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DR. DAVID L. SCHREIBER, P.E.
President and Principal

EEC
SCHRC

September 23, 1982

Mr. Ray Gonzales
Hydraulic Engineer/HGEB
Division of Engineering/NRR
U.S. Nuclear Regulatory Commission
7920 Norfolk Avenue
Bethesda, MD 20014

Dear Ray:

Enclosed is my draft Hydrologic Engineering Summary for inclusion in the Draft Safety Evaluation Report for the Shearon Harris Nuclear Power Plant. There are several open items and unresolved issues, since we have not received any responses from the applicant to our safety questions.

I look forward to meeting in your office on Friday, October 1, 1982, to discuss the enclosure. I appreciate the opportunity to be of service to NRC.

Sincerely,

David L Schreiber

Dr. David L. Schreiber, P.E.
President & Principal

Enclosure: As stated

cc w/o encl. : M. Fliegel

DRAFT HYDROLOGIC ENGINEERING SUMMARY

SHEARON HARRIS NUCLEAR POWER PLANT

Units 1 and 2

Docket Nos. 50-400/401

DRAFT
HYDROLOGIC ENGINEERING SUMMARY
SHEARON HARRIS NUCLEAR POWER PLANT
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2.4 Hydrologic Engineering

2.4.1 Introduction

The staff has reviewed the hydrologic engineering aspects of the applicant's design, design criteria and design bases for safety-related facilities at the Shearon Harris Nuclear Plant. The acceptance criteria used as a basis for staff evaluations are set forth in Sections 2.4-1 through 2.4-14 of the Standard Review Plan (SRP), NUREG-0800. These acceptance criteria include the applicable GDC reactor site criteria (10 CFR 100), and standards for protection against radiation (10 CFR 20, Appendix B, Table II.) Guidelines for implementation of the requirements of the acceptance criteria are provided in Regulatory Guides, ANSI Standards and Branch Technical Positions identified in SRP Section 2.4-1 through 2.4-14. Conformance to the acceptance criteria provides the bases for concluding that the site and facilities meet the requirements of Parts 20, 50, and 100 of 10 CFR with respect to hydrologic engineering.

2.4.2 Hydrologic Description

The Shearon Harris Nuclear Plant is located geographically in east-central North Carolina about 16 miles southwest of Raleigh, North Carolina. The plant site is located hydrologically about 7.5 miles north of the confluence of the Cape Fear River and one of its tributaries, Buckhorn Creek, on a peninsula the applicant has created by impounding the waters of Buckhorn Creek. The dam, which was constructed on Buckhorn Creek about 2.5 miles north of its confluence with the Cape Fear River, has created a 4000-acre reservoir which will be used for cooling tower makeup requirements.

In addition to safety-related structures located on the plant island, the Main Dam, Auxiliary Dam, and their spillways are Seismic Category I structures that are reviewed from a hydrologic engineering standpoint. Plant grade, as well as the tops of the Main and Auxiliary Dams, are

all at elevation 260 feet above mean sea level (ft MSL). The reservoir behind the Main Dam will have a normal maximum pool elevation of 220 ft MSL, and the drainage area is 71.0 square miles. The reservoir behind the Auxiliary Dam will be used as the primary source for emergency cooling water, and it is located on one arm of the main reservoir adjacent to the plant. The water level in the auxiliary reservoir will be maintained at a minimum elevation of 250 ft MSL, and the drainage area behind the Auxiliary Dam is 2.43 square miles.

Buckhorn Creek at its confluence with the Cape Fear River, about 12 miles northwest of Lillington, drains a watershed area of about 79.5 square miles. The point of confluence is at Cape Fear River Mile 192. The Cape Fear River at Buckhorn Dam just upstream of its junction with Buckhorn Creek has a drainage area of 3196 square miles. The Deep and Haw Rivers join together to form the Cape Fear River about 6 miles upstream from Buckhorn Dam. The Cape Fear River discharges into the Atlantic Ocean 28 miles downstream of Wilmington, North Carolina, at Cape Fear. The estimated average flow for Buckhorn Creek over 55 years (1924-1978) is about 88 cubic feet per second (cfs). Likewise, the estimated average flow in the Cape Fear River at Buckhorn Dam over 54 years (1925-1978) is about 3119 cfs.

