

AMENDMENT NUMBER TWO
TO THE ENERGY FACILITY SITE CERTIFICATE
FOR THE NORTHWEST NATURAL
SOUTH MIST FEEDER PIPELINE

RECEIVED
APR 23 1999
DEPARTMENT OF ENERGY

This Amendment Number Two to the Energy Facility Site Certificate for the Northwest Natural Gas South Mist Feeder Pipeline is issued and executed pursuant to the Final Order Approving Amendment Two to the site certificate for the South Mist Feeder Pipeline between the State of Oregon (State) acting by and through its Energy Facility Siting Council (EFSC or "the Council") and Northwest Natural Gas Co. (NWN), an Oregon corporation.

The amendment authorizes NWN to construct and operate a 24-inch diameter natural gas pipeline as described in section I. below. Throughout this amendment, we refer to the 24-inch pipeline as the "conditioned pipeline expansion."

The findings of fact, reasoning and conclusions of law underlying the terms and conditions of this amendment are set forth in the Council's Final Order Approving Amendment Number Two which was issued on April 9, 1999 and which by this reference is incorporated herein.

This amendment does not affect the conditions in the Site Certificate for continued operation of the 16-inch South Mist Feeder pipeline. In the event of a conflict between the descriptions of the amended Facility or the conditions in this Site Certificate Amendment and the Council's Final Order, this Site Certificate Amendment shall control.

I. DESCRIPTION OF THE AMENDMENT

A. The Amended Facility

The conditioned pipeline expansion will involve the construction and operation of a new pipeline 24 inches in diameter, travelling approximately 29 miles from the Mist underground storage facility to a location on NWN's existing 16-inch South Mist Feeder pipeline, known as the Bacona Blowdown Station, in the NW ¼ of the NE ¼ of Section 20, T 3N R 3W, Willamette Meridian, in Washington County. For most of its length, the new pipeline will be in the 440 yard wide corridor described in the Site Certificate for the existing 16-inch pipeline. In certain locations NWN found it necessary to deviate from the existing corridor to avoid construction difficulties or to reduce the need for stream and highway crossings. These deviations, also called "reroutes", total approximately 4.5 miles in length.

The corridor for the conditioned pipeline expansion begins at Miller Station, near 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 to the Bacona Blowdown Station, where the 24-inch pipeline will rejoin the existing 16-inch pipeline.

Throughout its application, NWN refers collectively to its proposed changes to the Mist underground gas storage operation and the South Mist Feeder Pipeline as the "Project." In this amendment, we refer to the 24-inch pipeline, as approved, as the "conditioned pipeline expansion."

B. The Site of the Conditioned Pipeline Expansion

The "construction site" of the conditioned pipeline expansion is the 440 yard wide corridor, between the Mist Underground Gas Storage Facility and the Bacona Blowdown Station, as approved in the original site certificate, dated February 1989, and the three "reroute" areas shown on Figure 1 and described in Attachment A of this amendment.

The Council recognized in its Final Order that its findings in some instances were based on assumptions that the pipeline will be placed along a specific alignment within the area that NWN studied in connection with its application for this site certificate amendment. The Council also recognized, however, that NWN will need the flexibility to make changes to the location of the pipe in order to accommodate the requests or requirements of landowners, other agencies and on-the-ground conditions.

Therefore, this amendment authorizes the Office of Energy (OOE) to approve adjustments to the conditioned pipeline expansion route, within the construction site, if OOE determines that such adjustments are consistent with the Council's findings of compliance with the standards in OAR 345 Divisions 22, 23, and 24 in the Final Order and do not violate conditions of this Amendment.

At completion of construction and for the duration of this site certificate, the site, as that term is defined in ORS 469.300 and OAR 345-01-010, of the conditioned pipeline expansion shall be the 440 yard wide corridor, between the Mist Underground Gas Storage Facility and the Bacona Blowdown Station, as approved in the original site certificate, dated February 1989, except that in the reroute areas which are outside the corridor, the site shall be the rights-of-way for the conditioned pipeline expansion that NWN has obtained by lease, easement, purchase or other lawful means.

II. CONDITIONS FOR AMENDMENT No. 2

The Site Certificate shall be amended to include the following conditions:

A. General Conditions and Conditions from OAR 345 Division 27

- (1) NWN shall construct the pipeline within the construction site described in Attachment A to this Site Certificate Amendment.
- (2) The conditioned pipeline expansion shall be designed, constructed, operated and retired:
 - (a) Substantially as described in the amended Site Certificate;
 - (b) In compliance with the requirements of ORS Chapter 469, applicable Council rules, and applicable state and local laws, rules and ordinances in effect at the time Amendment No. 2 to the Site Certificate is issued; and
 - (c) In compliance with all applicable permit requirements of other state agencies.

(3) Construction of the conditioned pipeline expansion shall begin not later than the end of March 2000 and be completed not later than December 31, 2001.

