

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

IN RE: THE NUCLEAR SAFETY OF THE PALO VERDE STATION

In the matter of)	Docket Nos. STN 50-592
Arizona Public Service Co.)	50-593
et al.)	
(Palo Verde Nuclear Generating)	
Station, Units 4 & 5))	June 26, 1979

Comments of the intervenor, Larry Bard, on the Draft Environmental Statement of the above mentioned docket nos.

The following are my comments on the DES of PV 445. They are section by section comments pertaining specifically to the information presented in the numbered section being discussed at that point.

1.1 The proposed project

In the middle of the first paragraph it is stated that "Secondarily treated sewage effluent from the city of Phoenix, Arizona, 91st Avenue sewage treatment plant will be the sole source of cooling water." This statement would seem to indicate a major weakness in the planning and design of these large central station electrical power plants. A constant source of cooling water is required at these plants due to the fuel used to supply electricity, uranium. Even when shut down the reactors require substantial quantities of water to remove residual heat generated by waste products created in the fission process. To depend on a single source of this cooling water would seem to require rigid standards in both planning and design. No failures in the 91st Avenue sewage treatment plant, the transmission line from the treatment plant to the nuclear site, or the treatment plant on site can be tolerated. It is unreasonable to expect this will be the case for the 30 year life of the PV 445.

The intervenor believes that a more flexible cooling water supply system is more appropriate and such a system can be designed and constructed for reasonable costs. I also believe that benefits from such a design would far outweigh any additional costs. By using drainage water from irrigation districts, tailwater from

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these same districts, low quality groundwater that is in the vicinity of the plant, all supplemented by effluent, the Palo Verde plant can assist the central Arizona region in making maximum use of her scarce resources such as water by reusing this resource as many times as possible before it is consumed by Palo Verde.

1.2 Status of reviews and approvals

In the last paragraph it is stated that the applicant will not be required to meet Federal, State, or local water quality effluent discharge limits because there will be no discharges. The intervenor would like to point out this is only true if all ponds on the site are adequately sealed to prevent seepage and any deposits of chemicals removed during treatment of water or evaporation in ponds are adequately stabilized to prevent erosion from flash floods or wind erosion which are common occurrences in the desert environment of the site.

2.2.2.1 Community Characteristics

The intervenor would like to emphasize two points mentioned in this section. In the second paragraph on Demography: "Future growth of this western area and many areas of Arizona depends upon the nondepletion of water resources." In the second paragraph on Employment: "Economic growth of all of Maricopa County, Particularly manufacturing, has and will be limited by the lack of an ample and reliable source of water."

The staff conceals these important points in the total water management picture of central Arizona but when it comes down to analyzing the impact of diverting and consuming vast quantities of this valuable resource to cool Palo Verde, they are remiss.

2.2.4 Water use

The staff contributes to confusion in this section. In the second paragraph they use three different units in discussing water use within communities in the Phoenix area. It would clarify matters if consistent units were used, where this would facilitate comparisons of data.

Also in this section is the statement "The CAP water will be used primarily for agricultural purposes." It would be wise if the staff became aware of efforts by municipal and industrial users to change this allocation scheme.

Table 2.11 Cultural resources listed in the national register
The intervenor would like the address of Our Lady of Mount Carmel Catholic Church checked.

2.4.3 Seismicity

The data on earthquakes discussed is from recorded epicenters as of 1957 near the site and Arizona in general since 1927. The intervenor questions this information as to its adequacy. As of 1976, Arizona did not have enough instruments in place to accurately record seismic activity and triangulate to find epicenters. The state has been relying on neighbor states to assist in earthquake monitoring. With this situation in mind it seems that the data base used in the discussion in the DES is inadequate.

2.5.2 Water Quality- 91st Avenue effluent

In this section the staff discusses the toxic effects of some soluble loads that are treated at 91st Ave. This results in plant shut down and poorer quality water during these periods. This correlates with my discussion on Sec 1.1.

2.5.3 Groundwater

The applicant contends that 25% of water infiltrated into the perched zone via irrigation (or rather 25% of water pumped for irrigation) returns to the groundwater reservoir. If this were the case would it not be wise to dewater this perched zone consisting of 3000 to 10,000 ppm dissolved solids, and use it to cool Palo Verde rather than let it seep through the permeable layer to the groundwater, there upon contaminating that zone.

