

variety of natural objects and contours, as well as man-made devices, serves to disrupt the line between source and receptor. (TR Vol. 19 and 20, Arnold)

- b. The unit of measurement for sound is a decibel or dB. When considering the human response to noise, at a particular dB level, a factor is added, an A-weighting factor, or dbA. The A scale indicates the human response to noise. Leq refers to equivalent energy noise level over a specific period of time. It is used to identify persistent noise such as that which might lead to worker discomfort. (TR Vol. 20, pp. 3114, 3115 Arnold)  
L<sub>dn</sub>, the day-night sound level, represents the average noise for a 24-hour period with a 10 dB penalty for nighttime noise between 10:00 p.m. and 7:00 a.m., recognizing the less active pace of most people during those hours. There is a measure for extreme short duration noises, L<sub>max</sub>, which is commonly related to generally accepted levels which are assumed to cause disturbance of sleep, possible waking, and consequent upset.
  
- c. The dB noise scale is logarithmic, meaning, for instance, that the apparent loudness of a noise doubles for each 10 dB increase in sound though the dB scale may range from a theoretical 0 level to levels exceeding 100 dB. (TR Vol. 19 and 20, Arnold)  
Noise levels from steam blowout may range from 95 dbA to 115 dbA within 1,000 feet from the source (TR Vol. 19, p. 3119, Arnold). Most ambient sound levels move in a much narrower

range. Background sound levels in the vicinity of the Creston site ranged from 26 dbA to 48 dbA over varying locations and sound durations. (App. Table 4.5.3-1) Sound survey sites along Highway 2 recorded levels in the area of 60 dbA for certain durations. By way of example, normal conversation level for persons six feet apart is considered to be 60 dbA. The sound of a vacuum cleaner in a house is perceived at 70-80 dbA by its operator, depending on the make and model. (TR Vol. 24, p. 3828, Saunders)

### 3. Noise Regulations

- a. The Washington Department of Ecology has published noise regulations in WAC 173-60. The noise from steam blowout will exceed the limits established in that reference and a variance from its provisions will be issued upon review and compliance with conditions which may be imposed by the Department and approved by EFSEC. This regulation presently does not apply to rail carriers. The Department of Ecology enforces the regulation only on a complaint basis. Enforcement of the regulation and action taken under it is not likely to provide significant mitigation for noise impacts which may occur from CGS.
- b. The U. S. Environmental Protection Agency has established standards in the nature of guidelines or goals. Current short-term goals seek to reduce environmental noise levels to  $L_{dn}$  65 dbA. (App. Sect. 5.5.-4)

4. Unit Coal Train Impacts

- a. There may be a wide range of varying effects from train noise depending upon which of the three coal regions is chosen to fuel the plant. (App. Figure 3.4.1-1, Table 3.4.3-1, DEIS Table 2-10, p. 2-53) From Spokane and west to the site, four more alternatives are being considered, with varying potential noise impacts. (App. Fig. 3.4.2-1, Table 3.4.3-2) This confusing array of possibilities must be considered in light of the limited authority of this Council. Common carrier railroads are specifically excluded from the category of associated facilities in the statute. RCW 80.50.020(6). There is, therefore, no requirement that railroad lines be certified with the energy site. Further, no railroad company stands as a party in this proceeding. Water Power does not deny impacts will occur to those residing near the rail lines. Water Power has taken the position that impacts be mitigated on a case-by-case basis. Water Power has left the task of mitigation to the railroad. (Anderson, TR Vol. 20, pp. 3209, 3210) The Council will consider the requirement of a unit train noise study once Water Power selects a coal source for the CGS.
- b. The noise impact of unit coal train passage has been the subject of study by Water Power's consultants. A threshold range of influence was determined to be  $L_{max}$  65 dbA. The study assumed an average of 2.5 trains passing during the day and 1.5 trains passing at night. The actual number of trains for four-

unit operation may vary from 3.4 to 5.4 trains a day depending on the coal source selected. Baseline sound levels of 96 dbA for locomotives and 86 dbA for rail cars were assumed to exist 100 feet from the track. The study assumed other factors and the general effect of the assumptions was toward a conservative over-estimation of potential noise effects. Duration of the pass-by was calculated to be approximately two minutes at the assumed speed of 50 mph. During the four train per day schedule, duration of noise in excess of 65 dbA would amount to about eight to ten minutes. These levels assume a receptor 500 feet from the track. Of that duration, approximately six minutes would be spent exposed to  $L_{max}$  of 80 dbA or more. As a consequence of this brief daily passage,  $L_{dn}$  levels would experience some incremental increase from train noise at a distance of 3,500 feet. Peak pass-by levels, the eight to ten minutes per day, would be 70 dbA at 1,570 feet and 65 dbA at 2,875 feet.

- c. The ultimate scheduling of trains is unknown. It is certainly a matter outside the control of this Council. These findings assume the passage of unit trains along the selected routes also during nighttime hours. Sleep interference levels are difficult to establish as a standard because the conditioning and attitudes of the subject play a central role. The sleep interference value of 65 dbA has been well-documented. People exposed to  $L_{max}$  levels of 65 dbA suffer interference with sleep when the

background ambient level is 55 dbA or less. Though peak pass-by levels of 65 dbA will occur within 2,875 feet of the tracks, sleep interference will not necessarily occur to all residents in that zone. The peak pass-by level assumes a person standing outside. The sleeping person, inside a house, will benefit by some reduction in noise depending upon the type of house construction, room size, and furnishings. If windows are sealed closed, the reduction from outside noise levels may be as much as 25 dbA. If the window is partially open, the reduction may be only 15 dbA. In this fashion, sleep interference in the hot summer months may be reduced by ventilation or a quiet air conditioner.

- d. Depending upon the route chosen, as many as 749 farm or residential structures are within areas where some noise effects from unit trains may occur. There is a significant potential for sleep interference to those persons residing in 54-56 farms or residences. Sensitive noise receptors within 1,200 feet of the tracks on the existing Cheney to Burlington Northern Main Line are the following: Eastern Washington University; Antonian School; Medical Lake High School; Silver Lake Recreation Area; and Meadow Lake Recreation Area.

## 5. Noise Study

The potential exists for substantial unmitigated noise impacts from unit coal trains serving the CGS. A procedure for the Council to

require a unit coal train noise study should be a condition of site certification.

6. Coal Source Selection

Noise impacts from unit trains at Cheney and Medical Lake will be substantially reduced if these areas are bypassed. Selection of a coal region other than the Green River-Hams Fork region or routing from Spokane to Creston by Alternates 2 or 3 would have this effect.

7. Transmission Line Noise

Under conditions of high humidity, transmission line noise becomes audible and may be annoying in the absence of background noise to mask it. Levels up to 50 dbA may occur at 100 feet from a transmission line of the type proposed by the Application. The character of the noise is a buzzing sound caused by electrical discharge from dusty insulators. Water Power will identify any receptors within 100 feet of any transmission line placed as a consequence of certification. Noise effects from identified locations will be mitigated by line maintenance, insulators or shields. In the event noise effects cannot be reduced below 50 dbA in this fashion, the line will be located sufficiently distant from the receptor so as to reduce the impact below the 50 dbA threshold level.

8. Steam Blowout

Steam blowout is an operation designed to remove construction debris, rust, scale and other matter which accumulates between the

time the pipes are fabricated and their ultimate use in operation. This operation will generate extremely high noise levels. (See Finding VIII.K.2.c) Noise from this activity could reach levels as high as 75 dbA in Creston and 86 dbA at the four residences closest to the plant. These noises will be of short duration, a three-to-six minute period each hour for two to three weeks prior to initial startup of each generating unit. This source will generate noise only during daylight hours. Water Power will notify residents within the Creston area in advance of the scheduled time for the operation. As extreme noise levels from steam blowout could cause hearing loss to workers at the site, care will be taken to ensure that they are protected from adverse effects.

9. Noise from Construction Activity

- a. There will be noise generated by construction activities, presently scheduled to occur from 1984 to 1994. This may result in a rise in ambient noise levels for residences close to the site in an amount less than five dbA. No violation of the state noise regulation will occur in this range and effects are minimal.
- b. Construction workers may be subject to higher peak noise levels. Protection is provided by compliance with provisions of the applicable occupational and safety regulations. Water Power will comply with such regulations during construction.

L. Light and Glare

1. Development of the CGS will increase light sources in the area during construction and operation. The added light sources will not be typical of a rural area and will alter the existing visual characteristics. Nighttime lighting will be used during construction. This lighting will be viewed by travellers on Highway 2 for a distance greater than five miles in either direction of the site. The lighting will not create any glare off-site, but will be noticeable and significantly greater than any of the existing light sources.
  
2. There will also be nighttime lighting during operation. This illumination will most likely be as noticeable as construction lighting. Aircraft warning lights on top of the four emission stacks will be noticeable for great distances at night in any direction. Security lighting at the well field pump houses will also be noticeable at night. These lights will alter the existing night characteristics of the rural area. Water Power will mitigate the impacts by using lamp shades on plant lighting wherever possible, having the effect of directing the light onto the CGS site.
  
3. Development of the railroad line from Bluestem to Rocklyn will add a specific type of light source in the rural area where it didn't previously exist. Trains making night deliveries of coal will pass approximately nine residences which may be impacted by train lights. The generally increased train activity on existing tracks along the route will create additional light sources during nighttime deliveries

of coal. There will, of course, be indirect increases in light sources to the existing rural area as it changes with increased human habitation during construction and operation of the CGS.

M. Archaeological and Historical Resources

Based on present knowledge, no significant impacts to archaeological or historical resources are anticipated.

N. Aesthetics

The development of the CGS will have an adverse aesthetic and visual impact on the Lincoln County area resulting from the introduction of an industrial use into the rural area. The completed plant will be visible for a distance of five miles. Vapor plumes will also be visible. The microwave station on Creston Butte will have visible impacts. Solid waste disposal sites will create short-term negative aesthetic impacts. Increased rail traffic will alter existing visual characteristics along the tracks. Towers, conductors and rights-of-way will have long-term visual impacts along the transmission corridor system. The appearance of the local communities will be altered by the increased population.

## IX. MITIGATION OF SOCIOECONOMIC IMPACTS

### A. Population Distribution

Water Power has committed to certain actions to influence the CGS-immigrant population size and distribution, as outlined in Article 2, Sect. a, Exhibit 52.

#### 1. Local Training Programs

To the extent legally possible, Water Power will recruit workers from among the local population. A reasonable means of encouraging local participation is to provide local training programs. It is anticipated that these programs will require the combined efforts of Water Power and the local trade unions. With respect to operational workers, Water Power has instituted an informational program in the local schools so that interested students may make academic preparation for eligibility for training programs. The Council finds that a policy of local hiring will serve to minimize impacts to the community.

#### 2. Encouragement of Private Development of Permanent Housing and Mobile Home Parks

The record shows that encouragement of private development of housing for CGS-induced population will be undertaken. The record does not establish that these efforts will be totally successful. (See Sect. IX. C.1, below)

#### 3. Bachelor Quarters and Recreational Vehicle Park

Water Power has committed to provide 100-300 bachelor quarters and a 150-space recreational vehicle park in or near the Town of Creston.