(4) No construction, including clearing of a right of way, except for the initial survey, may commence on any part of the facility until the certificate holder has adequate control, or has the statutory authority to gain control, of the lands on which clearing or construction will occur.

(5) NWN shall prevent any condition over which NWN has control from developing on the conditioned pipeline expansion site that would preclude restoration of the site to a useful condition.

(6) NWN shall restore vegetation to the extent practicable and shall landscape portions of the area disturbed by construction in a manner compatible with its surroundings and/or proposed future use. Upon completion of construction, NWN shall dispose of all temporary structures not required for future use and all timber, brush, refuse and flammable materials or combustible material resulting from the clearing of land or from construction of the facility.

(7) NWN, in consultation with ODFW and DSL, shall develop specific mitigation plans consistent with Council findings under the Council's Fish and Wildlife Habitat standard. Such plans must be approved by the OOE prior to the beginning of construction or, as appropriate, operation.

(8) NWN shall terminate the 24 inch pipeline at the "Bacona Blowdown Station" located at the NW ¼ of the NE ¼ of Section 20, T3N R3W, WM in Washington County. NWN may terminate the 24 inch line at a point north of this location, but shall not extend the pipeline south of this point.

(9) NWN shall construct the conditioned pipeline expansion along the route that was the basis for the evaluation in the Final Order and within the construction site as described in section I.B of this amendment. NWN may request deviations from the route, and the Council authorizes the OOE to approve such adjustments to the conditioned pipeline expansion route, within the construction site, if the OOE determines that such adjustments are consistent with the Council's findings of compliance with the standards in OAR 345 Divisions 22, 23, and 24 in the Final Order, and do not violate conditions in this Amendment.

(10) After construction, the site, as that term is defined in ORS 469.300 and OAR 345-01-010, of the conditioned pipeline expansion shall be the 440 yard wide corridor, between the Mist Underground Gas Storage Facility and the Bacona Blowdown Station, as approved in the original site certificate, dated February 1989, except that in the reroute areas which are outside the corridor, the site shall be the rights-of-way for the conditioned pipeline expansion that NWN has obtained by lease, easement, purchase or other lawful means.

Site Specific Conditions Under 345-027-0023

(1) NWN shall notify OOE, the State Building Codes Division and the Department of Geology and Mineral Industries promptly if site investigations or trenching reveal

that conditions in the foundation rocks differ significantly from those described in the Application for Amendment No. 2. The Council may, at such time, require the certificate holder to propose additional mitigating actions in consultation with the Department of Geology and Mineral Industries and the Building Codes Division.

- (2) NWN shall notify OOE, the State Building Codes Division and the Department of Geology and Mineral Industries promptly if shear zones, artesian aquifers, deformations or clastic dikes are found at or in the vicinity of the site.
- (3) NWN shall submit to OOE copies of all incident reports involving the certified pipeline required under 49 CFR §192.709.

Monitoring Conditions Under 345-027-0028

- (1) NWN shall establish, in consultation with affected state agencies and local governments, monitoring programs as required by the Site Certificate for impact on resources protected by the standards of division 22 and 24 of this chapter, and to ensure compliance with the Site Certificate. The programs shall be subject to the review and approval of the Council.
- (2) NWN shall establish monitoring programs as required by permitting agencies and local governments, as required by the Site Certificate.
- (3) If NWN becomes aware of a significant environmental change or impact attributable to the facility, NWN shall submit to OOE as soon as possible a written report identifying the issue and assessing the impact on the facility and any affected Site Certificate conditions.

B. Conditions related to EFSC Standards

Structural Standard:

NWN shall follow the GeoEngineering recommendation that seismic design of facilities underlain by shallow bedrock (geologic units T_{CRB}, T_S, T_{PB}, T_K, and T_{KV} on Figure G-3 of the application, Exhibit 19) be performed using the following parameters:

Parameter		Value
Seismic Zone Factor	Z	0.30
Soil Profile Type	S	S _B
Seismic Coefficient	C _a	0.30
Seismic Coefficient	C _v	0.30

Soils Standard

1. NWN shall backfill trenches using native soils. Where necessary, the pipeline will be surrounded by bedding sand. Once installation is complete, the soils will be revegetated to minimize any form of erosion from rain or wind.
2. Erosion prevention techniques and sediment control measures will be used as described in the Washington County Erosion Control Plans Technical Guidance Book, dated February 1994. Examples include temporary sediment fences described in section 3.3.1, the straw bale sediment barrier described in section 3.3.3, straw mulch shown in section 3.3.7, sediment traps and ponds from section 3.3.11, and

temporary interceptor dikes and swales in section 3.3.11. Use of these measures is not limited to Washington County.

3. NWN will install strain gauges on the 24-inch pipeline at locations suggested by Geo-Engineers following their study. The gauges will be installed following installation just prior to backfilling and calibrated to zero stress at that time. These gauges will be "read" periodically to see if there is a change in stress levels that would indicate ground movement. In addition, there will be three aerial inspections and one walk through per year with special instructions to visually monitor these areas for indications of ground movement.
4. NWN will implement recommendations at Exhibit 19 §§ 5.2, 5.3 of the application to avoid erosion due to groundwater and rainfall finding a preferential path through pipeline backfill materials.

