PMSTPCOL PEmails

From: Paul Kallan
Sent: Monday, June 02, 2008 10:53 AM
To: Stephen Williams
Subject: RAIS
Attachments: STP RAIs 051908-d.doc

Hi Stephen,

Here are the RAIs we sent to the applicant.

regards,

Paul Kallan, Project Manager
Office of New Reactors
Division of Site and Environmental Reviews
Environmental Projects Branch 1
Tel: (301) 415-2809

Tracking:

Recipient	Read
Stephen Williams	Read: 6/2/2008 11:14 AM

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From: Paul Kallan

Created By: Paul.Kallan@nrc.gov

Recipients:
"Stephen Williams" <Stephen.Williams@nrc.gov>
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Requests for Additional Information (RAIs)
South Texas Project Units 3&4
Combined Operating License Application

Hydrology/Alternative Plant Systems

RAI Number	Question Summary (RAI)	Full Text (supporting information)
2.2 – 1 10 CFR 51.71(d)	Provide a more complete description of mineral and petroleum resources in Matagorda County adjacent to the proposed facilities. The presence of petroleum wells in the vicinity of the site makes it necessary to explain why there are no mineral or petroleum "resources adjacent to or within the site boundary presently being exploited or of known commercial value." Provide a more complete statement on the control of mineral rights, and, hence, the control of future drilling at the STP site.	The statement on mineral and petroleum resources at the site needs to address the potential presence of resources in the vicinity of the site (ESRP 2.2.1 "vicinity" = 6-mile band). Include references (e.g., USGS or State of Texas reports) detailing the mineral and petroleum resources in the county or region. This information is needed to more fully support the statement made in the application that no mineral or petroleum (oil, gas) resources adjacent to or within the site are of known commercial value (ER section 2.2.1.1). Why exactly would petroleum wells be of commercial value so close to the property, (i.e., between Bay City and the site) but not adjacent to or within the property? Is there a geologic structure that precludes the presence of mineral or petroleum reserves within the site? Who else owns the mineral rights for the STP site and what percentage do they own? Does STP control all potential drilling on the property or do the other owners also have control over drilling within the site boundary?
2.3 – 1 10 CFR 51.71(d)	Provide USACE documentation regarding the status of the MCR as waters of the US.	Provide U.S. Army Corps of Engineers documentation that the Main Cooling Reservoir (MCR) is determined to not be "waters of the United States." Describe the status of the MCR as "navigable waters of the United States" in light of the above determination.
2.3 – 2 10 CFR 51.71(d)	Describe the existing storm water treatment and outfalls, and the water bodies into which they discharge.	Describe existing storm water outfalls including any storm water treatment associated with each. Also, describe the water bodies these outfalls discharge into.
2.3 – 3 10 CFR 51.71(d)	Provide information regarding water rights under severe droughts.	Explain how water rights for MCR makeup may be affected by a drought more severe than the drought of record.

RAI Number	Question Summary (RAI)	Full Text (supporting information)
2.3 – 4 10 CFR 51.71(d)	Provide water use requirements downstream of the STP intake.	Describe the water use requirements in Segment 1401 of the Colorado River downstream of the Reservoir Makeup Pumping Facility (RMPF).
2.3 – 5 10 CFR 51.71(d)	Provide the location and other pertinent data for the salinity wedge in the Colorado River during various discharges.	Provide pertinent data and information on the location of the salinity interface opposite the intakes in the Colorado River, and its position during different river flow conditions.
2.3 – 6 10 CFR 51.71(d)	Provide details of MCR operation during existing two–unit and future four–unit operation to help staff independently estimate water–use and water–quality impacts.	Provide details of operating policy for the MCR including details of water withdrawal conditions and limits defined by the Lower Colorado River Authority (LCRA) permit. Provide details on differences in the operating policy of the MCR for operation with all four units compared to the existing operation with two existing units. When was the maximum operating water level in the MCR increased from 45 to 47 ft mean sea level (MSL)? Why was this necessary? Discuss the impact of an increase in maximum water level of the MCR from 47 to 49 ft MSL on natural and forced evaporation and on seepage losses from the MCR. Why is a discharge of 1200 cfs in the Colorado River near the RMPF considered the threshold for “high flow?” How is the discharge in the Colorado River near the RMPF monitored? Provide water budget and water quality models of the MCR for two–unit and for four–unit operation taking into account the water withdrawal policy, LCRA permit limits, discharges into the MCR, seepage losses from the MCR, and blowdown from the MCR. Provide details of frequencies of operation of the RMPF for existing two–unit operation and for future four–unit operation.

RAI Number	Question Summary (RAI)	Full Text (supporting information)
		Provide details of existing water use for Units 1 and 2 as well as estimated water use for all four units, including (1) maximum annual makeup from Colorado River, (2) maximum monthly makeup from the Colorado River for each month, (3) maximum annual consumptive use, and (4) maximum monthly consumptive use for each month. Provide an explanation as to why there has been no release of water to the Colorado River from operation of Units 1 and 2. Describe the assessment performed or provide the analysis to support the conclusion that the impact on water quality in the Colorado River from the operation of the MCR blowdown would be SMALL. Include the description of chemical and thermal impacts. Describe the impact of a prolonged drought on water quality in the MCR and how this may affect the water quality impact on the Colorado River during a subsequent blowdown.
2.3 – 7 10 CFR 51.71(d)	Provide details of the process followed in the selection of the site hydrogeologic conceptual model.	Provide a statement of the process followed to develop the site hydrogeologic conceptual model so staff can better understand alternate conceptual models that had been considered, those rejected, and those adopted. The site hydrogeologic conceptual model provides the contextual background to explain (a) drawdown at offsite wells, (b) potential impacts to wetlands, (c) potential alteration of groundwater gradients, (d) changes in water quality, (e) the relationship between the MCR and surrounding relief, observation, and production wells, and (f) the estimate of the sustainable, safe yield, or available groundwater resource. The process to be followed, and the representation that it was followed, should be evident on the record for the staff to rely upon it.

RAI Number	Question Summary (RAI)	Full Text (supporting information)
2.3 – 8 10 CFR 51.71(d)	Provide groundwater observations for a sufficiently long period to reveal seasonal trends. If available, also provide long-term trend data on groundwater in the vicinity of the proposed facility.	Section 2.3.1.2.3.2 of the ER states "Monthly water level measurements from these groundwater observation wells began in December 2006 and will be continued through December 2007." The application does not include groundwater observations for this complete period. Provide the complete period of observation data to reveal seasonal trends and an assessment that it is representative of long-term conditions. If available in the STP site records, provide the long-term historical data to reveal the long-term trend for wells within the STP site boundary, especially any near or adjacent to the proposed facilities.

RAI Number	Question Summary (RAI)	Full Text (supporting information)
2.3 – 9 10 CFR 51.71(d)	Provide construction details, purpose, and function of relief wells surrounding the MCR.	(a) Provide construction details of the MCR relief wells, (i.e., screened interval and depth) and describe the purpose of the relief wells. If the MCR relief wells are designed and function to maintain the structural integrity of the dike surrounding the MCR, then state that purpose and describe briefly how it is achieved. If the MCR relief wells are designed to isolate the MCR hydraulically from the Upper Shallow Aquifer, then state that purpose and describe briefly how it is achieved. (b) If the MCR relief wells discharge waters that originate from the MCR, then so state. If the MCR relief wells penetrate the Upper Shallow Aquifer, and some of the discharge/recharge is from/to that aquifer, so state and provide an estimate of the quantities and qualities of each flow component. (c) Is the influence of MCR relief wells apparent in the potentiometric plots that appear in the application, or is their influence local to the dike that surrounds the MCR and not seen in potentiometric plots of the Upper Shallow Aquifer? Responses to these questions about the MCR relief wells will clarify the purpose and function of these wells, and the route that a release from the MCR may take as it returns to waters that surround the site.

RAI Number	Question Summary (RAI)	Full Text (supporting information)
2.3 – 10 10 CFR 51.71(d)	Address inconsistency in ER text with respect to hydraulic conductivities presented in Figure 2.3.1–32.	Section 2.3.1.2.3.6 of the ER states: "Figure 2.3.1–32 included the grain size derived hydraulic conductivity with aquifer pumping test and slug test derived hydraulic conductivity. Comparison of the boxplots suggests that, although the grain size derived hydraulic conductivity is in the range of regional hydraulic conductivity, it is above the STP aquifer test ranges. Comparison of geometric means indicates the grain size derived hydraulic conductivity is within the range of the STP aquifer test results." Reconcile the last two sentences with the data and boxplots presented in Figure 2.3.1–32.

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2.3 – 11 10 CFR 51.71(d)	Address the inconsistency between the 1985 forecast of a decline in groundwater use in Matagorda County against currently available county data on groundwater use. Provide a projection of future groundwater use in Section 2.3.2.2, and provide a breakdown of water demand, described in Table 2.3.2-6, between that to be provided by surface water and groundwater resources.	(1) Provide a summary discussion of the underlying rationale for the substantial decline in groundwater consumption in Matagorda County (~50%) by 2030 forecasted by the State of Texas in 1985 (e.g., movement from groundwater to surface water sources because of salt or brackish water intrusion, an observed and marked decline in groundwater quality). Has salt or brackish water intrusion been observed, evaluated, or forecasted for the Chicot aquifer? Since the 1985 forecast, how has groundwater resource utilization changed? Has the forecast become reality? Based on the NRC's initial independent evaluation, in discussions with the Coastal Plain Groundwater Conservation District (CPGWCD) during the ER Site Audit in February 2008, the 1985 forecast does not appear to have materialized and that portraying groundwater usage in Matagorda County in this light may not be current despite the availability of a State authored reference. Provide a discussion to reconcile these views. (2) Provide a projection of future groundwater use in Section 2.3.2.2 that could affect or be affected by the construction or operation of the proposed project. The current discussion is limited to current or present–day usage. Table 2.3.2–6 provides the water demand for the Lower Colorado River Region; however, it appears to represent the combined surface water and groundwater demand. If the table reflects the combined demand, then provide a breakdown of the water demand described in Table 2.3.2–6 between surface water and groundwater resources.
2.3 – 12 10 CFR 51.71(d)	Provide an analysis of the sustainable groundwater resource.	ER Section 2.3.1.2.4.3, states "Water demand could be met by increasing the yield of the existing wells or installing new wells with the objective that total STP use would not exceed the 3000 acre–ft per year permitted amount. A detailed

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		evaluation of groundwater availability and estimates of aquifer drawdown, water conservation measures, and identification of alternative sources, if practicable, will be addressed as part of the detailed engineering for STP 3 & 4." Similar statements appear in other sections. NRC independent analysis and evaluation of the groundwater resource include its availability for the plant and the plant's impact upon it. The analysis addresses the potential impact of the current 3000 acre–feet per year permitted amount. An analysis is needed of the sustainable groundwater resource (e.g., safe yield) available from plant's groundwater source, the Deep Aquifer portion of the Chicot aquifer. The groundwater impacts analysis cannot be deferred until completion of detailed engineering. The concept of the sustainable groundwater resource (e.g., safe yield or available groundwater resource) should be described in Section 2.3.1; once included, it could then be used (1) in Section 2.3.2.2 Groundwater Use to quantitatively describe the groundwater resource available to STP today and in the future, (2) in Section 2.3.2.2.1 Onsite Use to describe the available groundwater resource, (3) in Section 4.2.2 Water Use Impacts to quantitatively describe the STP groundwater use during construction in light of the sustainable or available groundwater resource in the region, (4) in Section 5.2.2 Water Use Impacts to quantitatively describe the STP groundwater use during operation in light of the sustainable or available groundwater resource in the region, and (5) in Section 10.5S.1.2, Hydrology and Water Use, to quantitatively describe the proposed STP usage compared to the sustainable or available groundwater resource to assess the cumulative impacts to the groundwater resource.