This is a responsible approach to the need for temporary housing facilities and, if reasonably maintained and dismantled, the facilities will minimize potential blights upon the community in the nature of scattered and unregulated temporary housing. It is an appropriate condition of Site Certification that the planning and construction of these facilities be timed to accommodate the earliest influx of workers. (Ex. 52)

4. Bus Transportation

Water Power has committed to provide a commuter bus service for workers living in the Spokane and Grand Coulee areas. (Ex. 52) This is a reasonable means to encourage workers to locate or remain in Spokane or Grand Coulee. To the extent the transportation program may encourage immigration to Grand Coulee, that community may suffer population-induced impacts.

B. Ultimate Responsibilities: Net Financial Burden

1. Water Power will assume responsibility for the "net financial burden" of negative socioeconomic impacts induced by the CGS. (Ex. 52, Art. 8) The assumption of net financial burden is an adequate fulfillment of Water Power's responsibility to mitigate socioeconomic impacts.
2. Any local political subdivision, not party to Exhibit 52 or 112, shall be entitled to payments for net financial burden. (TR Vol. 18, p. 2988, Rafferty) The means by which entitlement must be substantiated is an appropriate provision for the Site Certification Agreement.

C. Housing

1. Water Power has recognized the need for housing for the CGS-induced population. Water Power has proposed construction of bachelor quarters and an RV park. Water Power will also provide planning assistance and will encourage private sector housing development to accommodate needs. (TR Vol. 16, pp. 2649-50, Rafferty)
  
2. Water Power and the local government participants through a socio-economic mitigation agreement (Exhibit 52) propose to facilitate the development of permanent housing by the private sector through provision of adequate public utilities and facilities. Under the terms of Exhibit 52, Water Power would provide funding to the cities of Creston, Davenport, Wilbur, Reardan and Almira for capital improvements to sewer and water and street facilities in order to resolve existing or baseline problems and to make these services available for new housing to accommodate the CGS-related population. The program is designed to address the need for services to new housing required by CGS. The agreement further includes mutually agreed upon growth targets for each of the towns.
  
3. Further action by the Applicant may be necessary to assure that reasonable accommodations are available to the CGS-induced population. A program to develop and implement housing plans is an appropriate condition of Site Certification. (TR Vol. 30, pp. 4699-4700, Stouder)

4. Although the Applicant has provided substantial information on existing housing conditions in the impact area, further studies are necessary. Studies should be required within a time frame to be designated in the Site Certification Agreement.

D. Monitoring

1. A sound monitoring program is crucial to the mitigation of socio-economic impacts. Conceptual Mitigation Planning, the mitigation approach elected by the Applicant, relies for its effectiveness on continuous adjustments to projections with actual experiential data. (TR Vol. 16, p. 2538, Rafferty)
2. Provision for a monitoring program to gather and analyze data and implement programs, subject to Council approval, is an appropriate condition of Site Certification. Data-gathering techniques may include, but are not limited to, those outlined in Article 2 and Appendix 1 of Exhibit 52.

E. Impact Financing

1. Payment of mitigation funds must precede actual impacts to permit planning and implementation of programs. (See Sect. VIII of these Findings)
2. Water Power has committed to prepay mitigation funds. This is a reasonable and prudent mitigation measure. (Ex. 52)

3. Scheduling of advance payments is appropriate.
4. Exhibit 52 anticipates that advance payments will be reimbursed by sales and use taxes generated by the project and accruing to Lincoln County. To the extent that prepayment of sales and use taxes may be accomplished under state law and Department of Revenue regulations, the Council finds this approach to be in the best interests of the public.
5. To the extent prepayment of sales and use taxes is not permitted by law, advance payments will be in the form of grants to the local political subdivisions. For those jurisdictions outside of Lincoln County, or otherwise unable to participate in the agreement relating to the prepayment or distribution of revenue, any mitigation payments that are documented and approved by the Council will be in the form of grants. (See Section IX.B above)
6. The schedule for reimbursement, recoupment or credit for the prepaid taxes was estimated and shown in Exhibit 56. The precise schedule for such reimbursement, recoupment or credit cannot be made; however, such reimbursement, recoupment or credit will occur either at the time the local sales and use taxes or property taxes become due, or when such taxes are paid by the State of Washington to the local taxing districts that are parties to the CGS Socioeconomic Impact Mitigation Agreement and Interlocal Cooperation Agreement as set forth in Exhibit 52.

7. Exhibit 52 anticipates that it may be necessary to advance property tax payments to Lincoln County to mitigate impacts to fire districts. No other provisions involving property taxes, including those for reimbursement, are outlined in the record. The Council finds that advancement of property taxes and reimbursement, carried out in accord with Department of Revenue regulations, is a reasonable way to ensure adequate funding for the Fire Protection Districts. (Ex. 52)

8. Impact mitigation payments made to the School Districts will be in the form of grants. (Ex. 112)

9. The record does not reveal the means by which political subdivisions not parties to Exhibit 52 or 112 can apply for mitigation funds. A process should be set out in the Site Certification Agreement. (Ex. 52)

F. Archaeological and Historical Resources

Water Power has agreed to perform on-the-ground surveys for archaeological and historical resources before transmission towers and other facilities are erected. (App. Sect. 4.9.1-2) Further, all significant artifacts will be deposited with the Washington Archaeological Collection Repository.

G. Aesthetics

Water Power has committed to select as unobtrusive a color scheme as possible for the plant, to suppress visible emissions and dust and to perform landfill and reclamation operations in ways consistent with existing

topography and vegetation. Construction specifications should require that contractors preserve natural landscapes and restore work areas to a natural appearance. Though these measures are reasonable, there will be, nevertheless, irreversible negative aesthetic impacts from the construction of the CGS, associated facilities and necessary rail lines.

H. Land Use

1. Water Power will compensate displaced landowners in accord with private agreements. (App. Sect. 5.8.5)
2. Transmission line rights-of-way that displace woodlands will be re-seeded for grazing.
3. If the new railroad branch line is constructed between Bluestem and Rocklyn (Alternatives 3 or 4), Burlington Northern will compensate the property owners for the right of way. Property damages for impacts resulting from severance, noise, glare, and loss of light, view and air will be compensable or mitigated. Cattle passes and fencing are compensable items or mitigating measures. Grade crossings will be provided when and where determined necessary.
4. State-of-the-art equipment will be used on the locomotives and rolling stock (coal cars) to minimize wayside fires and noise. Regardless of which railroad access (alternative 1, 2, 3 or 4) is selected, continuous rail with welded joints will be utilized. The roadbed, ties and rail shall be well maintained to minimize wayside fires and noise.

5. Grade crossings of public roads will be provided with whatever protective devices are warranted by standards promulgated by the Washington Utilities and Transportation Commission (WUTC). The grade crossings and their maintenance shall be the responsibility of the railroad.
  
  6. Water Power will advance payments to Lincoln County for two planning professionals to assist the local political subdivisions in the planning and regulation of CGS-induced primary and secondary growth. (Ex. 52)
  
  7. Water Power and its contractors should perform no construction inconsistent with the Shoreline Management Act or its local enactments.
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- I. Noise  
See Sect. VIII.K, above.
  
  - J. Light and Glare  
See Sect. VIII.L, above.

## X. TRANSPORTATION IMPACTS AND MITIGATION

### A. Road and Rail Impacts

#### 1. Overview

- a. Substantial impact to the transportation systems of Lincoln and Spokane County will occur from construction and operation of the CGS. Road and rail impacts are interrelated and must be considered in the setting in which they occur. The transportation system in Lincoln County presently serves an agricultural economy. Impacts in population areas of Spokane County will occur at locations already heavily burdened by transportation complexities.
- b. Changes in the railroad system in Lincoln County needed to accommodate unit coal trains may impact the ability of farmers to haul grain to markets. Additional rail traffic will complicate and delay traffic movements at points where vehicles and pedestrians normally cross the tracks.
- c. The movement of large numbers of construction workers, principally along Highway 2, will impact the present rural nature of uses of the highway. The present traffic is composed of pedestrians, farm equipment and domestic animals, as well as motor vehicles. The patterns of movement of this employment force have been extrapolated and projected. Little is actually known of these patterns though demographic data collection and analysis underlying predictions has been thorough, fair and highly professional.

- d. Planning in the area of transportation impacts and mitigation is beyond the scope of conceptual engineering. Judgments must, in large part, be made as the situation develops. For these reasons, a transportation impact study will be conducted as provided in the Site Certification Agreement.

2. Grain Haul Impacts

- a. Witnesses at the public hearings expressed repeated concern about their ability to haul grain to market. The apprehension is elusive and diffuse, in the nature of informed suspicion. (See TR Public Hearing-Creston, p. 77, Hayes, and p. 93, Sheffels, as examples) The CGS, a major rail transport incident in the region, is more an occasion for this concern than the cause. Construction of the Bluestem-Rocklyn rail line will, if implemented, probably route unit coal trains away from Davenport. Beyond this single factor, there is little reason to believe CGS construction or presence will affect grain haul service. The Council's authority over these impacts is limited. (RCW 80.50.010(6)) Moreover, farmers' concerns relate to matters not easily regulated. If a problem exists, it is with lines of communication concerning economic planning between the farmers of Lincoln County and Burlington Northern. Farmers fear the railroad would prefer reduced service to its grain haul customers, and that perhaps, even now, Burlington Northern is implementing a policy of eliminating direct farm-to-market service. Burlington Northern has expressed views,

though reserved, to the contrary, indicating no intention to change existing service. The economic merits or demerits of farm-to-market rail service are matters to be determined by market forces. If regulation of this relation is to occur, it must be by the Interstate Commerce Commission or possibly, the Washington Utilities and Transportation Commission.

- b. For whatever reason, should Burlington Northern choose to abandon the Reardan-Mondavi line, there would result an added burden on the county road system, heightened at harvest season. There is little information in the record about the capacity of roads in the county to absorb grain haul traffic in the event of rail line closure. The DEIS comments that the effects of such a diversion would be negligible. (DEIS Sect. 2-55) Potential effects on transportation in the event of rail closure should be addressed in the traffic study required by the Site Certification Agreement.
  
- c. Construction of the section of rail line between Bluestem and Rocklyn, if elected by Burlington Northern, may result in short term grain haul problems which are capable of mitigation. There exists the possibility that the Burlington Northern branch line would be closed during construction or during any upgrading of existing branch lines. The Applicant should provide in its agreements with Burlington Northern that construction of this line be scheduled to minimize impacts to agricultural uses of the line during the period of construction.