Land Use Standard (including conditions recommended by affected local governments)

1. Within the Federal Emergency Management Act ("FEMA") 100-year regulatory floodway, 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 pre-construction slopes and grades and will be revegetated. (WCC § 421-7.1, 7.6)
2. If the pipeline crosses a stream or drainage hazard area, it will be installed under the channel and the channel will be restored to its original conditions (WCC § 421-7.3)
3. There will be no above ground structures that will catch debris or impede floodwater flow. (WCC § 421-7.4)
4. The existing grades and dimensions of the floodway will not be changed. Trench excavations that have disturbed vegetation will be revegetated. (WCC § 421-7.5)
5. The site will be restored, as far as practicable, to its original state by filling the trench with stockpiled topsoil and then replanting. (WCC § 421-11)
6. Maintenance outside the public right of way shall be done by means of hand implements (lawn mowers are considered hand implements) unless a Development Permit for an alteration is first obtained from Washington County. (WCC § 421-14.1)
7. NWN will not dump in a flood area. (WCC § 421-14.8)
8. NWN will take the erosion control measures described in Exhibit 33-A and 33-B of the application. All erosion control activities will be performed in accordance with the Washington County Technical Guidance Book dated February 1994. NWN will instruct its contractors on how and when to implement these erosion control plans. (WCC § 410 1.6B)
9. NWN shall submit to Columbia County Land Development Services plans for avoiding, restoring or mitigating any wetlands crossed by the pipelines or shall provide a letter from the Oregon Division of State Lands that all DSL's requirements have been met regarding wetlands in the area.
10. NWN shall submit to Columbia County LDS a letter from the Oregon Department of Transportation that all of ODOT's permit requirements have been met.

11. NWN shall submit to Columbia County LDS a letter from the Mist-Birkenfeld and Vernonia Fire Districts stating that all fire safety concerns have been addressed.
12. NWN shall obtain from the Washington County Operations Division a utility permit to allow construction of the pipeline within the County road right-of-way. A copy of the permit shall be submitted to the Land Development Division project planner.
13. NWN shall provide the Washington County Land Development Division project planner with a copy of any permits from the Oregon Division of State Lands and/or the U.S. Army Corps of Engineers for work that will be done in flood plain areas.
14. NWN shall provide an erosion control plan, meeting the requirements of Washington County Code (WCC) Section 428, for all construction activities. The erosion control plan shall be submitted to the Washington County Land Development Division project planner prior to commencement of any construction.
15. NWN shall work with farmers and forest operators on a case-by-case basis to minimize impacts to local farming and forestry activities during construction.
16. NWN shall repair cultivated areas disturbed during construction to pre-construction conditions.
17. NWN shall protect drainage and flood hazard areas from soil erosion and equalize cut and fill to yield no net fill in these drainages. NWN should certify at the completion of the project that no net fill has occurred in flood hazard areas. Dispose of excess overburden/spoils in accordance with the grading and drainage sections of the code. Any excess soils must be placed in an authorized area outside the flood hazard area. NWN shall obtain any required grading permits from Washington County for placement of this material.
18. This approval is for the gas pipeline improvement project described in the application materials. The gas pipeline shall be installed using directional boring for stream crossings numbered 2, 3, 4, 8, 20, 26, 29, 30, 34 and 35, as listed in Table 7 (revised) of the Application, Exhibit 22.
19. Enhancement of riparian habitats through planting or other such improvements is strongly encouraged by Washington County. WCC section 421-4.6B suggests the planting of "at least 5 plants per 100 feet of bank area."
20. NWN shall coordinate construction activities with the owners of adjacent and nearby lands who are carrying out forest operations.
21. The permanent right of way for the pipeline shall not exceed 50 feet in width.
22. NWN shall provide a drainage control plan meeting the requirements of Washington County Code Section 412 for all construction activities. The drainage control plan shall be submitted to the Washington County Land Development Division project planner prior to construction in Washington County.
23. No urban service connection shall be allowed to the 24 inch pipeline, unless specifically approved by Columbia or Washington County pursuant to applicable local and/or state land use regulations.
24. On land zoned PA-38 in Columbia County, NWN shall place new pipeline in the public right-of-way.

25. NWN shall design and construct the pipeline utilizing the flood hazard prevention measures committed to in the NWN letter from Charles Stinson to Adam Bless dated March 25, 1999.

