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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JUN 20 1975

Regulatory File Cy.

Mr. Daniel R. Muller
Assistant Director for Environmental Projects
United States Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Muller:

The Environmental Protection Agency has reviewed the draft environmental statement for the Palo Verde Nuclear Generating Station Units 1, 2, and 3 prepared by the U.S. Nuclear Regulatory Commission (NRC) and issued April 1975. Our detailed comments are enclosed.

With regard to radiological aspects, we expect that the proposed plant design is capable of limiting radioactive emissions and resulting doses from plant originated effluents to the "as low as practicable" guidance as given in Appendix I to 10 CFR 50. However, because of the potential for additional radioiodine releases due to use of treated sewage in the cooling system, the Applicant's environmental radiological monitoring program should include a sampling plan to determine the radionuclide content of incoming treated sewage on a continuing basis. Thus, the total potential radiological impact can be predicted.

The estimates of offsite hourly particulate air concentrations in the draft statement indicate that primary ambient air quality standards may be exceeded if the indicated cooling tower design criterion of 0.04% drift is utilized and if the projected particles are considered "particulate matter" within the meaning of EPA's regulations (40 CFR 50.6) using the reference method set forth in Appendix B of those regulations. However, data on the particle characteristics from emissions of this type, based on the application of the reference method, are not available to determine the applicability of the EPA air

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

quality standard. We believe that by utilizing "state-of-the-art" drift eliminators it is possible to reduce the estimated drift losses, and thus the entrained particulates (if the tower emissions are determined as such using the required reference method), to levels which are expected to be within the 24-hour primary ambient air standards. The final statement should provide an evaluation of the worst 24-hour average tower emission concentrations which may be expected at the critical site boundary with the plant utilizing "state-of-the-art" cooling tower design. We also suggest that the NRC require the Applicant to employ the most efficient "state-of-the-art" drift eliminators at the plant.

EPA believes that Palo Verde Nuclear Generating Station Units 1, 2, and 3 can operate in general compliance with the Federal Water Pollution Control Act Amendments of 1972 (FWPCA). However, we have some concern as to consumptive water use of this plant in such an arid region.

In light of our review and in accordance with EPA procedure, we have classified the project as ER (Environmental Reservations) and rated the draft statement Category 2 (Insufficient Information). If you or your staff have any questions concerning our comments or classification, we will be happy to discuss them with you.

Sincerely yours,

Sheldon Meyers

Sheldon Meyers
Director
Office of Federal Activities (A-104)

Enclosure

[illegible]

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ENVIRONMENTAL PROTECTION AGENCY

WASHINGTON, D.C. 20460

June 1975

ENVIRONMENTAL IMPACT STATEMENT COMMENTS

Palo Verde Nuclear Generating Station

Units 1, 2 and 3

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INTRODUCTION AND CONCLUSIONS

The Environmental Protection Agency has reviewed the draft environmental statement issued in April 1975, by the U.S. Nuclear Regulatory Commission in conjunction with the application of the Arizona Public Service Corporation for the construction permit to build the Palo Verde Nuclear Generating Station, Units 1, 2, and 3. The proposed plant will be located in Maricopa County, 15 miles west of Buckeye, Arizona. Each unit will produce up to 3800 MWt and incorporate a closed-cycle, mechanical-draft cooling tower system to dispose of waste heat. Approximately 99 percent of the station cooling water will come by pipeline from the Phoenix 91st Avenue municipal sewage treatment plant. Blowdown discharges will be diverted to an onsite evaporation pond. The following are our major conclusions.

1. Our review and evaluation of the draft statement indicated that the proposed plant appears to be capable of limiting radioactive releases originating from reactor operation to within the "as low as practicable" guidance of Appendix I to 10 CFR 50. However, the unusual circumstance of the influent makeup water being contaminated with radioiodine leads us to suggest that the radionuclide content of incoming treated sewage water be determined on a continuing basis to ascertain the contribution of this source to total doses offsite.