3. Unit Coal Trains

- a. Water Power proposes to obtain coal to fuel CGS from one of three coal regions now being considered. These regions are Lethbridge, in the Province of Alberta; Powder River on the Wyoming-Montana border; and Green River-Hams Fork lying principally in southwestern Wyoming. Three regional rail approaches to Spokane over three different rail carriers are being considered as alternatives, depending on the coal source ultimately selected. (DEIS Fig. 2-15) Round trip distances would be approximately 1,000 miles for the Canadian coal and approximately 2,000 miles for coal from the American coal fields. Four units of production would require an average of 3.4 trains a day for Canadian coal, 4.4 trains for Powder River coal and 5.4 trains per day for Green River-Hams Fork coal. This average is the number of trains passing a given point each day, half of the trains being loaded, and half returning empty. (DEIS Sect. 2-53)
- b. Four additional alternatives are being considered for routing of unit trains from the Spokane area to the site. All of these alternatives would use Burlington Northern tracks; alternatives 1 and 2, the Reardan-Mondavi branch line through Davenport; alternatives 3 and 4, the Burlington Northern main line to Bluestem. The main line alternative approaches require construction of approximately 8 to 12 miles of new track from Bluestem to Rocklyn. Three more alternatives, A, B and C, are

proposed to link Bluestem and Rocklyn. (DEIS Fig. 2-17, Table 2-12)

- c. The requirement of plant fueling will result in impacts at rail crossings which have not been addressed or defined. As a consequence of Water Power's conceptual approach, conflicts at rail crossings involving unit trains may occur at a variety of potential locations, according to the route selected. Depending on train speed, each unit train may take from two to four minutes to pass at crossings. The delays may have impacts on the operation of emergency vehicles. There is an increased potential for rail-highway accidents. More site-specific information is needed once rail routes are finally identified.
  
- d. Rail line traffic and impacts will depend on which of several alternatives are used. From the view of impacts, the most desirable regional route is the Spokane International Line to Lethbridge, Alberta. This route is less than half the distance of other possible routes, has the lowest existing traffic and provides access to the highest quality coal. The coal characteristics would allow fueling by fewer unit trains. Selection of this source would also avoid rail impacts in the already burdened Cheney-Medical Lake area. There may be a cost disadvantage to its selection. Cost consideration is of prime interest to Water Power. It is also a direct responsibility of this Council. Common carrier rail lines are not associated

facilities within the meaning of RCW 80.50.010(6). Therefore, no certification of rail routes is authorized. However, the best interests of state citizens are served by careful study of impacts and implementation of mitigation for identified impacts wherever possible. In this regard, the task of mitigation would be significantly eased if the Cheney-Medical Lake route was avoided.

- e. On the whole, the routes identified are reasonable alternatives to the problem of plant fueling, given the conceptual nature of the approach. No significant adverse environmental impact will occur if mitigation measures identified by the transportation impact study are implemented.

#### 4. Road Impacts

- a. At peak employment in 1992, 2,196 workers are projected to be travelling to and from the CGS. As access to the plant will be by way of Highway 2, all workers will utilize the highway for ingress and egress to and from the plant. Preliminary assessments of the magnitude of this labor force in terms of its impacts on Highway 2 capacities have been made. There appears to be no critical concern complicating management of this problem. (DEIS Sect. 3-119 - 3-124, TR Vol. 22, Walther) These matters should be addressed in any transportation study required by the Site Certification Agreement.

- b. There is a lack of information concerning potential effects to road systems within the towns affected by population increases. The actual increases and population patterns in each of the towns are not known at this time, being the subject of projections by experts in the Application and the testimony. There is need for assessment of traffic impacts to the towns, particularly Davenport, Creston and Wilbur. Impacts to affected towns should be assessed in the transportation study.

B. Traffic Study and Mitigation

1. At such time as Water Power announces its decision to commence construction of CGS, a transportation study should be implemented as required by the Site Certification Agreement.
2. The study should examine road impacts along Highways 2 and 174 and within the towns of Reardan, Davenport, Creston, Wilbur, Grand Coulee and Harrington. Consideration should be given to all potential vehicle conflicts in which CGS-related traffic may participate. Potential vehicle conflicts with pedestrian movements should be assessed. Routes of school buses and emergency vehicles should be identified with regard to potential conflicts with work-related traffic and coal trains. Agricultural uses of Highway 2 and 174 should be assessed and transportation impacts from CGS considered.
3. Assessment of the transportation consequences of the passage of unit trains through Medical Lake should be a part of the study, if the rail route selected passes there.

4. Consideration should be given to the potential for accidents and the identification of any potentially accident-sensitive areas.
  
5. The study should consider and comment on the feasibility of certain mitigation measures as well as the justification therefore. The following approaches should be assessed: upgrade of the intersection of Highway 2 with the plant access road to facilitate turning movements and reduce vehicle conflicts; placement of traffic signals and warning signs at appropriate locations; structuring worker shifts or patterns to reduce transportation impacts; use of rail-highway grade separations; placement of pedestrian or farmer overpass and underpass of roads and rail lines; and communication devices between the railroad company and those in particular need of schedule information, such as farmers and emergency vehicle operators. Reference should be made in the course of analysis to generally accepted criteria for the management of roads, such as the Manual on Uniform Traffic Control Devices and publications, standards and specifications of the American Association of State Highway and Transportation Officials (AASHTO), Washington State Association of Counties, WSDOT and WUTC.

## XI. WATER QUALITY IMPACTS AND MANAGEMENT

### A. Water Quality Impacts (Excluding Surge Pond)

#### 1. Leachates

- a. Water Power, the Department of Ecology (DOE) and the Council have recognized that the proposed project may potentially degrade ground water and surface water quality.
- b. The primary sources of potential degradation are leachates from disposed bottom ash, fly ash, FGD (Flue Gas Desulfurization) sludge and the 90-day coal storage pile. Potential contaminants and pollutants cannot be precisely identified until a coal source is selected.
- c. Solid and liquid wastes from the site may fall into the "dangerous wastes" category under DOE regulations signed in February, 1982, and effective on March 12, 1982. (TR Vol. 27, p. 4325, Knudson)
- d. Based upon the record, detrimental effects upon flora and fauna are not expected. However, there is still the potential that some such effects could occur.
- e. Contamination of local aquifers would degrade the quality of waters used for domestic, stock and irrigation purposes.

## 2. Surface Water

- a. The project will significantly modify the natural drainage patterns at the site. Because of the construction of various on-site ponds, the total run-off to Sinking Creek will be reduced by about 3% at the beginning of the project. Run-off will then increase, over the 35-year span of the landfill operation, to a maximum of about 15% over current levels. As a consequence of runoff and recharge from the surge pond, Sinking Creek will likely develop a perennial flow. However, increasing the flow of Sinking Creek will not, in itself, lower the quality of the water.
  
- b. Of the 39 ponds and wetlands in or near the plant area, 18 ponds will not be affected; 14 will be affected and seven may or may not be affected, depending on the exact location of the drainage ditches. The 18 unaffected ponds represent more than 50 percent of the total pond surface area on the site. (TR Vol. 12, p. 1863; App. 5.2.4)
  
- c. Construction of the well site, makeup water pipeline and associated electrical transmission facilities will temporarily increase local turbidity. Due to use of containment structures, no increased turbidity is anticipated for local streams from construction of the plant and landfill. The record does not indicate that significant environmental impacts will result from any changes in turbidity.

- d. Some substances contained in the air emissions from the CGS may enter into surface waters at the CGS site and surrounding areas. The principal source of such substances is the deposition of salt from the cooling towers. The anticipated impacts are not environmentally significant.

3. Ground Water

- a. There is no evidence of hydraulic continuity between the well field location and the local aquifers. (TR Vol. 12, p. 1906, Loo) No adverse impacts on the pumping of water for local use are anticipated from operation of the well field.
- b. There is evidence of variability of aquifer characteristics in the area. The shallow aquifers have hydraulic continuity with Sinking Creek and there is potential for carrying contamination there.
- c. Water Power's ground water measurements are preliminary and final conclusions on aquifer characteristics will await further study.

B. Water Quality Mitigations (Excluding Surge Pond)

1. Preliminary Findings

- a. It is reasonable and prudent that the proposed project, as a condition of certification, meet all standards of RCW 90.48,

which forbids the pollution of any receiving waters in the State.

- b. The Applicant does not expect ground water to be degraded by leachates from the ash and sludge disposal areas or the coal storage pile. However, it may be less expensive to line these areas before operation, than to bear the costs of restoring ground waters to baseline quality and lining these areas after operations have begun, if degradation does occur. (TR Vol. 26, p. 4182 and TR Vol. 27, p. 4238, Wildrick)
- c. The coal pile will be compacted which will discourage percolation.
- d. Water Power proposes not to line either the coal pile, the solid waste storage areas or the run-off drainage ditches. It maintains that leaching from these areas is unlikely to occur and, if present, will be subject to rapid detection and mitigation. The record supports this position from a preliminary standpoint only. Further confirming studies will be required. The Applicant has agreed to perform studies of this nature. The parameters of such studies are appropriate conditions of site certification. If such studies do not confirm Applicant's preliminary position, lining of any or all of the above-referenced areas may be required. (TR Vol. 32, p. 4530, Loo)

- e. The timing of the above-referenced studies will be a crucial condition of certification. The record shows that monitoring of a test pile of the chosen coal may be required to gauge leachate probability and character. (TR Vol. 27, p. 4263, Burkhalter) The establishment of necessary data on aquifer recharge rates is likely to take as long as one year. (TR Vol. 26, p. 4177, Wildrick)

## 2. Commitments to Lining

- a. Water Power has committed to lining with impervious liners, the various liquid waste storage ponds where contaminants will be known to occur. These include the waste water evaporation pond, the sanitary waste stabilization pond and the water retention ponds. This is a prudent measure for the protection of water quality.
- b. It is a reasonable condition of certification that the runoff ditches leading to the ponds be lined as well.

## 3. Solid Wastes

- a. The Applicant proposes to combine the FGD sludge, fly ash and bottom ash; to treat this combination with a fixating reagent; and to dispose of it by compacting it in a dry landfill. This process is known commercially as the "pozzolanic process" and is offered in lieu of lining. It will lessen the risk of ground water contamination from the areas where these materials are

stored. (TR Vol. 4, pp. 542, 543 and 548; Vol. 5, pp. 622-623, Normoyle; Vol. 5, p. 565, Falkenberg; Vol. 27, p. 4350, Burkhalter)

- b. Alternative methods of solid waste disposal have been considered including ponding in lined areas, shipment of ash back to the coal mine, and sale of fly ash and bottom ash to available markets.
- c. Lining of solid waste areas is unnecessary at this time because the process of fixating fly ash, bottom ash and FGD sludge will provide a relatively impervious barrier to leachates. Shipment of ash back to the mine is not a reasonable alternative for a variety of practical, legal, and monetary considerations. Water Power will actively promote the sale of fly ash and bottom ash to existing markets. (TR Vol. 5, p. 547, Normoyle)
- d. Water Power will use portable toilets for sanitary wastes at the construction site until sanitary waste systems are installed.

#### 4. Dam Safety

It is estimated that the site will contain approximately nine impoundments most of which will have the capacity of retaining volumes of 10-acre feet or more of water. It is a reasonable condition of certification that all such structures be designed to safely withstand 100-year frequency flood events. The level of design should be based

upon the degree of hazard to life and property that exists in the floodplains below these structures. It is an appropriate condition of site certification that all structures comply with state law, DOE regulations and safety requirements.