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2.3 – 13 10 CFR 51.71(d)	Provide a clarification on the role of production wells related to groundwater pathway and impact on the deep aquifer.	Midway through the last paragraph of Section 2.3.1.2.5.1 the ER states, "Potentiometric surface maps for the Deep Aquifer indicate that groundwater flow beneath the site is moving toward the site production wells, thus precluding the potential for offsite migration in the unlikely event that effluent passes through the clay layer. These factors suggest that there is no credible offsite release pathway for the Deep Aquifer." Provide the technical basis for the latter statement because it introduces consistency issues between the site safety and environmental reviews, for example, (1) questions on the operational protocols for each of the production wells (e.g., for how long can they be offline, what rates do they pump when online), (2) the question that if they are instrumental to protection of the surrounding Deep Aquifer resource (and if so, are they safety related facilities if an accident occurs?), and (3) issues with regard to groundwater pathway that should be addressed in the SSAR.
2.3 – 14 10 CFR 51.71(d)	Provide a description of the STP groundwater monitoring program.	The ER states in Subsection 2.3.1.2.6 (2nd paragraph) "As part of detailed engineering for STP 3 & 4, the current STP groundwater monitoring programs will be evaluated with respect to the addition of STP 3 & 4 to determine if any modification to the existing program is required to adequately monitor plant effects on the groundwater." Provide a description of the anticipated STP groundwater monitoring program changes that may be considered and rationale that would be used to make the determination to incorporate Units 3 and 4 effects. If a finalized plan is not available, then provide statements of the purpose and objective, as well as, an explanation of how they will be met.

RAI Number	Question Summary (RAI)	Full Text (supporting information)
2.3 – 15 10 CFR 51.71(d)	Provide definitive information regarding known or assumed tritium sources.	Regarding the field observations of tritium in the REMP wells in 2005 and 2006, identify whether there are known or assumed tritium sources or both. If the MCR is the source, then provide the rationale for is occurrence (e.g., MCR water has infiltrated into the shallow aquifer through windows in the clay sequences underlying the MCR, or it related to relief well operation). If it is from other operational releases or from offsite, then provide the bases.
2.6 – 1 10 CFR 51.71(d)	Provide a summary of past and expected surface settlements and how future settlements may impact surface water drainages, a description of various dewatering options, and relative settlements expected for each dewatering option.	Section 2.6.1.1 of the ER states "Surface settlement (as a result of facility construction) could temporarily affect surface water drainage. … This is supported by experience with STP 1 & 2 and ..." The ER further states "…the potential for minimal settlement is possible, but the expected magnitude of settlement is considered manageable…" Provide (1) a summary of the relevant experience with STP 1 and 2, (2) an estimate of the settlement possible and expected, (3) a description of the influence on surface water drainage (e.g., the ditch conducting relief well discharges), and (4) a description of the relationship between settlement and options being considered for dewatering the site (e.g., will some minimize and others maximize the potential for settlement and approximately how much).
4.2 – 1 10 CFR 51.71(d)	Describe water resources that may be impacted along the transmission line.	Describe water resources that may be impacted along the transmission line due to required modifications to the transmission line.

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4.2 – 2 10 CFR 51.71(d)	Describe construction–related water quality impacts to hydrologic features.	Describe construction–related impacts to hydrologic features on or near the site, including any drainage pattern changes due to placement structures and drainage ditches for Units 3 and 4. Provide a map showing the location of these hydrologic features on the site. Describe construction–related water quality impacts to the unnamed onsite drainage, Texas Prairie Wetland, Little Robbins Slough, and Kelly Lake.
4.2 – 3 10 CFR 51.71(d)	Provide information regarding the Erosion and Sediment Control Plan and Storm Water Management Plan.	Provide the STP 3 & 4 Erosion and Sediment Control and Storm Water Management Plans. If finalized plans are not available, provide statements regarding the objectives of each plan and an explanation of how the objectives will be met. Provide the projected date the final plans will be available.
4.2 – 4 10 CFR 51.71(d)	Describe the impacts of new pump installation activities.	Describe the impacts, including water quality impacts, of new pump installation activity on the RMPF, the intake area, and the Colorado River.
4.2 – 5 10 CFR 51.71(d)	Provide information regarding the locations of drainage ditches and retention ponds.	Provide information regarding the locations of drainage ditches and retention ponds. If the information is not currently available, then when, prior to the completion of the NRC staff's review, will the locations of drainage ditches and retention ponds be determined?
4.2 – 6 10 CFR 51.71(d)	Describe the analytical process used to determine impacts to surface water hydrology would be SMALL.	Provide a description of the analytical process and bases used to conclude that the impact of construction on surface water hydrology would be SMALL.
4.2 – 7 10 CFR 51.71(d)	Provide a list and description of pre–construction activities mentioned in ER Section 1.1.2.7.	Provide a list and description of pre–construction activities mentioned in ER Section 1.1.2.7.

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4.2 – 8 10 CFR 51.71(d)	Provide a map or drawing showing the extent of the excavations, and how close they will come to STP 1 & 2, the MCR, and wetlands. Describe the dewatering and excavation process.	The excavation for each unit (900'x950') and for each ultimate heat sink (650'x550') are provided; however, whether these areas overlap and could create a larger excavation is not discussed. Provide a map or drawing showing the extent of the excavations, and how close in proximity they will be to STP 1 & 2, the MCR, and wetlands. Describe the dewatering and excavation process and duration, or the options that STP is evaluating [e.g., will an initial dewatering depth involve an area encompassing the footprint of both reactors and continue for an extended period of time, (i.e., 4 years or longer); would the deepest dewatering efforts be local to the reactor facilities and short term, (i.e., 1 year)]
4.2 – 9 10 CFR 51.71(d)	Why is the lower value of subsidence estimates used?	A range of subsidence estimates are provided in Table 4.2–1, however, the discussion thereafter focuses on the lower and not the highest value; provide the rationale for using the lower, rather than the bounding value. Could the upper estimate of subsidence be tolerated by the MCR, or would mitigation measures be required? What level of subsidence would indicate that an alternate approach to dewatering (e.g., perhaps involving cutoff walls, injection wells, infiltration trenches) is needed? If a decision has not been made regarding the dewatering method to be employed, then describe the alternatives being evaluated (e.g., discharge to MCR, use of discharge to mitigate wetland impacts, onsite drainage ditches, injection wells) and the potential impacts of each. Describe how dewatering is related to the Storm Water Pollution Prevention Plan that is being developed, (i.e., where will the dewatering product be discharged?). Discuss subsidence (i.e., its cause, the magnitude of its impact, etc.) as it relates to environmental impacts (e.g., the storm water management plan, where MCR relief well discharge will be routed).

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4.2 – 10 10 CFR 51.71(d)	Demonstrate the lack of connectivity between dewatering wells and the wetlands and shallow surface water features.	Section 4.2.1.2 of the ER states, "The presence of the surficial clays would also isolate wetlands and shallow surface water (natural and man–made drainage) features in the vicinity of STP 3 & 4 from the underlying subsurface soil units being dewatered during construction." Are there long–term pumping data sets available from the construction of STP 1 & 2 that demonstrate the lack of connectivity between dewatering wells and the wetlands and shallow surface water features in the vicinity of proposed Units 3 and 4? Have long–term aquifer tests demonstrated this situation? Will STP develop a monitoring plan that could identify impacts and trigger mitigation measures? If so, describe the objectives and details of the monitoring plan, and describe the possible mitigation measures.
4.2 – 11 10 CFR 51.71(d)	Provide a full description of the potential impacts to nearby groundwater users.	Section 4.2.2 of the ER states that since STP use would not exceed the site's 1860 gpm (3000 acre–ft/yr) existing permit, "the Coastal Plain Groundwater Conservation District (CPGWCD) would be aware of potential impacts to nearby groundwater users." Provide a description of the potential impacts to nearby groundwater users related to full use of the permitted quantity.
4.2 – 12 10 CFR 51.71(d)	Present an evaluation or validation of the model shown at the beginning of Section 4.2.2.1.	Present an evaluation or validation of the performance of the equation (model) shown at the beginning of Section 4.2.2.1 to predict present day drawdown from the production wells. Given the existing data set, how is the data to be used to validate the model to forecast future drawdown resulting from greater groundwater withdrawals during construction and operation of STP proposed Units 3 and 4?

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4.2 – 13 10 CFT 51.71(d)	Provide information regarding dewatering discharge locations, any required ditches and retention ponds and associated permits, storm water outfalls, storm water treatment, and water bodies into which storm water will be discharged.	Describe the dewatering discharge (e.g., quantity, frequency, and locations) for all ground and surface water including precipitation and storm water that would be collected in the excavation pit for Units 3 and 4. Provide details of any ditches and retention ponds needed for discharge from dewatering. Provide details of any required permitting for discharge from dewatering and when these permits will be obtained by STPNOC.
4.6 – 1 10 CFR 51.71(d)	Describe the planned control program to mitigate construction-related impacts to aquatic ecosystems from suspended sediments.	During conference calls between the applicant and staff occurring since the site audit, the applicant indicated that changes to ER Rev. 1 include new information on diversion of water from dewatering areas for the reactor foundation. Confirm the planned control program for addressing impacts to benthic communities from excess water during construction. The discussion should encompass all diverted waters from construction activity.
5.2 – 1 10 CFR 51.71(d)	Discuss the incremental change in the availability of the water resource, and the incremental change in groundwater drawdown as an impact of station operation on potential water users.	Discuss the impact of station operation on potential water users. Describe this in terms of the incremental impact potential seen by offsite users of water resource. What are the magnitude, duration, and frequency of the loss of surface and groundwater resources to other users due to the operation of Units 3 and 4?

RAI Number	Question Summary (RAI)	Full Text (supporting information)
5.2 – 2 10 CFR 51.71(d)	Address inconsistencies in the ER regarding groundwater impact levels.	There appears to be an inconsistency in the ER regarding the impacts to the groundwater resource during construction, operation, and cumulative impacts. All use the full 3000-acre-ft/year rate; however, different impact levels are concluded. Reconcile how the analysis of the operational impacts to the deep Chicot aquifer conclude a SMALL impact when a conclusion of SMALL to MODERATE has been reached as a result of construction impacts in the same aquifer. Both analyses considered pumping the aquifer at its maximum permitted level (3000 acre–ft/yr). Provide the basis for how cumulative impacts to groundwater during construction can be estimated to be SMALL when the conclusion in the construction impact section is SMALL to MODERATE with possible mitigation involving the construction of additional deep aquifer wells. While the cumulative operational impact conclusion of SMALL is consistent with the earlier conclusion in the operational impacts section, it does not appear to be consistent with the SMALL to MODERATE impact conclusion of the construction impacts section. Present a basis for the evaluation of impacts to the groundwater resource. Such a basis should include several metrics including the sustainable groundwater resource and drawdown at offsite locations, and it should allow construction and operation impacts to be compared for consistency.

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5.2 – 3 10 CFR 51.71(d)	Describe quantitatively the known impacts and qualitatively the potential future impacts on the groundwater system.	The ER section 5.2.3.1 regarding water quality impacts during operation does not address chemical impacts on the groundwater system despite the communication between the MCR and the shallow aquifer in the conceptual model. Describe these known impacts quantitatively and the potential future impacts qualitatively. Present the radionuclide and chemical levels that exist in the MCR and the portion that could be introduced to the shallow aquifer in the future. Address how present–day measured levels could change from MCR operation under STP 1 & 2 to that under the operation of all four units.
5.10 – 2 10 CFR 51.71(d)	Explain the difference regarding the potential impact significance for water quality impacts found in Table 5.10-1 and the determination stated in the text of Section 5.2.3.	Section 5.2.3.1 states, "Impacts of chemicals in the proposed MCR blowdown on the Colorado River water quality would be SMALL and would not warrant mitigation." Table 5.10-1 shows the water quality impacts would be SMALL to MODERATE. Explain the difference between the potential impact significance presented in Table 5.10-1 and Section 5.2.3.1 for water quality and mitigation.
5.10 – 3 10 CFR 51.71(d)	Explain the difference in the planned control program information for the discharge system and the description of temperature limits for TPDES Permit No. WQ0001908000.	Sections 5.2.3.1 and 5.3.2.2.1 state that the TPDES permit (No. WQ0001908000) allows a daily average discharge temperature of 95°F and daily maximum discharge temperature of 97°F. Section 5.3.2 of Table 5.10-1 states that "…discharges would be 95° or less." Explain the difference in the discharge temperature information.
6.3 – 1 10 CFR 51.71(d)	Describe waste effluent and storm water outfalls that will be added to existing outfalls and the water bodies into which they will discharge.	Describe waste streams and storm water outfalls that will be added to existing outfalls, including any storm water treatment associated with each that may be required for Units 3 and 4 construction and operation. Also, describe the water bodies into which these outfalls will discharge. Describe the impact and cumulative impacts of the all units' discharge through outfalls into water bodies at and near the site.

