

S.W. Ostry

BEFORE THE ENERGY FACILITY SITING COUNCIL  
OF THE STATE OF OREGON

STANDARD

In the Matter of the Application )  
by OREGON NATURAL GAS DEVELOPMENT ) ORDER  
CORPORATION for a Site Certificate )

I

General Findings of Fact

A. Procedural history and record

1. This application was filed by Oregon Natural Gas Development Corporation on February 5, 1981. Notice of the receipt of an application for a site certificate for an underground storage facility was published in the March Secretary of State's Bulletin and in the media. By its Order, on March 13, 1981, EFSC appointed Frank Ostrander, Assistant Attorney General and Dr. Peter Paquet of the Oregon Department of Energy, Siting and Regulation staff, as co-presiding officers to conduct the hearing required by ORS 469.370 and to take all other necessary actions consistent with EFSC's statutory authority to develop as full and complete a record as possible. On March 18, 1981, notice of the contested case hearing was published in the news media and distributed to EFSC's mailing list established according to ORS 183.341.

2. Also by its order on March 13, 1981, EFSC appointed the Columbia County Commissioners, as members of the Special Advisory Council as required by ORS 469.480. On March 23, 1981, the presiding officers sent copies of the application and the Siting Council's relevant standards to the Department of Transportation, the State Health Division, the Water Resources Department, the State Geologist, the State Parks and Recreation Division, the Department of Fish and Wildlife, the Water Policies Review Board, the Public Utility Commissioner, the State Forester, the Department of Agriculture, the Economic Development Department, the Department of Land Conservation and Development, and Columbia County as required by ORS 469.350(3). Responses from these various agencies were received and are incorporated in the record as appropriate. No agency opposed the application and no negative or opposing testimony was received.
3. On April 15, 1981, the first pre-hearing conference was held at the Department of Justice's offices at 520 S. W. Yamhill in Portland, Oregon. On May 12, 1981, at the same location a second pre-hearing conference was held. The formal contested case hearing itself was held on May 18, 1981, beginning at

10:00 a.m. at the Village Inn in St. Helens, Oregon. The hearing did not attract significant public interest, although a reporter for the local newspaper and a few members of the public did attend. The local official's advisory group appointed by the Council sat with the presiding officers during the hearing. Their written advice to the Council concerning the application is attached hereto as Appendix 1.

4. On May 6, 1981, pursuant to OAR 345-15-012 and OAR 137-03-005, Reichhold Energy Corporation requested to intervene in the proceedings as a party. On May 13, 1981, the presiding officers issued an order granting party status to the Reichhold Energy Corporation. As a condition of the order and with the concurrence of its legal counsel Reichhold was joined with the applicant as a consolidated party.
5. The record in this proceeding consists of EFSC's notices, its March 10 Order, the Petition to Intervene filed by the Reichhold Energy Corporation, the presiding officers Order Granting Party Status, the transcripts of the two pre-hearing conferences, the transcript of the May 18, 1981 hearing, and the Exhibits presented at that

hearing, which are identified on page 4 of the hearing transcript beginning with "Hearing Exhibit No. 1" (Application dated 2/6/81). There were 69 Exhibits admitted into evidence at the hearing. Subsequent to the hearing a letter was received from the Oregon Department of Economic Development, which was designated by the hearing officers as Exhibit number 70. Legal counsel for ONG had no objection to including Exhibit 70 or to the entire record as designated. Nine persons made appearances at the hearing. No limited appearance statements were offered or received. A list of those who appeared is set forth beginning at page 1 of the hearing transcript.

B. Description of the proposed facility and related or supporting facilities.

1. ONG, a wholly owned subsidiary of NNG, a co-applicant in this proceeding (Exhibit 67, 68, 69, 10, 11, 12, Tr 23-24), proposes to convert two existing producing gas fields near Mist, Oregon to underground reservoirs by constructing some additions to the existing production facilities. Underground reservoir storage will allow ONG's parent company and co-applicant Northwest Natural Gas, to increase the reliability and efficiency of its service by enabling it to store gas in Oregon

during low demand periods to serve as reserves available for high demand periods. Exhibit 2, p 1; Tr 10-21 Petterson.) The Mist gas field was discovered in April, 1979 and has been developed to include five producing wells tied together with gathering lines to gas processing equipment located at Miller Station. (Exhibit 2, pp 4-6). As of 1979, there were 399 separate underground storage pools in operation in the United States. (Exhibit 2, p 7.)

2. A typical underground reservoir is little more than a gas production field with some means to inject gas back into the ground. There are, however, differences. Well spacing patterns will be closer. Large compressors are needed for gas injection and additional buried pipe line connections to Miller Station will be needed. (Exhibit 2 pp 10-10B.)
3. An underground gas storage reservoir is unique among the energy facilities subject to the EFSC's jurisdiction in that the facility is a natural formation which is located where nature created it thousands of years before. (Exhibit 2, pp 10B-10C.) Thus there is no question of siting the facility in another location.

4. The facility will be located on approximately 1600 acres and will include the existing production facilities such as wellheads, gathering lines, pipelines and the Miller Station which processes and measures gas. The facility will use two underground gas pools known as the Bruer and Flora Pools. For the whole project about 20 acres of surface land will be used. The remaining acreage will remain in timber production. The proposed facility will require the drilling of 2 to 5 storage wells and the construction of additional gathering lines and pipelines. Another feature will be a compressor plant which will have up to 4,000 installed horsepower, which will be installed and built on the Miller Station Property. All of this will require only a small additional use of surface land. (Tr 13-17, Petterson Exhibit 3)

## II

### Findings of Fact and Conclusions of Law Relating to EFSC's Standards

#### A. Applicable Standards

##### Finding of Fact

1. ONG proposes to build and operate an underground storage facility for natural gas. (General Findings of Fact. No.B.1.)

Conclusion of Law

1. Based on Finding of Fact II A1, EFSC finds that ONG must comply with OAR ch 345, Division 111 (Standards for the Siting of Underground Reservoirs) in order to obtain a site certificate.