The Construction Permit review was performed under the assumption that the water inventory in the main reservoir would be augmented by pumping from the Cape Fear River. Although the FSAR still discusses the possibility of pumping from the Cape Fear River, it is our understanding, through discussions with the applicant, that such pumping may not be necessary. We have asked the applicant to clarify this issue and provide the necessary documentation changes. To date, such information has not been received.

There are no known surface water users of Buckhorn Creek within the reservoir area or downstream of the Main Dam. The nearest downstream potable water supply intake on the Cape Fear River is at Lillington,

about 12 miles downstream of Buckhorn Dam. Three other municipalities (Dunn, Fayetteville, and Wilmington) also withdraw water from the Cape Fear River further downstream of the plant. There are also 10 industrial water supply intakes, including the applicant's Brunswick Plant, on the Cape Fear River downstream of the Shearon Harris Plant. The nearest industrial intake is at Fayetteville.

The bedrock units of the Sanford Formation of the Newark Group (Triassic) provide the groundwater source in the site vicinity. The primary permeability of this Triassic aquifer is very low; however, fractures provide a secondary permeability. Fractures are common to a depth of about 100 feet, but below that depth they become tighter. Below about 400 feet in depth the fractures are closed and sealed to groundwater flow. Holly Springs and Fuquay-Varina are the nearest communities using groundwater for public water supply. Holly Springs, 7 miles east of the plant, has two wells supplying a total of about 40,000 gallons per day (gpd). Fuquay-Varina, 10 miles southwest of the plant, has 8 wells supplying about 400,000 gpd. None of these 10 wells draw water from the Triassic aquifer underlying the plant. Besides these 10 wells, there are 21 other public wells within 10 miles of the plant. In addition, there are a group of houses in Corinth, about 5 miles southwest, that have individual wells drawing water from the Triassic aquifer. The production rates of these wells range from 0.5 to 13 gallons per minute (gpm).

The applicant has provided hydrologic descriptions of the plant site and vicinity. We have reviewed the applicant's information in accordance with procedures in SRP (NUREG-0800) sections 2.4.1 and 2.4.2. We conclude, with the exception of the description of reservoir flow augmentation from the Cape Fear River, that the applicant's hydrologic descriptions are sufficient to meet the requirements of General Design Criteria 2.

2.4.3 <u>Flood Potential</u>

Four potential sources of site flooding were considered by the applicant:

1. flooding on Buckhorn Creek

2. intense local precipitation on the plant island
3. dam failures
4. hurricane-induced wind wave activity.

We conclude based upon our reviews of the material presented that the four above flooding sources are the only credible sources of potential flooding at the plant site.

The applicant did not consider a Probable Maximum Flood on the Cape Fear River because of the 100-ft difference in elevation between the top of the Main Dam and the riverbank. We concur with the applicant's appraisal of this issue. However, there could be backwater effects of the PMF on the Cape Fear River through Buckhorn Creek on the downstream face of the Main Dam. The applicant states that riprap slope protection has been provided, but we are awaiting details regarding design bases. Our concurrence that adequately designed riprap has been provided on the downstream face of the Main Dam will be necessary prior to issuance of the Operating License.

2.4.3.1 <u>Local Stream Flooding</u>

The PMF's were calculated by the applicant for the 2.43 square-mile drainage basin above the Auxiliary Dam and the 71.0 square-mile drainage basin above the Main Dam. The former area is a sub-basin of the latter area. The applicant calculated these PMF's in accordance with the procedures of Regulatory Guide 1.59, Revision 2, Appendix A. The peak discharge for the PMF through the Auxiliary Dam spillway is 5030 cfs, and the corresponding still-water surface elevation is 256.0 ft MSL. The peak discharge for the PMF through the Main Dam spillway is 14,190 cfs, and the corresponding still-water surface elevation is 238.9 ft MSL.

The applicant calculated the effects of coincident wind wave activities on the PMF still-water levels noted above using Corps of Engineers procedures. However, one of the references used by the applicant is outdated. We have asked the applicant to reevaluate the analyses

of wind setup and wave runup using the current reference. We are awaiting details of this reanalysis to determine whether or not there will be any significant changes on wave runup on the Auxiliary Dam, Main Dam, and plant island.