RAI Number	Question Summary (RAI)	Full Text (supporting information)
6.3 – 2 10 CFR 51.71(d)	Provide information regarding the anticipated operational monitoring deriving from the NRC 10 CFR 20.1406 initiative and the Nuclear Energy Institute program.	While the program initiated with the Nuclear Energy Institute (NEI) is mentioned in the section on Existing Hydrological Monitoring, no mention is made of it under Operational Monitoring. Provide information regarding the anticipated operational monitoring derived from the NEI program. If not available, provide an overview of operational monitoring objectives and consistency with the NRC 10 CFR 20.1406 initiative and the NEI program.
9.4 – 1 RG 4.2	If the MCR is part of the closed-loop cooling system, then describe alternatives considered for the proposed circulating water system including a description of all elements required by ESRP 9.4.2. Describe the process followed to determine that no obviously superior alternatives for the proposed circulating water system, water supply, and water treatment exist.	Provide an evaluation of locations, designs, and environmental impacts of alternatives to the RMPF and to the MCR blowdown and spillway. Provide an evaluation of the alternative water supplies and alternative water treatments for the circulating water system. Describe the process followed to evaluate the environmental preference of the alternatives. Describe the economic costs of circulating water system alternatives that are preferable to the proposed system.
10.5S – 1 10 CFR 51.71(d)	Describe groundwater conservation and other mitigative measures as noted in Section 10.5S.1.2.	Section 10.5S.1.2 of the ER states: “The maximum withdrawal rate required …will be maintained below the withdrawal rate permitted by the CPGCD through water conservation or other mitigative measures.” Describe the water conservation and other mitigative measures.

RAI Number	Question Summary (RAI)	Full Text (supporting information)
10.5S – 2 10 CFR 51.71(d)	Describe the analytical process used to determine cumulative impacts to downstream surface water users.	Section 10.5S.2.2 of the ER states: "Compliance with these limits assures that the cumulative impacts on downstream users due withdrawal of water from the Colorado River to support 4–unit operation will be SMALL, not warrant mitigation, and not have a regional effect." Describe the analytical process used to arrive at the conclusion that the cumulative impact on downstream water users will be SMALL. Impacts that may be SMALL still warrants consideration of mitigation; identify the mitigation measures that were not considered to be warranted based on an assessment of benefits.

RAI Number	Question Summary (RAI)	Full Text (supporting information)
2.7 – 1 10 CFR 51.50 10 CFR 51.70(b) 10 CFR 51 Ap. A RG 4.2	Provide a climatological summary of the STP meteorological data.	According to ER Section 6.4, meteorological measurements have been made at the STP site for more than 30 yrs. These data should provide a better climatological description of the STP site than the 30–yr normal climatological data for Victoria, 53 miles from the STP site and other data listed in Sections 2.7.1, 2.7.3, and 2.7.4 of the ER. Is there reason to believe that NWS data collected at Victoria is more representative of site conditions than the data collected at STP?
2.7 – 2 (5.3.3.1) 10 CFR 51.50 10 CFR 51.70(b) 10 CFR 51 Ap. A RG 4.2	Discuss the likelihood that the combination of the MCR and the STP Unit 3 & 4 cooling towers will have a synergistic effect that increases the frequency or intensity of fog.	Sections 2.7.4.1 and 5.3.3.1.2 of the ER discuss fogging from the MCR and from the proposed cooling towers for Units 3&4 as if they were completely independent when, in fact, they are in close proximity and are in operation simultaneously. Therefore, it is appropriate to consider the cumulative effects of the MCR and the cooling towers; provide the cumulative effects analysis.
2.7 – 3 (7.1) 10 CFR 51.50 10 CFR 51.70(b) 10 CFR 51 Ap. A RG 4.2 RG 1.145	Describe which PAVAN files were used and how the 50% χ/Q values were derived.	Section 2.7.5.2 of the ER contains χ/Q values for the evaluating the impacts of design basis accidents. The NRC staff independently reviewed the PAVAN output files submitted by STPNOC; it is unclear how the 50% χ/Q values were determined from the PAVAN output files. Provide a description of the process to determine the 50% values from the PAVAN output.
2.7 – 4 (5.4.2) 10 CFR 51.50 10 CFR 51.70(b) 10 CFR 51 Ap. A RG 4.2 RG 1.111	Explain why the XOQDOQ results presented in the FSAR differ from the results presented in the ER.	FSAR Section 2.3S.5.2 and ER Section 2.7.6.2 presents results of long–term atmospheric dispersion and deposition calculations for use in evaluating the radiological consequences of normal reactor operation of Units 3&4. Please explain and justify why the radial distance and distance-segment boundary χ/Q and D/Q values presented in FSAR Tables 2.3S-28 and 2.3S-29 differ from the values presented in ER Table 2.7-16.

RAI Number	Question Summary (RAI)	Full Text (supporting information)
2.7 – 5 (4.4.1) 10 CFR 51.50 10 CFR 51.70(b) 10 CFR 51 Ap. A RG 4.2	Interpret the word "may" as it relates to actions to mitigate potential impacts of construction on air quality.	The word "may" appears frequently in ER Sections 3.9S.1 et seq. relative to measures that could be used to mitigate impacts of construction on air quality. Clarify how the staff is to value measures that "may?" be implemented. Is there a commitment to take some or all of the measures? Is there sufficient likelihood that some or all of the measures would be taken to allow the staff to give credit for the actions? Who determines whether the measures will be taken? What are the bases for the determination and when would this determination be made?
3.4.1 – 1 (5.3.4) 10 CFR 51.50 10 CFR 51.70(b) 10 CFR 51 Ap. A	Provide a citation for the estimated cooling tower noise level of about 57 dBA.	ER Section 2.7.7 discusses noise at the STP site but does not address potential cooling tower noise. ER Section 5.3.3.2.2 (page 5.3–28) states a noise level for the cooling tower of 57 dBA at 200 ft. However, no citation or supporting analysis is provided for the noise level estimate.
5.3.3.1 – 1 10 CFR 51.50 10 CFR 51.70(b) 10 CFR 51 Ap. A RG 4.2	Justify the assumption in the 2nd paragraph of ER Section 5.3.3.1.2 that there will not be increased fogging.	ER Section 5.3.3.1.2 states that the MCR did not increase fogging and that additional fogging is not likely to occur as a result of the addition of Units 3&4. The 1st paragraph of this section supports the first part of the statement; however, the technical basis has not been provided to support the second part. Operation of Units 3&4 may increase the heat load on the MCR without increasing the radiating surface area significantly. The facts need to be addressed technically before the second part of the statement can be accepted.
5.3.3.1 – 2 10 CFR 51.50 10 CFR 51.70(b) 10 CFR 51 Ap. A RG 4.2	Provide consistent values for cooling tower drift deposition at the Unit 3&4 switchyard.	ER Section 5.3.3.1.3 (2nd sentence, last paragraph, page 5–24) states a maximum summer deposition rate and an annual average deposition rate for the Unit 3&4 switchyard. These rates do not appear to be consistent. Reconcile whether the annual average is correct if the summer rate is correct.

RAI Number	Question Summary (RAI)	Full Text (supporting information)
7.1 – 1 10 CFR 51.50 10 CFR 51.70(b) 10 CFR 51 Appx A RG 1.3 RG 4.2	Provide the source of the dose factors used in evaluation of each design basis accident.	Tables 7.1–1 through 7.1–6 of the ER present isotopic release rates for ABWR design basis accidents. Doses calculated from the isotopic release rates are not consistent with the doses listed Tables 7.1–8 through 7.1–14, which are summarized in Table 7.1–15. The differences appear to be associated with dose factors. The ABWR DCD lists 3 sets of dose factors. Provide the source of the dose factors used for each DBA.
7.1 – 2 10 CFR 51.50 10 CFR 51.70(b) 10 CFR 51 Appx A RG 1.3 RG 4.2	Provide correct EAB and LPZ dose estimates for the Clean Up Water Line Break Outside Containment DBA in Table 7.1–12.	Table 7.1–12 lists the estimated whole body and thyroid doses for this accident. In the table, the whole body and thyroid doses at each distance are identical. Table 7.1–8 lists the estimated doses for the Failure of Small Lines Carrying Primary Coolant Outside Containment DBA which involves the same set of isotopes. There is about a factor of 50 difference in the whole body and thyroid doses in Table 7.1–8. Reconcile which of the doses in Table 7.1–12 is in error. Comparison with other whole body and thyroid doses in Table 7.1–15 indicates that this error exists elsewhere.
7.2 – 1 10 CFR 51.50(c) Severe Accident Policy Statement Safety Goals Policy Statement	Provide MACCS2 input and output files for MACCS2 calculations that include calculations of early fatalities for an average individual within 1 mile of Units 3&4.	The Commission has established safety goals for nuclear power plants (51 FR 30028, August 1986). These goals include an average individual early fatality risk and a goal population risk of latent cancers. The staff has used the safety goal insights to put severe accident impacts into context. The MACCS2 code is used to provide estimates of early fatalities and latent cancers for comparison with the Commission's safety goals. STPNOC provided MACCS2 input and output files for Units 3 & 4. However, the MACCS2 calculations associated with those files do not include evaluation of the average individual early fatalities. Provide the MACCS2 code with the early fatality calculations enabled and provide the input and output files for these analyses.

RAI Number	Question Summary (RAI)	Full Text (supporting information)
7.2 – 2 10 CFR 51.50(c) Severe Accident Policy Statement Safety Goals Policy Statement	Provide a description of each severe accident scenario and release category.	The MACCS2 files submitted by STPNOC identify severe accident scenarios using an alphabetic character string. Provide a cross-walk between the alphabetical character string and the accident or release scenario being evaluated.
7.2 – 3 10 CFR 51.50(c) Severe Accident Policy Statement Safety Goals Policy Statement	Provide source terms, core damage frequencies and severe accident consequences by release category. Separate the consequences for the air and water pathways.	Section 7.2.1 of the ER provides risk information in the aggregate. In performing its independent evaluation, the staff considers both core damage frequency and consequences by release category and pathway. Table 7.2–1 presents risks, not core damage frequency and consequence and combines population dose risk from the air and water pathways. In addition to providing the disaggregated risk information, provide the accident isotopic source terms and release fractions for each release category.
7.2 – 4 10 CFR 51.50(c) Severe Accident Policy Statement Safety Goals Policy Statement	Provide a discussion of the risks associated with external initiating events.	Section 7.2.2.1 of the ER states that the risk estimates in Table 7.2–1 are only for internally initiated events. Risks associated with external initiating events need to be described for completeness. Provide estimates of Core Damage Frequencies for external event and a comparison with the CDFs for internally initiated events.
7.2 – 5 10 CFR 51.50(c) Severe Accident Policy Statement Safety Goals Policy Statement	Describe how evacuation was modeled in MACCS2.	Section 7.2.2.1 states that 95% of the 50 mile population was assumed to evacuate following declaration of a general emergency. Provide the evacuation assumptions that were used in the model. How were evacuation parameters estimated? Where were the “evacuees” assumed to go?