B. Minimum Distances From Dwellings - OAR 345-100-036(1)

"In order to issue a site certificate for a facility the Council must find that:

1. The following supporting facilities can 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
- d. roads and road maintenance equipment housing . . . 15 meters"

Findings of Fact

1. The closest existing permanent habitable dwelling to the project is a residence on State Highway 202, near the north edge of Section 15, T 6N R 5W, WM. (Exhibit 4.) The only major facility on the site as defined by OAR 345-100-025 is the 12 acre Miller Station which is 2,238 meters or 7,000 feet from the nearest residence. This distance is substantially more than the distance required by the standard. All future major facilities for the project will be constructed at the Miller Station. (Exhibit 25, Exhibit 9, Exhibit 2L.)

2. The nearest minor facility as defined by OAR 345-100-025 to a dwelling is the production well known as Columbia County No. 6 which is 636 meters or 2,000 feet from the nearest residence. (Exhibit 25, Exhibit 9, Exhibit 2L.) This is substantially further than required by the standard. Future minor facilities will also be located at distances meeting or exceeding the distances required by the standard. (Exhibit 25, p 4.) For example, all compressors of less than 1,000 horsepower will be located on the Miller Station property which is 2,238 meters or 7,000 feet from the closest residence. (Exhibit 25, p 4.) The nearest road on this site is 320 meters away or 1,000 feet from the nearest residence. There are no road maintenance equipment housings as part of the project. Future roads and road maintenance housings will be located at distances exceeding the standard. (Exhibit 25, p 4.)

#### Conclusion of Law

1. For the reasons set forth in Findings of Fact II B1-B3, EFSC finds that major and minor facilities as defined in OAR 345-100-025 are or can be located at distances well in accordance with the schedule set forth in OAR 345-100-036.

#### C. Pipelines - OAR 345-100-036(2)

"In order to issue a site certificate for a facility the Council must find that: . . .

(2) Pipelines can be constructed in accordance with the requirements of the US Department of Transportation as set forth in Title 49, Code of Federal Regulations, Part 192 Subpart C, in effect on the date of these rules."



### Findings of Fact

1. All the existing pipelines and equipment at the Mist site except for production wells and well-head equipment which are not required to meet the Federal standards were designed, constructed, tested and are operated according to the applicable sections of the Federal regulations cited in the standard. (Exhibit 26.) The Public Utility Commissioner of Oregon enforces these regulations within the state of Oregon. (Exhibit 27.) Pipelines constructed in association with the proposed facility can and will be constructed in accordance with the regulations. (Exhibit 26, p 6.)

### Conclusion of Law

1. For the reasons set forth in Finding of Fact II C1, EFSC finds that pipelines can be constructed in accordance with the requirements of OAR 345-100-036(2).

### D. Noise - OAR 345-100-036(3)

"In order to issue a site certificate for a facility the Council must find that: . . .

- (3) The facility can be designed so that noise resulting from operation of compressor stations and related facilities shall not violate standards specified by the Oregon Department of Environmental Quality in OAR 340-35-35, Noise Control Regulation as of the effective date of these specific standards."

### Finding of Fact

1. The nearest noise sensitive property as defined in DEQ's regulations, OAR chapter 340, Division 35 is a

dwelling located 7,000 feet from the plant installation. Using the worst case analysis including operation of 5 compressor-exhausts and 5 coolers and no attenuation by natural shielding but allowing for air absorption, the maximum sound level reaching the nearest noise sensitive property is calculated to be 12 dbA which is below the level readable on noise instrumentation. This level of noise would not be heard at the nearest noise sensitive property. Even if larger engines and larger coolers than those assumed above were used, muffler and cooler fan operating conditions can hold the sound level well below the dbA increase prohibited by the standard. (Exhibit 13.)

#### Conclusion of Law

1. Based on Finding of Fact II D1, EFSC finds that the facility can be designed so that noise resulting from operation of compressor stations and related facilities will not violate the DEQ standards cited in the standard.

#### E. Abandoned wells - OAR 345-100-036(4)

"In order to issue a site certificate for a facility the Council must find that: . . .

"Abandoned wells within the area affected by the project can be capped and sealed, using the best available technology, so as to prevent leakage."

#### Finding of Fact

1. There are 5 abandoned or suspended wells on the site of the proposed facility. Each well was abandoned in accordance with existing Department of Geology and Mineral

Industries rules which require plugging of each well at 3 elevations. This represents the best available technology for well abandonment. There are no other wells other than producing wells or monitoring wells within the site. Future wells, if any, at the proposed site can be abandoned in accordance with the same Department of Geology and Mineral Industries regulations. (Exhibits 28, 29, 30, 31 and 32.)

#### Conclusion of Law

1. Based on Finding of Fact E1, EFSC finds that abandoned wells within the area affected by the project can be capped and sealed using the best available technology so as to prevent leakage.

#### F. Geologic Structure - OAR 345-100-036(5)

"In order to issue a site certificate for a facility the Council must find that: . . .

"The facility has a geologic structure such that it is capable of being sealed, in the event of leakage, in a manner that will prevent toxic or flammable levels to exist at the surface."

#### Findings of Fact

1. The gas at the Mist site is trapped in the Clark and Wilson sandstone which is of upper Eocene age (approximately 40 million years old). The sandstone is overlain by 2,000 feet of shale, mudstone and siltstone. The gas is confined above by the shale and mudstone, below by shale, and laterally by saline formation water. The geological structure is formed by a northwest trending

broadfold which is intersected by faults. Natural gas occurs at a depth of 2,220 to 2,900 feet below the surface. (Exhibit 33, p 1.)

2. Geologic conditions encountered at the Mist gas field indicate that the gas has been contained since at least the Pliocene era (10,000 million or so years). Although capping shale and siltstone in the Mist field is more than 2,000 feet thick, less than 100 feet of this type of sedimentary rock should provide sufficient seal against upwards leakage of formation fluids under a normal formation pressure gradient. (Exhibit 33, pp 1-2; Tr 80-103 Newton, Stinson, Olmstead.)

