98

ROAD CLASSIFICATION

Primary highway, hard surface

Secondary highway, hard surface

Light-duty road, hard or improved surface

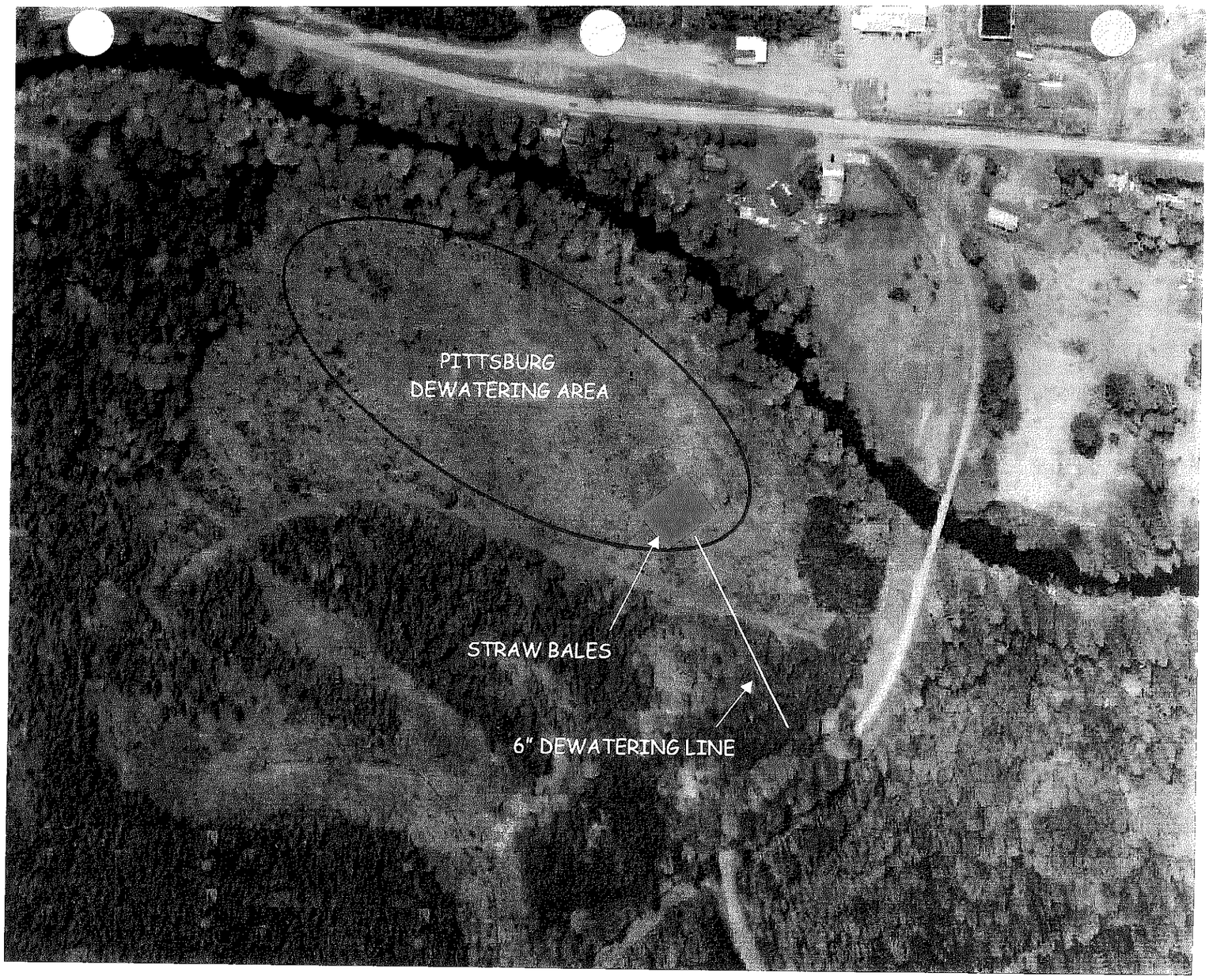
Unimproved road

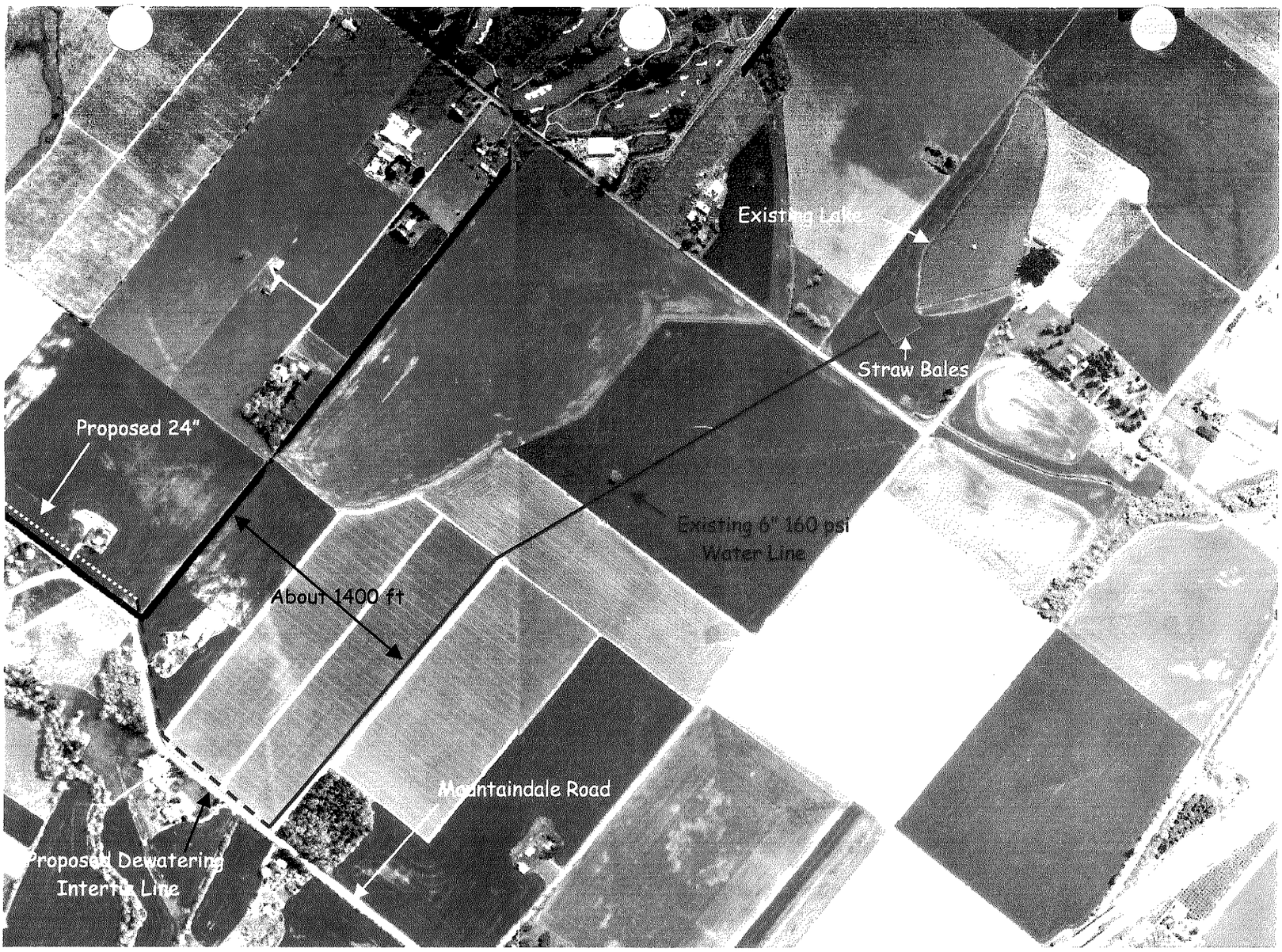
Interstate Route U. S. Route State Route