2. The estimates of offsite hourly particulate air concentrations in the draft statement indicate that primary ambient air quality standards may be exceeded if the indicated cooling tower design criterion of 0.04% drift is utilized and if the projected particle sizes are such as to be considered "particulate matter" within the meaning of EPA's regulations (40 CFR 50.6) and using the reference method set forth in Appendix B of those regulations. However, data on the particle characteristics from emissions of this type, based on the application of the reference method, are not available upon which to make a determination of the applicability of the EPA air quality standard. We believe that by utilizing "state-of-the-art" drift eliminators it is possible to reduce the estimated drift losses, and thus the entrained particulates (if the tower emissions are determined as such using the required reference method), to levels which are expected to be within the 24-hour primary ambient air standards. The final statement should provide an evaluation of the worst 24-hour average tower emission

concentrations which may be expected at the critical site boundary with the plant utilizing"state-of-the-art"cooling tower design, and we urge that the Applicant employ most efficient drift eliminators currently within the "state of the art".

3. EPA believes that Palo Verde Nuclear Generating Station Units 1, 2, 3 can operate in general compliance with the Federal Water Pollution Control Act Amendments of 1972 (FWPCA). However, we have some concern as to consumptive water use in an arid region. The final statement should provide a brief discussion of water management in Central Arizona over time, including sources of water supply and water demands, and relate the PVNGS's impact on consumptive use to the larger water management context.

RADIOLOGICAL ASPECTS

Radioactive Waste Treatment

Based on our evaluation of the draft statement, the proposed gaseous and liquid waste treatment systems appear to be capable of limiting the radioactive discharges and resulting doses to within the "as low as practicable" guidance of Appendix I to 10 CFR Part 50.

We noted with considerable interest the circumstance of I-131 in the influent water to the site, and the resultant 57 mCi/yr estimated atmospheric discharge due to this source. While this discharge of radioactivity is not due to I-131 produced by reactor operation, it does result as a consequence of the design of the station and its cooling system. It appears that the iodine source-term assumed was directly from the Applicant's environmental report, and that no independent assessment of the potential source was undertaken by the NRC. It is apparent that the actual quantities of I-131 in the sewage effluent are not known at this time. Nor has the draft statement discussed the model used to predict the iodine releases from the site, or its possible chemical form. It may be possible, by a reasonable modification of the treatment process for influent water or routing within the closed-cycle system, to minimize this release. The final EIS should discuss whatever detailed data are available and a commitment should be made to obtain the additional information necessary to define the behavior of this radioiodine within the plant cooling water system.

It would be helpful in assessing the net dosimetric impact of this design if the final statement would discuss the dose impact of the alternative use of the sewage water proposed for use as station makeup. Our understanding is that this source is currently used for agricultural irrigation and, therefore, a potential I-131 food chain pathway exists as a result of such practices. The diversion to Palo Verde Nuclear Generating Station of this contaminated water may result in a net reduction in population exposure, because of the remote location of the site. Such a reduction in population exposure may offset the estimated dose impact due to discharge of this source at the site, thus providing a net dose benefit.

The Palo Verde design will result in no discharge of radioactivity to any off-site streams. Apparently, however, the

liquid waste treatment systems in this plant will be operated in a similar fashion to other plants, with any non-recyclable liquid being discharged to an evaporation pond. (The most notable of these is the condensate demineralizer regeneration wastes, although we are also concerned about turbine building drains.) We noted in the Combustion Engineering Standard Safety Analysis Report (CESSAR), that the "System 80" type plant is estimated to discharge 19 millicuries/yr/unit of I-131 in liquid effluent. It seems that it is possible that this source may find its way into the circulating, closed-loop cooling system or evaporation pond and ultimately result in an atmospheric release. No discussion of such a potential contribution to total atmospheric I-131 was undertaken in the draft statement, and we believe this should be addressed in the final statement.