3. From well logs, rock characteristics including porosity and permeability and the type of formation fluid can be ascertained. The fracture gradient of the cap rock, however, has not been tested as yet at Mist. If the gradient is normal, that is roughly equivalent to the weight of overlying sedimentary rock the rock should withstand 1.0 psi per foot of depth. If injection of the gas does not exceed 0.5 psi per foot of depth (the normal fluid pressure gradient) the capacity of the rock should be ample to protect against fracturing the cap rock seal. (Exhibit 33, p 2; Tr 85-103 Newton, Stinson, Olmstead.) Without actual testing of breakrock, it is difficult to determine what the upper limits of gas pressure are for the caprock. Experience in similar formations in other states indicate

that as high as 70% or 80% may be safe. (Tr 90-103 Newton, Stinson, Olmstead.)

4. The only man-made penetrations of the reservoir pools at Mist are the recent gas wells which have been drilled. There is a slight possibility that casing seals or cement plugs may at some time in the future develop leaks; however, charging shallow fresh water zones with the gas is a very remote possibility since there are not significant fresh water aquifers in the area. Escape of stored gas by abandoned exploration holes is also very unlikely because the Clark and Wilson sand is 100% water saturated at these locations and none of the gascap extends to them. As long as storage reservoir pressures do not exceed the original primary reserve pressure there is no likelihood of pushing the gas through producing or injection wells. All wells will be monitored during storage operations. Leaks and seals can be repaired by recementing broken casings with squeeze-cementing methods commonly employed in the oil and gas industry. (Exhibit 33, pp 3-4; Tr 78-79; 84-85.)

5. The probability of the caprock seal being ruptured by earthquake or other natural event is extremely low as this part of Oregon is an aseismic region. (Exhibit 33, p 5; Tr 96-97 Newton.)

#### Conclusions of Law

1. This standard does not require that the geologic structure be capable of being sealed after a cataclysmic

natural event, such as a massive earthquake fissure which would essentially create a new geologic structure. In any event, such an occurrence is unlikely in this case. (Finding of Fact II F 5).

2. Based on Findings of Fact II F 1-F5, EFSC finds that the geological structure of the caprock at the proposed facility is capable of being sealed in the event of leakage in a manner that will prevent toxic or flammable levels to exist at the surface so long as the pressure of the gas injected into the storage facility does not exceed the original gas pressure or a higher level based on break-testing of the caprock seal.

G. Leakage - OAR 345-100-036(6)

"In order to issue a site certificate for a facility the Council must find that: . . .

The related and supporting facilities of the proposed facility can use the subsurface safety devices and testing procedures which can prevent leakage which could change the quality or quantity of adjacent oil, gas or water resources or endanger the health and safety of the citizens of Oregon."

Findings of Fact

1. As noted in General Finding of Fact I B 4, the related and supporting facilities of the proposed facility consist of gathering lines, pipelines, a compressor plant, injection-withdrawal wells and monitoring wells.

2. Surface safety devices at producing wells consist of a safety system which will automatically shut down gas

production from the well if header pressure is too high or too low, there is a fire at the wellhead, sand or sediment flow from the well, or there is a loss of control or pilot pressure. (Exhibit 34, p 2.) This represents the technologically best available surface safety equipment and any future producing wells which may be drilled within the affected area will be equipped similarly. Injection withdrawal wells which will be drilled for the storage facility will be equipped with the same surface safety system and will also be equipped with a subsurface safety valve. This valve will close automatically for the same conditions that close the surface safety valve. (Exhibit 34, Exhibit 35.)

3. A control and safety system is in use at the Mist field as shown in Exhibit 36. This system will shut down all flow of gas if header pressure is too high or too low, there is a fire in the reconcentrator building or if there is a loss of control air pressure. Several alarms, both on site and remotely in Portland, will register several other parameters including dehydrator temperature glycol level, generator temperature, generator oil pressure, air compressor failure, stand-by air supply, and high or low gas flow. These monitors represent the best available technology. Header pressure, station flow and start-stop gas compressors can be controlled remotely from the gas supply office of Northwest Natural Gas at 123 N. W. Flanders in Portland. (Exhibit 34.)

4. In addition to the automatic and alarm features described in Findings 1 and 2, daily monitoring of the facility by trained, on-site operators will occur. The operators will make a daily inspection of each wellhead and will make a continuous log of significant events. In addition, there is a continuous in-line chromatograph which will take periodic samples of the gas from each reservoir so that any change in gas composition could be detected. (Exhibit 34, p 3.)

5. Physical security sensitive areas of the project are the Miller Station and wellhead sites. The Miller Station has a chain-link perimeter fence with a remotely operated main gate visible from the operating building. All wellheads are fenced and have locked gates. There is also a microwave communication system directly connected with Portland. (Exhibit 34, pp 3-4.)

#### Conclusion of Law

1. Based on Findings of Fact II G1-4, and Finding of Fact II H 1, below, EFSC finds that ONG can use the technologically best available surface and subsurface safety devices and testing procedures which can prevent leakage which could change the quality or quantity of adjacent oil, gas, or water resources or endanger the health and safety of the citizens of Oregon.

#### H. Monitoring - OAR 345-100-036(7)

"In order to issue a site certificate for a facility the Council must find that: . . .



A program can be developed using the best available technology to monitor the facility, to ensure the public health and safety."

#### Findings of Fact

1. The existing monitoring program at the facility consists of daily inspections of each wellhead by an operator; semi-annual down-hole pressure testing of each well; annual aerial pipeline inspection of gathering lines and main transmission lines; annual pipeline inspection by qualified personnel traveling along the pipeline right-of-way; periodic analysis of ground water as sampled from the Miller Station potable water wells; and a remote readout in the Portland office of Northwest Natural Gas of vital flow and pressure permimeters. In addition to the existing program, two previously dry holes will be used as observation wells, Columbia County No. 5 to monitor the Breur pool and Columbia County No. 32-3 to monitor the Flora pool. Each well is on the down dip edge of its respective reservoir and can be used to monitor the water table of the reservoir as well as any gas leakage if it were to occur at the down dip edge. This represents the technologically best available system for ensuring the public health and safety

#### Conclusion of Law

1. EFSC finds based on Finding of Fact II H 1 and the annunciators and other systems described in Findings of Fact II G 1-G 5, that ONG can develop a program using the best available technology to monitor the facilities to ensure the public health and safety.