PITTSBURG, OREG

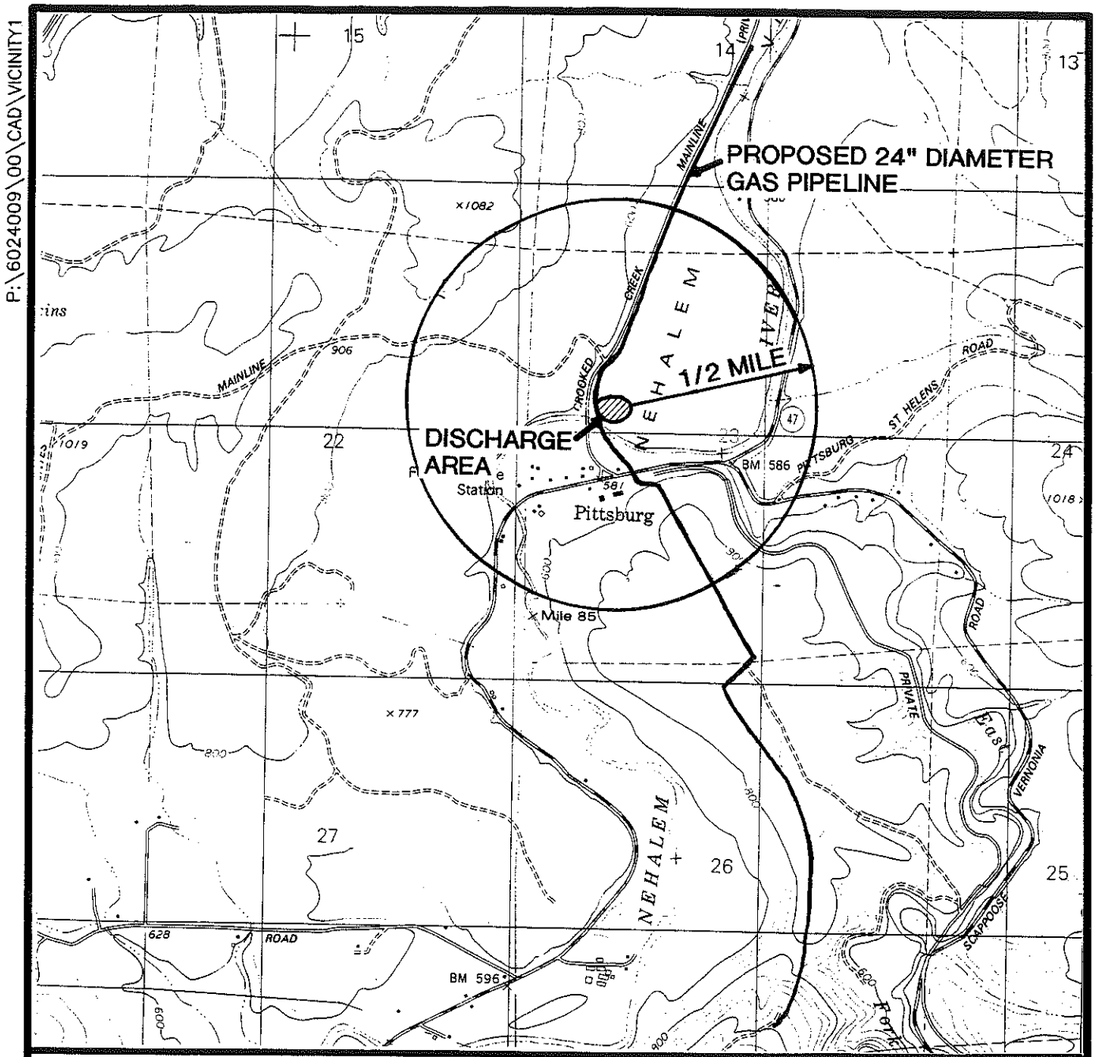
NW/4 VERNONIA 15' QUADRANGLE

INTERIOR—GEOLOGICAL SURVEY, RESTON, VIRGINIA—1980


PITTSBURG
DEWATERING AREA
STRAW BALES
6" DEWATERING LINE


Existing Lake
Straw Bales
Proposed 24"
Existing 6" 160 psi
Water Line
About 1400 ft
Mountaindale Road
Proposed Dewatering
Interim Line

P:\6024009\00\CAD\VICINITY1



Reference: USGS 7.5' topographic quadrangle map, "Pittsburg, Or", 1979.