RAI Number	Question Summary (RAI)	Full Text (supporting information)
7.2 – 6 10 CFR 51.50(c) Severe Accident Policy Statement Safety Goals Policy Statement	Provide a list of major surface water users within 50 mi of STP Units 3 & 4, especially public water supplies.	The MACCS2 code estimates a water ingestion dose based on user input. Section 2.3.2.1 includes a partial list of surface water users, but not all; it does not include surface water users within the Tres Palacios River Basin. For MACCS2 analysis, the surface water pathway is an extension of the air pathway, and therefore is not constrained to a single watershed. Provide the basis for not considering all of the appropriate surface water users or an update of the analysis.
7.2 – 7 10 CFR 51.50(c) Severe Accident Policy Statement	Revise the discussion of the groundwater pathway risks for STP Units 3 & 4 to support the conclusion in the last sentence of ER Section 7.2.2.3.	ER Section 7.2.2.3 discusses the groundwater pathway. However, the discussion does not appear to support the conclusion in the last sentence of the section. The first paragraph of the section is not related to either severe accidents or STP Units 3 & 4. The second paragraph is not related to STP Units 3 & 4. The discussion in the third paragraph does not support the conclusion in the final sentence of the paragraph. Doses are not related to core damage frequency. Provide an update to the section to discuss groundwater pathway risk.
7.2 – 8 10 CFR 51.50(c) Severe Accident Policy Statement Safety Goals Policy Statement	Describe how the average individual risk listed in ER Section 7.2.3 was determined.	Section 7.2.3 and Table 7.2–1 present an average individual risk for comparison with the Commission's safety goal. Average individual risk can be calculated using early fatality estimates generated by the MACCS2 code. However, the MACCS2 analyst did not configure the input files to enable the output to report the appropriate early fatality estimates, and as a result, the output files do not contain the detail necessary for comparison.
7.2 – 9 10 CFR 51.50(c) 10 CFR 52.79(d)(3)	Discuss ABWR DCD COL action items and open items related to severe accidents and how the action and open items will be addressed.	Section 7.2 of the ER does not address COL action items and open items related to severe accidents that are listed in Section 19.9 of the ABWR DCD, Revision 4. These items need to be acknowledged and addressed.

RAI Number	Question Summary (RAI)	Full Text (supporting information)
7.3 – 1 10 CFR 51.50(c) 10 CFR 52.79(d)(3)	Discuss the process for ensuring that SAMAs related to operating procedure and administrative controls will be evaluated prior to plant startup.	Section 7.3.3 presents a discussion leading to the conclusion that SAMAs associated with administrative changes are likely not to be cost beneficial. However, the last paragraph of the section states that evaluation of specific administrative controls will occur when the Units 3 & 4 design is finalized. How will completion of that evaluation be tracked?

RAI Number	Question Summary (RAI)	Full Text (supporting information)
2.2.1 – 1 10 CFR 51.71(d) RG 4.2, Rev. 2, section 2.1.1	Revise Tables 2.2–1 and 2.2–2 in the ER to reflect land occupied by STP units 1 and 2 and auxiliary facilities.	Tables 2.2–1 and 2.2–2 in the ER omit information regarding the land occupied by STP Units 1 & 2 and auxiliary facilities. Provide an update to these tables to reflect this land activity.
9.3 – 1 10 CFR 51.71(d) RG 4.2, Rev. 2, section 9.2	Explain how the Limestone alternative site satisfies NRC's siting criteria for candidate sites.	The revision to ESRP 9.3 (p. 9.3–2) issued for use by the NRC staff and for public comment calls for candidate sites "to be among the best that can reasonably be found for the siting of a nuclear power plant." Similar language is at p. 9.3–1 of the original version of ESRP 9.3. Section 9.2.1 of Regulatory Guide 4.2 Rev. 2 states that candidate sites must be realistic siting options, potentially licensable, and capable of being developed. The information in the ER superimposed the location of nuclear units upon the existing Limestone, Units 1 and 2; since Units 1 and 2 are not expected to be retired, identify where prospective nuclear units could be located on the Limestone site. The staff learned on their visit to the Limestone site that (1) NRG's proposed coal–fired unit 3 at Limestone will use dry cooling because insufficient water is available for wet cooling, (2) any new nuclear units sited at the Limestone site would also likely need to use dry cooling resulting in a significant economic penalty in comparison to the STP site, and (3) NRG does not own the mineral rights at the Limestone site and natural gas production wells. Natural gas exploration and production activities at the site may make siting new nuclear units at the site problematic for safety reasons. Explain how the Limestone site satisfies the ESRP 9.3 and Regulatory Guide 4.2 Rev. 2 siting criteria for candidate sites given the land availability, water limitations and ongoing natural gas exploration and production activities at the site.

RAI Number	Question Summary (RAI)	Full Text (supporting information)
9.3 – 2 10 CFR 51.71(d) RG 4.2, Rev. 2, section 9.2	How would inclusion of information regarding the proposed coal–fired unit 3 at the Limestone site affect the discussion of the site in section 9.3.3.1 of the ER?	NRG's planned coal–fired Unit 3 at the Limestone site is not mentioned in section 9.3 of the ER. Would the addition of information regarding Unit 3 at the Limestone site affect any of the discussion in section 9.3.3.1 of the ER? Would the discussion result in the same conclusions?
9.3 – 3 10 CFR 51.71(d) RG 4.2, Rev. 2, section 9.2	What are the dimensions of the existing transmission line ROWs serving the Limestone site?	What are the dimensions (length and width) of the existing transmission line rights–of–way serving the Limestone site?
9.3 – 4 10 CFR 51.71(d) RG 4.2, Rev. 2, section 9.2	Explain how the Malakoff alternative site satisfies NRC's siting criteria for candidate sites.	The revision to ESRP 9.3 (p. 9.3–2) issued for use by the NRC staff and for public comment calls for candidate sites "to be among the best that can reasonably be found for the siting of a nuclear power plant." Similar language is at p. 9.3–1 of the original version of ESRP 9.3. Section 9.2.1 of Regulatory Guide 4.2 Rev. 2 states that candidate sites must be realistic siting options, potentially licensable, and capable of being developed. The staff learned on their visit to the Malakoff site that (1) water from the Cedar Creek Reservoir is fully committed and would not be available for new nuclear units sited at the Malakoff site, (2) there is some water available in Lake Palestine but the quantity currently available would be insufficient to support wet cooling for two ABWR units, and (3) it is not clear where additional surface water could be obtained for plant cooling, including the Richland-Chambers Reservoir. Explain how the Malakoff site satisfies the ESRP 9.3 and Regulatory Guide 4.2 Rev. 2 siting criteria for candidate sites given these water limitations.

RAI Number	Question Summary (RAI)	Full Text (supporting information)
9.3 – 5 10 CFR 51.71(d) RG 4.2, Rev. 2, section 9.2	Who are the current owners of the Allens Creek and Malakoff alternative sites?	Who are the current owners of the portions of the Allens Creek and Malakoff alternative sites upon which new nuclear units could potentially be sited?

RAI Number	Question Summary (RAI)	Full Text (supporting information)
3.5 – 1 RG 4.2 10 CFR 20 10 CFR 51.45	Provide explanations and calculations, as appropriate, of the inputs to the LADTAP, GASPAR, and construction worker dose calculation. One acceptable way to respond to this RAI would be to provide the calculation packages.	ESRP 3.5, Section III, states in "when ER precedes the SER, the following analysis should be performed … reviewer should calculate the quantity of radioactive materials released annually in effluents … use the parameters and calculational techniques described in NUREG–0016… If the applicant has provided a source term that is consistent with these parameters and calculational techniques … the reviewer should accept it and should not perform a separate calculation." Provide the source term calculations and the associated input and output files.
4.5 – 1 10 CFR 20 RG 8.8, Rev. 3	Discuss rationale for comparing construction worker doses to 40 CFR 190 criteria.	In Table 4.5–19 of the ER, STP compares the construction worker public dose to 40 CFR Part 190 criteria. 40 CFR 190 applies to doses at the site boundary, not at the Unit 4 construction site which is inside the site boundary. Therefore, the comparison of worker annual dose to 40 CFR 190 criteria in Table 4.5–19 does not appear to be appropriate. Discuss the rationale for this comparison.
4.5 – 2 10 CFR 20	Discuss rationale for comparing construction worker doses to 10 CFR 50 Appendix I criteria.	In Table 4.5–18 of the ER, STP compares offsite public doses due to liquid effluents from Unit 3 to 10 CFR 50, Appendix I design objectives. However, this table also compares <u>onsite</u> worker doses due to Unit 3 gaseous effluents to the Appendix I design criteria. Because Appendix I applies to members of the public located in an unrestricted area, this comparison does not appear to be appropriate. Discuss the rationale for this comparison.

RAI Number	Question Summary (RAI)	Full Text (supporting information)
4.5 – 3 10 CFR 20 10 CFR 51.45	What was the thought process for using Units 1 & 2 Annual Effluent Report data for 2005 to calculate air pathway doses to construction workers?	The GASPAR analyses provided by STPNOC contained four input files. File "GASPSTP1.dat" appears to be the input file for modeling existing units 1 & 2 effluents. In the ER, Table 4.5–1 lists Maximum Annual Gaseous Effluents from STP 1 & 2, for years 2002 through 2006. The maximums listed in the last column of Table 4.5–1 appear to be consistent when compared to the annual Effluent Reports on hand. However, annual releases for 2005 were the midpoint of the 5–year review period, from a total curie release standpoint. Provide the rationale for using the 2005 data used to calculate worker doses rather than the year with maximum curie release. Table 4.5–1 lists the maximum annual releases of gaseous effluents; how is this information used in the context of the 2005 data?
5.4.1 – 1 10 CFR 20 10 CFR 51.45	What source term was used for the LADTAP input file “LADTROB2.DAT”?	In the LADTAP analyses provided by STPNOC, LADTROB2.DAT indicates that the source term is taken from DCD Table 12.2–22 and dilution factors listed in the ODCM were applied. For example, Table 12.2–22 of the DCD states that 118 MBq/y of I–131 is the annual average liquid release and the corresponding dilution factor for Little Robbins Slough is listed as 8.56E–06 (From Table B4–1, page B4–25 of DCM Rev 14). In this example, the product of these values (1.01E–03 MBq/y) does not appear to be consistent with the value listed in the input file (2.87E–03 MBq/y). This applies to all radionuclides listed in LADTROB2.DAT source term. Instead, the input file appears to rely upon the release values from FSAR Table 12.2–22. Provide the basis for the values used in the LADTAP analyses.

RAI Number	Question Summary (RAI)	Full Text (supporting information)
5.4.1 – 2 10 CFR 51.45	Why does the ABWR DCD table 12.2–22 not match the FSAR table 12.2–22	The quantities of radionuclides listed in the ABWR DCD Table 12.2–22 and the FSAR Table 12.2–22 are not consistent. The lists of radionuclides between the two tables differ – ABWR DCD does not have Nd–147 and FSAR does not have Ag–110m and Sb–124. Provide the basis for the set of radionuclides used in the analyses.
5.4.1 – 3 10 CFR 51.45	What is the basis and where did the source term for LADTROB2.DAT come from?	In the LADTAP analyses provided by STPNOC, LADTROB2.DAT indicates that the source term is taken from DCD Table 12.2–22. The source term appears to be based on the FSAR Table 12.2–22 which lists 53 radionuclides, however, the input file only lists 36. Provide the basis for the set of radionuclides used in the analyses.
5.4.1 – 4 10 CFR 51.45	Where did the source term for LADTROB2.DAT come from?	In the LADTAP analyses provided by STPNOC, LADTROB2.DAT indicates that the source term is taken from DCD Table 12.2–22. Table 12.2–22 does not list Nd–147, but neodymium–147 is in the input file. Provide the basis for the set of radionuclides used in the analyses.
5.4.4 – 1 10 CFR 51.45	What effect will raising the MCR level by 2 feet, have on the migration of radionuclides from MCR to Little Robbins Slough?	After the water level is raised, will the “Radionuclide fractions Reaching Offsite Bodies of Water” listed in the ODCM (Table B4–1) change? If they are expected to change, would analysis of impacts from the 2 proposed ABWRs need to be reanalyzed using revised values in Table B4–1 in the ODCM?

RAI Number	Question Summary (RAI)	Full Text (supporting information)
4.1.3 – 1 (5.1.3) 36 CFR 800.13	Provide the plant procedure for inadvertent discovery of archaeological remains.	During construction or operation of the plant archaeological deposits may be encountered. During the site audit, STP staff indicated that there would be a procedure that would identify steps to be taken if there is an inadvertent discovery. Provide a copy of the procedure.

RAI Number	Question Summary (RAI)	Full Text (supporting information)
3.7 – 1 RG 4.2	Explain whether the replacement of transmission line towers would result in impacts outside existing transmission line corridors.	ER sections 3.7 and 4.3.1.1.3 indicate that two of the six existing transmission lines that run from the STP site to the Hillje substation in a single corridor will be upgraded over about 20 miles of their length. In the upgrades, the conductors of the two transmission lines and some of the transmission line towers will be replaced. The preamble to ER section 2.2.2 indicates that neither new corridors nor expansion of existing corridors would be required for these upgrades. Although corridor expansion would not be required, explain whether the replacement of transmission line towers would impact areas outside the existing transmission corridor, such as via material laydown areas, new access roads, etc. If there would be impacts to areas outside the existing transmission corridor, what land cover types would be affected and what would be the aerial extent of impact?