I. Application Information - OAR 345-100-036(8)

"In support of assessments required in this specific standard, the applicant shall submit:

- a. An engineering study, including but not limited to:
  - i. Characteristics of the cap rock, such as areal extent, average thickness, and threshold pressure,
  - ii. Oil and gas reserves of storage zones prior to start of injection including calculations,
  - iii. Casing diagrams, including cement plugs, and actual or calculated cement fill behind casing, of all idle, abandoned, or deeper zone producing wells within the area affected by the project.
- b. At least one geologic cross section through at least one injection well in the project area;
- c. List of all observation wells used to monitor the project, indicating what parameter each well is monitoring (i.e., pressure, temperature, etc.)."

Finding of Fact

1. Information contained in Exhibits 1 and 2 and the Appendices to Exhibits 1 and 2, Exhibit 33, and Exhibits 38, 39, and 40 include the supporting information required by the standard.

Conclusion of Law

1. Based on Finding of Fact II I, 1, EFSC finds that the applicant has complied with OAR 345-100-036(8).

J. Water Quality - OAR 345-100-040(1)

"In order to issue a site certificate for a facility, the Council must find that:

"The facility can be designed so that water quality can be maintained as follows:

a. for groundwater which is potable, as defined by the Environmental Protection Agency in Federal Register Vol 40, No. 28, December 24, 1975 and Vol 41, No. 133, July 9, 1976 paragraphs 141.11, 141.12, 141.15a and 141.16 - contaminants from the facility will not make the water non-potable.

b. for surface waters which meet the requirements of Oregon River basins given in subsection (2) of OAR 340-41-205, 145, 185, 325, 365, 445, 485, 525, 565, 605, 645, 685, 725, 765, 805, 845, 885, 925 and 965 contaminants will not cause surface waters to exceed these levels. References to maximum permissible concentrations of radioactivity shall refer to paragraphs 141.15a and 141.16 in the Federal Register Vol. 41, No. 133, July 9, 1976.

c. for ground or surface waters which currently exceed the foregoing standards of (a) or (b) contaminants in water discharged from the facility, measured at the point of entrance to the ground or surface water, will not exceed the concentrations of the foregoing standards (a) or (b)."

#### FINDINGS OF FACT

1. There are two discharges from the operation of the gas production phase of the Mist field. They are sewage from the Miller Station and a small volume of formation water produced in association with the natural gas. The same sources of waste water will also be present during the life of the underground storage field. The sewage discharged daily is roughly equivalent to that of a residence. The sewage is disposed of in a drain field that was approved by the Columbia County Subsurface Sewage Department in accordance with DEQ requirements. Formation water is the water that is naturally present in sedimentary

strata and is generally water that has been trapped at the time of deposition of the rock. The formation water produced daily is about 20 gallons per well. Since the gas storage formation is of marine origin it is assumed to be sea water. The existing ground water is potable. Ground water is present at Miller Station in a fractured shale formation that is 216 feet below the surface and is 84 feet thick. The second ground water system is a shallow gravel bed off the proposed site which is used by most of the residents of the Mist area. (Exhibits 41, 42, 43, 44.)

2. The aquifer at Miller Station is protected from surface contamination by 216 feet of non-water bearing shale placed on a clay. These units have very little permeability therefore future construction and sewage disposal should have no adverse impact on the aquifer. The aquifer is isolated from the gas injection/withdrawal wells through the use of casings which are set well above the bottom of the aquifer. Casings are cemented to the wall rock from the bottom of the casing to the land surface thus preventing the mixing of lower fluids with upper waters. The aquifer is protected from pollution by the produced formation waters by the low permeability of the shales and clays and by the disposal of the produced formation waters in a seepage pit at each well site. The seepage pits will consist of holes 10 feet deep and approximately 5 feet across and filled with gravel. This disposal method will offer gradual dilution of

the low volume of produced formation waters with the rain water which is percolating through the weathered surface rock. The Department of Environmental Quality has approved this disposal method. (Exhibit 41, pp 5-7, Exhibit 45.)

3. The surface water in the vicinity of the site generally meets DEQ's potability standards as referenced in the standard. (Exhibit 41, 46, 47.)

4. There will be no direct discharge of waste fluids to surface water as a result of the operation of the storage facility. Drilling muds will be contained in tanks and sumps during the drilling of wells and will be disposed of in a landfill away from the site. (Exhibit 41: Tr 121.) Formation water will be disposed of in seepage pits as described in Finding of Fact II J 2 above. If this water did mingle with the surface water it would be diluted to the point where it would not appreciably affect existing water quality of the surface water. (Exhibit 41, 45, 48, 49.)

5. Certain of the surface waters in the area may exceed the potability standards cited in the standard. For the reasons set forth above in Findings of Fact II J 1-4, above contaminants from the facility will not cause appreciable pollution or exceed the concentrations allowed by the standard.

#### Conclusion of Law

1. For the reasons set forth in Findings of Fact II J 1-J 5, contaminants from the facility will not make ground

water or surface water non-potable and will not otherwise exceed the concentrations allowed by OAR 345-100-040(1).

K. Natural resource areas - OAR-100-040(2)

"In order to issue a site certificate for a facility, the Council must find that:

The proposed site is not in one of the designated natural resource areas listed below and the proposed project is not likely to produce significant adverse impacts on any such area including:

(a) National Parks, National Monuments and National Wildlife Refuges;

(b) State of Oregon Parks, Waysides, Wildlife Refuges and Natural Area Preserves;

(c) Wilderness areas as established under the Federal Wilderness Act (16 USC 1131 et seq.) and areas recommended for designation as wilderness areas pursuant to Section 603 of the Federal Policy and Management Act of 1976 (P.L. 94-579);

(d) Scenic Waterways designated pursuant to ORS 390.825;

(e) Federally-designated Wild and Scenic Rivers established pursuant to P.L. 90-452;

(f) Experimental areas established by the Rangeland Resources Program, School of Agriculture, Oregon State University;

(g) Areas having unique or significant wildlife, geologic, historic, botanical, research or recreational values as lawfully designated by the state agency having jurisdiction over such values."