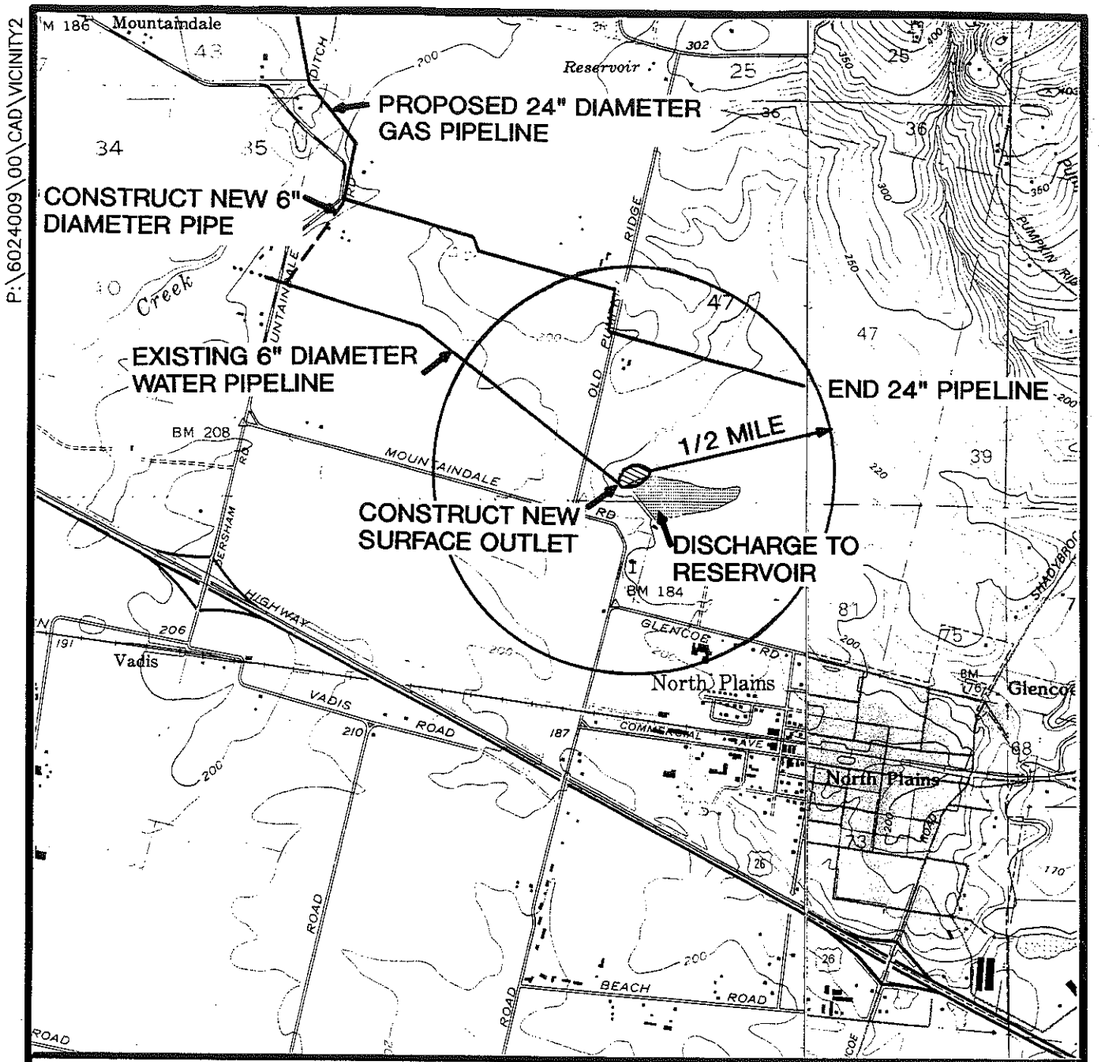
6024-009-00 DRS:RJW 09/02/98

Geo Engineers

PITTSBURG DISCHARGE POINT

FIGURE 1

P:\6024009\00\CAD\VICINITY2



References: USGS 7.5' topographic quadrangle maps,
"Forest Grove, Or", photorevised 1970 and 1975.
"Hillsboro, Or", 1990.

6024-009-00 DRS:RJW 09/02/98

Geo Engineers

LIND RESERVOIR DISCHARGE POINT

FIGURE 1

VERNONIA 2, OREGON (358884)

Period of Record Monthly Climate Summary

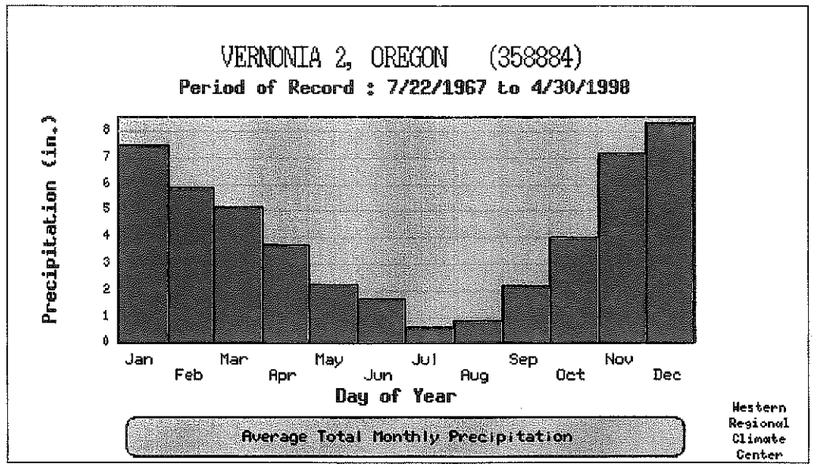
Period of Record : 7/22/1967 to 4/30/1998

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	44.3	49.7	54.0	58.0	64.4	69.4	75.5	76.6	72.4	62.3	50.6	44.0	60.1
Average Min. Temperature (F)	29.6	30.8	33.3	35.8	40.0	44.6	47.1	46.6	42.8	37.0	33.7	30.5	37.7
Average Total Precipitation (in.)	7.42	5.82	5.11	3.70	2.21	1.65	0.61	0.86	2.13	3.95	7.14	8.28	48.88
Average Total SnowFall (in.)	4.3	3.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	2.4	11.7
Average Snow Depth (in.)	1	0	0	0	0	0	0	0	0	0	0	0	0

Western Regional Climate Center, Greg McCurdy, gmwrcc@dri.edu

VERNONIA 2, OREGON

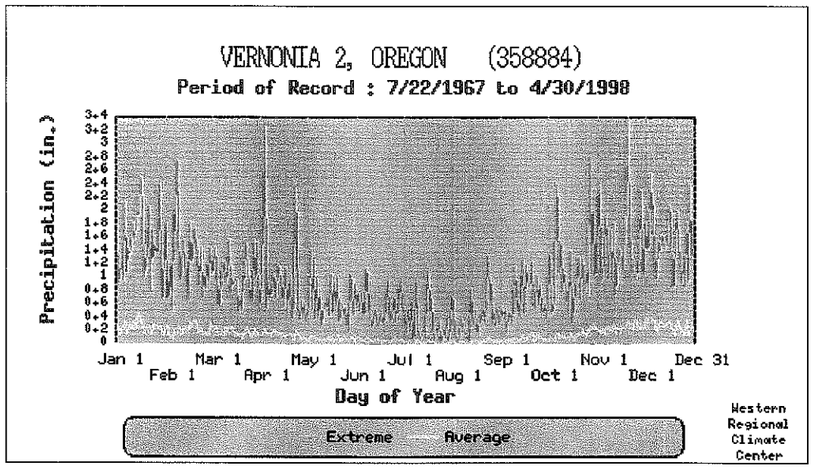
POR - Monthly Average Total Precipitation



- Average precipitation recorded for the month.