C. Surge Pond

1. The storage of water in the makeup water surge pond will recharge shallow aquifers and is likely to create perennial flow in the Sinking Creek drainage southwest of the surge pond location.
2. Water Power proposes to introduce 700 pounds of copper sulfate yearly into the surge pond to control algae. Copper sulfate will precipitate as copper hydroxide. (TR Vol. 12, pp. 1879-1881, Mayer) The copper hydroxide will not dissipate, but will accumulate at the bottom of the pond. Although other means of controlling algae are available, copper sulfate was chosen for its cost-effectiveness and ease of handling. Trace amounts of copper will leave the surge pond as ground water flow.
3. Water Power has estimated surge pond seepage at a rate of six cubic feet per second (cfs). (TR Vol. 12, p. 1885, Anderson) Depending on how the pond is constructed, the rate could vary considerably. Seepage at 6 cfs represents a loss of 15-20% of the total pumpage from FDR Lake. There is ascertainable economic value assigned to pumpage from FDR Lake. (TR Vol. 12, p. 1883, Normoyle) It is not known how much of the surge pond seepage will emerge as surface

flow. (TR Vol. 12, p. 1917, Anderson) If the rate of leachate is high enough, copper may be carried from the surge pond into Sinking Creek via the aquifer. (TR Vol. 26, p. 4214, Burkhalter)

4. Water Power does not propose to line the surge pond to prevent leakage. The decision not to line is based on Water Power's perception that the risk of negative impacts from leakage is too low to justify the costs of lining. The record supports the position that the risk is low. However, if substantial leakage did occur, the release of copper compounds could be environmentally harmful. (TR Vol. 26, p. 4214, Burkhalter)
5. Water Power proposes to monitor groundwater impacts and take mitigating measures, if necessary. It has not yet established a water level monitoring program. A year or more of monitoring will be necessary to determine the quantity and rate of precipitation infiltration to the aquifer. Establishing the recharge rate will improve the predictions of leachate infiltration to the aquifer.
6. Additional information is needed on the precise probability and character of leachates from the surge pond. Further studies, within specific parameters, are appropriate conditions of site certification. Such studies could be incorporated into the testing program the Applicant has proposed. (TR Vol. 12, p. 2017A, Berthrong) Timing of such studies should be planned to substantially precede any potential

negative effects of leachate. Should the studies support the Applicant's position that lining is unnecessary, only monitoring of leachate effects will be required as a condition of site certification.

D. Potable Water

Water Power has stipulated with the Washington Department of Social and Health Services (Exhibit 106) that installations supplying potable water to the CGS during construction and operation will conform with standards and regulations of DSHS.

## XII. AIR QUALITY

### A. Potential Impacts

#### 1. Introduction

- a. In Section IV.C. of these Findings, the existing air quality in the Creston area and the methodology used by the Applicant to predict the effects of CGS construction and operation on air quality are described. This section discusses air quality degradation which will result from construction and operation of the CGS and the methods used to mitigate adverse effects.
  
- b. In balancing ecological and energy concerns, these findings: (1) identify the effects of various airborne pollutants upon the environment; (2) consider control technologies which are reasonably available; and (3) determine the levels and methods of control necessary to reduce pollutants to acceptable levels considering the environment, energy and cost.
  
- c. CGS stack emissions will include various pollutants regulated by the Federal Clean Air Act. These include carbon monoxide (CO), nitrogen oxides (NO<sub>x</sub>), sulfur dioxide (SO<sub>2</sub>), particulate matter (PM), ozone, lead, beryllium, mercury, vinyl chloride, fluorides, sulfuric acid mist, total reduced sulfur, reduced sulfur compounds, and hydrogen sulfide. The record shows that asbestos, vinyl chloride, total reduced sulfur, reduced sulfur compounds and hydrogen sulfide will be emitted in negligible quantities.

- d. Of particular concern are SO<sub>2</sub>, NO<sub>x</sub> and particulates. (DEIS D-47) (Ex. 45, p. 6-54) The two major variables which determine the impacts of these pollutants are concentration and duration. A high concentration encountered over a short period of time may result in harm equal to that of lesser concentrations encountered over a longer period of time. (Ex. 45, p. 6-54)
  
- e. Synergistic effects occur when the total effect of two or more pollutants is greater than the sum of their individual effects. (DEIS D-47; Ex. 45, pp. 6-54; TR Vol. 15, pp. 2381-2382; App. Sect. 5.6-16) For example, some studies have indicated that where SO<sub>2</sub> and NO<sub>x</sub> are present in combination, the potential for harm is increased over the added effects of the two. (Ex. 45, pp. 6-64; TR Vol. 15, p. 2381) Other studies do not show such synergistic effects.

## 2. Potential Impacts - General

- a. Construction and operation of the CGS will result in increased fugitive dust and carbon monoxide (CO) levels. These are emissions which do not come from the plant itself, but from construction, traffic, material storage and handling, and train delivery of coal. Sources and levels of these particulate emissions are listed in Exhibit 45, Table 3.2-13. This listing describes the sources and levels which may be expected to occur.

- b. Both the stacks from the combustion process and the cooling towers will have visible plumes under certain conditions. The visibility of the cooling tower plume is expected to be greater due to the high moisture content of the emissions. In predicted worst-case conditions, occurring approximately 0.4% of the time, cooling tower plumes extending for 7 to 8 miles are expected. This will probably occur during days of high relative humidity which are generally associated with overcast or rainy conditions. (Exhibit 45, pp. 6-44, 6-45) Extended visible plumes from the combustion stacks will occur less frequently and will be substantially smaller in size.
- c. Combustion stack emissions will usually be invisible due to particulate control devices. However,  $\text{NO}_x$  stack emissions could convert to  $\text{NO}_2$  under certain circumstances resulting in a reddish-brown plume discoloration. (Exhibit 45, pp.6-45) Modeling results indicate that on very infrequent occasions a reduction in visibility from 5-10% could occur when the plume would be visible as a reddish-brown discoloration to an observer looking through the plume. (Ex. 45, pp.6-47, 6-52) Plumes will have no significant visibility impact upon existing Prevention of Significant Deterioration (PSD) Class I areas nor on integral vistas associated with National Parks. (Ex. 45, pp. 6-42, 6-52)
- d. The plant in operation will not cause any significant misting, fogging or icing. Such extremely low levels as might occur

under certain conditions will rarely extend beyond plant site boundaries. (DEIS, Sect. 3-10, 3-11)

- e. Construction and operation will also involve refuse disposal and waste burning. In performing these activities, the Applicant will be required to comply with all local, state and federal regulations and guidelines, as required in the Site Certification Agreement.
- f. Operation of vehicles and fuel burning equipment will result in exhaust emissions and possible emissions from hauled materials blowing away. The most reasonable methods for controlling these emissions are: ensuring that all vehicles and fuel-burning equipment are kept in proper mechanical order; and requiring vehicles hauling materials to be covered where those materials are likely to be blown away when hauled. These requirements should be stated in the Site Certification Agreement.
- g. Fugitive dust will occur during site preparation and construction. Traffic, clearing, grading and excavation will result in increased fugitive dust levels. The most reasonable methods for controlling these emissions are watering, paving, controlling the speed of vehicles and chemical treatment. Conditions necessary to mitigate these emissions should be contained in the Site Certification Agreement.

- h. The presence of salts and dissolved minerals in the cooling tower emissions is another concern. Some salt build-up can be expected in the area surrounding the plant as the land is irrigated and the water evaporates. Because salt drift from the cooling towers will be concentrated within one mile of the towers, the vast majority of salt will be deposited within the boundaries of the plant site. These depositions will increase the dissolved salt load in site rainwater runoff. If runoff is properly controlled, no significant adverse environmental impact is likely to occur.
  
- i. Under certain rare meteorological conditions, such as inversion fumigation break-up, concentrations of  $SO_2$  and  $NO_x$  may give rise to a perceptible odor of sulfur. These conditions will be rare and normally the odor will not be perceptible off the plant site. (DEIS 3-22, TR Vol. 28, p. 4487) Therefore, odor will not present a significant adverse environmental impact.
  
- j. Operation of the CGS will release radionuclides in very small amounts. This results from the fact that coal contains trace amounts of radioactive isotopes of uranium, thorium, radon, radium, lead, polonium and bismuth. These releases are at levels below any threat to health. The vast majority of these trace amounts will be removed by the particulate controls to be used at the plant. With the exception of Radon-222, which is a gas, these materials will be collected in the fly or bottom ash.

The Applicant has entered into an agreement with the Washington State Department of Social and Health Services dated December 10, 1981, which deals with monitoring these materials. The conditions of that agreement are reasonable and provide adequate and appropriate protection for the public and the environment. The conditions of the agreement are appropriate for incorporation into the Site Certification Agreement regarding the CGS.

- k. Sulfuric acid mist is a by-product of the combustion and flue gas desulfurization (FGD) processes. Any such emissions are not expected to be carried beyond the plant boundary or to occur in harmful concentrations.

3. Potential Impacts-Sulfur Dioxide (SO<sub>2</sub>)

- a. Analyzing the potential effects of SO<sub>2</sub> emissions on the environment, one must note, as did one witness: "...there is, really, at this point in time, very little information on this area of long-term effects of low level concentrations of sulfur dioxide." (TR Vol. 13, p. 2089, Henriques; TR Vol. 15, p. 2375, 2376 and 2378, Kohut; Ex. 124, p. E-23)
- b. Studies have been conducted to attempt to identify the concentrations of SO<sub>2</sub> and NO<sub>x</sub> which will be injurious to plants over relatively short-term exposures (typically a few hours). Conclusions from the studies indicate the threshold levels of harm

for vegetation at the CGS area will not be exceeded by concentrations which can reasonably be expected from operation. (Ex. 45, pp. 6-55 through 6-66; DEIS Appendix D-IV) Likewise, Federal and State Ambient Air Quality Standards have been established at levels which are designed to protect plants and animals from harm. CGS operation is not predicted to result in concentrations approaching these levels.

- c. Long-term pollutant effects are more problematical than short-term effects. Almost all of the major research conducted to study the effects of  $\text{SO}_2$  and  $\text{NO}_x$  on plant and animal life has been undertaken since 1970. (Ex. 45, pp. 6-55 through 6-70) The majority of these studies has been conducted since 1975. The recent dates of these studies reflect the developing state of scientific knowledge about these matters.
- d. Acid rain is a phenomenon which has received a great deal of attention recently. Acid rain refers to a complex chemical reaction wherein atmospheric emissions of sulfur and nitrogen oxides are converted into acids and are deposited by rain or snow. Such materials can also be deposited in dry form and converted to acids by rain, fog, dew, or applied water. The acids most commonly involved are sulfuric acid ( $\text{H}_2\text{SO}_4$ ) and nitric acid ( $\text{HNO}_3$ ).
- e. The acidity of a material is given a numerical value known as

pH. The pH scale ranges from 0 to 14. pH 1 is very acidic (battery acid), 7 is neutral and 13 is very alkaline (lye). pH is logarithmic in nature, so that pH 3 is 10 times as acidic as pH 4 and 100 times as acidic as pH 5.