At the CP stage, we reviewed the applicant's PMF analyses and the effects of coincident wind-wave activities. We concurred then with the applicant's analyses and concluded that the two safety-related dams and the plant island will not be flooded during a PMF on the Buckhorn Creek drainage. We have reviewed the FSAR material presented by the applicant in accordance with the procedures described in SRP Sections 2.4.2 and 2.4.3. We have found no new information, with the possible exception of the above-noted backwater effects on the downstream face of the Main Dam and the pending reanalysis of wind-wave runup, that would lead us to change our earlier conclusions. We therefore conclude, subject to concurrence with the two above-noted exceptions, that the plant meets the requirements of GDC 2 with respect to flooding from the Buckhorn Creek drainage.

2.4.3.2 Flooding by Intense Local Precipitation

Safety-related structures, systems, and components are protected from the effects of the local Probable Maximum Precipitation (PMP) by grading the plant yard away from all such facilities and by providing a site drainage system that includes inlet structures and underground reinforced concrete pipe. Open ditches and underground reinforced concrete pipe are used along the peripheral areas of the plant island. The concrete pipe drain most of the site to the Main Reservoir but a small portion of the runoff is drained to the Auxiliary Reservoir via the Emergency Service Water Intake and Discharge Channels. Even in the event of complete blockage of the storm drainage system at the time of the PMP, the plant island is capable of being drained by overland flow on the open roads and ground surface directly to the Main Reservoir or the Emergency Service Water Intake and Discharge Channels. The site drainage system is designed for a storm intensity of 5 inches per hour.

During a local PMP, the maximum accumulation of water on the plant island is 9.68 inches. All Seismic Category I structures and safety-related systems are protected to at least elevation 261 ft MSL. Since plant grade elevation is 260 ft MSL, the safety-related structures and systems are protected from flooding from intense local precipitation.

The applicant did not discuss the effects of local intense precipitation on the roofs of safety-related buildings. We have asked the applicant to provide an analysis of the potential for ponding of water on safety-related building roofs during a local PMP, the resulting roof loads, and whether the roofs are designed to accept these loads. We are awaiting details of this analysis. Our concurrence that the roofs of safety-related buildings have been designed and constructed to handle the effects of the local PMP will be necessary prior to issuance of the Operating License.

Using the procedures described in SRP Section 2.4.2, we have reviewed the applicant's methods of runoff analysis for site and roof drainage during the local PMP. We concur that conservative procedures have been used and that the site drainage systems will function as they are intended. However, we must review and concur in the design of the roof drainage systems before we can conclude that the plant meets the requirements of GDC 2 with respect to flooding by intense local precipitation.

2.4.3.3 Potential Dam Failure Flooding

There are no existing dams or water control structures in the Buckhorn Creek drainage basin other than the Main Dam, Auxiliary Separating Dike, Auxiliary Dam, and the Makeup Water System Dikes that have been constructed specifically for the Shearon Harris Plant.

The applicant analyzed the effect of the Auxiliary Dam failing on the Main Dam, even though both dams are Seismic Category I. It was conservatively assumed that the Auxiliary Dam fails instantaneously and that the wave height and velocity travels downstream through Tom

Jack Creek into the Main Reservoir without any attenuation. The water in the Main Reservoir would only rise about 1.5 feet, and no significant wave action would result.

Using the procedures described in SRP Section 2.4.4, we have reviewed the applicant's methods of analyzing the flooding effects of potential dam failures. We concur that conservative procedures have been used and that potential dam failures pose no threats to safety-related structures or systems. We conclude that the plant meets the requirements of GDC 2, 10 CFR Part 100 and 10 CFR Part 100, Appendix A with respect to flooding by potential dam failures.

2.4.3.4 Hurricane-Induced Flooding

The Probable Maximum Hurricane (PMH) could cause water level changes in both the Auxiliary and Main Reservoirs. However, since the plant is not located right on or near the coast, the only dynamic mechanism that can credibly be considered for producing high water levels is the probable maximum wind associated with a PMH. The maximum wave runup was estimated by the applicant using a 133-mph wind speed on normal water levels in the two reservoirs.

Because there is a 40-ft difference in elevation between the top of the Main Dam and the normal water level in the reservoir, wave action on the Main Dam during a PMH was not considered. On the Auxiliary Reservoir, the 133-mph wind speed results in a maximum water elevation that is 4.4 ft below the top of the Auxiliary Dam and 5.6 ft below plant grade. Since these water surface elevations are less than those that would be achieved in a PMF on the Buckhorn Creek drainage, the PMH does not cause the Design Basis Flood (DBF) levels.