VERNONIA 2, OREGON

POR - Daily Precipitation Average and Extreme



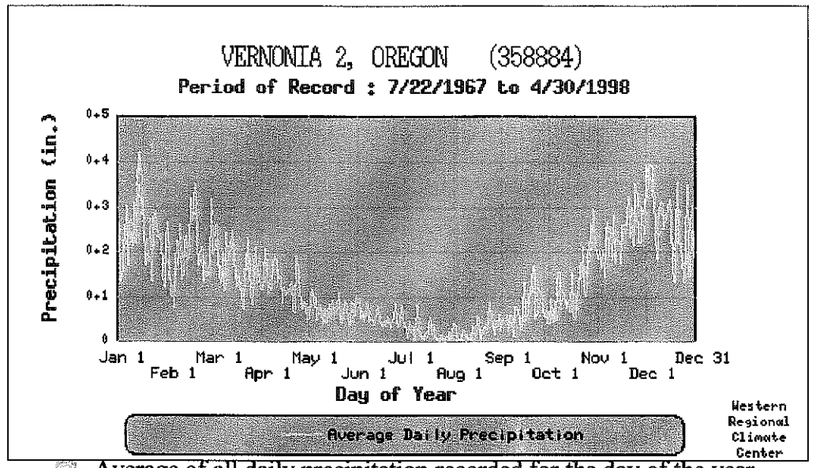
- Extreme is the greatest daily precipitation recorded for the day of the year.
- Average is the average of all daily precipitation recorded for the day of the year.

If you would like to apply a running average analysis to smooth the data and replot the following graph, then enter a value in the following field (between 1 and 31) and click the Go button to reload this image.

1 Go

VERNONIA 2, OREGON

POR - Daily Precipitation Average



- Average of all daily precipitation recorded for the day of the year.

HILLSBORO, OREGON (353908)

Period of Record Monthly Climate Summary

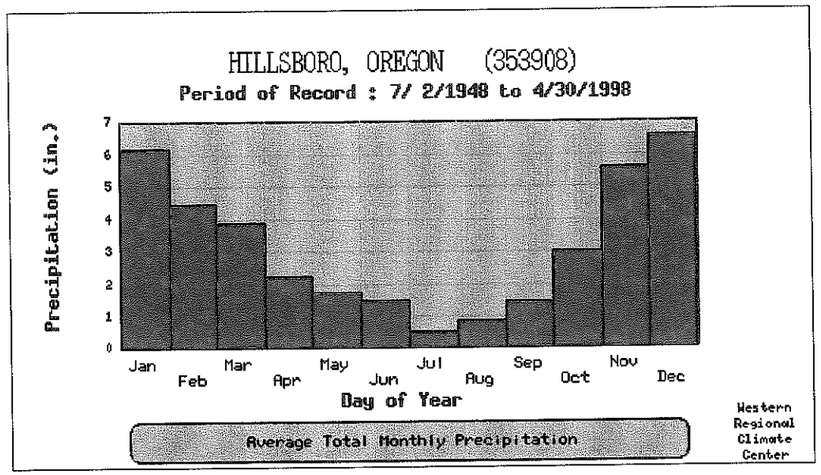
Period of Record : 7/ 2/1948 to 4/30/1998

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	45.2	50.7	55.5	61.4	68.3	73.6	80.6	80.8	76.0	64.4	52.4	46.0	62.9
Average Min. Temperature (F)	32.9	35.0	36.8	39.5	44.2	49.4	52.5	51.7	47.6	41.5	37.4	34.1	41.9
Average Total Precipitation (in.)	6.17	4.46	3.86	2.22	1.72	1.46	0.49	0.84	1.42	2.99	5.59	6.54	37.78
Average Total SnowFall (in.)	3.3	0.8	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.0	5.7
Average Snow Depth (in.)	0	0	0	0	0	0	0	0	0	0	0	0	0