Dose Assessment

Our estimated thyroid dose equivalent rate (about 56 mrem/yr to a six month old child's thyroid assuming the milk is from the nearest goat, 2 miles north of the proposed plant) is due to the emission of radioiodine from this facility and the radioiodine in the makeup sewage water. However, this particular pathway is not presently used as a milk source for man nor has the release of radioiodine from incoming treated sewage water been verified by the Applicant. We believe it is the responsibility of the Applicant to provide sufficient background data on the radionuclides contained in the treated sewage water and to include in the environmental radiological monitoring program radiochemical analysis for radioiodine in the sewage to document this source term and its potential environmental significance.

A monitoring program to determine if any real iodine pathways are established in the future should be discussed. For example, if the goat which now is not milked for human consumption should be so utilized in the future, a pathway which produces excessive dose from iodine may then exist. The Applicant should have a program in which such potential pathway changes are periodically audited, and any such changes should be reported to the NRC.

Reactor Accidents

EPA has examined the NRC analyses of accidents and their potential risks which the NRC has developed in the course of its engineering evaluation of reactor safety in the design of nuclear plants. Since these issues are common to all nuclear plants of a

given type, EPA concurs with the NRC approach to evaluate the environmental risk for each accident class on a generic basis. The AEC has in the past and NRC continues to devote extensive efforts to assure safety through plant design and accident analyses in the licensing process on a case-by-case basis.

For the past two years, AEC sponsored an effort to examine reactor safety and the resultant environmental consequences and risks on a more quantitative basis. We have strongly encouraged this effort and continue to do so. On August 20, 1974, the AEC issued for public comment the draft Reactor Safety Study (WASH-1440), which is the culmination of the extensive effort to quantify the risks associated with light-water-cooled nuclear power plants. EPA is conducting a review of this document, including in-house and contractual efforts through May 1975, after which we will issue a final set of comments. Initial comments, issued November 27, 1974, indicated the AEC's efforts represent an innovative step forward in concept and methodology in the evaluation of risks associated with nuclear power plants. The study appears to provide an initial meaningful basis for obtaining useful assessments of accident risks.

If future NRC efforts in this area indicate unwarranted risks are being taken at the Palo Verde Nuclear Station, we are confident the NRC will assure appropriate corrective action. Similarly, if EPA efforts identify any environmentally unacceptable conditions related to reactor safety, we will make our views known. Until our review of the Reactor Safety Study is completed, we believe there is sufficient assurance that no undue risks will occur as a result of the continued planning for the Palo Verde Nuclear Station.

Transportation

EPA, in its earlier reviews of the environmental impacts of transportation of radioactive material, agreed with the AEC that many aspects of this program could best be treated on a generic basis. The NRC has codified this generic approach (40 F.R. 1005) by adding a table to their regulations (10 CFR Part 51) which summarizes the environmental impacts resulting from the transportation of radioactive materials to and from light-water reactors. This regulation permits the use of the impact values listed in the table in lieu of assessing the transportation impact for individual reactor licensing actions if certain conditions are met. Since this nuclear power plant appears to

meet these conditions and EPA has agreed that the transportation impact values in the table are reasonable, this approach appears adequate for this action..

While the impact resulting from the routine transportation of radioactive materials was chosen at that level within which the impact of 90% of the reactors currently operating or under construction fell, the basis for the impact, or risk, of transportation accidents is not as clearly defined. There are current efforts by both EPA and ERDA (the Energy Research and Development Administration) and/or NRC to more fully assess the radiological impact of transportation accidents. As the quantitative results of these analyses become available, EPA intends to conduct reviews to ascertain the acceptability of the potential transportation risks. If EPA efforts identify any environmentally unacceptable conditions related to transportation, we will make our views known. Until our reviews of the transportation accident analyses are completed, we believe there is sufficient assurance that no undue risks will occur as a result of transportation accidents for this nuclear power plant.