Finding of Fact

1. The proposed site of the facility is not in one of the designated natural resource areas listed in OAR 345-100-040(2). (Exhibit 50, p 1; Exhibit 52, 54.) The

closest federally managed National Wildlife Refuge is for the Columbian white tailed deer on Tenasillahe Island, a distance of about 20 miles. The closest Oregon Wildlife Refuge is near Jewell, approximately 10 miles to the west of the proposed site. There will be no negative impacts on wildlife in the area. (Exhibit 52.)

#### Conclusion of Law

1. Based on Finding of Fact II K 1, EFSC finds that the proposed facility is not in one of the designated natural resource areas in the standard and is not likely to produce significant adverse impacts on any such area.

#### L. Plant and Animal Life, Soils, OAR 345-100-040(3)(4)(5)(6)(7)(8)

"Studies have been performed characterizing the relative abundance and diversity of the plant and animal species at the proposed site of the facility. (Shannon-Weaver index H shall be a satisfactory measure of diversity) and

The proposed project is not likely to jeopardize the continued use of deer, elk and antelope wintering ranges or migration routes.

The above ground portions of the facility shall not be located on antelope fawning areas, sage grouse strutting or nesting grounds, raptor nesting areas, or waterfowl and waterbird nesting and rearing areas.

Areas within the project boundary with unstable or fragile soils have been satisfactorily identified and available construction techniques can be employed to reduce adverse impacts such as compaction and erosion.

The bird species within the area affected by the proposed facility have been identified and the facility is not likely to jeopardize the

continued existence of local or migratory populations of such bird species.

Construction and operation of the facility is not likely to jeopardize the continued existence of any of the following species, or destroy habitat critical to continued existence of these species.

- i. Wildlife
  - (A) Deer, Columbian white-tailed (Odocoileus virginianus leucurus),
  - (B) Wolf, Gray (Canus Lupus),
  - (C) Eagle, Bald (Haliaeetus leucocephalus)
  - (D) Falcon, American peregrine (Falco peregrinus anatum),
  - (E) Falcon, Artic peregrine (Falco peregrinus tundrius),
  - (F) Goose, Aleutian Canada (Branta canadensis leucopareia),
  - (G) Pelican, brown (Pelecanus occidentalis),
  - (H) Butterfly, Oregon silverspot (Speyeria zerene hippolyta),
- ii. Plants - any of the fifty-one species proposed by the Fish and Wildlife Service as endangered in Oregon by publication in the Federal Register (41 FR 24524; June 16, 1976).

NOTE: The species identified in subsection (9) consist of endangered and threatened wildlife listed as of October 1, 1978, in 50 CFR Part 17 with a range which includes Oregon, and species in Oregon proposed by the Fish and Wildlife Service for addition to the list in 50 CFR Part 17 as published in the Federal Register."

#### Findings of Fact

1. A study was performed characterizing the relative abundance and diversity of the plant and animal species at the proposed site of the facility. (Exhibit 19; Tr 45-47, Kirk.)



2. The proposed site is very typical of areas managed for timber production in western Oregon. (Tr 47-47, Kirk). The diversity of plant and animal species on the site may be characterized as high because of its diverse habitat and diverse vegetation. (Tr 47, Kirk; Exhibit 18).

3. Antelope do not occur in the area of the proposed site. (Exhibit 19). Deer and elk do not migrate in the commonly understood sense in northwestern Oregon. Deer remain on relatively small areas throughout the year and elk rotate through feeding areas on a 15 to 20 day cycle within an area that does not exceed about 4 square miles. (Exhibit 19, p 1.) Loss of any forage from the areas utilized by the above ground portions of the facility should not have a substantial effect on use of the area as winter range. (Exhibit 19, p 2). The proposed facility is not likely to jeopardize any deer or elk wintering ranges. (Exhibit 19; Tr 49, Kirk).

4. Antelope, sage-grouse, water fowl, and water birds do not occur in the area of the proposed facility. (Exhibit 20, p1). Thirteen species of hawks and owls might use the area. Of those 4 are cavity nesters and are unlikely to nest in the area because most cavities have been eliminated by prior timber harvesting. Five of the remaining species might use the area for nesting during periods when second growth Douglas-fir is beginning to dominate over brushy species. The remaining species might use the area while it

is covered with older second growth. There are no raptor nests identified on the site. The presence of the facility however should not substantially affect raptor nesting periods. (Exhibit 20; Tr 50-52, Kirk.)

5. The soils on the proposed site are typical for the coast range area of Oregon. (Tr 38, Kelly.) Laboratory testing and engineering analysis of the site of the Miller Station including soil classification, moisture content, natural density, compaction, compression and resonant column dynamic tests reveal that the site soils are capable of supporting the planned building and equipment loads. (Exhibit 14, p 2; Tr 38, Kelly.) Construction of pipelines and other related or supporting facilities at the site may encounter isolated unstable or fragile soils, however, commonly available construction techniques can be used to stabilize the soils. (Tr 38, Kelly; Exhibit 14; Exhibit 17; Tr 40-43, Petterson.)

6. The bird species in the immediate vicinity of the proposed facility have been identified. (Exhibit 21.) The habitat surrounding the facility area is not unique and is similar to much of the surrounding countryside. Construction of the facility may displace some individual birds, but the displacement would be so slight that any effect on the populations of those birds would be imperceptible. (Exhibit 21.)

7. None of the animal species or plants identified as

endangered in OAR 345-100-040(8) is found on the proposed site. (Exhibit 22; Exhibit 23; Exhibit 24; Tr 55-57, Kirk.) There would be no significant impacts from construction of the proposed facility on these plants or animals.