Western Regional Climate Center, Greg McCurdy, gmwrcc@dri.edu

HILLSBORO, OREGON

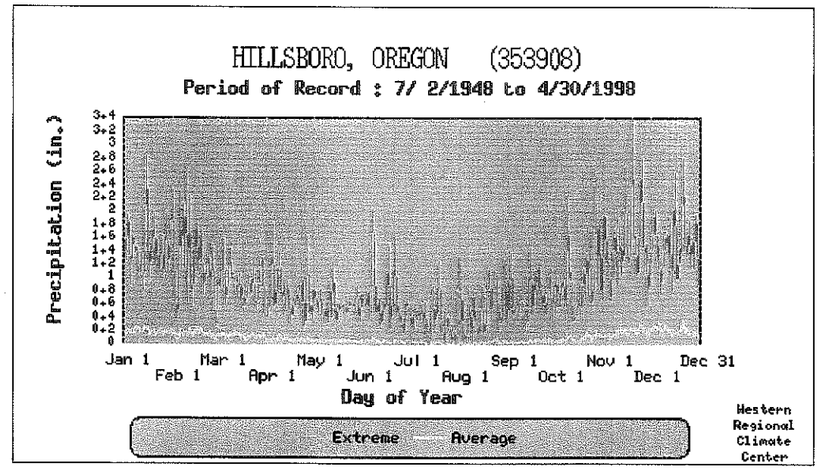
POR - Monthly Average Total Precipitation



- Average precipitation recorded for the month.

HILLSBORO, OREGON

POR - Daily Precipitation Average and Extreme



- Extreme is the greatest daily precipitation recorded for the day of the year.
- Average is the average of all daily precipitation recorded for the day of the year.

If you would like to apply a running average analysis to smooth the data and replot the following graph, then enter a value in the following field (between 1 and 31) and click the Go button to reload this image.

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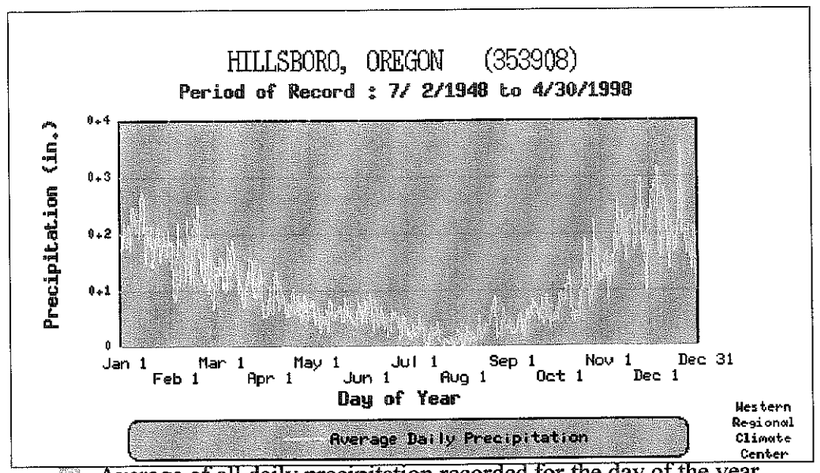
HILLSBORO, OREGON

POR - Daily Precipitation Average



- Average of all daily precipitation recorded for the day of the year.

APPENDIX C

License No. _____

STATE OF OREGON

WATER RESOURCES DEPARTMENT

APPLICATION FOR LIMITED WATER USE LICENSE

Applicant(s): Northwest Natural

Contact Person: Michael J. Hayward

Mailing Address: 220 NW Second Ave.

Portland, OR 97209 (503) 226-4211, Ext. 4327
City State Zip Phone #

I (We) make application for a limited license to use or store the following described **surface waters** or **groundwater**-not otherwise exempt, or to use **stored water** of the state of Oregon **for a use of a short-term or fixed duration**:

1. **SOURCE OF WATER** for the proposed use: Nehalem River
a tributary of _____.

2. **TOTAL AMOUNT OF WATER** to be diverted: _____ cubic feet per second, or 2000 gallons per minute. If water is to be used from more than one source, give the quantity from each: _____.

3. **INTENDED USE(S) OF WATER:** (check all that apply)

_____ Road construction or maintenance;
_____ General construction;
_____ Forestland and rangeland management; or
X Other: Hydrostatic pressure test of new pipeline and directional boring.

4. **DESCRIPTION OF PROPOSED PROJECT:** Include a description of the intended place of use as shown on the accompanying site map, the method of water diversion, the type of equipment to be used (including pump horsepower, if applicable), length and dimensions of supply ditches and pipelines: NW Natural is installing approximately 38 miles of 24 inch diameter gas pipeline that begins about 1.5 miles north northwest of Mist and ends near West Union Rd. in North Plains. This limited license will be a one-time use for pressure testing of the pipeline and for directional boring of river and creek crossings. The total estimated volume needed for the project is 5.5 million gallons. The water will be pumped from the Nehalem River using a diesel fired pump rated at 2000 gpm with an 8 inch suction hose.

This page to be completed by the local Watermaster.

WATER AVAILABILITY REPORT-SURFACE WATER APPLICATION

Name of Applicant _____ Application Number _____

1. To your knowledge, has the stream or basin that is the source for this application ever been regulated for prior rights?