Fuel Cycle

The NRC's predecessor, the AEC, issued a document (WASH-1248) titled, "Environmental Survey of the Uranium Fuel Cycle" in conjunction with a regulation (10 CFR 50, Appendix D) for application in completing the cost-benefit analyses for individual light-water reactor environmental reviews (39 FR 14188). The information therein is employed in NRC draft statements to assess the incremental environmental impacts that can be attributed to fuel cycle components which support nuclear power plants. In our opinion, this approach appears adequate for plants currently under consideration, and such estimates of the incremental impacts for the Palo Verde Nuclear Plant are reasonable. However, as suggested in our comments on the proposed rulemaking (January 19, 1973), if this is to continue for future plants, it is important for the NRC to periodically review and update the information and assessment techniques used. EPA intends to monitor developments in the fuel cycle area closely and will bring to the NRC's attention any factor or concerns we believe relevant to continued improvement in assessing environmental impacts.

The concept of environmental dose commitment is a recent development which we believe should be included in the assessment of the environmental impact of the fuel cycle. The information presented in the draft statement indicates the "Maximum Effect"

in terms of annual person-rems (man-rems) within a 50-mile radius. As many of the radionuclides involved persist in the environment over extremely long periods, their impact is not adequately represented by an annual dose. Instead, we recommend that the maximum effect for fuel cycle releases be indicated by an environmental dose commitment, that is, by the projected person-rems which will be accumulated over several half-lives of the radioisotopes released annually from these facilities. (This would involve decades for very long-lived isotopes.) Also, such evaluations should be done for the total U.S. population exposure. Radionuclides of importance in this approach include Kr-85, I-129, tritium, radium, C-14, and the actinides.

High-Level Waste Management

Environmental impacts will arise as a consequence of the techniques and procedures utilized to manage high-level radioactive wastes. These impacts have some relevance to the environmental considerations regarding each nuclear power plant in that the reprocessing of spent fuel from each will make some contribution to the total waste. EPA concurs, however, with the NRC's approach of handling waste management impacts on a generic basis rather than by including a specific, in-depth analysis in each nuclear power plant's environmental statement. As part of this effort the AEC, on September 10, 1974, issued for comment a draft statement titled "The Management of Commercial High-Level and Transuranium-Contaminated Radioactive Waste" (WASH-1539).

Though a comprehensive long-range plan for managing radioactive wastes has not yet been fully demonstrated, acceptance of the continued development of commercial nuclear power is based on the belief that the technology to safely manage such wastes can be devised. EPA is available to assist the NRC and ERDA in their efforts to assure that an environmentally acceptable waste management program is developed to meet this critical need. In this regard, EPA provided extensive comments on WASH-1539 on November 21, 1974. Our major point of criticism was that the draft statement lacked a program for arriving at a satisfactory method of "ultimate" high-level waste disposal. We believe this is a problem which should be resolved in a timely manner, since the country is committing an increasingly significant portion of its resources to nuclear power and wastes from operating plants are already accumulating.

NON-RADIOLOGICAL ASPECTS

Condenser Cooling System and FWPCA Requirements

Palo Verde Nuclear Generating Station, (PVNGS) Units 1, 2, and 3, will utilize 9 wet-type, mechanical-draft cooling towers for the dissipation of waste heat from the condenser cooling system. Water for condenser cooling will be obtained from the city of Phoenix, Arizona's 91st Avenue municipal sewage treatment plant. This sewage effluent, treated to the secondary level, will be given tertiary treatment by PVNGS prior to use for condenser cooling. The heated water will be concentrated by a factor of 15 prior to blowdown with the blowdown then being conducted to evaporation ponds for final disposal. There will be no discharge from these evaporation ponds and, therefore, there will be no need for a National Pollutant Discharge Elimination System (NPDES) Section 402 permit for this aspect of the facility.