We have used the procedures described in SRP Section 2.4.5 to review the applicant's methods of analyzing surge and seiche flooding effects of a PMH. We conclude that the plant design meets the requirements of GDC 2 and 10 CFR Part 100 with respect to surge and seiche flooding.

The basis for this conclusion is that maximum water levels resulting from a PMH are less than the DBF levels for the plant.

2.4.4 Cooling Water Supply

Under normal operating conditions, the plant will be cooled using natural draft cooling towers. Makeup water will be supplied to the cooling towers from the main reservoir and blowdown returned to the main reservoir. Losses from the cooling towers and the two reservoirs are to be made up from local natural runoff in the Buckhorn Creek drainage and possibly diversion of some water from the Cape Fear River. The use of the latter source has not yet been clarified by the applicant, as noted above in Section 2.4.2.

The primary standby source of emergency cooling waters in the event the non-safety related cooling towers with makeup from the main reservoir are unavailable, is the auxiliary reservoir, which is located on one arm of the main reservoir adjacent to the plant. Normal water level in the auxiliary reservoir will be 252 ft MSL, and the minimum water surface elevation will be 250 ft MSL. Water from the auxiliary reservoir passes through the Emergency Service Water Intake Channel to the dual Intake Structure that provides either emergency service water or cooling tower makeup water. The main reservoir will be the back-up source of water in an emergency. Water from the main reservoir passes through the Cooling Tower Makeup Water Intake Channel to the Intake Structure. Emergency service water obtained from either reservoir is discharged from the Emergency Service Water Discharge Structure into the Auxiliary Reservoir.

Because plant site drainage, including overland runoff, flows into the intake and discharge canals of the essential service water system, there is a potential for sediment to build up in the canals and auxiliary reservoir during operation, especially while heavy construction is still in progress. We have asked the applicant to describe the program for monitoring sediment buildup in the ESWS canals and the auxiliary

reservoir. This information is forthcoming, but we have not yet received it. Our concurrence with the need for and the design of a sediment monitoring program will be necessary prior to the issuance of an Operating License.

We have also asked the applicant to provide information on the inspection program that will be established for safety related water control structures, such as the dams, canals, and intake and discharge structures. Our concurrence with this inspection program will also be necessary prior to issuance of an Operating License.

Because of the uncertainty over whether or not pumping from the Cape Fear River will be used to augment the water in the two reservoirs, several unanswered questions remain. Of utmost importance is that the applicant update the information provided in FSAR Section 2.4.11. The information as presented is applicable to four-unit operation, which is the mode of operation for which the CP was granted. The applicant now is requesting an OL for two units only. If flow augmentation from the Cape Fear River is not used, then an analysis of the worst drought on record for Buckhorn Creek, February 1951 through January 1952, must be conducted by the applicant and provided to the Staff for review.

During the CP review, we requested the applicant provide assurance that ice formation could not preclude the use of the safety-related water supply during severe winter conditions. We concluded at that point that circulation of heated water in the auxiliary reservoir during severe winter conditions may be necessary to assure the water supply. The applicant agreed to provide the details of such a plan in the FSAR. Briefly, this plan consists of starting the emergency service water pumps whenever the auxiliary reservoir water temperature drops below 35° F. The heated water from pump operation will be discharged into the Emergency Service Water Discharge Channel. The formation of ice in the Emergency Service Water Intake Channel will be prevented by the water flowing to the pumps. Furthermore, the

suction inlets for all pumps are located more than 10 ft below the low water level. Heated hoods will prevent ice buildup on the traveling screens, which will be run continuously if potential icing conditions are prevalent. We have reviewed this plan and concur that its implementation will protect safety-related equipment during periods of extremely cold weather.

Until we receive and review the applicant's analysis of the need for flow augmentation from the Cape Fear River for two-unit operation, we cannot conclude that the plant design is acceptable and meets the requirements of GDC 2 with respect to low lake levels and cooling water supply. nor can we conclude that it meets the requirements of GDC 44 with respect to thermal aspects of the heat transfer systems.