Fish and Wildlife Habitat

1. NWN shall prepare a Fish and Wildlife Habitat Mitigation Plan (Plan) consistent with the goals and criteria specified by the Council in Section IV.A.7.j of the Final Order.
2. NWN shall not begin specified construction activities or operation until OOE, in consultation with ODFW and interested federal agencies, has approved the Plan. OOE will identify the specified construction activities after consulting with ODFW and interested federal agencies.
3. All mitigation measures proposed by NWN and listed in section IV.A.7.d of the Final Order are deemed commitments and are hereby added as conditions to the site certificate.
4. All measures recommended by ODFW and listed in Section IV.A.7.e of the Final Order are hereby added as conditions to the site certificate.
5. In sections of construction considered critical, work will not proceed without confirmation that OOE and ODFW have been notified at least one week in advance. This notice is required to afford OOE and ODFW the opportunity to send qualified monitoring personnel. If NWN provides timely notice, the failure of OOE or ODFW to send qualified personnel shall not prevent NWN from performing the specified work. The Fish and Wildlife Mitigation Plan shall identify those sections of construction that are considered critical.
6. NWN shall use flume and diversion methodology as described in its U.S. Army Corps of Engineers (USCOE) permit application at all stream crossings that contain flowing water at the time of construction. NWN shall ensure that fish passage consistent with ODFW standards and criteria will be provided at all fish-bearing streams that contain flowing water at the time of construction.
7. NWN shall use the wetland crossing methodology described in its USCOE permit application at all wetland crossings.
8. NWN shall not disturb wetland areas, riparian areas, or waterways until it has obtained all required section 401 and section 404 permits and approvals, including any required authorization relating to a federally-listed threatened or endangered species. If the conditions in the amended site certificate conflict with conditions imposed by the DEQ in its section 401 certification or the U.S. Army Corps in its section 404 permit, NWN shall consult with OOE and ODFW to resolve the conflict before beginning construction.
9. NWN shall maintain the right-of-way during pipeline operation using the methods described in section IV.A.7.g of the Final Order. At stream and wetland crossings, NWN shall not remove trees that are allowed to grow or are planted within the permanent right-of-way of the 24 inch pipeline, except for an area within five feet on either side of the centerline of the pipeline, for the life of this site certificate.

10. NWN shall be responsible for costs associated with ODFW monitoring. ODFW will monitor in an advisory capacity to OOE.
11. NWN shall bore under stream crossings numbered 2, 3, 4, 8, 20, 26, 29, 30, 34 and 35 as listed in Table 7 (revised) of Exhibit 22 of the Application; and under wetlands numbered 060514C (at Lindgren Creek crossing), 040306B (at Kenusky Creek crossing) and 060514A (at Lyons Creek crossing) as listed in Table 8 of Exhibit 22 of the Application.
12. NWN shall not begin construction on the 24 inch pipeline until it has obtained a 1200c Stormwater Discharge Permit from DEQ.
13. NWN shall use the measures described in its March 26, 1999 letter from M. Hayward, NWN to Meehan, OE, to respond to a release of drilling mud (bentonite) as a result of boring operations during pipeline construction.

Financial Assurance

If the project is halted prior to completion, NWN shall restore of any right-of-way that has been disturbed. NWN shall be responsible for backfilling of any open ditch, revegetation and restoration costs, and any damages to rights-of-way as specified in easements.

Historic, Cultural and Archaeological Resources

1. NWN shall retain a qualified archaeologist to monitor construction activity in the areas of sites 35CO41, 35CO39 and all grading and excavation activities associated with the Nehalem River crossing near Natal.
2. NWN shall locate the 24-inch diameter pipeline as described in its application for amendment, pages 108 through 111. Specifically, NWN shall route the 24-inch pipeline as follows, unless NWN in consultation with a qualified archaeologist identifies another location which has less impact to these sites: in the vicinity of 35CO41, on the northeast side of the existing 16-inch pipeline; in the vicinity of ORCO6, on the eastern side of the highway; in the vicinity of ORCO5, on the east side of the existing pipeline; in the vicinity of 35CO40, about 150 meters southwest of the site; in the vicinity of 35CO38, on the west side of the existing pipeline; in the vicinity of ORCO4, on the north side of the existing pipeline; in the vicinity of ORCO3, immediately adjacent to the existing pipeline; in the vicinity of 35CO39, on the east side of the existing pipeline.
3. 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).

Socio-Economic Impact

NWN shall obtain all required permits from the Oregon Department of Transportation for construction in public road right-of-way and shall conform to the Standard Specifications

for Highway Construction – 1996, Oregon Department of Transportation, Section 00220 – Accommodation For Public Traffic. Ambulances, fire trucks and police shall be afforded immediate passage.

Waste Minimization

1. NWN shall transport construction waste materials to an appropriate recycling facility or to an approved sanitary landfill for nonrecyclable goods. NWN shall collect scrap steel and welding rod for transportation to a recycling facility. Geotextile and straw bales shall be transported to an approved landfill.
2. Water used for pressure testing shall be disposed of in a manner consistent with approved permits.