   Yes _____ No _____

If yes, please explain.

2. Has the stream or basin that is the source for this application ever been regulated for minimum streamflows?

   Yes _____ No _____

If yes, please explain.

3. Do you observe this stream system during regular field work?

   Yes _____ No _____

If yes, what are your observations for the stream.

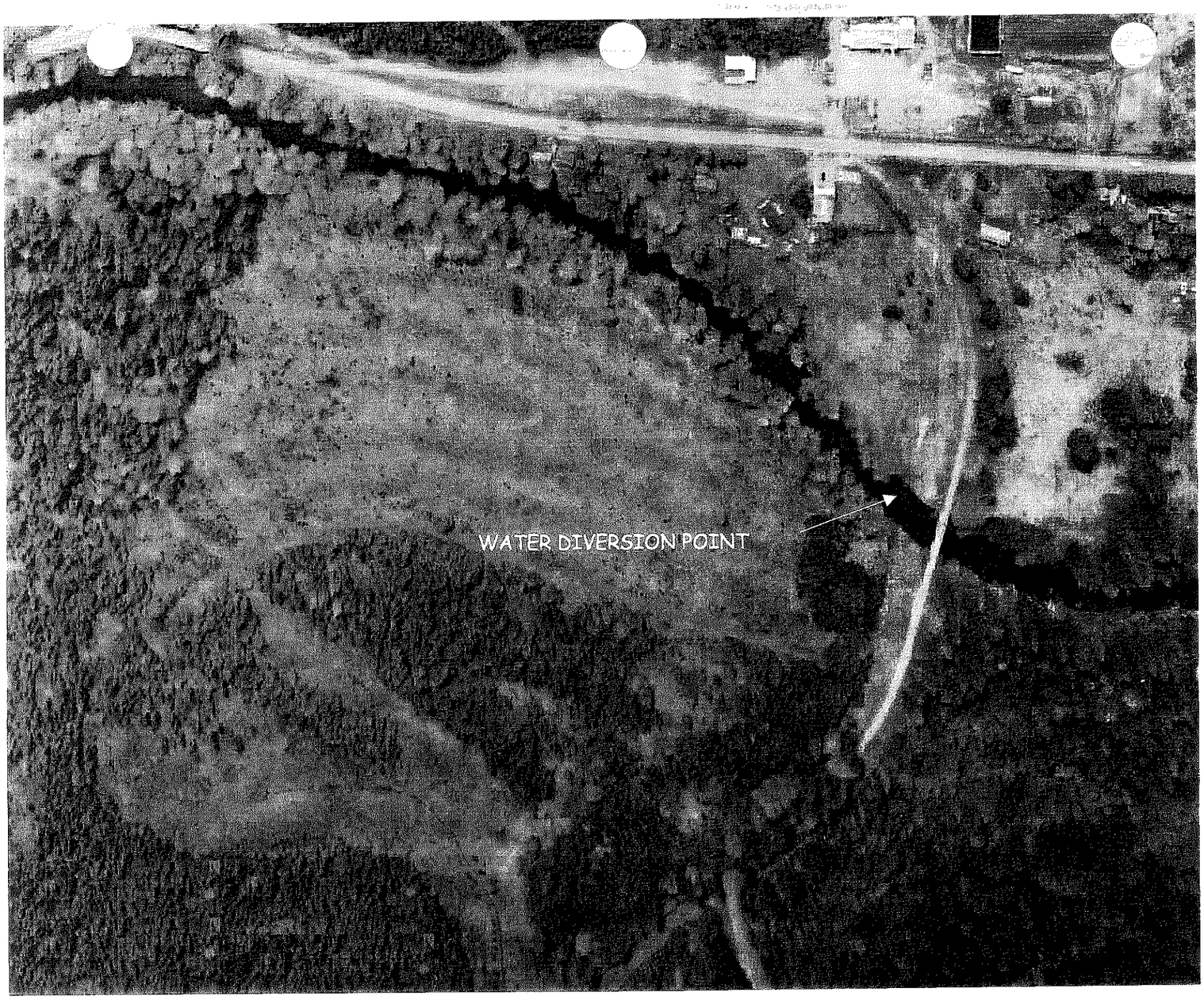
4. Based on your observations, would there be water available in the quantity and at time needed to supply the development proposed by this application.

   Yes _____ No _____ Don't Know _____

What would you recommend for conditions on a permit, that may be issued approving this application?