The reclamation and reuse of municipal wastewater and the closed-cycle, no-discharge cooling system are in general conformance with the overall policy direction and guidelines of the Federal Water Pollution Control Act Amendments of 1972 (FWPCA). However, there appears to be an environmental trade-off between the consumptive use of water in an arid environment and the threat to wildlife in the Salt and Gila River Basins. Both of these factors are important in the context of total water management in central Arizona. The environmental statement should present a brief discussion of water management in central Arizona over time and include: sources of water supply - surface waters, groundwaters, Central Arizona Project import waters; water demands - municipal, industrial, agricultural; and relate the PVNGS's impact on consumptive use and the greenbelts of the Salt and Gila Rivers to the larger water management context.

Bacteriological Effects

PVNGS seems to be in general compliance with EPA's Steam Electric Power Generating Point Source Category Effluent Guidelines and Standards, Federal Register, of October 8, 1974. The innovative and benefical use of municipal effluent is to be commended. However, EPA has concern about the level of pathogens contained in tower drift. Our detailed comments concerning the air quality impacts of this effect are in the next section (Air Quality). With respect to the influent water as the potential

source of this impact, it would seem appropriate for the Applicant to set up a special monitoring program to (1) make a positive estimate of enteric virus presence in the sewage effluent stream, (2) determine the success of removal and inactivation processes, and (3) establish the concentration and dispersion of pathogenic microorganisms from the cooling tower.

In the event that the data collected indicates a need for further treatment of the effluent, the Applicant should consider providing more complete tertiary treatment.

Air Quality

The estimates of offsite hourly particulate air concentrations in the draft statement indicate that primary ambient air quality standards may be exceeded if the indicated cooling tower design criterion of 0.04% drift is utilized and if the projected particles are considered "particulate matter" within the meaning of EPA's regulations (40CFR 50.6) using the reference method set forth in Appendix B of those regulations. However, data on the particle characteristics from emissions of this type, based on the application of the reference method, are not available to determine the applicability of the EPA air quality standard. We believe that by utilizing "state-of-the-art" drift eliminators, it is possible to reduce the estimated drift losses, and thus the entrained particulates (if the tower emissions are determined as such using the required reference method), to levels expected to be within the 24-hour primary ambient air standards. The final statement should provide an evaluation of the worst 24-hour average tower emission concentrations which may be expected at the critical site boundary with the plant utilizing "state-of-the-art" cooling tower design. We recommend that the NRC require the Applicant to install the most efficient "state-of-the-art" drift eliminators at the plant. We also suggest that a pre-operational monitoring program for particulates be established and continued during operation to assess the impact on particulate levels from the cooling tower facilities.

Assurances that deterioration in soil quality by particulate deposition will not be significant seem to be predicated on continued minimal land use in the area of the plant site. The large proposed housing projects mentioned in the draft statement would seem to lie within an area of potentially reduced fertility due to these emissions. The final statement should discuss the

potential impact on soil quality from drift deposits and the remedies which may be available, should the proposed residential development occur. This assessment should be made taking into account the above recommendations regarding installation of the "state-of-the-art" drift eliminators.

One of the impacts addressed in the environmental report which has not been discussed in the draft statement is the potential emission in the cooling tower plumes of enteric viruses, bacteria, and other organisms normally associated with sewage. The Applicant has presented a well-documented analysis of this problem but the NRC has not acknowledged whether an independent assessment has been made in the course of their review to verify the Applicant's conclusions. The final statement should address the potential pathogenic impact of the releases from the cooling system.

Additional information concerning the wastewater reclamation system is necessary to evaluate the air quality aspects of this portion of the facility. Either in the final impact statement or as soon thereafter as design development permits, the following information should be provided:

a. Gaseous emission stack height and internal diameter
b. Exit gas temperature and velocity
c. Sulfur content of fuel
d. Btus/hr heat input rating of the equipment
e. Relevant air pollution dispersion estimates for effects on ambient air quality
f. Statement concerning applicability and compliance with State and/or Federal new source performance standards for fuel burning sources.

Neither the draft statement nor the Applicant's environmental report provide sufficient information concerning the diesel generators or the auxiliary boilers. The final statement should specify the size of the diesel generators, the rated capacity of the auxiliary boilers (in terms of Btus/hr heat input) and sulfur content of fuel.