RAI Number	Question Summary (RAI)	Full Text (supporting information)
2.4.1 – 1 10 CFR 51.71(d)	Provide information regarding terrestrial species composition and abundance by habitat type on the STP site.	Provide a description of the dominant and common vegetation and wildlife species found in the habitats existing on the STP site, either as shown in Figure 2.4–1 of the ER, or as described and displayed at the site audit in draft documentation for habitat mapping conducted by ENSR for the applicant. Include information on large and small mammals (including bat species potentially present), common reptiles and amphibians found in the habitats on the STP site and the section of the Hillje transmission corridor to be upgraded. Some of this information is contained in the May 2007, ENSR Corporation Report: 10720–008, but habitat descriptions are not consistent between the ER and the ENSR 2007 report. During the site audit, contractor and applicant staff indicated that a new report describing the habitats on site and the wildlife commonly found in those habitats was under preparation. Provide the finished report.

RAI Number	Question Summary (RAI)	Full Text (supporting information)
2.4.1 – 2 10 CFR 51.71(d)	Provide current information on the type and relative abundance of migratory bird species and waterfowl using the habitats on the STP site, potential impacts to these populations, and proposed mitigation measures to limit impacts during construction and operation.	Provide current information on the type and relative abundance of migratory bird species and waterfowl using the habitats on the STP site. Discussions between the applicant and NRC at the site audit indicated that the current and past five years of site–specific data for the Matagorda County Christmas Bird Count for count stations on and adjacent to STP, can be summarized to provide information on the relative abundance of these birds. Further discussions indicated that radar data describing preferred migration pathways may be available to determine impacts to migratory species from STP construction and operations. Describe any data and information that can be used to address these issues. Also, provide information on any management or operational practices that STP plans to implement to limit adverse effects to migrating birds during facility construction and operation (e.g., downward pointing lighting on buildings, roads, structures).
2.4.1 – 3 10 CFR 51.71(d)	Provide information and maps depicting all wetlands identified on the STP site during field surveys in 2006, 2007 and 2008.	Information provided at the site audit and during communications with the applicant indicates that additional wetland surveys and delineations have been conducted since the March 2007 Ecological Survey Report (ER Reference 2.4-3) and the ER was issued. Please provide field data sheets that describe the wetland identification and delineation for surveys done on the site. Please provide maps and tables indicating the locations, acreages and type of each of these wetlands. Include information describing whether each wetland would be impacted, either permanently or temporarily, by the project.

RAI Number	Question Summary (RAI)	Full Text (supporting information)
2.4.1-4 10 CFR 51.71(d)	Provide updated information describing and mapping water features and related wetland features on the STP site.	During site audit field visits, NRC staff observed wetland indicators in and along the edges of drainage ditches within the project sites. Were these areas investigated for wetland features or surveyed for delineation during any of the wetland surveys conducted on the site? Were surveys completed for the eleven ditches which feed into the large drainage ditch that will be rerouted around the power block for Units 3 and 4? If so, please provide survey information. Were other water features identified that were not identified as wetlands? If so, please describe the locations and characteristics of such water features in detail and include maps. Based on recent survey information, please explain how the re-located portion of Little Robbins Slough was considered; is it identified as a wetland or on-site water feature? Please clarify with maps and text whether any upstream portion of Little Robbins Slough exists in a natural condition on the STP site. If so, is this upstream portion on STP identified as a wetland or on-site water feature?
2.4.1 – 5 10 CFR 51.71(d)	Provide graphics that illustrate the salt deposition isopleths overlaid on existing habitat maps and wetland maps.	The extent and distribution of salt drift and deposition have been modeled and described verbally in the ER. Provide graphics that illustrate the salt deposition isopleths overlaid on existing habitat maps and wetland maps.

RAI Number	Question Summary (RAI)	Full Text (supporting information)
4.3.1 – 1 10 CFR 51.71(d)	Identify and discuss habitats and important species associated with the 20–mile upgrade section of the Hillje transmission corridor.	The habitats and corridors for the existing STP transmission lines associated with Unit 3 and 4 operations are described in general terms in Table 2.2–4 of the ER. Additional information is needed to describe the importance of these habitat types to important species known to occur or that could occur within or adjacent to the 20–mile section of the Hillje corridor that will be upgraded. Provide a listing of these species and a discussion of their habitat use within or adjacent to this 20–mile section of the Hillje corridor.
4.3.1 – 2 10 CFR 51.71(d)	Provide information and figures describing the proposed locations of various construction project areas and activities and describe associated impacts to terrestrial resources.	Discussions held at the site audit and subsequent conference calls indicated that there may be changes to the proposed locations of various construction activities and construction materials sites. For example, it is unclear whether the proposed activities at the locations given in the ER for the laydown yard and spoils piles (both from construction activities and dredging) will continue in the locations described in the ER. Provide information and figures describing the proposed locations of these areas if the planned locations have changed from ER Rev. 1, or if they have not changed, so indicate. In addition, provide information on the associated impacts from construction if the planned locations are different than stated in ER Rev. 1.

RAI Number	Question Summary (RAI)	Full Text (supporting information)
9.3.2 – 1 10 CFR 51.71(d)	Provide the documentation that supports the statements and conclusions used in Section 9.3 on terrestrial resources at the Limestone site.	Section 9.3.2.1.4 of the ER states that the impacts to terrestrial resources at the Limestone site "would be similar to those at the proposed STP site." During the alternative site visit, staff was told by NRG representatives that the STP Units 3 & 4 would likely be constructed on the Freestone County portion of the facility, as opposed to Limestone County where the coal plant is located. It is not clear if the evaluation of the Limestone site in the ER was for the region in Limestone or Freestone County. Clarify the description of the site as to the specific area evaluated. Based on the use of readily available information (e.g., GIS layers describing the habitats and vegetation of Texas or national land cover datasets), and assuming the same footprint as the STP site, respond to the following associated requests: (1) Identify any forested habitats or wooded bottomlands in the area where the plant would be constructed. (2) What proportion or acreage of the proposed site comprises farmland, rangeland, and industrial activities? (3) Identify any wetlands on the site that could be impacted by construction activities. (4) Identify the size and extent of the wetlands.

RAI Number	Question Summary (RAI)	Full Text (supporting information)
9.3.2 – 2 10 CFR 51.71(d)	Provide the documentation that supports the statements and conclusions used in Section 9.3 on terrestrial resources at the Allens Creek site.	Section 9.3.2.2.4 states that the impacts to terrestrial resources at the Allens Creek site "would be SMALL, similar to those at the proposed STP site." Based on the use of readily available information (e.g., GIS layers describing the habitats and vegetation of Texas or national land cover datasets), and assuming the same footprint as the STP site, respond to the following associated requests: (1) Identify the extent and acreage of the hardwood riparian and forested lands that would likely be impacted. (2) Identify the acreage of open cropland and pasture that would likely be impacted. (3) Identify any wetlands on the site that would likely be impacted and the proportion or acreage of wetlands contained within the construction area footprint. (4) Identify the potential ROWs for transmission corridors. (5) Provide information available concerning potential routes and the species/habitats and wetlands that might be affected by new transmission line construction.
9.3.2 – 3 10 CFR 51.71(d)	Provide the documentation that supports the statements and conclusions used in Section 9.3 on terrestrial resources at the Malakoff site.	Section 9.3.2.3.4 states that the terrestrial resources at the Malakoff site "would be similar to or greater than those at the proposed STP site." Based on the use of readily available information (e.g., GIS layers describing the habitats and vegetation of Texas or national land cover datasets), and assuming the same footprint as the STP site, respond to the following associated requests: (1) Identify the estimated acreages of agricultural cropland, wetlands, pasture, hardwood forest, and/or riparian bottomland forests on the site that might be affected by proposed construction activities. (2) Identify the potential ROWs for transmission corridors. (3) Provide information concerning potential routes and the species/habitats and wetlands that might be affected by new transmission line construction.

RAI Number	Question Summary (RAI)	Full Text (supporting information)
2.4.2 – 1 10 CFR 51.71(d)	Provide the results of the 12 months of aquatic resource sampling in the Colorado River.	Describe the aquatic resources in the Colorado River within the vicinity of the site based on the sampling efforts in 2007–08. Include vertebrate and invertebrate species. Describe how the species have changed in the Colorado River since the diversion channel was constructed into East Matagorda Bay in 1993. Include the changes in resources that are needed for evaluation of impingement and entrainment at the Reservoir Makeup Pumping Facility (RMPF). Describe the sampling protocols and sampling locations used to characterize the aquatic resources in the river during efforts in the 1970's, 1980's and the most recent activities. What is the relationship of the aquatic resources over 12 months compared to water quality parameters (e.g., salinity, dissolved oxygen, temperature)? Describe any anomalies in the data and how anomalies may contribute to uncertainties in the data. For example, in 1983 one sample from the river included more than 99% of all the recorded catch efforts for bay anchovy.
2.4.2 – 2 10 CFR 51.71(d)	Describe the aquatic habitat features at the RMPF.	Describe the habitat features at the RMPF. Include the sediment types and channel features. Relate the habitat features to the flow characteristics of the river (e.g., the movement of the salt water wedge). Are the aquatic resources likely to be attracted to the shoreline at the RMPF? Does the RMPF provide habitat for aquatic resources? Discuss how habitat features affected the sampling activities (e.g., use of seines, etc. in the vicinity of the RMPF).

RAI Number	Question Summary (RAI)	Full Text (supporting information)
2.4.2 – 3 10 CFR 51.71(d)	Characterize the aquatic resources in the MCR.	Describe the aquatic resources in the MCR. Include vertebrate and invertebrate species. Describe the sampling protocols and sampling locations used to characterize the aquatic resources in the MCR. What is the relationship of the aquatic resources over 12 months compared to water quality parameters (e.g., salinity, dissolved oxygen, temperature)? Describe the impingement/entrainment results at the CWIS. Include a description of the sampling protocol (e.g., sampling locations, sampling frequencies). Relate the aquatic species in the MCR compared to those found in the Colorado River.
2.4.2 – 4 10 CFR 51.71(d)	Describe the saltwater wedge at the RMPF (~NMM 8 on the Colorado River).	The discussion in Section 2.4.2 is based on sampling efforts in the Colorado River prior to the diversion channel's construction in 1993 opening access to East Matagorda Bay. Describe the current conditions affecting the saltwater wedge at the RMPF. Include channel characteristics (cross–sectional area), seasonal variations and influence of pumping at the RMPF in relation to saltwater moving up the Colorado River.
2.4.2 – 5 10 CFR 51.71(d)	Discuss the uncertainties in evaluating the aquatic resources from past to current studies.	The discussion in Section 2.4.2 is based on sampling efforts in the Colorado River prior to the diversion channel's construction in 1993 opening access to East Matagorda Bay. Discuss uncertainties with evaluation of aquatic communities (e.g., phytoplankton, zooplankton, ichthyoplankton) that exist currently in the Colorado River based on studies from 1974.
2.4.2 – 6 10 CFR 51.71(d)	In Table 2.4–2, what land area does the column, "STP Site", include?	In Table 2.4–2, what does the column, "STP Site", encompass in area? Is it Matagorda County or the site boundary? Does it include the Colorado River?