- f. Normal rain is somewhat acidic (in the range of pH 5.6) due to natural conditions. The effects of increased acid in rainfall can be substantially mitigated by the buffering capacity of the receiving soils or waters. The soils in the region of the CGS in Lincoln County are known to have a high buffering capacity and acidification of soils in Lincoln County as a consequence of CGS emissions, will not be noticeable. Soils will be tested as provided in the Site Certification Agreement.
- g. Acid rain may be harmful in two main ways: by direct effect on plants, animals and structures; and by promoting the release of potentially harmful metals from soils and sediments (for example, aluminum).
- h. Acid rain presents significant potential harm to the environment. Fish, for example, are known to be sensitive to acid accumulations. Lakes with pH values below 4.6 may become void of fish over time, due to the effects on reproduction. Lakes in the Adirondack Mountains of the United States are known to have become considerably more acidic since the 1930s. (App. Sect. 5.6-36) This acidity is attributed to

depositions of sulfur and nitrogen oxides from industrial processes and other human activities.

- i. Aquatic organisms other than fish may be injured by acid rain. Algae, plankton and other organisms are affected in extreme cases and changes in feeding patterns or relationships may occur.
  
- j. Acidification may also have an adverse effect upon terrestrial plants. (App. Sect. 5.6-30) For example, long-term acidification may decrease the productivity of forest soils. (App. Sect. 5.6-30, DEIS Sect. 3-27) The magnitude of effects to the forest is largely unknown at this time. High levels of acidification are known to affect plant growth. (Ex. 45, Table 607-1) However, the long-term effects of lower concentrations are not well understood. (DEIS, p. 3-29)
  
- k. Acid rain was frequently mentioned at public hearings as a feared result of the operation of the CGS. This phenomenon is a particular and understandable concern of the farmers in the area whose livelihood is directly and inextricably connected to the fertility and characteristics of the soil. The optimum pH of soils for wheat growing is between 6.4 pH and 7.5 pH, conditions which now exist in the best wheat growing soils in Lincoln County. (Creston hearing, Nov. 18, 1982, p. 35) Any threat to the continued existence of these optimum conditions is naturally viewed with alarm.

1. The Council's analysis of this phenomenon is further complicated by the fact that some of the nitrogen compounds contained in acid rain have a beneficial nutrient effect on plants. In fact, sulfur and nitrogen are added to cultivated soils through the application of fertilizers. This makes indirect depositions of these compounds through acid rain that much more difficult to quantify.
  
- m. Another critical factor in measuring the effect of acid rain is the buffering capacities of the soils and waters involved. It appears that the largest body of water in the area, FDR Lake, has a substantial buffering capacity which should not be significantly adversely affected by CGS operation. (App. Sect. 5.6-36)
  
- n. In short, the effects of acid rain on the environment are not well understood. Based upon what is now known, the Council would not expect CGS operation, as controlled by provisions to be included in the Site Certification Agreement, to have significant adverse effects. Based upon what remains unknown, there is a possibility of effects from long-term operation which necessitates further study and strict monitoring of operation.
  
- o. The Council's findings reflect the testimony of the Applicant's principal air quality experts: "There has certainly been a lot of concern expressed over acid precipitation, and there is a great

deal of current work being conducted by the government, our government, other governments, and research-oriented organizations to try and better understand and characterize acid precipitation. I guess I would just like to start off by saying there are a lot of questions that haven't been answered yet in terms of the quantitative relationships between sources of emissions and acid precipitation somewhere downwind." (TR Vol. 14, p. 2252, Paulus)

- p. The effects of any acidification of precipitation which may occur as a consequence of CGS operation, will be nowhere near the magnitude of such effects in areas (such as the Ohio Valley) where there are many plants, burning high sulfur coal, located close to one another. (TR Vol. 14, p. 2255, Paulus)

B. Control Technology-General

1. Nitrogen Oxides (NO<sub>x</sub>)

NO<sub>x</sub> emissions are controlled by boiler design and operational characteristics. NO<sub>x</sub> emissions can easily be limited to less than 0.5 lb/mmbtu for subbituminous coals and 0.6 lb/mmbtu for bituminous coals by the use of the boiler design proposed and proper operational controls. The conceptual boiler design proposed by the Applicant constitutes "best available control technology" (BACT) if operated properly. The Applicant will be required to submit for approval, all operational criteria prior to commencing operation. The Council

should specify operational criteria in the Site Certification Agreement. Design specifications and guarantee requirements will be subject to Council approval as provided in the Agreement.

2. Cooling Tower Impacts

The four proposed, 12-cell circular mechanical draft cooling towers are reasonable and appropriate to mitigate the occurrence of visible plumes. The towers will also reduce off-site salt deposition levels to less than 2000 kilograms per square kilometer/month, as provided by the Site Certification Agreement.

3. Particulate Emissions

a. In Table 4.2 of the supplemental BACT submittal to EPA, the Applicant's Prevention of Significant Deterioration document, Water Power lists various sources of fugitive particulate emissions and proposed types and levels of controls. These controls are generally reasonable and appropriate with the exception of certain sources and controls which should be treated in the Site Certification Agreement.

b. Stack particulate emissions can be limited to the New Source Performance Standard (NSPS) of less than 0.03 lb/mmBtu, per unit, by the use of a baghouse, containing fabric filters. This constitutes best available control technology. The Council further finds that similar results could be expected from the use of electrostatic precipitators and would consider approval

of such devices if detailed designs were first submitted to the Council. Approval of design specifications and guarantee requirements will be required before control facility construction and operation may commence. The particulate matter emission removal efficiency will be at least 99% for each unit, as established by performance tests.

4. Stack Height

The emissions stacks themselves are a method of mitigation. The design and height of the stacks encourage mixing and dispersion of emissions and minimize the possibility of icing or fogging. The proposed 555-foot stack height is consistent with good engineering practice.

5. Opacity

Particulate matter opacity levels will not exceed state or federal standards. Specific limitations should be established in the Site Certification Agreement.

6. Carbon Monoxide and Volatile Organic Compounds

Optimum combustion efficiency minimizes the production of carbon monoxide and volatile organic compounds. Boiler design and operation are the controlling factors. Optimizing combustion constitutes best available control technology for these emissions. Design specifications and guarantee requirements should be reviewed by the Council prior to construction to ensure these emissions are minimized, in accordance with the Site Certification Agreement.

7. Sulfur Dioxide (SO<sub>2</sub>)

- a. There are presently 16 FGD systems (at eight coal-fired plants) with greater than 90 percent sulfur removal efficiencies operational in the United States. (TR Vol. 28, p. 4397, Paulus) For 13 of these systems, the total emissions exceed those which would occur if the CGS were to operate at 86.5 percent efficiency with coal D because higher sulfur coal is being burned in the other plants.
  
- b. Greater removal efficiencies remove more materials which results in more solid waste disposal. On the whole, this is an environmental benefit. As discussed elsewhere in these Findings, the Council is confident that solid waste disposal conducted as required will not have a significant adverse environmental impact. It is preferable to have these materials deposited in one discrete location where both potential adverse impacts and controls are well understood than to have them released into the atmosphere and deposited by the winds and rain in ways and with effects predicted by computer models and published scientific research.
  
- c. The Applicant proposes to purchase and install control technology capable of operating at an 86.5% efficiency level using coal D (worst case coal for sulfur content identified in the Application) on a 30 day rolling average. Capital costs are therefore not a factor in selecting emission levels. The

Applicant has stated that various operating levels of control efficiency result in varying costs. For example, the annual operating cost difference for one unit is approximately 3.5 million dollars if removal efficiency is increased from 70% to 86.5%. This amount would decrease, under the Applicant's proposal, as more units are built, because removal efficiencies are increased as more units are built.

- d. Coal washing prior to combustion is a proven technology which will significantly reduce SO<sub>2</sub> emissions. In view of Water Power's commitment to purchase coal with a sulfur content at or below 0.843 lbs/mmbtu, and the efficiency levels which can be achieved by the control equipment the Applicant has committed to install, precombustion coal washing will not be required.
  
- e. Water Power has proposed substantial monitoring programs to determine the actual effects of plant operation on air quality and the environment. These monitoring programs are appropriate and should be required in the Site Certification Agreement. The results of actual monitoring will be an appropriate basis for future adjustments in operating control efficiencies. Adjustments will be considered based upon the results of monitoring programs.

- f. A discussion of the Lowest Achievable Emission Rate (LAER) for the CGS is not appropriate since the CGS is not located within a non-attainment area.
  
- g. The Prevention of Significant Deterioration (PSD) increment for the Creston area serves as a limitation of future industrial expansion. With four units operating at maximum capacity (valves wide open; five percent overpressure), the models used predict substantial use of the PSD increment at one location on Johnny George Mountain. Although the record does not reveal any planned activity in the area which would be threatened by using all but  $0.1 \text{ ug/m}^3$  (micrograms per cubic meter) of the available 24-hour increment in the area (VALLEY model) or  $32.4 \text{ ug/m}^3$  of the available increment (COMPLEX I model), the PSD limitation creates an exhaustible and perhaps irretrievable resource. Allowing emissions at control efficiencies less than 86.5% using coal D (worst case coal for sulfur content identified in the Application) may limit the potential for reasonable future progress in the area; however, the Council finds the risk of limiting future progress to be small.
  
- h. Application of FGD emissions control efficiency of 86.5% using coal D (worst case coal for sulfur content identified in the Application) will result in an emission reduction of  $\text{SO}_2$  to levels not to exceed 1,250 pounds per hour for each unit and 4,560 pounds per hour for four units.

- i. Although the record before the Council contains a great deal of information concerning the expected impacts of various levels of SO<sub>2</sub> control, there are still many unknowns in this area. Based on this record, the Council cannot now find, as a fact, that allowance of SO<sub>2</sub> emissions above 4,560 pounds per hour will not cause significant long-term environmental impacts, resulting in greater costs than the energy and economic costs of such controls.
  
- j. In determining the appropriate method to control SO<sub>2</sub> emissions, the Applicant and the Council have considered various technologies. These technologies included fuel desulfurization, wet and dry limestone, flue gas desulfurization, lime FGD, alkaline fly ash FGD, wet soda FGD, and magnesium oxide FGD. Based upon the record, the wet limestone flue gas desulfurization method:
  - 1) has been proven in large scale applications;
  - 2) is capable of efficiencies greater than 90%;
  - 3) could use locally available limestone; and
  - 4) is, compared to other reasonable technologies, the least expensive. (TR Vol. 13, p. 2061, Paulus)

The Council finds that the wet limestone flue gas desulfurization technology which will limit SO<sub>2</sub> emissions from each unit to 1,250 pounds per hour and from four units to 4,560 pounds

per hour presently constitutes "best available control technology" (BACT).

- k. These limitations were established with the expectation that Water Power will, prior to construction, submit to the Council for approval, detailed design information identifying the specific control equipment to be used and the guarantees and warranties which will be required from manufacturers. (TR Vol. 28, pp. 4443, 4444, Henriques)
  
- l. Control technologies for control of air pollutants are being constantly developed and refined. There is the distinct possibility that the future will see technologies superior to those considered at this time in terms of control, cost, reliability and overall engineering efficiencies. For this reason, the Council reserves the opportunity to review BACT for units three and four when a decision to construct those units is made.