#### Conclusion of Law

1. Based on Findings of Fact II L 1- L 7, EFSC finds that studies have been performed characterizing relative abundance and diversity of the plants and animals species at the proposed site of the facility; the proposed project is not likely to jeopardize the continued use of deer, elk and antelope winter ranges and migration routes; the above ground portions of the facility will not be located on antelope fawning areas, sage grouse strutting or nesting areas, raptor nesting areas, or waterfowl and waterbird nesting and rearing areas; areas within the projects boundaries with unstable or fragile soils have been satisfactorily identified and available construction techniques can be employed to reverse any adverse impacts; the bird species within the areas affected by the proposed facility have been identified and the facility is not likely to jeopardize the continuing existence of local or migratory populations of such bird species; and construction and operation of the facility is not likely to jeopardize the continuing existence of any of the species identified in OAR 345-100-040(8).

M. Land Use, ORS 345-100-045

"In order to issue a site certificate for a facility the council must find that:

1. "That the Land Conservation Development Commission has acknowledged pursuant to OAR 197.251 (1979 replacement part) the comprehensive land use plan[s] and implementing measures of the general purpose local government[s] having land use planning jurisdiction over the site facility and that the facility has been determined by the local government[s] to be consistent with the plans[s] and measures;
2. That if the plan and implementing ordinances measures have not been acknowledged by the Land Conservation and Development Commission, the applicant has demonstrated to the council that after providing notice and opportunity for public and other government agency review and comment, the statewide planning goals (OAR Chapter 660, Division 15) have been considered and applied by the local government[s] during a land use review of the facility, and such facility has been determined by the local government[s] to be consistent with applicable statewide planning goals and local land use plan and measures; or
3. If the local government[s] having land use planning jurisdiction over the site of the facility has not completed a land use review of the facility prior to approval of a site certificate as required by subsection (1) and (2) of this rule, or if such local government has denied that the facility is consistent with applicable statewide planning goals and land use plans and measures the council has determined that the application is consistent with the statewide planning goal. Provided, however, that a site certificate authorizing the construction within the boundaries of an incorporated city shall be conditioned on compliance with city ordinances in effect on the date of the application of the site certificate as required by ORS 469.400(6) (1979 replacement part).

Finding of Fact

1. Columbia County is the local government with land use

jurisdiction over the proposed facility. (Exhibit 55, p 2.) Columbia County's land use plan has not been acknowledged by the Land Conservation and Development Commission. (Exhibit 55, p 2.) On April 22, 1981, the Columbia County Board of Commissioners at their regularly scheduled meeting determined that the proposed facility is in conformance with the statewide planning goals and the existing county comprehensive land use ordinances. The County's action followed similar action at a public hearing by the County Planning Commission on April 6 and previous meetings with the Mist area Citizens Advisory Group. (Exhibit 55; Exhibit 56; Exhibit 57; Exhibit 58; Exhibit 59; Exhibit 60; Tr 131-132, Petterson.)

#### Conclusion of Law

1. Based on Finding of Fact II M 1, EFSC finds that the applicant has demonstrated that after providing notice and opportunity to the public and other government agency review, the statewide planning goals have been considered and applied by the local government concerned (Columbia County) during a land use review of the facility and that the facility has been determined by the local government to be consistent with applicable statewide planning goals and local land use plans and measures as required by OAR 345-100-045 (2).

#### N. Socio-economic Impacts - OAR 345-100-050

"In order to issue a site certificate the Council must find that:

1. The applicant has identified the major and reasonably foreseeable socio-economic impacts on person and com-

munities located in the vicinity of the facility resulting from construction and operation, including, but not limited to, anticipated need for increased governmental services or capital expenditures, and

2. The applicant and the affected local government can provide adequate resources to mitigate the impacts identified pursuant to (1), and

3. The applicant has an adequate process for periodically updating, during construction and operation, its assessment of anticipated impacts of the facility.

#### Findings of Fact

1. The applicant has discussed the socio-economic impacts of the proposed facility with a variety of Columbia County Departments, major landholders in the vicinity of the proposed site, and relevant state agencies. (Exhibit 61, Tr 131-135.) The socio-economic impacts of the facility are not major. The well drilling and other construction activity associated with construction of the facility will require less than 20 employees for short periods of time. Operation of the proposed facility will require the addition of only 1 to 3 additional families living in the area. Impacts on police, fire, schools, restaurants, state agencies and other socio-economic impacts from the proposed facility will be minor. (Tr 137-143, Petterson.)

2. Construction and operation of the proposed facility will have a positive economic impact on Columbia County's ability to provide services as the tax return to Columbia County from the facility will provide in future property tax years approximately \$69,000: (Exhibit 61, p 6; Tr

143-147, Petterson.)

3. An early written comment by the Oregon Department of Economic Development indicated that the Department did not oppose the project but that there were concerns raised by the Port of St. Helens and Columbia County questioning the positive contribution of the facility to the economy of the area. (Exhibit 63; Tr 147, Petterson.) This comment was not substantiated. No appearance by the Port of St. Helens was made at the hearing. The County Commissioners who were present at the hearing did not raise any such concerns other than expressing an interest in whether construction and operation of the proposed facility would preclude further exploration for their oil and gas below the underground storage reservoir, which it would not. (Tr 147-160, Petterson.) A portion of this section of the transcript is not sworn testimony by either the County Commissioners or the attorney for ONG. Nonetheless, that construction and operation of the facility would not preclude further exploration is supported by sworn testimony. (Tr 157, Petterson.) The County Commissioners were also given an opportunity to testify as sworn witnesses, but declined. (Tr 149.) In any event, subsequent to the hearing, a letter was received from the Oregon Department of Economic Development reversing their previous statement. (Exhibit 70.)

4. The applicant has an adequate process for updating periodically the assessment of impacts from the facility by

regular coordination with those agencies which may be affected. (Exhibit 61, p 8.)

#### Conclusion of Law

1. Based on Findings of Fact N 1-N 4, EFSC finds that the applicant has identified the major and reasonably foreseeable socio-economic impacts on persons and communities located in the vicinity of the facility from construction and operation of the facility, that the applicant and the affected local governments can provide adequate resources to mitigate any such impacts; and that the applicant has an adequate process for periodically updating its assessment of impacts as required by OAR 345-100-050.

#### O. Water Rights - OAR 345-100-052

"In order for the Council to issue a site certificate for a facility the council must find that the requirements for water used in construction and operation of the facility can be met without infringing upon the existing water rights of other persons."