2.5.4 Groundwater quality

In this statement on quality phenols are mentioned as being present in quantities excessive of USPHS. The intervenor wonders where these are coming from and if the staff or applicant has made any efforts to determine this.

2.6.2 Local Meteorology

In the last paragraph, it is stated wind data was collected for 1 year. Does the staff actually believe that this is an adequate data base?

3.3 Plant Water Use

The staff mentions that after leaving the on site treatment plant the cooling water will be stored in a 50 acre storage reservoir. It would be helpful if this acreage were converted into actual days

of cooling water capacity or at least a volume so that the length of time that the plant can be cooled with on site reservoir water can be determined. This would help alleviate questions and confusion of those reviewing the DES.

3.4 Heat Dissipation System

Approximately 2/3 of the heat generated by PVNGS will be wasted. Has the staff or applicant considered using this waste heat to purify poor quality water which could then be used to cool PVNGS. This would alleviate multiple pollution problems. By using the waste heat, less would need to be dissipated to the atmosphere, reducing thermal pollution. By using low quality water, selective groundwater pollution problems could be solved nonstructurally and valuable effluent could be used and reused for other purposes.

In the third paragraph it is stated that the water will be cooled to 31.5°F via the cooling towers. This figure is then repeated in Table 3.2. This is a numerical error in converting °C to °F. It is distressing to the Intervenor that such a obvious error was missed in the staff's review, in such a simple numerical calculation. The intervenor can only wonder as to what other errors have been missed in other much more critical calculations.

3.6.1 Water supply

"...applicant states that the treatment processes will markedly reduce the numbers of any such agents (bacteria, viruses, protozoans, etc) present in the influent sewage effluent (ER(a), Supp.3)." The intervenor wonders if any recent analysis or reanalysis of this claim has been done since the ER PVNGS 1,2,&3 was completed.

3.6.5 Evaporation Ponds

There is no mention of the effect of dissolved salt concentration on the rate of evaporation from open bodies of water. The staff and applicant have been negligent in its analysis by not including all variables in the evaporation mechanism.

In the last paragraph of this section the staff states that no estimate of aeolian erosion can be generated due to lack of data. The impression is given that no problem will arise, but this is inappropriate and wrong. Because there is a lack of data, only points to the inadequacy of the review and monitoring of the site, not to the absense of a problem.

3.7.1 Sanitary wastes

There is a discussion of the solid waste disposal area on site but without any description of this area. It is difficult to review this report for adequacy of design of systems, if discussion on them is limited to the fact that they are there but nothing on how they work.

4.1.1.2 Nonagricultural considerations.

In the last paragraph soil stabilizing of disturbed areas is discussed. For large areas revegetation is mentioned as the method to be used if climate permits. It would seem that the staff is unaware of the difficulties of revegetation in low rainfall areas such as the plant site. It is unlikely that much ground cover can be maintained unless a major commitment of time and water are spent on this stabilizing method. A contingency plan would seem appropriate if revegetation is unsuccessful.

4.2 Impacts on water use and impacts to waterways

This entire section is inadequate. There is no discussion of the impact of using the sewage effluent on the water balance of the entire region, as the title of this section would lead one to believe.

4.2.2 Groundwater

The discussion here talks about dewatering the perched zone if it is necessary. From my understanding the excavations of the first three reactors required such dewatering. Also units 4&5 are closer to evaporation ponds, which would lead to higher perched zones. Also in this section the depth to the perched zone given is different from the depth cited in sec. 2.5.3. Which is accurate?

4.2.3 Water quality

IN the discussion on water quality effects, some concern ^hould be given to contamination of the perched zones leading to contamination of the deep groundwater via seepage through old abandoned well holes either onsite or offsite.

4.4.3.1 The number and distribution of newcomers.

In this section the case is made about the availability of large numbers of construction workers in the area. How does this relate to the recent press releases by the applicant concerning delays on unit 1. This is supposedly due to large turnover rate of employees and insufficient numbers of skilled employees.

4.4.3.2 Impact to population and employment

"when compared to the total number of new people expected in the area, will not produce any unique problems to an area that will be growing rapidly in the next decade." This maybe so, but what is the added impact on a city that has no control over this growth, or an adequate planning program as it is?