Noise Impacts

Our concern regarding noise impacts focuses on occupational noise hazards and traffic-related noise impacts which may occur during the construction phase of the project. In addition, to

help evaluate any offsite noise impacts of the project, during either construction or operational phases, some indication should be provided in the final statement of current and projected future land use categories and population densities in the vicinity of the project site. Comparisons may then be made between noise levels and the recommended noise levels for the land use categories indicated near the plant site. While levels indicated in Table 1 do not consititute a standard, they should be used as a benchmark or reference for describing the magnitude of any offsite noise impacts.

Construction workers and plant operating personnel should not be exposed to noise levels in excess of those specified in Table 2. The final statement should demonstrate that such noise levels will not be exceeded, and that plans exist to reduce human exposure in high noise level areas to levels below those indicated. In addition, impulse noises from equipment, such as jackhammers and pile drivers should not exceed the limits established in Figure 1. During plant operation potential noise sources will be associated with transformers, turbines, ventilating systems, and circulating water pumps. Anticipated noise emission levels from each of these sources should be included in the final statement.

Noise generated by traffic resulting from the project may be significant. With respect to this project, it appears that the only potential problem which might result would be during construction. Truck traffic generation during construction should be indicated and the potential noise problems addressed.

For your convenience, Table 3 lists basic information on sound levels associated with various types of construction equipment. Since these levels are averages, actual noise levels will vary somewhat from those indicated. In particular, noise levels will generally be higher than those in Table 3 for products within each category having a higher than average capacity. Level 1 indicates current quiet products, and Level 2 lists equipment which can be quieted by the use of best demonstrated technology.

Source: EPA Document 550/9-74-004 (March 1974) "Levels Document" — Table 4

TABLE 1

YEARLY AVERAGE* EQUIVALENT SOUND LEVELS IDENTIFIED AS REQUISITE TO PROTECT THE PUBLIC HEALTH AND WELFARE WITH AN ADEQUATE MARGIN OF SAFETY

	Measure	Indoor Activity Interference	Indoor Hearing Loss Consideration	Indoor To Protect Against Both Effects (b)	Outdoor Activity Interference	Outdoor Hearing Loss Consideration	Outdoor To Protect Against Both Effects (b)
Residential with Outside Space and Farm Residences	L_{dn}	45		45	55		55
	$L_{eq(24)}$		70			70	
Residential with No Outside Space	L_{dn}	45		45			
	$L_{eq(24)}$		70				
Commercial	$L_{eq(24)}$	(a)	70	70(c)	(a)	70	70(c)
Inside Transportation	$L_{eq(24)}$	(a)	70	(a)			
Industrial	$L_{eq(24)(d)}$	(a)	70	70(c)	(a)	70	70(c)
Hospitals	L_{dn}	45		45	55		55
	$L_{eq(24)}$		70			70	
Educational	$L_{eq(24)}$	45		45	55		55
	$L_{eq(24)(d)}$		70			70	
Recreational Areas	$L_{eq(24)}$	(a)	70	70(c)	(a)	70	70(c)
Farm Land and General Unpopulated Land	$L_{eq(24)}$				(a)	70	70(c)

Code:

a. Since different types of activities appear to be associated with different levels, identification of a maximum level for activity interference may be difficult except in those circumstances where speech communication is a critical activity. (See Figure D-2 for noise levels as a function of distance which allow satisfactory communication.)
b. Based on lowest level.
c. Based only on hearing loss.
d. An $L_{eq(8)}$ of 75 dB may be identified in these situations so long as the exposure over the remaining 16 hours per day is low enough to result in a negligible contribution to the 24-hour average, i.e., no greater than an L_{eq} of 60 dB.

Note: Explanation of identified level for hearing loss: The exposure period which results in hearing loss at the identified level is a period of 40 years.

*Refers to energy rather than arithmetic averages.