2.4.5 Ground Water

The overburden in the plant area consists of up to about 15 ft of dense, low permeability, clayey soils and saprolite. Below the overburden are the bedrock units of the Sanford Formation of the Newark Group (Triassic), which are the sources of ground water in the site vicinity. The Triassic rocks consist of claystone, shale, siltstone, conglomerate, and fanglomerate. Thin diabase dikes are found intruded in the Triassic rocks. Even though the primary permeability of the Triassic rocks is very low, secondary permiability is provided by fractures which are filled with water below the water table. These fractures are common to about 100 ft in depth, becoming less prevalent below that. The fractures are closed and sealed to waterflow below about 400 ft in depth.

Recharge to the Triassic rock aquifer by percolation of water from the surface is slow and controlled by the location of joints and fractures. The larger reserves of ground water are found near the diabase dikes. In the plant site vicinity, ground-water supplies have been developed near several small dikes for plant construction use. The applicant has installed a total of 15 small capacity wells, which yield a total withdrawal of about 450 gpm. The applicant does not intend to use ground

water for plant operation. Ground water use will cease after the plant potable water system becomes operational.

The general ground water movement in the plant area prior to plant construction was to the southeast. Because of pumping during construction, water levels have been changed significantly, but the general direction of movement is still towards the southeast. The ground-water table gradient varies considerably at the site, but the maximum gradient is about 0.06 ft/ft.

During the CP review, we concluded that the design basis ground-water level of 251 ft MSL was conservative and acceptable and that the auxiliary reservoir water surface elevation of 252 ft MSL will not affect ground-water levels at the plant. Our present review of the FSAR materials, which includes additional ground-water level measurements, reveals no information that would lead us to change our previous conclusions. Furthermore, there is no permanent dewatering system at this plant.

Details regarding the number of existing ground-water users were provided in Section 2.4.2. Because of low population density in the plant vicinity and low well yields, the number of future ground-water users is not expected to increase significantly. The low yields are a result of low permeability and limited storage capacity in the proximity of diabase dikes.

The applicant states that, for ground-water monitoring purposes during construction, two pre-construction piezometers and 16 piezometers installed late in 1979 were available at the plant site. Water level measurements and water quality samples have been obtained from these 18 piezometers. Since it is not clear the applicant intends to continue monitoring these piezometers during operation, we have asked that the piezometers to be retained for an operational ground-water monitoring program be identified. We also requested descriptions of data, measurement methods, processing methods, and data analysis. Our review and concurrence of the operational ground-water monitoring program will be necessary prior to issuance of an Operating License.

The applicant has provided descriptions of regional and local ground-water aquifers, regional and local ground-water use, and construction monitoring programs. We have reviewed the applicant's information in accordance with the procedures in SRP Section 2.4.12. We conclude, with the exception of the description of the operational ground-water monitoring program, that the applicant's descriptions and analyses are sufficient to meet the requirements of 10 CFR Part 100, its Appendix A, and General Design Criteria 2 and 4.

2.4.6 Accidental Releases of Liquid Effluents

The accidental release of radioactive liquid to the ground from holding tanks within the plant was not evaluated in the CP review with the detail indicated in SRP 2.4.13. Therefore, we have made independent calculations of the transport capabilities and potential contamination pathways of the ground-water environment under assumed accidental conditions.

The waste evaporator concentrate tank, which is the tank with the highest potential concentration of release and is located in the Waste Processing Building, is postulated to fail, spilling its contents on the floor. The 4,000 gallons contained in the tank are then assumed to instantaneously and non-mechanistically leak through the building floor and/or walls into the surrounding ground water where they are dispersed and transported downgradient south-southeast about 3000 ft to the Thomas Creek arm of the main reservoir. There are no water supply wells along this route, nor are there apt to be in the future. This is still on-site, and the applicant has committed to using no ground water after construction is completed.

Because of the fractured nature of the Triassic Rock Formation, it was conservatively assumed that the accidental release would move the entire 3000 ft to the reservoir through a fracture. Based upon the applicant's field test data, the materials comprising the fractures are 50 times more permeable than the Triassic Rock itself. We concur

(based on our review of pertinent literature) in the applicant's values for permeability (based on field tests) and ground-water gradient. The latter is based on field measurements made prior to construction. We believe the preconstruction ground-water table configuration will also be representative during operation after the applicant ceases pumping from the construction water supply wells. However, we do not concur in the applicant's assumed value of porosity for the fracture materials. Using a conservative value for porosity (obtained from the literature for similar materials) and the applicant's values of permeability and gradient, we obtain a ground-water travel time along the 3000 ft pathway of 5.1 years. This value does not account for dispersion, sorption, or radioactive decay.