"There may be some attempt on the part of local workers to leave their present positions and try to secure positions in the PVNGS construction force." If this were true why is the applicant having difficulty attracting adequate numbers of skilled workers if benefits are so great at PVNGS?

4.4.4.2 Applicants purchase of materials

The applicants purchase of effluent is considered a benefit in this section, without consideration of options for effluent use ~~eliminated~~ by its consumption at PVNGS.

5.2 Impacts on water use

Comment the same as on section 4.2

5.2.1 Surface water

There is no discussion on options eliminated by the contract for effluent from the City of Phoenix. Any discussion is incomplete unless intangible costs, benefits, or options are discussed.

In the last paragraph, the applicant proposes to store effluent on site if extended shutdowns occur. What capacity of water storage is planned, that is, how many days of effluent can be stored on site before capacity is reached?

5.2.2 Groundwater

There is no discussion of impacts on groundwater recharge at upstream locations, when all sewage is diverted to 91st Avenue. Many prime recharge points have been identified on the east side of the basin that are unuseable when all the sewage is piped to the west side of the basin.

5.2.3 Water quality

The intervenor questions if the regulatory agency is doing an adequate job, when it allows the applicant to do its own monitoring. In this case it is ground water quality.

5.5.1.2 Water diversion effects

The list of assumptions and procedures followed in determining water availability and usage are questionable. In specific, 2 and 3.

Assumption 2 totally ignores Indian water rights and there claim on sewage effluent from Phoenix. Assumption 3 is based on the applicants projections of effluent. There has been no independent analysis by the staff in this area of contention, as is required by NRC regulations.

In the second paragraph, it is assumed that only water from 91st Ave will be diverted, hence no adverse impact between 23rd and 91st AVE. Recent actions by the Applicant indicate that this may not be the case. Due to the Applicants own projections on availability of effluent for the first summers of operation, they will not have enough water available to cool the reactor in Unit 4. To alleviate this situation, the applicant is searching for sources, such as trade offs with the Buckeye Irrigation District for more water in the summer for PVNGS and and repayment during winter months. Also, direct transfer from 23rd to 91st Ave is being considered. This would then effect this section of the river. Environmental damages must be considered for this possible solution to the water supply problem.

"On the basis of the projected population growth for the of Phoenix area, a linear increase in sewage effluent is assumed." This statement has two faults. First it accepts the applicants population projections with no statement on the rigorousness of staffs evaluation of these projections. Second it assumes a linear increase in effluent production which is a simplistic approach to a major point of contention in these proceedings.

5.6 Impacts on people

5.6.1.1 Traffic

The work force for PV 4&5 will be about 280 full time employees during operation. They are not expected to affect traffic arteries. The intervenor wonders how this interreacts with the present situation where an interchange on Interstate 10 is being proposed to accommodate construction workers at PVNGS. There seems to be traffic problems now requiring State tax payers to correct, through Federal subsidies, to build this structure in the Federal Interstate system. Then in a few years it will only be used for a handful of regular employees most of which will be from out of state, imported as experts to operate the plants.

5.6.1.2 Dust and noise

Does the applicant propose methods of mitigation for the "noise (that) may be considered a nuisance by some humans within this radius" assumed to be the effected area around the plant?

5.6.1.4 Water Use

The applicant strongly opposes the statement that "various allocations of water in the area are discussed in detail" in previous sections of the DES. This statement points out what is probably the most insufficient aspect of the applicant data and the staffs analysis of this data. Until further studies are conducted on the projects impact on water resources and their management in the Phoenix area this draft statement is as yet incomplete.

5.8.5 Radioactive Effluents

The eighth paragraph discusses assumptions used for radon releases from stabilized tailings piles. What is the basis for this assumption? By stating basis of assumptions the staff can help facilitate areas of confusion and contention.

5.8.6 Radioactive wastes

"...high-level and transuranic wastes are to be buried at a Federal Repository, and no release to the environment is associated with such disposal....No radiological environmental impact is anticipated from such disposal." This statement would seem to be a little premature. As yet no wastes have been adequately disposed of, neither military nor commercial. These statements are design objectives and hopes of the engineers, not necessarily the data base of experience thus far gained.