RAI Number	Question Summary (RAI)	Full Text (supporting information)
2.4.2 – 7 10 CFR 51.71(d)	Provide correspondence with U.S. Fish and Wildlife Service, National Oceanic and Atmospheric Administration, and U.S. Army Corps of Engineers that has occurred since September 20, 2007.	Based on discussions at the site audit, discussions between STPNOC and Federal and state resource agencies are continuing concerning aquatic resources. Provide recent correspondence.
2.4.2 – 8 10 CFR 51.71(d)	Discuss the different classifications of wetlands on the STP site and the acreages associated with each.	In various sections of the ER, different acreages of wetlands are stated. For example, wetland acreage discussions on page 2.4–1 ("7600 acres of various types of wetlands…"), 2.4–7 (list of bullets in Section 2.4.2.1.1), and 4.1–4 ("…110 manmade and 3.9 non–jurisdictional wetlands…") appear to be different. Also, provide clarification on the appropriate units for each discussion (e.g., acre or acre/ft).
2.4.2 – 9 10 CFR 51.71(d)	What requirements are there for Segment 1401 of the Colorado River associated with listing of the region as "impaired waters due to the presence of bacteria"?	Discuss the relationship between the state's designation of the water quality for Segment 1401 of the Colorado River in the vicinity of the plant and the aquatic resources found during recent monitoring efforts.
2.4.2 – 10 10 CFR 51.71(d)	Provide information on the application for the Coastal Consistency Determination for Units 3 & 4.	In a letter from Greg Gibson to NRC on February 28, 2008 concerning Responses to Environmental Report Site Audit Comments (Docket #: 52–012 and 52–013), it was stated that STPNOC was working with the Texas General Land Office (GLO) to be in compliance with the Texas Coastal Management Program. Provide correspondence and consistency determination documentation with GLO concerning natural resources.
4.3.2 – 1 10 CFR 51.71(d)	What are the requirements for dredging in the Colorado River under the existing permits with the U.S. Corps of Engineers?	Provide updated correspondence with U.S. Corps of Engineers concerning activities in preparation for Units 3 and 4 that were on–going after completion of ER Rev. 1.

RAI Number	Question Summary (RAI)	Full Text (supporting information)
4.3.2 – 2 10 CFR 51.71(d)	Provide specific examples of activities that will reduce impacts to aquatic resources associated with the Erosion and Sediment Control Plan and Storm Water Management Plan.	ER Section 4.3.2 references compliance with the state's Erosion and Sediment Control Plan and Storm Water Management Plan. These plans include options or examples of activities to minimize impacts to aquatic resources. Provide a description of the options and examples that can be used at the STP site.
4.3.2 – 3 10 CFR 51.71(d)	What are the impacts from construction activities on aquatic resources associated with surface water and drainage ditches?	ER Section 4.3.1 and 4.3.2 did not discuss the rapid bioassessment study of the identified construction impact areas. What are the potential impacts to the aquatic resources based on the results of more recent evaluations? What characteristics of the relocated drainage ditches will allow for introduction of aquatic resources found in the ditch that will be filled during construction of reactor facilities for Units 3 and 4?
4.3.2 – 4 10 CFR 51.71(d)	Provide information and figures describing the proposed locations of various construction project areas and activities and describe associated impacts to aquatic resources.	Clarify the location of construction activities and sites associated with wetlands and other water resources. Clarify if the locations given in ER Rev. 1 for the laydown yard and soils piles (both from construction activities and dredging) are still the current plans. Provide information on the location of these areas if they have changed from ER Rev. 1, and provide information on the associated impacts from construction in these locations.
5.3.1.2 – 1 10 CFR 51.71(d)	Describe the design feature of the RMPF that allows an "escape route" for fish to swim back to the river and precluding entrapment.	Section 5.3.1.2.1 Describe design features of the RMPF that preclude or mitigate entrapment of fish. Is the "escape route" the fish return system on the intake structure, or is it some other feature (e.g. distance between trash racks and traveling screens)? Discuss whether the fish return system on the RMPF was blocked off and was not used at the time of the site audit. Describe the process for fish (and other aquatic species) trapped around the RMPF to be returned to the river, and any circumstances during which the fish return system is not functional.

RAI Number	Question Summary (RAI)	Full Text (supporting information)
5.3.1.2 – 2 10 CFR 51.71(d)	Describe the process for calculating the maximum design approach velocity at the traveling screens on the RMPF for four units and provide the results of the calculations.	Section 5.3.1.2.1 describes the maximum design approach velocity of the water for the original design, for 2 units and for 4 units. However, the approach velocities are cited as 0.5 fps, 0.55 fps and 0.50 fps. Describe the process for calculating the maximum design approach velocity at the traveling screens on the RMPF for four units. Provide all the data used to calculate the velocity of the water at a screen.
5.3.1.2 – 3 10 CFR 51.71(d)	What is the magnitude of impingement and entrainment of aquatic species at the RMPF for the species of fish currently found in the Colorado River compared to species present prior to 1993 when the diversion channel directed the river into East Matagorda Bay?	Provide one year of impingement/entrainment results for the RMPF or justify why impingement/entrainment results for the RMPF are not necessary for assessing impacts of RMPF operation on the aquatic communities in the Colorado River. Section 5.3.1.2.1 is based on impingement and entrainment of Colorado River species described in Section 2.4.2 that have not been evaluated since the river was changed by the construction of a diversion channel into East Matagorda Bay. Describe the species in the river traveling from the bay that may now be affected by impingement and entrainment at the RMPF. Describe seasonal differences in the species in the Colorado River that may be impinged or entrained at the RMPF. Estimate susceptibility of species to be entrained in the MCR and provide bases for assumptions about species mortality upon entrainment as discussed in Section 5.3.1.2.2 Main Cooling Reservoir.

RAI Number	Question Summary (RAI)	Full Text (supporting information)
5.3.1.2 – 4 10 CFR 51.71(d)	What is the impact of operation of the RMPF on managed species included in the Fisheries Management Plans for the Gulf of Mexico?	Initial information on sampling the Colorado River in 2007 demonstrates that the species associated with essential fish habitat identified in the Fisheries Management Plans for the Gulf of Mexico are being found in the vicinity of the RMPF. What level of impact to those species (and their life stages) and their prey species is likely to be experienced in association with the RMPF? What characteristics of the essential fish habitat (e.g., river substrate) are likely to be impacted by operation of the RMPF?
5.3.1.2 – 5 10 CFR 51.71(d)	Please describe the proposed bank stabilization project and its impact on terrestrial and aquatic resources.	At the STP site audit, NRC staff learned that there will be a bank stabilization project in the area of the discharge to prevent diffuser outlet boxes from falling into the river.

RAI Number	Question Summary (RAI)	Full Text (supporting information)
5.3.2 – 1 10 CFR 51.71(d)	Provide information on how aquatic resources may be impacted by discharges at outfall 001.	The information provided in Sections 3 and 5 does not provide enough information to determine the water quality characteristics of the MCR and how these characteristics will be monitored to be in compliance with the discharge criteria in TCEQ permit # WQ0001908000. More information is needed in order to evaluate impacts to the aquatic resources in the Colorado River from discharges at outfall 001. The characteristics of the water being discharged from the MCR and the characteristics of the water in the Colorado River that is receiving the water from the MCR are needed to evaluate the discharge plume. This information is needed to evaluate the potential of the discharge plume to impede passage of aquatic resources in the river. What are the temperature and water quality characteristics in the MCR at the discharge structure? What are the flow and temperature conditions of the Colorado River when discharges from the MCR are likely to happen? Section 5.3.4 states that the blowdown will likely occur during high river flow periods during the winter and the spring. What is the cross–section distance of the Colorado River at outfall 001? How far will the maximum temperature plume from the discharge at outfall 001 reach across the surface of the river? This calculation should be provided at the greatest temperature extremes of the discharge plume and the river water temperature and flow conditions.
5.3.2 – 2 10 CFR 51.71(d)	How will water discharged at outfall 001 be evaluated and compliance with TCEQ permit # WQ0001908000 be determined?	Discuss the conditions in which chemical impacts are considered SMALL associated with permit criteria. Where will temperature and water quality be measured in the water that is to be discharged into the Colorado River?

RAI Number	Question Summary (RAI)	Full Text (supporting information)
5.3.2 – 3 10 CFR 51.71(d)	What is the impact of outfall 001 and discharge from the MCR on managed species included in the Fisheries Management Plans for the Gulf of Mexico?	Initial information on sampling the Colorado River in 2007 demonstrate that the species associated with essential fish habitat identified in the Fisheries Management Plans for the Gulf of Mexico are being found in the vicinity of the outfall 001 on the Colorado River. What level of impact to the species (and their life stages) is likely to be experienced by those species in the vicinity of outfall 001? What characteristics of the essential fish habitat (e.g., river substrate) are likely to be impacted by discharges from the MCR?
5.3.4 – 1 10 CFR 51.71(d)	What are the annual maximum and minimum flow rates and temperatures for the Colorado River in the vicinity of the blowdown structure on the Colorado River? What is the frequency planned for discharging at outfall 001?	The description of the discharge from the MCR into the Colorado River in ER Sections 3.4.2.2, 5.3.2, and 5.3.4 includes information on the TPDES Permit No. WQ0001908000, but there is no information that relates the permit conditions to those at the discharge. Describe the process for evaluating the flows and temperatures of the Colorado River to the size of the thermal plume in support of the assessment that thermophilic microorganisms are not likely to be a risk to public health. Describe how often discharges will occur at outfall 001 and create an opportunity for thermophilic microorganisms to interact with the public.
5.3.4 – 2 10 CFR 51.71(d)	Identify the recreational uses within Segment 1401 of the Colorado River and discuss the potential for exposure to thermophilic microorganisms via the thermal plume associated with outfall 001.	ER Section 5.3.2.1 states that Segment No. 1401 of the Colorado River is designated for contact recreation. Contact recreation is a pathway for risk to public health from thermophilic microorganisms. Describe the recreational activities currently in the river at the vicinity of outfall 001 and the likelihood of exposure to the thermal plume from discharges. Describe the width of the river at outfall 001 and how close the thermal plume would reach to the residents and their docks on the far side of the river.

RAI Number	Question Summary (RAI)	Full Text (supporting information)
5.3.4 – 3 10 CFR 51.71(d)	Provide documentation of any correspondence with the Texas Department of State Health Services in support of the evaluation of thermophilic microorganisms in the vicinity of the discharge from the MCR into the Colorado River.	Has the Texas Department of State Health Services been contacted concerning the incidence of thermophilic microorganisms in Texas and within Segment 1401 of the Colorado River?
5.3.4 – 4 10 CFR 51.71(d)	How does the state's designation of Segment 1401 of the Colorado River as "impaired" relate to the impact evaluation?	ER Section 2.4.2.5 states that TCEQ designated Segment 1401 of the Colorado River as "not meeting the state water quality standard for bacteria". Wastewater from the operations of Units 1 and 2 are currently discharged in the MCR and the same plan is proposed for Units 3 and 4. Describe how outfall 001 will be monitored to ensure that discharges from the MCR are compliant with the state's concern for the increase of bacteria in the vicinity of the plant.
9.3.2-4 **10 CFR 51.45(c)** 10 CFR 51.71(d)	Please describe potential impacts to threatened or endangered species and their habitats as a result of construction and operation at each of the three alternative sites.	An up-to-date summary of the potential presence of threatened or endangered species in the terrestrial or aquatic environment at the three alternative sites is required to evaluate the potential impact of construction and operations on related terrestrial and aquatic habitats.
9.3.3 – 1 10 CFR 51.71(d)	Describe the process used to quantify the impact statement for aquatic resources at the Limestone site and provide the documentation that supports the statements and conclusions used in Section 9.3.	Section 9.3.3.1.5 states that the aquatic resources at the Limestone site "would be SMALL to MODERATE, and greater than those at the proposed STP site." Describe the process used to quantify the impact statement for aquatic resources at the Limestone site. Describe the differences between the Limestone site and the STP site that justify rating the aquatic resource impacts differently.

RAI Number	Question Summary (RAI)	Full Text (supporting information)
9.3.3 – 2 10 CFR 51.71(d)	Describe the process used to quantify the impact statement for aquatic resources at the Allens Creek site and provide the documentation that supports the statements and conclusions used in Section 9.3.	Section 9.3.3.2.5 states that the aquatic resources at the Allens Creek site "would be SMALL, similar to those at the proposed STP site." The section states that intake and discharge structures could cause short–term adverse effects to the proposed lake's aquatic environment. Provide information about the aquatic resources in the Brazos River/Allens Creek watershed. Is the statement about "short–term adverse effects" associated with construction or operation? If the phrase concerns operation, how is that impact considered to be short–term over the operational period for the proposed plant? Describe the process used to quantify the impact statement for aquatic resources at the Allens Creek site and the water resources used to supply the proposed lake.
9.3.3 – 3 10 CFR 51.71(d)	Describe the process used to quantify the impact statement for aquatic resources at the Malakoff site and provide the documentation that supports the statements and conclusions used in Section 9.3.	Section 9.3.3.3.5 states that the aquatic resources at the Malakoff site "would be SMALL, similar to those at the proposed STP site." There is no information about the aquatic resources at the "reservoirs or rivers adjacent to the site" that would be used for the proposed plant. Is the statement about "short–term adverse effects" associated with construction or operation? If the phrase concerns operation, how is that impact considered to be short–term over the operational period for the proposed plant? Describe the process used to quantify the impact statement for aquatic resources at the Malakoff site.