Retirement

Prior to termination of the Site Certificate, NWN shall retire the pipeline site sufficiently to restore it to a useful condition. Site restoration shall include, but not be limited to, steps to:

- (a) Remove any hazardous material stored in buildings or located in process equipment and dispose of them following applicable state hazardous materials statutes and rules,
- (b) Remove above ground portions of all pipelines, and cut and cap the remaining portion in five mile increments and at each end. NWN shall purge the pipeline to ensure that all natural gas is removed.
- (d) If necessary, revegetate the area, including pipeline right of ways, to prevent erosion and encourage habitat development,
- (e) Inspect all pipelines and remove any hazardous materials found, and dispose of hazardous materials generated from cleaning the pipelines in accordance with applicable state hazardous materials statutes and rules.

C. Conditions Related to Public Health and Safety Standards at OAR 345 Division 24

Under ORS 469.401(2), EFSC must impose conditions in the site certificate for the protection of public health and safety. Throughout this amendment are conditions related to other decisional criteria that are ultimately intended to protect public health and safety. The following conditions protect public health and safety specifically with regard to EFSC standards for surface facilities related to underground natural gas storage and natural gas pipelines.

1. The pipeline shall be constructed and operated in accordance with 49 CFR 192 regulations, and shall include isolation valves as specified in 49 CFR 192.179. Twenty four inch valves and cross ties shall be installed adjacent to the valves on the existing 16-inch pipeline.
2. NWN shall maintain a program to monitor the pipelines to ensure protection of public health and safety, including but not be limited to:
 - (a) pressure sensing devices positioned on the pipelines at Miller Station to relay information to both Miller Station and the Portland gas control centers.

- (b) high and low pressure alarms monitored on a 24 hour basis to detect and locate areas where pressure variations may indicate abnormal conditions, and
 - (c) emergency response personnel on duty 24 hours a day, at Miller Station or in Portland, trained to respond to situations that require immediate attention.
3. The following specifications from NWN's "South Mist Feeder Looping Project - Design Summary" dated February 19th 1999 are deemed commitments by NWN:
- a) NWN shall specify pipe that meets the requirements for Class 3 locations as defined at 49 CFR 192.5 (March 15, 1999). NWN shall specify .375 inch wall thickness and 52,000 lb. tensile strength in all sections of the pipeline.
 - b) NWN shall perform 100% X-ray testing of all welds on the 24 inch pipeline.
 - c) NWN shall maintain at least 24 inches of clearance between the pipeline and any underground structure, including the existing 16 inch line.
 - d) NWN shall maintain a minimum of 48 inches of pipe cover in all locations, and 60 inches in timberland or cultivated land.
 - e) NWN shall hydrostatically test the pipeline at a minimum of 1080 psig in all sections.
 - f) NWN shall use at least a 12 mil thick fusion bonded epoxy (FBE) coating on the pipeline, except that pipe used for road crossings shall have a 25 mil FBE coating.
4. Program Development Requirements: Prior to commencement of operations on the 24 inch pipeline, NWN shall develop and obtain OOE approval for the following programs:
- a) Training of personnel responsible for patrolling the pipeline, with emphasis on early recognition of conditions indicating increased landslide hazard.
 - b) Accelerated pipeline surveillance program with provisions for increased surveillance in extreme weather years. The program shall include recommendations by a geotechnical engineer for locations that warrant accelerated surveillance in excess of the periodic patrolling requirements for the pipeline in general.
 - c) Training of personnel responsible for drainage control, with emphasis on identifying areas where pipeline installation could increase the drainage hazard and on implementing effective solutions.
 - d) Continuing investigation of internal inspection devices with the capability to detect internal flaws, corrosion, and other pipeline defects ("smart pigs"), and a program for utilization of such devices commensurate with their availability and reliability.
 - e) Development of criteria to identify the level at which NWN will excavate pipe sections for stress relief, based on strain gauge readings.


D. Permitting Requirements of Agencies Other than EFSC

The Council finds that the NWN Application complies with the requirements for the following permits, subject to conditions recommended in consultation with the affected agencies:

1. Removal/Fill permits from the Division of State Lands, subject to the conditions listed in section IV.D.1 of the Final Order.

2. Limited Water Licenses from the Water Resources Department, subject to the conditions listed in section IV.D.2 of the Final Order
3. Water Pollution Control Facilities (WPCF) permits from Department of Environmental Quality, subject to the conditions listed in section IV.D.3 of the Final Order.


IN WITNESS THEREOF, this Site Certificate Amendment has been executed by the State of Oregon, acting by and through its Energy Facility Siting Council, and Northwest Natural Gas Co.



Northwest Natural Gas Co.