Table 6.2 Water Quality Parameters (for groundwater monitoring systems)

Why does this table not include grease and oils? In the text of this document monitoring of grease and oil is discussed, yet no monitoring of these products, which are directly related to construction of PVNGS show up in the proposed monitoring program sponsored by the applicant and supported by the staff.

6.1.3 Meteorological

The applicant has collected one years of data at the site. The staff has then compared this to data from the city of Phoenix and concluded that it represents average meteorological conditions. This has two problems, first one years data is far from an adequate

data base, and second 50 miles is a significant distance to judge meteorological conditions. Especially when different topography and wind patterns are considered. Extrapolation of this data would seem to be beyond normal statistical imagination.

6.1.4 Ecology

6.1.4.1 Initial base line studies

The intervenor wishes to support the staff's evaluation of the applicant baseline studies. The applicant seems unaware of statistical methods such as Styne's two stage sample size test to determine adequacy of data base in basic ecological measurements and statistical analysis. This would point to either inexperience in such ecological monitoring or the applicant lack of concern with such monitoring.

6.1.4.2 Construction-Phases Ecological Studies

Terrestrial

It would seem much work needs to be done in this area prior to construct and must be available for review before permits are granted.

Chapter 7 Environmental impact of Postulated accidents

It seems incredible that this chapter is only four pages long. Especially when it was release in April, after the accident at Three Mile Island II. Any environmental statement released after TMI and not consider its effects and experiences on postulated accidents can only be viewed as incomplete. The intervenor will reserve his rights to coment on this ~~226~~^{until} after this section is supplemented by more up to date information on reactor accidents.

8.1.1 Applicants Service area

"their sales are preponderantly to commercial and industrial establishments." The intervenor would like to make evident that often in discussions on need for power the burden to the residential consumer is frequently ignored in the costs yet included in the benefit to industry and commerce.

Table 8.4 Generating capacity by fuel use and equipment type for each participant in PVNGS Units 4&5

The intervenor is shocked that the applicant APS has no projected capacity from any alternative, energy source. They are content to use conventional sources such as fossil, nuclear, hydro, and combined cycles. IN a state that burns off $\frac{1}{2}$ million cubic feet of natural gas per day from one sewage treatment plant the local gas company project no future use of biogas. In a state that has plentiful wind

energy sites both in the northern plateau and the southern areas of the state, the local electric company projects no capacity feasible before 1992. In a state that has more days of ~~clear~~ insolation than any other state in the country the local utility projects no capacity in the next 13 years. This is a condemnation of the applicants analysis of future energy strategies.

8.2.2 Reserve Margin

"15% reserve is "prudent practice" for their individual operations" Aps reserve margin(% of peak demand) is 19.2 which is the lowest margin in the conglomerate that constitute the Applicant. This is above the 15% limit self imposed upon the utilities. In comparison to the other utilities, it would appear that APS requires an increase in peak power. It should be noted that PVMGS supplies base load, not peak power.

8.2.3.2 Load characteristics

This three sentence paragraph is all that the intervenor can find in this document that deals with the applicants need for base load. This discussion is entirely inadequate. Just stating that base load is needed is no justification for building a large central station power plant.

8.3.2 Impacts of energy conservation and substitution on the need for power Data in this section deal with reductions in usage from 1973 to 1977. It would seem appropriate to update this data as it is now 1979.

8.4 conclusions

"Forecasts which are too high can lead to construction of underutilized generating and transmission capacity, which leads to higher costs of electricity and inflationary pressures on the cost of the capital financing as well as high interest charges if construction is stretched out over a large period to avoid underutilization of capacity." This statement has direct relevance to PVMGS especially since Unit 1 has already been delayed 1 year, leading to cost overruns similar to those mentioned above. What is confusing is a later statement in this section: "This can be advantageous under conditions of nationwide capital shortages such as occurred in the recent past, and which are continuing." There is no mention that part of this problem results from construction of large central

station power plants which tie up large sums of capital, making it less available for other market investments, causing capital shortages.

What is really confusing in this discussion for need for power is that most of the discussion deals with peak power and the need for it, and very little discussion on need for base load power. When PVNGS is being constructed for base load, shouldn't the discussion deal with need for base load power?