RAI Number	Question Summary (RAI)	Full Text (supporting information)
2.5 – 1 10 CFR 51.45(c) 10 CFR 51.71(d)	Provide an electronic copy of the Socioeconomics "Validation Package".	It is the staff's understanding that every statement of fact in the socioeconomics section in the ER has been traced back to a source in a document described as the "Validation Package," and that this document is contained in electronic format on a single CD.
2.5 – 2 10 CFR 51.45(c) 10 CFR 51.71(d)	Update population and growth rates based on post–2000 Census data.	2000 Census data can now be supplemented with later information from Texas demographic sources and the American Community Survey. The information on population between censuses is expected to be supplemented from other sources if available. Does the availability of 5–6 years of additional estimated population data change any of the forecasts of population geographic distribution, growth rates, or ethnic composition? If not, state why. If so, provide revised values for the affected distributions and growth rates.
2.5 – 3 10 CFR 51.45(c) 10 CFR 51.71(d)	Provide an estimate of transient population employment in the fishing industry.	Based on local interviews, the staff has learned that there may be significant numbers of non–resident individuals in the area, especially near Palacios. Provide an estimate of the number of migrant seasonal workers in the 50 mile area around the proposed site and specifically in the Palacios area. Identify which industries employ these workers and discuss how this population affects the overall transient population discussion.
2.5 – 4 10 CFR 51.45(c) 10 CFR 51.71(d)	Provide a discussion of important community social structures and organizations.	Most community structure information such as non–profits, faith-based outreach, and social service organizations appears to be omitted. No organizations were identified. Provide analysis or describe how social service organizations, and membership and volunteer organizations, would be affected, by a population increase or an influx of the construction workforce, for example. How would it be different for the operations phase?

RAI Number	Question Summary (RAI)	Full Text (supporting information)
2.5 – 5 10 CFR 51.45(c) 10 CFR 51.71(d)	Identify public and private recreational facilities and opportunities, including present and projected capacity and percentage of use.	There is no information about current and projected future use of outdoor recreation areas. Is there a possibility that water used by the plant or the plant–related population will affect either water quantity or water quality for any recreation purposes? Identify the basis for any conclusions regarding this matter at the STP site and the alternative sites.
2.5 – 6 10 CFR 51.45(c) 10 CFR 51.71(d)	Provide a discussion of non–zoning controls on land development	Provide a discussion of local infrastructure and transportation plans that also control the location of housing and business, such as constraints on water hookups. Provide copies of the cities' land use plans.
2.5 – 7 10 CFR 51.45(c) 10 CFR 51.71(d)	Provide a discussion of changes to anticipated levels of traffic identified by state transportation planners for Matagorda and surrounding counties.	Based on staff interviews with local government officials, both US Highway 60 and FM 521 in particular were very crowded during construction of STP Units 1&2. Provide data regarding capacity and use information on the highways and transportation systems to identify potential choke points in the transportation net, as well as any plans to relieve those choke points.
2.5 – 8 10 CFR 51.45(c) 10 CFR 51.71(d)	Provide a discussion of distinctive (e.g., minority, ethnic, religious) communities that exist in the area of the STP plant.	The ER does not mention any distinctive communities. However, staff interviews identified at least a Vietnamese community in Palacios and the possibility of Hispanic communities. Provide a discussion of distinctive (e.g., minority, ethnic, religious) communities that exist in the area of the STP plant.

RAI Number	Question Summary (RAI)	Full Text (supporting information)
2.5 – 9 10 CFR 51.45(c) 10 CFR 51.71(d)	Discuss contacts made with minority and low–income populations and state whether they identified any environmental concerns about STP Units 3 & 4.	Provide documentation of any outreach to minority and low–income populations attempted regarding the proposed site, including any organizations contacted. Summarize comments of any organizations contacted by the applicant that locate and assess uniquely vulnerable minority and low–income communities located on or near the proposed station site. Describe unique customs or practices and health or other vulnerabilities that were described in those contacts. If none were described, so state.
2.5 – 10 10 CFR 51.45(c) 10 CFR 51.71(d)	What is the projected use of outdoor recreational facilities near STP?	Are there any universities that conduct studies of parks along the Colorado river? Has the state or any of the universities done surveys or other studies? Are there any fishing tournaments or other competitions on the Colorado River that could be affected by the proposed plant? Are there any professional outriggers such as kayak tours on the river?
2.5 – 11 10 CFR 51.45(c) 10 CFR 51.71(d)	Confirm whether the 2000 Census is the most recent data available for housing availability in the counties near STP.	Confirm whether data on number of units, vacancies, and tenure from the 2000 Census are the most recent data available. If more recent data are available (for example, price and vacancy data) use them to supplement the data currently shown.
2.5 – 12 10 CFR 51.45(c) 10 CFR 51.71(d)	Discuss non–governmental service organizations located in Matagorda County and adjacent counties.	Discuss the major non–governmental social services organizations in Matagorda and nearby counties, and identify services they provide. Include faith-based organizations which provide local social services to low-income residents in your discussion.
2.5 – 13 10 CFR 51.45(c) 10 CFR 51.71(d)	Discuss the participation in federal school free and low–cost lunch programs.	Some of the local school districts have majority participation in the federal school lunch program. For each ISD, discuss (including reported numbers of participating students in each ISD) how widespread the participation is and how important this program is to ISD finances.

RAI Number	Question Summary (RAI)	Full Text (supporting information)
2.5 – 14 10 CFR 51.45(c) 10 CFR 51.71(d)	Discuss the importance of local "roll–back" elections for ISD finances operating revenue.	Explain the importance of the "rollback election" mechanism on ISD M&O funds to the individual ISDs in the region of STP.
2.5 – 15 10 CFR 51.45(c) 10 CFR 51.71(d)	Discuss the outcome of the Moak, Casey, and Associates study and provide a copy.	The staff has learned that NRG has contracted Moak, Casey, and Associates of Austin, TX to prepare a study of the economic impact of STP 3 and 4 on local school finances. Summarize and provide a copy of the study.
2.5 – 16 10 CFR 51.45(c) 10 CFR 51.71(d)	Describe the tax impact of the expanding San Antonio share of the STP 1 & 2, and impact of STP 3 & 4.	The staff has learned the current ownership of STP 1 & 2 has changed over time, with San Antonio, the non–taxable entity, taking a larger share of the STP 1 & 2 plants. Describe the past effect and likely future effect of this trend of STP Unit 1 &2 ownership and the future ownership of Units 3 and 4 for local government and ISD revenues.
2.5 – 17 10 CFR 51.45(c) 10 CFR 51.71(d)	Describe the future impact of the growth in electricity production on water demand in the Colorado River.	The ER states that "steam–electric water demand will increase by 45%, from 153,522 acre–feet to 222,058 acre–feet in the same time period." Discuss what projects account for the increase.
2.5 – 18 10 CFR 51.45(c) 10 CFR 51.71(d)	Clarify contents and provide copies of references 2.5–14, 2.5–15, and 2.5–17.	Staff could not locate the information on road quality purported to be in reference documents 2.5–14 and 2.5–15. Reference 2.5–15 was not accessible on 1–16–2008. Provide a copy of reference 2.5–17 "Yoakum District Highway Traffic Map," TXDOT, 2005. Transportation Planning and Programming Division.
2.5 – 19 10 CFR 51.45(c) 10 CFR 51.71(d)	Confirm source for Table 2.5–9.	Table 2.5–9 seems to have as its source Reference 2.5–11 not 2.5–12.

RAI Number	Question Summary (RAI)	Full Text (supporting information)
2.5 – 20 10 CFR 51.45(c) 10 CFR 51.71(d)	Provide data on all property tax collections, including a separation of STP payments.	According to the ER, "Table 2.5–14 shows the total property taxes collected by the county, the total property taxes STPNOC has paid to Matagorda County, and the percent of the total county property taxes that are paid by STPNOC. " However, the actual table only appears to show a breakdown of STP owner payments, not a comparison with total property taxation. Provide a comparison with total property taxation.
2.5 – 21 10 CFR 51.45(c) 10 CFR 51.71(d)	Estimate the degree of congestion for key road links approaching STP.	Clarify the relationship between Texas "esal"–based road capacity and level–of–service measurements commonly used to estimate congestion, and provide LOS estimates for the key locations on the highway map and table for which AADT are reported.
2.5 – 22 10 CFR 51.45(c) 10 CFR 51.71(d)	Describe planned road upgrades on the commuting routes to STP.	In the course of offsite interviews, staff has become aware of several potential upgrades in the vicinity of Bay City. Are any upgrades actually planned for the transportation system in Matagorda County?
2.5 – 23 10 CFR 51.45 (c) 10 CFR 51.71 (d)	Discuss the environmental and socioeconomic impacts of upgrading the rail spur.	Is upgrading the 9–mile rail spur into the STP site a commitment of the STPNOC? If so, discuss the environmental and socioeconomic impacts of upgrading the rail spur.
2.5 – 24 10 CFR 51.45(c) 10 CFR 51.71(d)	Discuss seasonal low water issues with using the STP barge slip.	Are there seasonal low water issues in using the STP barge slip? How will they be overcome?
2.5 – 25 10 CFR 51.45(c) 10 CFR 51.71(d)	Provide an explanation as to why maximum water treated exceeds rated capacity in Table 2.5-30.	Provide an explanation of what it means to have maximum water treated exceed rated capacity of the system (several instances in Table 2.5–30).

RAI Number	Question Summary (RAI)	Full Text (supporting information)
2.5 – 26 10 CFR 51.45(c) 10 CFR 51.71(d)	Determine whether the population forecasts in the TX Water Plan are consistent with those in the demographic section.	Determine whether the population forecasts in the TX Water Plan are consistent with those in the demographic section. Region K grows by 92% from 2000 to 2040; but Matagorda County by 28%. Brazoria grows at the predicted rate for region H through 2040.
2.5 – 27 10 CFR 51.45(c) 10 CFR 51.71(d)	List private schools within 50 miles of STP, including specific details of each.	List private schools within 50 miles of STP, providing names, locations, teacher-student ratios, and enrollment.
2.5 – 28 10 CFR 51.45(c) 10 CFR 51.71(d)	Reconcile employment numbers for major employers.	Employment numbers in these two places are not consistent: The major employment facilities in the area, in addition to STP, include OXEA Corporation and Equistar Chemicals, LP. OXEA Corporation is located approximately five miles north–northeast of the plant and employs a total of 155 persons. Equistar, located about seven miles east of the STP site, employs 194 workers (STPNOC 2007b {FSAR Section 2.1S.3.3.1}. The plant produces industrial chemicals and employs approximately 250 workers. The second employer is Lyondell Chemical (Equistar), located approximately seven miles east of the STP site, which produces polyethylene chemicals, and also employs approximately 250 workers." (ER Section 2.5.2.1. Reconcile these numbers.
2.5 – 29 10 CFR 51.45(c) 10 CFR 51.71(d)	Provide revenue and expenditure data for the City of Palacios.	Are data available on revenues and expenditures in the City of Palacios, similar to the data provided for Bay City?
4.4 – 1 10 CFR 51.45(c) 10 CFR 51.71(d)	Add a month by month table of projected "workers on site".	Add a month by month table of projected "workers on site," to include existing operating workforce, outage workers, construction workforce for units 3 and 4, operating workforce for units 3 and 4 in Section 3–10S. The table should include an operating period with Units 1, 2, 3 and 4 all operational, with and without an outage workforce.