### XIII. TRANSMISSION SYSTEMS

#### A. Introduction

1. CGS will require transmission for up to 2,032 MW of electric output. Water Power has proposed various methods for provision of power within its service area and integration of the balance of the power into the Northwest Power Grid for the use of other participants in the project.
2. The service needs of other participants lie to the west of Creston. The only subscriber with a service area to the east is Washington Water Power. However, since transmission devices are many and varied, involving exchanges, sales and a variety of modes of transmission, it is too simplistic to say that 75 percent of the power will flow only west and 25 percent will flow only east.
3. The Council has an obligation to view an application in its totality. An essential element of any thermal power plant is the provision of sufficient associated transmission facilities to connect that plant to the Northwest Power Grid. RCW 80.50.020(6)

#### B. Transmission Setting and Need for Integration

1. The site of the plant is located approximately five miles from the major Bonneville Power Administration (BPA) east-west corridor. On this corridor presently exist one steel double circuit 230 kV line, one steel single circuit 230 kV line and two wood pole 115 kV lines. The present BPA system is not adequate to integrate CGS output.

2. BPA has indicated its intention to upgrade this corridor to add a double circuit 500 kV line running the length of the route from the Douglas Switchyard near Grand Coulee to the Bell Substation near Spokane. Authorization for monies for this upgrade has been submitted in the budgetary request of BPA for Fiscal Year 1983. Energization of the upgraded line is scheduled to occur by July of 1987. (Exhibit 115).
  
3. If constructed, this line will have sufficient capacity to carry the entire production from four units of generation, 2032 MW. Connection with the upgraded line would physically connect the entire output of the CGS with the Northwest Power Grid. Though the 500 kV upgrade is planned whether any units of CGS are built or not, much of the ultimate load on the line is eventually seen to originate at the CGS. The Council cannot order BPA, an agency not a party to this proceeding, to build the line. At this point, 500 kV upgrade is an expectancy backed by qualified assurances of BPA executives.
  
4. The capacity from the double circuit 500 kV line is relied upon by Water Power for transmission of the balance of participants' shares of CGS generation, ultimately 75 percent of 2,032 MW. Two of Water Power's transmission proposals rely upon 500 kV construction being completed by BPA. The remaining proposal, the southern 500 kV, is presented as an alternative in the event BPA does not upgrade to 500 kV service on its northern corridor. These Findings assume the necessary upgrade will occur. If this assumption is proved by

subsequent events to be in error, use of an identified alternative transmission route must be approved.

5. At the present time, there is no 500 kV service on the BPA corridor or in the Spokane vicinity. The first will approach Spokane in approximately 1984 when a line of this size is connected to the Bell Substation from the east, carrying power from the Colstrip stations in Montana. The introduction of this service will accommodate, if not require, adjustments and upgrades to the transmission network in the Spokane area and along the northern corridor. This requirement, or opportunity, to upgrade 500 kV service is a matter which is incidental, if not independent and collateral, to the requirement to integrate CGS generation to the existing transmission system. This improvement is similar, in terms of its impact on this proceeding, to the Applicant's evidence regarding support to the Lind-Harrington area and various 1990 reliability requirements for general transmission systems in Eastern Washington and Greater Spokane. This licensing proceeding, though providing an occasion for considering contingent and planned aspects of the total transmission setting, is principally concerned with simple connection with the existing energy distribution network. Stated another way, system engineering requirements of a wide region into the distant future become a remote concern once output from the plant is physically connected to existing transmission networks. See RCW 80.50.020(6)
  
6. The presence of transmission facilities within five miles of the plant is a compelling reality, a reality no doubt perceived and relied upon

by the Applicant in siting the plant. The fact that this corridor is owned and operated by an agency of the federal government charged with managing a major portion of the Northwest Power Grid - the "one utility" concept - adds further weight to this circumstance. Without regard to issues of cost and reliability, physical connection with BPA's proposed 500 kV system in the northern corridor will integrate CGS output into the Northwest Power Grid and allow transmission of energy to all plant subscribers.

7. BPA is an agency of the federal government, organized pursuant to federal law. It is required to accept and transmit energy provided to it, where capacity exists, on a nondiscriminatory basis according to published rate schedules. As a government agency, BPA does not seek profit nor is it allowed to acquire and accumulate profit. The rates charged by it for transmitting energy (wheeling) are, by design, directly caused, related to, and determined by the costs and expenses incurred by BPA in providing transmission service. (TR Vol. 37, pp. 5493-5506)

C. Proposed Facilities

1. Well field

The well field near FDR Lake will require electric energy. Providing this energy will require the construction of 12 miles of 115 kV transmission line and a distribution substation at the well field. The energy will be supplied by the Lincoln Electric Cooperative.

2. Water Power has proposed three alternative transmission systems to integrate CGS output into the existing transmission network. Various proposals have some elements in common. BPA has described an alternative to one of the proposals. The three alternatives proposed by the Applicant are referred to as the Northern Double Circuit 500 kV Alternative (Northern Alternative); the Southern Single Circuit 500 kV Alternative (Southern Alternative); and the Southern Double Circuit 230 kV Alternative, preferred by Water Power (Preferred Alternative).

a. Northern 500 kV

The Northern Alternative includes a double circuit 500 kV line running from the CGS to the Douglas Switchyard, near Grand Coulee; and a double circuit 500 kV line running from the CGS to the Bell Substation with one of the 500 kV circuits looped into and out of the future Marshall Substation. One 230 kV line would be looped into the CGS for station service. 500/230 kV transformers would be located at the Bell Substation and Marshall. Two of the 230 kV transmission lines on the existing BPA right-of-way would remain connected to the Bell Substation with one of the 230 kV circuits being connected to the Marshall Substation, by interconnection at the existing substation at Westside.

b. Southern 500 kV

The Southern Alternative includes a single circuit 500 kV line from the CGS to the Douglas Switchyard utilizing a route which

lies generally southerly of the existing BPA right-of-way. Three of the 230 kV lines on the existing BPA right-of-way would be connected to the transformer at Douglas. A 500 kV transmission line would connect the CGS to the future Marshall Substation. A 500 kV line would run from Marshall to the BPA right-of-way on the North-South connector. A 500/230 kV transformer at Marshall is proposed by this alternative. Marshall would also be connected by 230 kV line to the westside substation which would, in turn, be connected to existing 230 kV lines on the BPA right-of-way. Three 230 kV circuits on the BPA corridor would be connected with the proposed CGS.

c. Southern Preferred 230 kV

The Preferred Alternative provides for construction of double 500 kV circuits utilizing the existing Bonneville Power Administration's right-of-way in Lincoln County from the Creston Generating Station west to the Douglas Switchyard. Double 500 kV circuits would also extend eastward from the CGS to the BPA Bell Substation north of Spokane utilizing the existing BPA right-of-way. A unique feature of this plan is a double circuit 230 kV transmission line from the CGS to the future Marshall Substation south of Spokane. The line would be constructed, owned and operated by the Applicant. 500/230 transformation facilities would be constructed at CGS, in this proposal. No new construction would occur in the sensitive north-south corridor between Marshall and the BPA right-of-way. Also, no

looping of one of BPA's 230 kV lines into the CGS to provide station service would be required.

d. Comparison of Routing

The common routing features of the various alternatives can be described as follows:

- 1) Both the Northern and Southern 500 kV Alternatives involve the construction of transmission facilities between the BPA right-of-way (ROW) and the Marshall Substation for a distance of approximately 16 miles. This is the North-South Connector.
- 2) Both the Southern 500 kV and Preferred Alternative involve construction along new ROW to be owned by the Applicant south of the CGS connecting CGS with the Marshall Substation, a distance of approximately 60 miles.
- 3) Both the Northern and Preferred Alternatives involve construction of double circuit 500 kV lines on the existing BPA ROW from the Douglas Switchyard to CGS and from CGS to the Bell Substation for a distance of approximately 83 miles.
- 4) All of the alternatives contemplate a connection between the CGS and the BPA ROW near the plant for a distance of approximately five miles.

- 5) The Southern 500 kV alternative has one routing feature which it does not share with any of the other alternatives. In this plan, a route runs from CGS west to the Douglas Switchyard on a line south of the BPA ROW for a distance of approximately 36 miles, with another six miles along the BPA ROW to Douglas.

3. North-South Connector

The North-South Connector, a route of approximately 16 miles, is complicated by the relatively intense development of land uses along it, when compared to uses in the northern and southern corridors. The Spokane International Airport is in close proximity to the right-of-way as is Riverside State Park. There is more intensive residential development, a highway crossing and view impacts to the Indian Canyon Park Area. Fairchild Air Force Base is in the same general vicinity. Although construction of transmission facilities in this area will be difficult, no witness has suggested that such construction could not be accomplished. Impacts in the North-South Connector will be reduced to an acceptable level if the line selected for traverse is a 230 kV line. The lower height of tower structures with this line provides greater flexibility in routing and consequently facilitates passage of the flight paths of Spokane International Airport. Impacts on air traffic will be reduced to acceptable levels. Aesthetic impacts of single pole 230 kV lines will be minimal when compared to comparable impacts of 500 kV lattice towers. Low voltage transmission lines presently exist along routes in the North-South connector corridor.

4. Interconnection with BPA Northern Corridor

The five-mile segment from the CGS north to the BPA ROW is largely scabland containing sagebrush and grass. Disruption due to construction and operation of transmission lines will be minimal.

5. Existing Uses

- a. The portion of the Southern 500 kV Alternative Route extending from CGS to the Douglas Switchyard passes many marshes, ponds and wetlands, although the centerline would avoid the most sensitive areas. Eleven miles of agricultural lands would be crossed by this line. No transmission facilities exist along this route at the present time.
- b. The route southeast from CGS to the Marshall Substation is predominately composed of scabland and agricultural land. A significant number of lakes, ponds and creeks are located near the route. Waterfowl use of these areas is frequent. Approximately 100 homes are located within one mile of the centerline. Most of the homes sit on the eastern portion of the route. No transmission facilities presently exist along this route. Detailed environmental studies of this route have not been completed. Right-of-way has not been obtained and the line may yet vary from the proposed corridor.
- c. The BPA Northern Corridor from the Douglas Switchyard to the Bell Substation is presently occupied by transmission facilities.  
(See XIII B.1.)

6. Tower Construction
  - a. The Southern Alternative single circuit 500 kV line would be constructed on free-standing, four-legged galvanized steel towers. The base of the towers would be approximately 35 feet by 35 feet and the towers would be from 100 to 150 feet tall.
  - b. The double circuit 500 kV transmission line in the Northern Alternative will be free-standing, four legged, galvanized steel towers with a base of approximately 35 feet by 35 feet and from 175 to 200 feet tall.
  - c. The 230 kV Preferred Alternative would involve single pole towers with a base of approximately four feet by four feet and a height of 90 to 125 feet. The northern BPA portion of this alternative would involve 500 kV double circuit towers.
  - d. Towers for all alternatives would be spaced about 1,200 feet apart, or 4.4 to the mile. In the northern route, existing 115 kV wood pole lines would be replaced by 500 kV double circuit towers. Since the wood poles are more closely spaced, this will result in fewer poles on the ROW and is considered an improvement by farmers over the existing wood structures. (TR Vol. 9, Cluts, Public Hearing, Creston)

D. Impacts of the Preferred Alternative

1. General

- a. Since the Preferred 230 kV Southern Alternative also involves the construction of 500 kV double circuit lines on the Northern BPA ROW, it has the combined impacts of construction on both routes. The Northern BPA ROW already exists and contains several lines of transmission facilities. Transmission on this ROW alone, with connection to Marshall by 230 kV service, would result in the least impacts of any of the alternatives.
  