TABLE 2

NOISE EXPOSURE LEVELS, STEADY STATE

Duration (per day) in hours	EPA Max. Sound Level (dBA)
8	85
4	88
2	91
1	94
1/2	97
1/4 or less	100

Source: EPA's Recommended Occupational Noise Exposure Federal Register dated December 18, 1974

Source: BBN Report No. 2887 dated 27 November 1974, Regulation of Construction Activity Noise — Table S1

TABLE 3 BASIC INFORMATION ON CONSTRUCTION EQUIPMENT (1972).

Equipment Types	Present		Quiet Products Level 1		Best Technology Level 2		
	Sound Level (a)	Average Unit Price	Sound Level (a)	Average Unit Price	Sound Level (a)	Average Unit Price	Units Produced Per Year (b)
Air Compressor	81	$ 8,500	71	$ 9,500	65	$ 12,000	12,000
BackHoe	85	15,000	80	15,500	76	19,800	15,000
Concrete Mixer	85	25,000	83	25,400	75	27,500	7,000
Concrete Pump	82	50,000	80	50,650	75	55,000	500
Concrete Vibrator	76	2,000	70	2,060	66	2,200	6,000
Crane, Derrick	88	110,000	80	111,000	76	113,000	2,200
Crane, Mobile	83	50,000	80	51,000	76	53,000	4,300
Dozer	87	28,000	83	28,800	73	30,800	18,000
Generator	78	1,000	72	1,200	65	1,400	70,000
Grader	85	22,000	80	22,600	76	24,200	7,000
Jackhammer (P.B.)	88	800	80	850	75	950	(20,000)(c)
Loader	84	20,000	80	20,600	76	22,000	30,000
Paver	89	42,000	80	43,000	76	44,200	800
Pile Driver	101	33,000	90	33,500	80	37,000	350
Pneumatic Tool	85	300	75	320	65	400	(100,000)
Pump	76	430	71	450	65	580	50,000
Rock Drill	98	35,000	90	36,000	80	39,000	(1,000)
Roller	80	11,000	75	11,330	70	12,100	6,000
Saw	78	100	70	110	65	150	(500,000)
Scraper	88	70,000	83	71,500	78	75,000	5,000
Shovel	82	71,000	80	72,000	76	74,000	3,000
Truck	88	18,000	83	18,250	75	19,500	75,000

a. Sound level refers to average level during operation in dBA at 50 ft.

b. Estimated from Department of Commerce published data and industry sources (sales may include other industries).

c. Parenthesis enclose preliminary estimate.