RAI Number	Question Summary (RAI)	Full Text (supporting information)
4.4 – 2 10 CFR 51.45(c) 10 CFR 51.71(d)	Reconcile construction-period employment assumptions.	Reconcile the assumption in Section 4.4.2 that 50% of construction workers will live within the 50–mile commuting distance with the assumptions in Section 3.10S that less than 10% of the field craft labor and none of the non–field craft labor would come from within 50 miles. Also reconcile with the Section 3.10s statement that "Seventy to eighty percent of the construction workforce will be employed for more than four years. Most of the craft labor from outside the 50–mile radius will seek temporary housing, and most of the non–manual staff will relocate to the area and seek permanent housing."
4.4 – 3 10 CFR 51.45(c) 10 CFR 51.71(d)	Re–calculate wage impacts using more realistic wage rates.	The construction wages for skilled nuclear construction workers are likely to be significantly higher than the existing average annual construction wage in Matagorda County. Revise impacts using more realistic rates and cite sources.
4.4 – 4 10 CFR 51.45(c) 10 CFR 51.71(d)	Revise estimated impacts of post–construction job and income losses.	The ER states that "however, after construction completion, a total of 50% of the movers would be expected to migrate back out of the 50–mile region." At the end of the construction period, the entire income source of plant construction jobs goes away. This, rather than the specific workers, is the source of secondary impacts. Revise the post–construction impact to reflect the loss of the construction job income rather than the loss of the workers.
4.4 – 5 10 CFR 51.45(c) 10 CFR 51.71(d)	Further explain the land conversion assumption presented in Section 4.4.2 of the ER.	Explain why 50% of the land converted for construction workers would return to its original use and 50% would remain converted.

RAI Number	Question Summary (RAI)	Full Text (supporting information)
4.4 – 6 10 CFR 51.45(c) 10 CFR 51.71(d)	Re–calculate traffic impacts based on more realistic assumptions.	Section 4.4.2 of the ER states that "for purposes of analysis, it was assumed that 100% of the 4073 vehicles were attributable to the current STP labor force." This seems like an overestimate, since the plant workforce is about 1365. If they all arrived and left once a day and all drove alone, this would total about 2730. Recalculate peak traffic impacts, considering outage workers, contractors, and non–plant–related traffic in your estimate.
4.4 – 7 10 CFR 51.45(c) 10 CFR 51.71(d)	Calculate traffic impacts in congestion terms, not just impacts on pavements.	The ER currently uses "esal" (equivalent standard axle load) -based estimate of traffic from plant construction to calculate traffic impacts. This variable is relevant to pavement cracking and deterioration, but not to congestion. Calculate how the shift–change construction traffic relates to peak–hour vehicle capacity and congestion.
4.4 – 8 10 CFR 51.45(c) 10 CFR 51.71(d)	Calculate traffic interactions between STP and hurricane evacuations.	What would be the quantitative impact of plant workforce during construction to traffic on hurricane evacuation routes Highways 60, 35, 36, 71, 332 and 288, FM 521, FM 1095, FM 1468?
4.4 – 9 10 CFR 51.45(c) 10 CFR 51.71(d)	Discuss the impacts of any interactions between the re–built rail spur and road traffic, especially on FM 521.	If the rebuilt railroad spur would cross FM 521 on a grade crossing, what would be the impact on traffic flow on FM 521 and what actions would be taken to avoid impact? Discuss the impacts of any interactions between the re–built rail spur and road traffic congestion, especially on FM 521.
4.4 – 10 10 CFR 51.45(c) 10 CFR 51.71(d)	Discuss the impact of construction on housing demand.	The quantitative housing impact analysis appears to assume that the incoming construction workforce would occupy permanent housing. Discuss the likelihood of RVs and mobile homes as a housing choice, in view of the heavy reliance of these types of housing utilized during construction of units 1 and 2.

RAI Number	Question Summary (RAI)	Full Text (supporting information)
4.4 – 11 10 CFR 51.45(c) 10 CFR 51.71(d)	Discuss impact of STP 3 & 4-related population growth on social services demands.	Although the staff found in some of its interviews that, historically, STP 1 & 2 led to some increase in adverse social impacts, the social services section does not discuss impacts on programs such as Child and Family Services, Food Stamps, alcohol and drug abuse programs, and other social service programs and non–governmental charities. Discuss why not or provide an assessment of the impacts.
4.4 – 12 10 CFR 51.45(c) 10 CFR 51.71(d)	Describe impacts of overlapping construction and operations workforces.	Since the operations and construction work forces overlap, what is the cumulative impact on housing, services, etc. during the late construction phase. Is it less than the maximum impact of construction, in view of the relative permanence of the operating work force?
4.4 – 13 10 CFR 51.45(c) 10 CFR 51.71(d)	Estimate expenditures within the region for materials and services during construction.	Estimate expenditures within the region for materials and services during construction. Provide qualitative information, if quantitative information is not available, on the order of magnitude, scale, and type of local expenditures that are expected.
4.4 – 14 10 CFR 51.45(c) 10 CFR 51.71(d)	Provide a copy of any studies of the socioeconomic impacts on Calhoun and Jackson Counties.	The applicant has assumed that the construction and operations labor forces will be geographically distributed in the same percentages as the labor force for Units 1 & 2. This is perhaps a reasonable assumption, but has there been any assessment of what would happen if significant labor force numbers settled in Calhoun and Jackson Counties? These counties are both close by and have low populations. Provide a copy of any studies conducted on this topic.

RAI Number	Question Summary (RAI)	Full Text (supporting information)
4.4 – 15 10 CFR 51.45(c) 10 CFR 51.71(d)	List commitments to reduce physical impacts of construction.	The text notes for example: "As presented in Subsection 3.9S.2.1, procedures related to mitigating noise and vibration impacts from construction activities may include measures such as restricting noise and vibration generating activities to daylight hours, prohibiting construction traffic from driving on specific roads and through specific neighborhoods, use of less vibration producing equipment and/or methods (e.g., dampeners, staggering activities), and verifying that noise control equipment on vehicles and equipment is in proper working order. Notifications to regulatory agencies and nearby residents regarding atypical noise and vibration events (e.g., pile driving, steam/air blows) may also be performed." These actions seem to be noted as generic options. Identify which of these are commitments.
4.4 – 16 10 CFR 51.45(c) 10 CFR 51.71(d)	List commitments to reduce traffic impacts of construction.	"Public roads may be altered (e.g., widened, turn lanes installed) as a result of construction activities." Is this a commitment? If not, what circumstances would make it become a commitment?
4.4 – 17 10 CFR 51.45(c) 10 CFR 51.71(d)	List commitments to reduce physical impacts of construction.	"The following controls or similar ones could be incorporated into activity planning to further minimize noise and associated impacts: • Regularly inspecting and maintaining equipment to include noise aspects (e.g., mufflers) • Restricting noise–related activities (e.g., pile–driving) to daylight hours • Restricting delivery times to daylight hours" Identify which of these actions are commitments.

RAI Number	Question Summary (RAI)	Full Text (supporting information)
4.4 – 18 10 CFR 51.45(c) 10 CFR 51.71(d)	Provide a copy of RIMS II multipliers used.	Provide a copy of "RIMS II Multipliers for Matagorda and Brazoria Counties, Texas," BEA (U.S. Bureau of Economic Analysis), U. S. Department of Commerce. Economic and Statistics Administration. Bureau of Economic Analysis, Washington, D.C. February 2, 2007.
4.4 – 19 10 CFR 51.45(c) 10 CFR 51.71(d)	Provide information on any pre–existing health conditions among minority and low–income populations that could result in disproportionate adverse health impacts.	Discuss in detail pathways where any environmental (including socioeconomic) impact during construction may interact with cultural or economic facts that may result in disproportionate environmental impacts on minority and low–income populations. None in the natural system were found to be adverse in the ER, but only a summary of agency comments was reported. No information was supplied on potential pre–existing health conditions among minority and low–income communities, although the Texas Department of Health keeps fairly extensive local statistics on the health status of the population. Identify what other sources in the minority community and literature were used.
4.6 – 2 10 CFR 51.45(c) 10 CFR 51.71(d)	Indicate which actions to limit adverse impacts during construction are commitments.	A number of actions are identified in the table "Summary of Potentially Adverse Impacts of Construction" with respect to limiting impacts on direct physical impacts (4.4.1) and socioeconomic impacts (4.4.2). Which of these potential actions are actually commitments to take action by the applicant, as opposed to potential actions that could be taken by unspecified parties?
5.8 – 1 10 CFR 51.45(c) 10 CFR 51.71(d)	Estimate expenditures within the region for materials and services during operation.	Estimate expenditures within the region for materials and services during operation. Provide qualitative information, if quantitative information is not available, on the order of magnitude, scale, and type of local expenditures that are expected.

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5.8 – 2 10 CFR 51.45(c) 10 CFR 51.71(d)	Estimate tax yields during operations.	Base tax revenue yields on current ownership percentages. Using whatever reasonable assumptions are necessary, provide quantitative estimates of tax yields during operations.
5.8 – 3 10 CFR 51.45(c) 10 CFR 51.71(d)	Estimate maximum road congestion during operations.	As with section 4.4.2, reconcile trip data for plant workers, outage workers, and general public, focusing on peak hour usage of FM 521 in particular.
5.8 – 4 10 CFR 51.45(c) 10 CFR 51.71(d)	Estimate housing impacts using latest population data.	As with the corresponding subsection in Section 4.4, use latest housing figures (post–2000 Census), or explain that the 2000 Census data are the latest available.
5.10 – 1 10 CFR 51.45(c) 10 CFR 51.71(d)	Indicate which actions to limit adverse impacts during operation are commitments.	A number of actions are identified in the table “Summary of Potentially Adverse Impacts of Operation” with respect to limiting impacts on direct physical impacts (5.8.1) and socioeconomic impacts (5.8.2). Which of these potential actions are actually commitments by the applicant, as opposed to potential actions that could be taken by unspecified parties?
8.0 – 1 10 CFR 51.45(c) 10 CFR 51.71(d)	Clarify ownership of STP Units 3 & 4.	Section 8.0 and throughout the ER, various names are given for the same owners of Units 3 & 4 (e.g. CPS, City of San Antonio, CPS–Energy). Clarify NRG LP 3 & 4 are separate entities owned by NRG Energy. Verify these titles throughout other chapters.

RAI Number	Question Summary (RAI)	Full Text (supporting information)
9.3 – 6 10 CFR 51.45(c) 10 CFR 51.71(d)	Reconcile conflicting socioeconomic impact levels for the Limestone site.	ER Section 9.3.3: "Impacts to socioeconomic issues at the Limestone, site will be SMALL, with potential MODERATE beneficial impacts. These impacts are somewhat less than those at the proposed site." Detailed impacts were described in this section as generally similar to impacts at the STP site, some of which (e.g. traffic impacts on roads, housing) were described as MODERATE to LARGE at the STP site. Explain the differences between the sites that justify the different impacts.
9.3 – 7 10 CFR 51.45(c) 10 CFR 51.71(d)	Reconcile conflicting socioeconomic impact levels for the Allens Creek site.	ER Section 9.3.3: "Impacts to socioeconomic issues at the Allens Creek site will be SMALL, with potential MODERATE beneficial impacts, and MODERATE effects in Austin County, where the influx of workers could strain services. These impacts are similar or greater than those impacts predicted for the proposed site. Detailed impacts were described in this section as generally similar to impacts at the STP site, some of which (e.g. traffic impacts on roads, housing) were described as MODERATE to LARGE at the STP site. Explain the differences between the sites that justify the different impacts.
9.3 – 8 10 CFR 51.45(c) 10 CFR 51.71(d)	Reconcile conflicting socioeconomic impact levels for the Malakoff site.	ER Section 9.3.3: "It is expected that socioeconomic impacts would be SMALL to MODERATE, similar to those at the proposed STP site, since an influx of construction workers could temporarily adversely affect resources in Henderson County. However, MODERATE beneficial impacts may also occur as a result of increased taxes and jobs in the county." Detailed impacts were described in this section as generally similar to impacts at the STP site, some of which (e.g. traffic impacts on roads, housing) were described as MODERATE to LARGE at the STP site. Explain the differences between the sites that justify the different impacts.

RAI Number	Question Summary (RAI)	Full Text (supporting information)
10.5S-3 10 CFR 51.45(c)	Limited Work Authorization for Nuclear Power Plants	The ER provides evaluations of the cumulative impact of construction and preconstruction activities; however, the impacts of the construction and preconstruction activities need to be broken down or separated. As explained in the Interim Staff Guidance (ISG) dated March 31, 2008, the level of analysis necessary to estimate the breakdowns should be commensurate with the level of impact. Simple analyses should be sufficient for most impact areas. These breakdowns are necessary to allow the NRC staff to properly assess the impacts of the construction activities—the activities for which NRC authorization is requested.