4/20/99

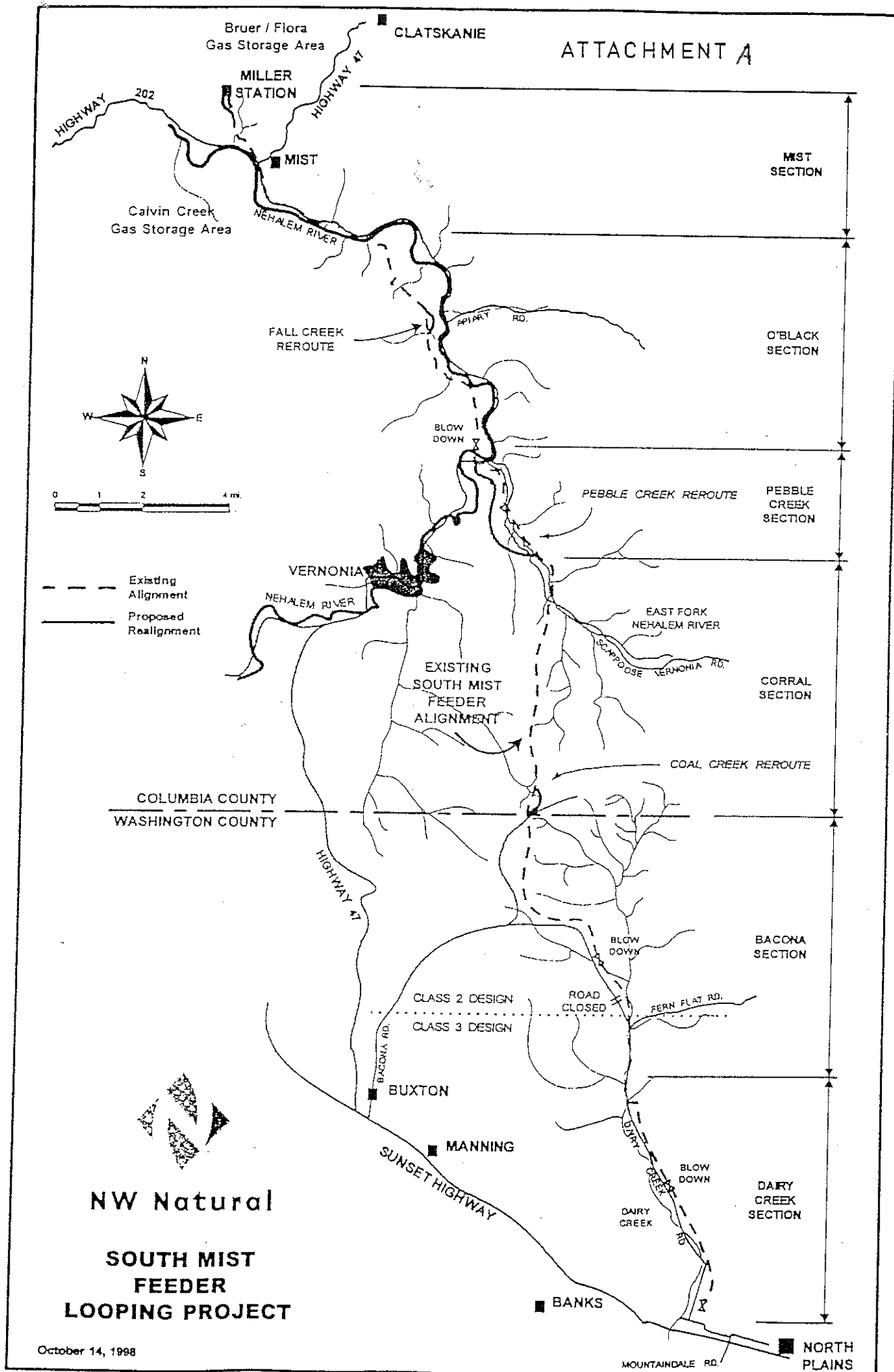
Date



Terry Edvalson
Chair, Energy Facility Siting Council

4/16/99

Date



*Final Order South Mist Feeder And No 2
 Attachment A. Fig. 1.*

**DESCRIPTION OF THE CENTERLINE FOR A
1320.00 FOOT WIDE CORRIDOR
COAL CREEK RE-ALIGNMENT**

A route located in the Southeast 1/4 and the Northeast 1/4 of Section 36, Township 4 North, Range 4 West and in the Southwest 1/4 and the Northwest 1/4 of Section 31, Township 4 North, Range 3 West, of the Willamette Meridian, Columbia County, Oregon and being more particularly described as follows:

Beginning at Engineer's Station 4235 + 02.42 of the proposed 24-inch feeder line; said point bears North 87° 55' 48" West 897.83 feet from Southeast corner of said Section 36, said point also being 10.00 feet West of an existing 16-inch pipeline; thence along the centerline of said proposed 24-inch feeder line corridor North 30° 02' 46" East 26.33 feet; thence North 82° 20' 40" East 146.80 feet; thence North 88° 50' 26" East 500.00 feet more or less to the Easterly corridor line of said 16-inch pipeline; thence continuing North 88° 50' 26" East 705.35 feet; thence 740.94 feet along the arc of a 500.00 foot radius curve to the left through a central angle of 84° 54' 18" to a point of tangency; thence North 03° 56' 08" East 412.34 feet; thence North 04° 31' 40" East 50.00 feet; thence North 49° 31' 41" East 96.89 feet; thence North 04° 31' 40" East 208.97 feet to a point of curvature; thence 182.69 feet along the arc of a 600.00 foot radius curve to the left through a central angle of 17° 26' 46" to a point of compound curvature; thence 124.04 feet along the arc of a 100.00 foot radius curve to the left through a central angle of 71° 04' 17" to a point of tangency; thence North 83° 59' 21" West 149.41 feet to a point of curvature; thence 224.61 feet along the arc of a 150.00 foot radius curve to the right through a central angle of 85° 47' 37" to a point of tangency; thence North 01° 48' 17" East 62.23 feet to a point of curvature; thence 109.33 feet along the arc of a 150.00 foot radius curve to the left through a central angle of 41° 45' 46" to a point of tangency; thence North 39° 57' 32" West 142.66 feet; thence North 48° 34' 26" West 46.25 feet to a point of curvature; thence 220.40 feet along the arc of a 600.00 foot radius to the right through a central angle of 21° 02' 46" to a point of tangency; thence North 27° 31' 38" West 86.21 feet to a point of curvature; thence 164.94 feet along the arc of a 300.00 foot radius curve to the left through a central angle of 31° 30' 03" to a point of tangency; thence North 59° 01' 42" West 223.82 feet to the intersection of the East line of the 16-inch pipeline corridor and a point of curvature; thence 194.64 feet along the arc of a 600.00 foot radius curve to the left through a central angle of 18° 35' 11" to a point of tangency; thence North 77° 36' 53" West 121.78 feet; thence North 58° 46' 50" West 125.29 feet; thence North 43° 16' 14" West 129.59 feet; thence North 19° 52' 15" West 70.23 feet; thence North 00° 22' 22" West 70.12 feet to a point of curvature; thence 198.71 feet along the arc of a 600.00 foot radius curve to the right through a central angle 18° 58' 31" to a point of tangency; thence North 18° 36' 09" East 46.63 feet to a point of curvature; thence 59.01 feet along the arc of a 100.00 foot radius curve to the right through a central angle of 33° 48' 33"; thence North 52° 24' 42" East 84.77 feet to a point that is 10.00 feet Easterly of an existing 16-inch pipeline and which bears North 31° 56' 31" West from the East 1/4 corner of said Section 36 and the point of termination.

*Final Order South Mist Feeder Amd No 2
Attachment A. Page 1.*

Exhibit D

**DESCRIPTION OF THE CENTERLINE FOR A
1320.00 FOOT WIDE CORRIDOR
FALL CREEK RE-ALIGNMENT**

A route located in the Southwest 1/4 of Section 3, Township 5 North, Range 4 West, Willamette Meridian, Columbia County, Oregon, and being more particularly described as follows:

Beginning at Engineers station 3457 + 35.22 of the proposed 24-inch feeder line said point bears North $63^{\circ} 00' 00''$ East 1440.00 feet more or less from the Southwest corner of said Section 3; said point also being 10.00 feet Westerly of an existing 16-inch pipeline; thence, along the centerline of said proposed 24-inch feeder line corridor North $68^{\circ} 06' 46''$ East 509.93 feet; thence North $00^{\circ} 15' 44''$ West 295.75 feet to a point of curvature; thence 164.23 feet along the arc of a 600.00 foot radius curve to the left through a central angle of $15^{\circ} 40' 59''$ to a point of tangency; then North $14^{\circ} 43' 37''$ West 260.00 feet more or less to the Easterly corridor line of said 16-inch pipeline; thence continuing North $14^{\circ} 43' 37''$ West 170.74 feet to a point of curvature; thence 244.98 feet along the arc of a 300.00 foot radius curve to the left through a central angle of $46^{\circ} 47' 13''$ to a point of tangency and the intersection of the Easterly corridor line of said 16-inch pipeline; thence North $61^{\circ} 43' 32''$ West 676.24 feet to a point 10.00 feet West of the existing 16-inch pipeline and the point of termination.

*Final Order South Mist Feeder Amd No 2
Attachment A. Page 2.*

Exhibit

E

**DESCRIPTION OF THE CENTERLINE FOR A 1320.00 FOOT WIDE
CORRIDOR
PEBBLE CREEK RE-ALIGNMENT**

A route located in the Southeast 1/4 and Southwest 1/4 of Section 36, the Southeast 1/4 and the Northeast 1/4 of Section 35 the Southeast 1/4 and the Northeast 1/4 of Section 26, the Southeast 1/4 and the Southwest 1/4 and the Northwest 1/4 of Section 23, all in Township 5 North, Range 4 West of the Willamette Meridian, Columbia County, Oregon, and being more particularly described as follows;