Accounting just for the hold-up time resulting from sorption on the fracture media results in the calculated concentrations of all released radionuclides, except ^{3}H and ^{90}Sr, being well below the maximum permissible concentrations (MPC) listed in 10 CFR Part 20, Appendix B, Table 2, Column 2, at the point of entry into the main reservoir. Since ^{3}H does not sorb onto the fracture material, its travel time is the same as for ground water, 5.1 years. The travel time for ^{90}Sr, accounting for sorption, is about 250 years to move the 3000 feet to the reservoir.

Since two radionuclides did not meet MPC by accounting for sorption hold-up alone, convective dispersion in the ground water was next considered. Assuming uniform, one-dimensional flow, an instantaneous point source release, and concentrations along the contaminant plume-centerline (conservative), results in a reduction in contaminant concentration by a factor of 1.9×10^{6} at the reservoir shoreline. Note that this reduction in concentration is a result of dispersion only -- the effects of sorption and radioactive decay are not included. If sorption and radioactive decay are factored into the concentration reduction analysis along with dispersion, the concentration at the shoreline of the reservoir of ^{3}H is reduced by a

factor of 2.5×10^6, while the concentration of ^{90}Sr is reduced by a factor of 7.5×10^8.

The values noted above for reductions in concentrations are extremely conservative. No allowance was made for the fact that the Waste Evaporator Concentrate Tank is located at elevation 211 ft MSL in the Waste Processing Building. This is almost 50 ft below plant grade, and it is more than 40 ft below the preconstruction ground-water level. As stated above we believe elevation 251 MSL will be representative of the ground-water level at this location during operation. Thus, a more realistic accident scenario would allow groundwater to seep into the Waste Processing Building through postulated cracks in the floor and/or walls and mix (and dilute) with the contents of the ruptured tank before the effluents diffuse out of the postulated cracks in the building into the surrounding ground water. The mixing inside the building would provide considerable dilution (several orders of magintude) before any contaminants could enter the ground water outside the building. Thus, the concentrations of all released radionuclides would be well below the MPC levels required by 10 CFR Part 20, Appendix B, Table 2, prior to entering the main reservoir. There would be considerable further dilution in the main reservoir and in the Cape Fear River prior to any contaminant reaching the nearest surface water supply at Lillington, 12 miles downstream of Buckhorn Dam.

We therefore conclude, based on the guidance of SRP Sections 2.4.12 and 2.4.13, that the plant meets the requirements of 10 CFR Parts 20 and 100 with respect to potential accident releases of liquid radioactive effluents.

2.4.7 Technical Specifications and Emergency Operation Requirements

The applicant did not include a section in the FSAR on this subject. The purpose of this section is to identify the technical specifications and emergency procedures required to implement flood protection for safety-related facilities and to assure an adequate water supply for

emergency shutdown and cooldown purposes. Until the applicant responds to and we have reviewed and concurred with all of the unresolved issues and open items noted in preceding sections on flooding and water supply, we cannot conclude following the guidelines of SRP 2.4.14, that the plant meets the requirements of 10 CFR 50, paragraph 50.36. Furthermore, the applicant has not addressed the hydrologic engineering safety-related aspects of constructing Unit 2 while Unit 1 is in operation. This response may also have a bearing on ultimate technical specifications and emergency operating procedures.

2.4.8 Conclusions

Based upon our independent review and analysis as described above, we cannot conclude that adequate flood design bases have been proposed and implemented by the applicant. Because of the large number of open items and unresolved issues, we cannot conclude that the plant meets the requirements of GDC 2 with respect to flooding. Likewise, we cannot conclude that the hydrologic design bases for the Ultimate Heat Sink have been implemented properly, nor can we state that they are in accordance with the provisions of Regulatory Guide 1.27 and meet the requirements of GDC 44. We can conclude, however, that plant operation will not adversely affect regional ground-water supplies, nor will ground water adversely affect the plant. Technical specifications and emergency operating procedures may or may not be required depending upon the resolution of the open items and unresolved issues noted earlier in this section.