9.1.2.1 Solar Energy.

This discussion fails to mention that solar domestic water heaters and pool heaters have a effect of reducing base load, directly reducing need for PVNGS. Solar space heaters are totally ignored. Also the upgrading of building construction to include passive solar design for space heating has been omitted, as a possible reducing force on need for base load power.

9.1.2.2 Wind energy

There is no mention of a proposal by SDGE to install wind machines on existing power transmission towers to add directly to the generating capacity.

9.1.2.7 Coal fired plant

A recent study by Exon, identified in the June 6 Washington Post and the June 19 Esquire conclude that there is no advantages of nuclear over coal. This would seem to contradict the independent studies identified in table 9.1. It seems that the economic comparison depends upon capacity factors used in comparisons. The applicant routinely uses 75%, which is unrealistic if compared to actual experience with reactors of the size of PVNGS. It would seem appropriate if economic comparisons used figures for capacity that are more in line with actual experience.

9.1.2.8 Health effects

"...(the current experience for serious accidents is zero)."
Is this statement still correct now that we have experienced TMI?

9.2 Alternative sites

- Socioeconomic factors
- Landowner dislocations

The intervenor wonders if the staff has investigated land ownership

patterns in the vicinity of the site. It has recently been learned that the family of the President of the applicant, APS, has major landownership in the area, and in fact sold part of this land which now is the site for PVNGS. There would seem to be some conflict of interest.

9.2.4 Staff's analysis

"In the staff's judgement, the severity of impact of plant operation on water resources is directly proportional to the percent of groundwater utilized." The intervenor would like to add that this is proportional to the quality of the groundwater used, which the staff has overlooked.

10.1 Unavoidable adverse environmental effects

10.1.1.2 Water

this section mentions how much will be used but fails to consider the impact of this consumption as would be expected by the title of this section.

10.1.2.2 Aquatic

The two statements in this section seem to conflict with each other. On the one hand diversion of effluent will improve quality of aquatic habitats in the Salt River, and the second statement says that aquatic habitats will be reduced. The intervenor is confused by these seemingly contradictory statements.

10.1.3 Radiological effects

The staff uses 1980 population projections for determining dosages for reactor that will not be operating until 1990. Would it not be better to use 1990 population projection figures.

10.2.2 Enhancement of productivity

"it is expected that plant operation employees will receive special training for their positions and thus will enhance labor productivity." TMI has experienced trouble finding enough qualified operators in the densely populated east coast area, which leads to overworked staff or possibly to operator error during the accident. What will be the effect on finding enough qualified operators in a more sparsely populated region such as the desert of Arizona, where 5 reactors are being constructed, requiring many more operators.

"Since the profits of the utilities are regulated, it is expected that the capital resources will yield a return at least equal to

that of other uses with similar risks." The intervenor wonders whose risks are being discussed when considering a regulated monopoly, The consumers or the stockholders?

10.2.3.1 Uses Adverse to productivity

10.2.3.2 Water use

There is no discussion of how this use will effect options eliminated by the consumption at PVNGS.

10.3 Irreversible and irretrievable commitments of resources

There is no discussion of the consumption of water that is irreversible and irretrievable, and how it effect the total water balance of the region.

10.4.2 Secondary benefits

1. Wages paid to construction and operating personnel
2. Taxes paid to local political subdivisions
3. Taxes paid to local school districts

Inclusion of these benefits contradicts Public Service Company of New Hampshire (Seabrook Station, Units 1 and 2), ALAB-471, 7 NRC 477, (April, 1978). Which ruled that increased employment and tax revenues to the affected community may not be counted on the benefit side of the cost-benefit balance.

10.4.3.2 Environmental costs

It seems inadequate that these costs are summarized in a table without any discussion on their impact. Benefits receive ample discussion so why not discuss the costs?

10.4.3.3 Radiological costs

Where do the estimates of radwaste cost come from. Just stating a projected cost without reference would seem to be inappropriate.

The above are the comments section by section on the DES. Due to time constraints, no attempt will be made to integrate all these comments into a logical presentation, but this will be attempted for presentation at a later date. To conclude the intervenor would like to state that the DES has major deficiencies in many areas that need attention before construction permits can be granted.

Respectfully submitted,

Larry Bard, Intervenor