Beginning at Engineers Station 3832 + 00 of the proposed 24-inch feeder line; said point bears North 60° 00' 00" East 1050.00 feet more or less from the South 1/4 corner of said Section 36; said point also being 10.00 feet Westerly of an existing 16-inch pipeline; thence along the center line of said proposed 24-inch feeder line corridor North 67° 46' 49" West 660.00 feet to the intersection of the Westerly corridor line of said 16-inch pipeline; thence continuing North 67° 46' 49" West 1093.85 feet; thence North 66° 51' 51" West 58.73 feet to a point of curvature; thence 172.72 feet along the arc of a 300.00 foot radius curve to the left through a central angle of 32° 59' 14" to a point of tangency; thence South 33° 52' 36" West 161.04 feet of a point of curvature; thence 122.06 feet along the arc of a 300.00 foot radius curve to the left through a central angle 23° 18' 41" to a point of tangency; then South 10° 33' 56" West 8.83 feet; thence North 79° 26' 05" West 1097.84 feet to a point of curvature; thence 171.78 feet along the arc of a 300.00 foot radius curve to the right through a central angle of 32° 48' 27" to a point of tangency; thence North 46° 37' 38" West 957.55 feet; thence North 10° 03' 40" East 292.69 feet; thence North 54° 55' 13" West 286.30 feet to a point of curvature; thence 98.48 feet along the arc of a 300.00 foot radius curve to the left through a central angle of 18° 48' 27" to a point of tangency; thence North 73° 43' 41" West 701.83 feet to a point of curvature; thence 146.06 feet along the arc of a 300.00 foot radius curve to the left through a central angle of 27° 53' 47" to a point of tangency; thence South 78° 22' 33" West 143.25 feet to a point of curvature; thence 182.71 feet along the arc of a 150.00 foot radius curve to the right through a central angle of 69° 47' 22" to a point of tangency; then North 31° 50' 05" West 353.43 feet to a point of curvature; thence 131.61 feet along the arc of a 600.00 foot radius curve to the right through a central angle of 12° 34' 06" to a point of tangency; thence North 19° 15' 59" West 35.13 feet to a point of curvature; thence 146.36 feet along the arc of a 600.00 foot radius curve to the right through a central angle of 13° 58' 36" to a point of tangency; thence North 05° 17' 23" West 814.73 feet to a point of curvature; thence 207.35 feet along the arc of a 300.00 foot radius curve to the left through a central angle 39° 36' 02" to a point of tangency; thence North 44° 53' 25" West 200.21 feet to a point of curvature; thence 177.80 feet along

*Final Order South Mist Feeder Arnd No 2
Attachment A. Page 3*

Exhibit F

the arc of a 300.00 foot radius curve to the left through a central angle of $33^{\circ} 57' 25''$ to a point of tangency; thence North $78^{\circ} 50' 49''$ West 5.11 feet to a point of curvature; thence 190.64 feet along the arc of a 150.00 foot radius curve to the right through a central angle of $72^{\circ} 49' 08''$ to a point of tangency; thence North $06^{\circ} 01' 41''$ West 439.56 feet to a point of curvature; thence 317.56 feet along the arc of a 300.00 foot radius curve to the right through a central angle of $60^{\circ} 38' 58''$ to a point of tangency; thence North $54^{\circ} 37' 17''$ East 270.85 feet to a point of curvature; thence 118.48 feet along the arc of a 200.00 foot radius curve to the right through a central angle of $33^{\circ} 56' 36''$ to a point of reverse curvature; thence 165.65 feet along the arc of a 300.00 foot radius curve to the left through a central angle of $31^{\circ} 38' 16''$ to a point of tangency; thence North $56^{\circ} 55' 37''$ East 302.47 feet; thence North $11^{\circ} 00' 14''$ East 635.84 feet to a point of curvature; thence 156.58 feet along the arc of a 600.00 foot radius curve to the right through a central angle of $14^{\circ} 57' 07''$ to a point of tangency; thence North $25^{\circ} 57' 21''$ East 261.14 feet to a point of curvature; thence 145.47 feet along the arc of a 900.00 foot radius curve to the left through a central angle of $09^{\circ} 15' 39''$ to a point of tangency; thence North $16^{\circ} 41' 42''$ East 508.62 feet to a point of curvature; thence 176.31 feet along the arc of a 300.00 foot radius curve to the left through a central angle of $33^{\circ} 40' 21''$ to a point of tangency; thence North $16^{\circ} 58' 40''$ West 2032.22 feet to a point of curvature; thence 670.65 feet along the arc of a 4500.00 foot radius curve to the right through a central angle of $08^{\circ} 32' 20''$ to a point of reverse curvature; thence 972.55 feet along the arc of a 4500.00 foot radius curve to the left through a central angle of $12^{\circ} 22' 58''$ to a point of tangency; thence North $20^{\circ} 49' 18''$ West 3070.53 feet; thence North $85^{\circ} 14' 20''$ West 110.00 feet to the intersection of the Easterly corridor line of said 16-inch pipeline; thence continuing North $85^{\circ} 14' 20''$ West 519.47 feet; thence South $61^{\circ} 20' 54''$ West 133.92 feet to a point that is 50.00 feet West of the said 16-inch pipeline and which bears South $21^{\circ} 00' 00''$ East 2175.00 feet more or less from the Northwest corner of said Section 23 and being the point of termination.