Source: EPA Document 550/9-74-004 (March 1974) "Levels Document" --Figure 4

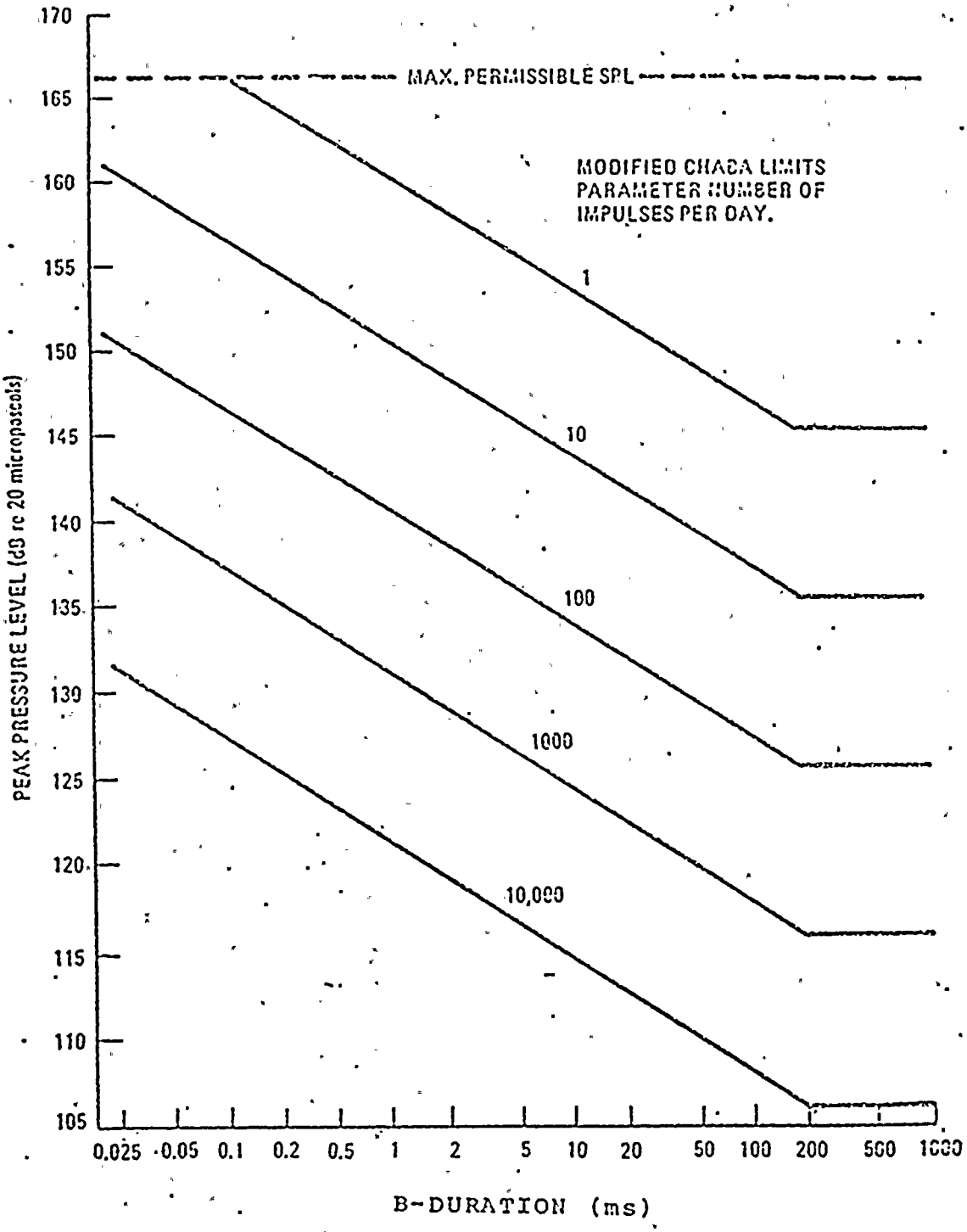

Figure 1 Set of Modified CHABA Limits for Daily Exposure to Impulse Noises Having B-Durations in the Range 25 Microseconds to 1 Second. (Parameter: number (N) of impulses per daily exposure. Criterion: NIPTS not to exceed 5 dB at 4 kHz in more than 10% of people.)

ADDITIONAL COMMENTS

1. On page 3-18 of the draft statement, the NRC staff estimates that the total volume of wet solid wastes that would be shipped offsite annually to be 4400 ft.^{3}/yr/unit. It is unclear from the previous paragraph in Section 3.5.3 as to whether that is the volume of waste that will be solidified before shipment or if this volume includes the solidification matrix.

2. The final statement should describe the method that will be used to control particulate emissions from the onsite concrete batch plant.

3. The long distance of the Palo Verde site from urban areas portends a substantial amount of vehicle miles traveled from the construction labor force. The energy use and air quality considerations may be quite significant. The Applicant should seriously consider the provision of bus transportation for the construction workers.

4. Two package plants are proposed to service the sanitary wastes during the construction phase. The final environmental statement should discuss disposition of the effluent.

5. Reference was made to erosion potential and sediment discharge to the ephemeral stream beds from construction runoff. Although the measures and controls to limit adverse construction impacts (Section 4.5) appear to be adequate, Effluent Guidelines for Steam Electric Point Sources require that limits on TSS not exceed 50 mg/l and pH be kept within a range of 6 to 9 for construction runoff which is associated with a 10 year, 24 hour rainfall event. It is suggested that containment for this runoff be made on site.