5. Any other recommendations you would like to make?

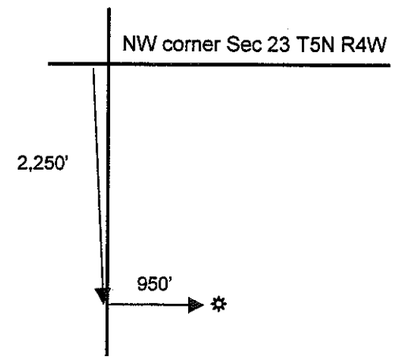
Signature _____ WM District # _____ Date _____


WATER DIVERSION POINT

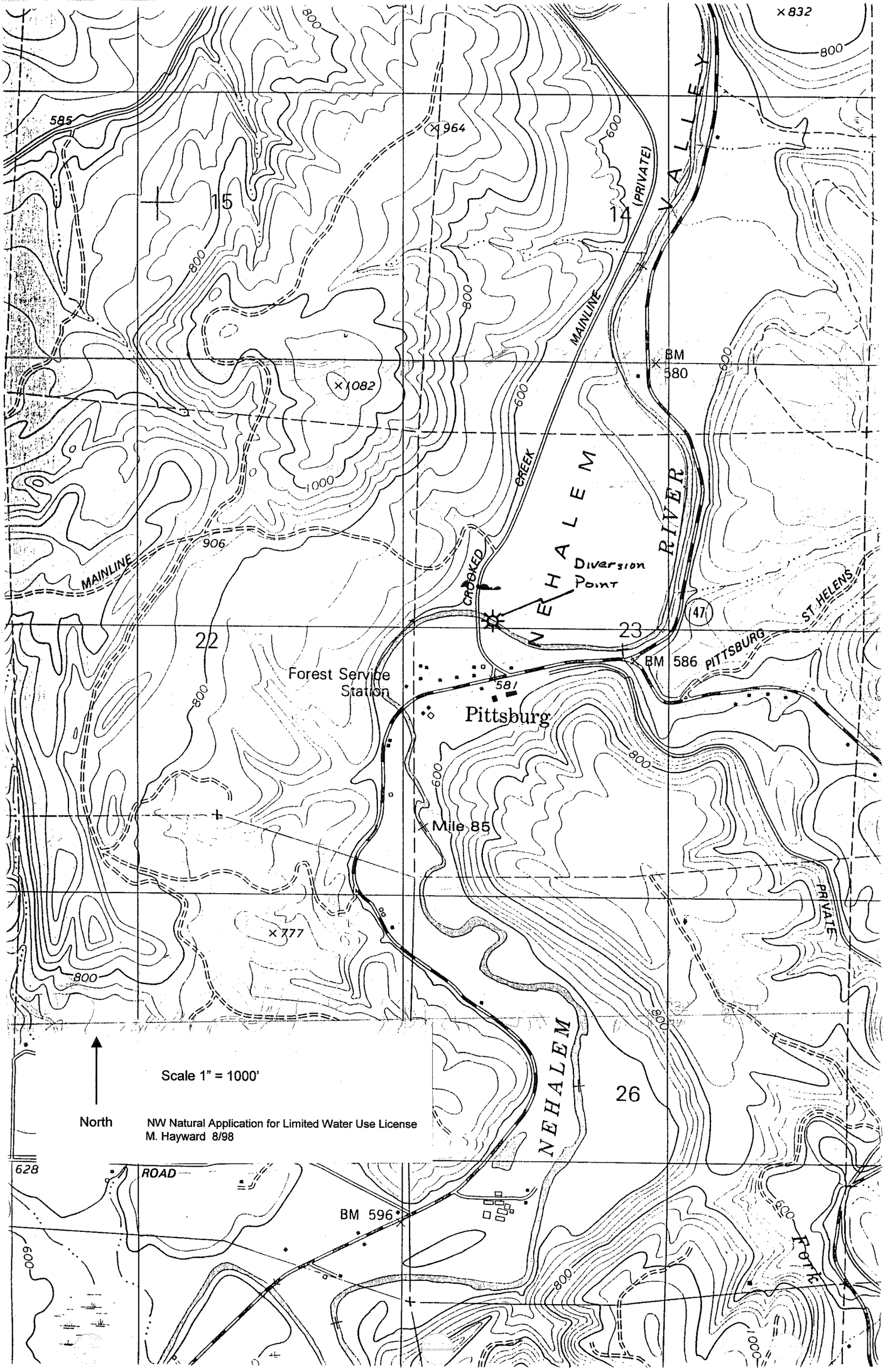
Point of Diversion

The point of diversion in the Nehalem River is as follows:

2,250 feet south and 950 feet east of the NW corner Sec. 23 T5N R4W



Please see attached map for topographic details. The point of diversion is marked by symbol: ✡, just north of the town of Pittsburg. A color air photo of the diversion point is also supplied



Scale 1" = 1000'
North
NW Natural Application for Limited Water Use License
M. Hayward 8/98
NEHALEM
RIVER
VALLEY
NEHALEM
Fork
Diversion Point
Pittsburg
Forest Service Station
Mile 85
BM 580
BM 586
BM 596
MAINLINE
(PRIVATE)
CROOKED CREEK
PITTSBURG ST HELENS
PRIVATE
ROAD
15
14
22
23
26
585
964
1082
906
777
581
628
47
832
800
600
1000