#### Finding of Fact

1. The proposed facility has an existing domestic size water well capable of 20 gallons per minute production located at the Miller Station. This well meets the estimated 250 gallons per day requirements of the existing facility. The only significant increase beyond this daily average will occur when the cooling systems of the compressors must be filled. This will require about 2000 gallons of water. The cooling systems, however, are non-



consumptive, and this demand on the well will occur once and then only very rarely. The use of water by the facility will not infringe upon existing water rights of any other persons. (Exhibit 64; Exhibit 65; Exhibit 66.)

Conclusion of Law

1. Based on Finding of Fact II 01, EFSC finds that the requirements for water during construction and operation of the facility can be met without infringing upon the existing water rights of other persons as required by OAR 345-100-052.

P. Organization, Managerial and Technical Expertise -  
OAR 345-100-053

"In order for the Council to issue a site certificate for a facility the council must find that the applicant has or can acquire the organization, managerial, and technical expertise to construct, operate, and retire the facility.

Findings Of Fact

1. Oregon Natural Gas Development Corporation is a wholly owned subsidiary of Northwest Natural Gas Company and as such, will have complete access to the organization, management and technical expertise of Northwest Natural Gas including use of facilities, equipment and personnel. (Exhibits 67, 68, 69.) During the last 15 year period the company has undertaken six multi-million dollar construction projects within its service area. These projects required special accounting, purchasing, design, and construction expertise within this company to accomplish these different

tasks. These same people, and their expertise, are available to develop, construct and operate the Mist underground storage project. (Exhibit 67, pp 2-3.) Only one area of the construction of the project is not within the existing engineering expertise of the company: the large compressor installation. Large equipment manufacturers offer installation services with their equipment, and ONG will employ a compressor installation contractor to provide the necessary technical expertise. (Exhibit 67, p 4.) Operation and retirement of the facility will be similar to existing natural gas operations and is within the technical expertise of the company. (Exhibit 62, pp 4-5.)

2. Certain activities involved in drilling will require special consultants, such as perforation experts. Such experts are available and will be acquired by the applicant as required. (Tr 165-166, Petterson.)

#### Conclusion of Law

1. Based on Findings of Fact II P 1 - P 2, EFSC finds that the applicant has or can acquire the organization, managerial and technical expertise to construct, operate and retire the facility.

#### Q. Financial Assurance - OAR 345-100-054

"In order to issue a site certificate for a facility the Council must find that the applicant, together with all co-owners, possesses or has reasonable assurance of obtaining the funds necessary to cover estimated construction costs, operating costs for the design lifetime of the facility, and the estimated costs of retiring the facility."

### Findings of Fact

1. The total amount of the construction costs of the proposed facility is estimated at \$7,500,000 dollars. The annual operating cost is estimated to be 2.5 million. The estimated cost of retirement in 1981 dollars is estimated to be about \$1,000,000. (Exhibit 10.) ONG is a wholly owned subsidiary of Northwest Natural Gas Company. Northwest Natural Gas will be the financial guarantor for the proposed facility. The annual construction expenditures for Northwest Natural Gas in 1981 are estimated to be \$37,000,000. Northwest Natural Gas may obtain these funds internally from its operations or externally by the sale of mortgage bonds, stock, or an existing revolving credit agreement for \$30,000,000. The total construction program for the company and its subsidiaries for the period 1981 through 1985 is expected to aggregate 212 million dollars. (Exhibit 10, pp 3-6; Exhibit 11; Exhibit 12.)

### Conclusion of Law

1. Based on Finding of Fact II Q 1, EFSC finds that ONG and its parent company, Northwest Natural Gas Company, possess or have reasonable assurance of obtaining the funds necessary to meet the estimated construction, operating and retirement costs for the proposed facility as required by OAR 345-100-054.

R. Applications - OAR 345-100-055

"In order to issue a site certificate for a facility the Council must find that:

1. The applicant shall submit an application which includes but is not limited to:

(a) a description of the facility;

(b) one or more maps, containing the following information for the general area between the terminal points of the proposed transmission lines;

1. topography, including contour lines, and lakes, streams and rivers.
2. natural resource areas listed in OAR 345-100-040.
3. transmission lines, improved roads, railroads and pipelines.
4. land ownership by class federal, state, local government, and private.
5. current and planned land uses including but not limited to forests, agriculture, range lands, population centers and airports.
6. known habitats of threatened and endangered species as defined in 50 CFR part 17 as of 7 the effective date of these rules.

(c) a description of the construction and operation of the facility to the extent possible.

(d) a description of proposed techniques for monitoring impacts.

(e) the location of the injection well;

(f) the location of all oil and gas wells, including abandoned and drilling wells and dry holes, which penetrate the underground reservoir proposed to be used for storage and the names of the owners of any interests in oil and gas within such underground reservoirs;

(g) the formation from which wells are producing or have produced;

(h) the name, description, and depth of the formation field, pools and sands to be injected.

(i) the depths of each formation into which gas is to be injected.

(j) the elevations of the top of the oil or gas bearing formation in the injection well and the wells producing from the same formation within one half mile of the intake well;

(k) the log of the injection well, or such

information as is available;  
(l) description of the injection well casing;  
(m) description of the gas, stating kind, where obtained, and estimated amounts to be injected daily;  
(n) the names and addresses of the operators;  
(o) list of approvals required from governmental agencies.

2. At the time an application is filed, the applicant may indicate to the Council what information the applicant considers to be within the exemption to the public records law, ORS Chapter 192, provided by ORS 469.560. The Council shall treat all such information as confidential subject to a determination by the council or the Attorney General pursuant to ORS 192.450 that the exemption is not applicable."

#### FINDING OF FACT

1. The applicant has submitted an application and supporting evidence sufficient to provide the information required by the standard. (Exhibits 1-70; Exhibit 2.)