- b. The Preferred 230 kV Alternative would be constructed along a route where no transmission facilities exist. No right-of-way for such a line presently exists. The Applicant was contacting landowners to receive their input on the proposed southern corridor as this hearing proceeded. Though opposition exists to this line, opponents grant that Water Power has been sensitive to the desires of area residents in the actual placement of the centerline. As a consequence, it is not yet known whether such a line, if physically placed, will wander outside the corridor designated in the Application.
  
- c. As would be the case with the intrusion of any major transmission facility in a previously uncommitted area, the environmental impacts may be significant. The line will pass through approximately seven miles of forest lands. Several miles are near wetland areas. Nine miles of cultivated agricultural land

would be crossed. The construction of the line and consequent road access may complicate the abilities of landowners to use their lands as presently used and as intended for future use. (TR Public Hearing, Creston).

2. Agricultural Concerns

- a. Siting of a southern line has been opposed in these proceedings by the Lincoln County Agricultural Coalition. This group opposes the placement of any transmission line over agricultural lands previously uncommitted to transmission and asserts: environmental impacts along the northern corridor are more or less fixed; there exists ample capacity on the upgraded corridor; sound policy requires full utilization of existing corridors; and there is, therefore, no need for the southern line. (TR Public Hearings, Spokane and Creston)
  
- b. The Coalition asserts the following effects will occur to the management of their lands: the presence of the structures will complicate the cultivation of lands, impeding their machines and equipment; the access required for construction and upkeep of the lines results in the uncontrolled entry of the public with consequent degradation of private ownership rights; and, there will be a marked detrimental aesthetic effect particularly where the line passes within sight of residences. Once the lines are in, it will be impossible to prevent future expansion of facilities in the right-of-way, it has been asserted. This group

is concerned about possible avoidance responses by domestic animals and reduction in property values. (See generally transcript of public hearings, Spokane and Creston).

- c. Though the record supports some of the concerns, others are not supported. For instance, there is no convincing evidence that domestic animals avoid transmission rights-of-way in any significant regard. The evidence of potential health effects fairly strongly supports the conclusion that any such effects are minimal and elusive. On the other hand, the long-term health effects of at least 500 kV and larger lines are not fully known and investigations are on-going. Asserted interference with radio and television is not established by the record except when in close proximity to the line and then only in conditions conducive to corona. Corona conditions and shock to humans and animals do occur but require infrequent and transient atmospheric conditions. In any case, electric shock is not likely to cause harm or injury, short-term or long-term, particularly with 230 kV lines. (TR Vol. 9, 10, Cluts, Lee and others).
  
- d. The presence of transmission lines has a marked detrimental effect on aesthetics and quality of life to those living and working under them. This effect has been articulately and persuasively presented by farmers testifying in these proceedings. (Public Hearings, Spokane and Creston).

- e. Though processes exist for the compensation of landowners for the intrusion represented by these lines, it is apparent farmers do not view such payments as being capable of totally replacing what they perceive to be lost. Such monies will provide no effective compensation to those individuals residing on, and working, land they do not own. It is apparent that farming and residence in Lincoln County do not uniformly follow ownership. Some farmers are both landowners and tenants. It is also apparent that there exists land in Lincoln County which is difficult to value in a simple market sense, having been the residence for several generations of a single family. (Public Hearings, Spokane and Creston).
  
- f. Farmers testifying in these proceedings demonstrate a feeling of identity with the land and the fragile renewable resources it fosters. They are concerned that agricultural pursuits and styles may be threatened by larger social, economic and political concerns.
  
- g. The concerns of these farmers cannot be determinative to a body charged with responsibility to a large region and all of the diverse interests within it. However, the attitudes of those who must live with transmission facilities provide a background for consideration of the transmission requests of the Applicant. Such facilities should not be placed casually or insensitively, without regard to issues of compelling need.

3. Energy Policy Issues

- a. Farmers have asserted that they, as individuals, may suffer from the conflict between transmission policies of Water Power and BPA. There is some credit to this view. (TR Public Hearing, Creston, Morse p. 25, Guhlke p. 41).
  
- b. Washington Water Power insists on a policy of ownership of the lines serving its service area. The Bonneville Power Administration asserts a policy disallowing Water Power ownership of any portion of its facilities on the northern corridor. These are matters of stated policy. There is a history of strained relations between Water Power and BPA. (Ex. 123) An upgraded northern corridor has the capacity for transmission of the total output of CGS energy. The Council is cognizant that both BPA and Water Power ultimately represent individuals - transmission customers of the Northwest Grid, in the case of BPA; and rate-payers of its service area, in the case of Water Power. BPA and Water Power assert that the aforementioned policies protect the larger interests of the individuals they ultimately serve.
  
- c. Though bearing a progressively remote relation to these proceedings, the Applicant asserts that the policy of transmission ownership, translated through values of cost and reliable electric service, requires construction of the southern 230 kV line, the Preferred Alternative. These values depart from the point

at issue as consideration proceeds to an assessment of distant system needs and plans bearing no direct relation to certification. Examples are long-term service needs in the Harrington area, and transmission facilities needed to serve loads for times in the distant future.

4. Environmental Criteria

The Applicant has set forth eight criteria from "Environmental Criteria for Electric Transmission Systems" (USDI/USDA, 1970) in its Application at Appendix D.3.3, Evaluation of Alternative Transmission Corridors, page 5-19. The criteria are as follows:

- a. Rights-of-way should be selected to preserve the natural landscape and minimize conflict with present and planned uses of the land on which they are to be located.
- b. Where possible, retirement or upgrading of existing lower voltage transmission circuits should be required to allow construction of higher voltage, higher capacity circuits on the existing right-of-way.
- c. Properly sited established rights-of-way should be used where warranted for the location of additions to existing transmission facilities.
- d. The joint use of electric transmission facilities by two or more

utilities should be encouraged, when feasible, to reduce the total number of transmission lines constructed.

- e. Rights-of-way should avoid heavily timbered areas, steep slopes, proximity to main highways, shelter belts and scenic areas.
- f. Long views of transmission lines parallel to existing or proposed highways should generally be avoided. Alternative routes away from highways should be considered. Where ridges or timber areas are adjacent to highways or other areas of public view, overhead lines should be placed beyond the ridges or timber areas.
- g. Open expanses of water and marshland, particularly those used as flight lanes by migratory waterfowl and as heavily used corridors by other birds, should be avoided. Areas of wildlife concentrations such as nesting and rearing areas, should be avoided.
- h. A route should be selected that will maximize the use of natural screens to remove transmission facilities from view.

Every Site Certification Agreement this Council has issued has required compliance with "Environmental Criteria for Electric Transmission Systems." (See Site Certification Agreement for Washington

Public Power Supply System (WPPSS) Units 3 and 5 at p. 11; Site Certification Agreement for WPPSS Units 1 and 4 at p. 9; Site Certification Agreement for WPPSS Unit 2 at p. 7; Site Certification Agreement for Puget Sound Power and Light Company Units 1 and 2 at p. 13).

5. Cost and Reliability

- a. Each of the proposed alternatives is reliable in terms of prudent utility management and the criteria established by the Western Systems Coordinating Council. (Klinger TR 5529). Given this acceptable level of reliability, discussions of which reliable system is the most reliable have little significance in these proceedings.
  
- b. There remain considerations of cost. The Applicant has presented a thorough, articulate and persuasive case for cost savings to its ratepayers. Water Power strongly opposes the loss of control over costs which would result were it required to utilize BPA facilities to wheel power sixty miles to its service area. In attempting to assess what the actual cost of wheeling will be, estimates have varied widely. The Applicant asserts that this cost will be a minimum of \$139,400,000 over the life of the project. This evidence is persuasive if for no other reason than because Bonneville's rate system is very complex, cumbersome, subject to economic factors over a wide regional

area, and presently in the midst of radical alteration. Bonneville asserts that its estimate of the comparable wheeling charges including losses, ranges from \$32,000,000 to \$124,000,000 (TR Vol. 37, p. 5519). BPA can give no assurance of how the rate may vary or what the final figure may be.

- c. Though the concept is subject to change, BPA does presently have to rate approaches in existence. They are the IR-1 rate and the FPT-2 rate. The FPT-2 rate is distance-based (TR Vol. 25, p. 5511). The IR-1 rate is a "postage stamp rate," which does not vary with distance. Applying the FPT-2 rate to CGS transmission to Spokane results in a cost of \$2.61 per kilowatt year. The equivalent IR-1 rate would be \$5.78 per kilowatt year (TR Vol. 25, p. 5513). Should the IR-1 rate become the only rate available in the future, the Applicant would pay a cost per mile of transmission greater than the system average. In view of the 60-mile transmission for the life of the CGS, application of the IR-1 rate would create a disproportionate cost disadvantage to the Applicant.
  
- d. BPA does not pay property taxes or sales and use taxes, whereas Water pays such taxes. The payment of such taxes benefits the state and local governments. (TR Vol. 37, p. 5624, Klinger)

E. BPA "Capacity Sharing" Proposal

BPA is willing to allow Water Power an arrangement whereby Water Power would pay 7/8 of the capital cost allocated to the construction of one 500 kV circuit in the northern corridor as well as station service and start-up. (TR Vol. 37, p. 5666, Klinger; p. 5607, Porter; and p. 5531) This would be a one-time payment roughly in the same amount as Water Power would pay if it owned property rights in the northern corridor. If it owned the line, Water Power could send energy east and west, more flexibly enter a variety of electric transmission arrangements, collect revenues for transmission of other companies' power, treat and control challenges to reliability along the route, and enjoy other direct and indirect incidents of ownership. Though paying an ownership amount under BPA's proposal, Water Power would suffer the following additional disadvantages over ownership. It would have to pay BPA a "firming up capacity charge" in the event of an outage on the line, while BPA could use that circuit as a back-up for its service without paying such a charge. The Applicant could transmit only energy from CGS and only to the Spokane area. In addition, Water Power would be charged for operation and maintenance. (TR Vol. 37, p. 5532)

F. Northern 500/230 kV Transmission Alternative

1. Route Described

Cost and reliability of all of the alternatives for connection of the CGS have been considered. In addition to the alternatives proposed by the Applicant, these values would be served by a line with the following design and routing: a double circuit 500 kV line from

Coulee to Bell, transformation from 500 kV to 230 kV in the vicinity of Indian Prairie and a 230 kV line in the North-South Connector to Marshall. This plan would be reliable. It would connect the 500 kV system from Colstrip to Coulee. It would provide two 500/230 kV transformers in the Spokane area. It would wheel all CGS power in a highly reliable fashion to project participants and to Water Power's service area. The plan would be consistent with the policy of maximum utilization of existing transmission corridors prior to embracing new transmission route construction, a policy which this Council endorses.

2. Connection at Indian Prairie

This Northern 500/230 kV Transmission Alternative will require construction of a 500/230 kV transformer at the juncture of the Northern Corridor and the North-South Connector in the vicinity of Indian Prairie. This substation facility would likely be constructed within the transmission corridor identified in the Application. Further, it is in an area which was reviewed by the Applicant in the course of its transmission centerline investigations. (TR Vol. 39, p. 5814) Existing there is a low density of structures (Ex. 117, p. 8) Construction of the substation would require approximately 33 acres of land. (TR Vol. 38, p. 5726) Environmental effects would be minimal, particularly when compared to 500 kV construction in the North-South Connector.

3. Ownership

The record reveals no legal impediment to providing ownership to Water Power of a line in the BPA right-of-way. BPA and the Applicant share a ROW in Montana, for example. The best interests of the people of the State of Washington and the policy of Chapter 80.50 RCW would be served by the Applicant having an interest in the nature of ownership in one 500 kV circuit from CGS to a juncture in the corridor where energy from that line could be conveniently transformed to 230 kV and routed to the Marshall Substation.

4. Advantages

A transmission line in the Northern Corridor would require the least new ROW. It would have the least environmental impacts. It would provide reliability and the lowest electrical losses.

G. Conclusion

1. The construction and operation of transmission facilities in the Northern Corridor are approved and will be certified if Water Power and BPA reach agreement on the following general conditions or their equivalent:

a. The Applicant has the use of one 500 kV circuit in both directions from CGS to a 500/230 kV transformer in the area of the juncture of the BPA right-of-way and the North-South Connector;

- b. Each 500 kV circuit on the Northern Corridor is considered a backup to the other and no charge is made by the Applicant or BPA for backup power in the event of one circuit outage;
  - c. Operation and maintenance costs for both circuits are shared equitably by BPA and the Applicant;
  - d. The Applicant pays a reasonable charge for the use of the BPA ROW;
  - e. The Applicant and BPA share wheeling revenues derived from wheeling energy other than that used to service the Applicant's loads;
  - f. Only 230 kV transmission facilities are constructed in the North-South Connector;
  - g. Station service is provided to CGS by BPA;
  - h. Total costs of the arrangement are equivalent to the cost of the Applicant's Preferred 230 kV Alternative.
2. Recognizing that this Council cannot compel BPA to enter into the relationship described above, the Council can and does require the Applicant to use its best good faith efforts to secure this arrangement or a similar acceptable arrangement for transmitting power on

the described route, and to report to the Council monthly on the status of the negotiations.

3. In the event an acceptable arrangement cannot be reached between the Applicant and BPA within six months from the time the Site Certification Agreement is executed and signed, use of an identified alternative transmission route must be approved. Such approval must involve a thorough and detailed environmental analysis of an established corridor and identified centerline.
4. Construction of transmission facilities from the BPA ROW to CGS for station service and backup should be approved as proposed.
5. Construction of transmission facilities to the CGS site for construction purposes and to the well field site should be approved as proposed.

#### XIV. WATER RIGHTS

##### A. Proposed Water Use

1. Waters for construction purposes for the first and second units will be obtained from wells located on the site itself. The use will average 50 gallons per minute (gpm) with a peak use of 200 gpm during the construction period. (Tr Vol. 8, p. 1156, Hamill) The source of these waters will be the same as two wells presently used by Mr. Merwin Houser, for potable, stock, and irrigation water. These two wells presently draw up to 1060 gpm. (Tr Vol. 8, p. 1157, Hamill) Water Power will either use the existing wells on-site or drill new wells to supply construction water for the first and second units. In either case, total water usage will not exceed what is presently permitted.
2. Except for water allocated for domestic and stock water supply, all irrigation withdrawal is now limited to the irrigation season, or April 1 to September 30.
3. Construction water requirements would require year-round use from the wells.
4. Water Power has proposed acquiring water for operation of the CGS project from the Columbia River at FDR Lake. The application proposes installing a well field and withdrawing waters from an aquifer which is in direct hydraulic continuity with FDR Lake.

5. In the operation of the plant, the Applicant proposes to pump a maximum of 62 cfs. The total annual requirement is 32,000 acre-feet.

B. Existing Federal Water Rights

The Federal Bureau of Reclamation has a Columbia River water permit for 13,450 cfs mainly for irrigation purposes with a priority date of May 10, 1938 (Exhibit III). The Bureau also has a 1938 Columbia River water right to a maximum of 75,000 cfs for power generation purposes (Exhibit III). The Bureau has a storage water certificate for storage of 6,400,000 acre feet of water behind Grand Coulee Dam for irrigation and hydroelectric power. (Exhibit III). The Bureau also has various other interests in waters behind Grand Coulee Dam. (Exhibit 111)

C. Availability of Water

1. The proposed use of water by CGS is a consumptive and beneficial use of water. The proposed withdrawal of water for operation of the CGS project by the Applicant will not have a physically measurable effect on the use of Columbia River waters by others downstream or on instream flows. (TR Vol. 32, p. 4942)
2. There are sufficient ground waters physically available for the proposed project.

D. Columbia River Water Management

The Department of Ecology has adopted certain minimum flow and management requirements for the pertinent reach of the Columbia River,

by the adoption of Chapter 173-563 WAC. This is known as the Columbia River Instream Resources Protection Program (CRIRPP) which became effective on June 24, 1980. These regulations were adopted after numerous meetings and communications with various groups using the Columbia River.

E. Public Interest

1. The public will greatly benefit from the generation of electrical energy by the CGS. Further, an assured supply of water is essential to the construction and operation of the CGS.
2. The use of water from FDR Lake will result in the generation of approximately 2,000 times the power that would be generated by the same water at Grand Coulee Dam and approximately 650 times as much as would be generated by the same amount of water at all of the other hydroelectric projects on the Columbia River below Grand Coulee Dam, assuming that all of the water used in the CGS was available for use to generate electrical energy at all of the hydroelectric plants on the Columbia River from Grand Coulee downstream. (App. Sect. 5.3.2).
3. Based on the above, in addition to the full record, the Council finds that there are overriding considerations of public interest, for which reason the Council should grant an exemption to the Applicant from the regulatory provisions of CRIRPP as set out in Chapter 173-563 WAC.

F. Request of Bureau of Reclamation

1. The Bureau of Reclamation has applied to the Department of Ecology for a change in purpose of use of the waters in active storage in the reservoir behind Grand Coulee Dam. (TR Vol. 36, p. 5405). If granted by the Washington Department of Ecology, it is contemplated that at least a portion of the water would be used by the CGS.

## CONCLUSIONS OF LAW

Having considered the whole record in this proceeding, and the foregoing Findings of Fact, the Council makes the following Conclusions of Law:

1. The Council has jurisdiction over the subject matter of Application No. 80-1 and the parties to this proceeding.
2. The Application for Site Certification is in compliance with the Council's guidelines for such applications contained in Chapter 463-42 WAC.
3. The Council has satisfied the statutory requirements contained in Chapter 80.50 RCW and in Chapter 43.21(C) RCW (SEPA) by evaluating the application; commissioning independent consultant review; conducting zoning and land use consistency and compliance hearings; conducting evidentiary hearings into compliance of the Application with the Council's guidelines as set forth in Chapter 463-42 WAC; conducting required and optional public hearings; developing and issuing a draft and final Environmental Impact Statement; and developing from the evidence, exhibits and other materials presented to the Council, Findings of Fact, Conclusions of Law and Order, constituting the required recommendation of the Council to the Governor of the State of Washington.
4. The proposed Creston Generating Station and associated facilities are consistent with and in compliance with Lincoln County, Douglas County, Spokane County, Grant County, City of Grand Coulee and City of Spokane land use plans and zoning ordinances, and are required for the public convenience and necessity.

5. To legally withdraw ground waters appropriated for irrigation use, under the existing Houger water right, it will be necessary for the Applicant to obtain from WDOE a temporary change in purpose of use to industrial/construction supply for the period of April 1 to September 30 (irrigation season).
6. The Council has authority, under the provisions of RCW 80.50.110 and .120, to authorize ground water withdrawal for construction supply during the non-irrigation season (October 1 through March 31, annually).
7. In the event the Applicant does not elect to use existing wells on the site as the source of water for construction purposes, the Council has authority pursuant to RCW 80.50.110 and 120, to authorize ground water withdrawal for the construction of units one and two from a new well or wells. In this circumstance, the Applicant should be authorized to withdraw an average of 50 gallons per minute (gpm) not to exceed 200 gpm for these purposes.
8. The Applicant should be authorized to withdraw, not to exceed 62 cubic feet per second (cfs) or 32,000 acre-feet per year, water from its proposed well field near FDR Lake for use at the Creston Generating Station. These waters will be exempt from the provisions of Chapter 173-563 WAC. This authorization would not preclude the Applicant from obtaining a superior priority right from the Bureau of Reclamation or others.
9. The Application for Site Certification constitutes a "Notice of Construction" for purposes of Chapter 463-39 WAC. The Project, if constructed and operated

according to the conditions of this document and the Site Certification Agreement, will be in accord with Chapter 70.94 RCW (Washington Clean Air Act) and the applicable rules and regulations adopted pursuant to that Chapter.

10. The Creston Generating Station, if constructed and operated according to the conditions of this document and the Site Certification Agreement, will be consistent with Chapter 80.50 RCW.
11. The Creston Generating Station, if constructed and operated according to the conditions of this document and the Site Certification Agreement, will not result in discharges requiring a National Pollutant Discharge Elimination System Permit.
12. The Governor of the State of Washington will act within the purpose of the statutes contained in Chapter 80.50 RCW by approving certification of the proposed site, provided that such certification is conditioned upon the application of each and every limitation stated in this Order and the Site Certification Agreement.
13. The Council is authorized to and should submit the following recommendation and order to the Governor of the State of Washington. Certification should be contingent upon execution by the Governor and the Applicant of the Site Certification Agreement for the Creston Generating Station.

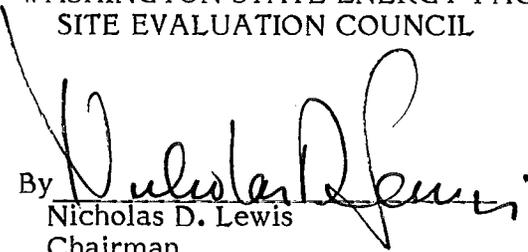
RECOMMENDATION AND ORDER

Having considered the entire record in this proceeding, including the above Findings of Fact and Conclusions of Law, the Council hereby reports to the Governor of the State of Washington that the Application for Site Certification for the Creston Generating Station is in compliance with the applicable law and regulations, and recommends to the Governor that he approve the Application for Site Certification and certify the site for construction and operation of the Project contingent upon execution by the Governor and the Applicant of the Site Certification Agreement for the Creston Generating Station.

IT IS FURTHER ORDERED That the foregoing report and recommendation, together with the foregoing Findings of Fact and Conclusions of Law, shall be, and the same are hereby, forwarded forthwith to the Governor of the State of Washington for his consideration and action.

DATED at Olympia, Washington, and effective this 24<sup>th</sup> day of May, 1982.

WASHINGTON STATE ENERGY FACILITY  
SITE EVALUATION COUNCIL

By   
Nicholas D. Lewis  
Chairman