#### CONCLUSION OF LAW

1. Based on Finding of Fact II R 1, EFSC finds that HEC has complied with OAR 345-111-070.

S. Compliance with OAR 345-40-040 and ORS 469.470

#### FINDING OF FACT

1. The proposed facility is not one of the types of facilities identified in ORS 469.470, or OAR 345-40-040.

#### CONCLUSON OF LAW

1. EFSC finds that the application by ONG does not have to comply with OAR 345-40-040 or ORS 469.470.

### III

#### ADDITIONAL CONCLUSIONS OF LAW

##### A. Compliance with ORS 469.310.

"In the interests of the public health and the welfare of the people of this state, it is the declared public policy of this state that the siting, construction and operation of energy facilities shall be accomplished in a manner consistent with protection of the public health and safety and in compliance with the energy policy and air, water, solid waste, land use and other environmental protection policies of this state. It is, therefore, the purpose of ORS 469.300 to 468.570 and 469.992 to exercise the jurisdiction of the State of Oregon to the maximum extent permitted by the United States Constitution and to establish in cooperation with the Federal Government a comprehensive system for the siting, monitoring and regulating of the location, construction and operation of all energy facilities in this state."

##### CONCLUSION OF LAW

1. Based on the Findings of Fact contained in parts I and II of this order, which show that the facility can meet EFSC's land use, public health and safety, and environmental standards, EFSC finds that the application by ONG for the siting construction and operation of an underground storage facility is consistent with the protection of the public health and safety and is in compliance with the energy policy and air, water, solid waste, land use and other environmental protection policies of this state.

##### B. Compliance with the energy policy of Oregon, ORS 469.010.

"The Legislative Assembly finds and declares that:

(1) Continued growth in demand for nonrenewable energy forms poses a serious and immediate, as well as future, problem. It is essential that future generations not be left a legacy of vanished or depleted resources, resulting in massive environmental, social and financial impact.

(2) It is the goal of Oregon to promote the efficient use of energy resources and to develop permanently sustainable energy resources. The need exists for comprehensive state leadership in energy production, distribution and utilization. It is, therefore, the policy of Oregon:

(a) That development and use of a diverse array of permanently sustainable energy resources be encouraged utilizing to the highest degree possible the private sector of our free enterprise system.

(b) That through state government example and other effective communications, energy conservation and elimination of wasteful and uneconomical uses of energy and materials be promoted. This conservation must include, but not be limited to, resource recovery and materials recycling.

(c) That the basic human needs of every citizen, present and future, shall be given priority in the allocation of energy resources, commensurate with perpetuation of a free and productive economy with special attention to the preservation and enhancement of environmental quality.

(d) That state government assist every citizen and industry in adjusting to a diminished availability of energy.

(e) That energy-efficient modes of transportation for people and goods shall be encouraged, while energy-inefficient modes of transportation shall be discouraged.

(f) That cost-effectiveness be considered in state agency decision-making relating to energy sources, facilities or conservation, and that cost-effectiveness be considered in all agency decision-making relating to energy facilities.

(g) That state government shall provide a source of impartial and objective information in order that this energy policy may be enhanced.

CONCLUSION OF LAW

1. Based on the findings in sections I and II of this order, EFSC finds that the energy facility proposed by ONG will contribute to reliably meeting the energy needs of the present and future citizens of Oregon in a cost effective manner and in compliance with the policy and goals set forth in ORS 469.010.

C. Waiver of Time Requirements of ORS 469.390

"Except as provided in section 4, chapter 609, Oregon Laws 1971, and ORS 469.410, no site certificate shall be issued under ORS 469.300 to 469.570 and 469.992 until the entire review time prescribed by ORS 469.370 has been utilized, except that the council may waive the time requirement if, pursuant to ORS 469.470, area studies of the entire state for that type of energy facility have been completed or have been determined to be unnecessary."

CONCLUSION OF LAW

1. As noted above in Finding III A, this facility is not a facility subject to ORS 469.470. Therefore, EFSC finds that a waiver of the time limits of ORS 469.390 is appropriate and in the public interest.

E. Compliance with ORS 469.400(3) and (4)

. . .

"(3) The site certificate shall contain conditions for the protection of the public health and safety and shall require both parties to abide by state law and rules of the council in effect on the date the site certificate is executed, except that upon a clear showing that there is danger to the public health and safety that requires stricter



laws or rules, the state may, subject to ORS 469.500, require compliance with such stricter laws or rules.

(4) The site certificate shall contain the applicant's warranties as to its abilities required under subsection (3) of ORS 469.470, its provisions as to protection of the public health and safety and as to time of completion of construction."

. . .

#### FINDINGS OF FACT

1. The site certificate attached hereto as Appendix 2 contains conditions for the protection of the public health and safety which are necessary for the protection of the public health and safety and to ensure compliance with EFSC standards in effect at the time this order is issued. The site certificate in Appendix 2 also requires both parties to abide by state law and the rules of the council in effect on the date the site certificate is executed.

2. The site certificate in Appendix 2 contains the applicant's warranties as to its abilities required under subsection 3 of ORS 469.470, protection of the public health and safety and completion of the project.

#### CONCLUSION OF LAW

1. EFSC finds that the site certificate contained in Appendix 2 complies with the requirements of ORS 469.400(3) and (4).

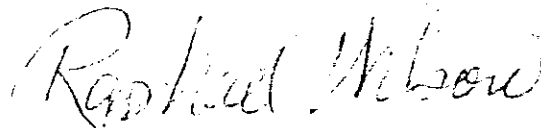
#### IV

#### ULTIMATE FINDING AND ORDER

Based on the Findings of Fact and the Conclusions of Law

contained in parts I through III of this order, EFSC finds that a site certificate consistent with the language and conditions in Appendix 2 of this order should be issued to Oregon Natural Gas Development Corporation for the construction of an underground storage facility for natural gas near Mist, Oregon as described and subject to the conditions in the site certificate. The site certificate shall be effective upon execution by both parties. The time period required by ORS 469.390 shall be waived.

IT IS SO ORDERED.



Bro. Raphael A. Wilson, Chairman  
Energy Facility Siting Council

DATED this 19<sup>th</sup> day of June, 1981.

NOTE: Appeal of this order may be made to the Oregon Supreme Court in the manner provided by ORS 469.400(1).