



Prepared for



and the
State Water Resources Control Board
Nuclear Review Committee

Independent Third-Party
Interim Technical Assessment

for the
Intake Relocation
for San Onofre Nuclear Generating Station

Prepared by



Bechtel Power Corporation

Report No. 25761-000-30R-G01G-00003 Rev. 0

July 11, 2012



**Independent Third-Party
Interim Technical Assessment**

for the

Intake Relocation
for San Onofre Nuclear Generation Station

Prepared by:



Bechtel Power Corporation

| Revision | Date | Affected Sections |
|-----------------|---------------|--------------------------|
| 0 | July 11, 2012 | Initial Issue |
| | | |
| | | |
| | | |
| | | |

Contents

| | |
|---|-----------|
| List of Abbreviations and Acronyms | iv |
| 1. Executive Summary | 1 |
| 2. Background and Introduction..... | 2 |
| 2.1 Purpose/Scope of Study..... | 2 |
| 2.2 Regulatory History | 2 |
| 2.2.1 Federal | 2 |
| 2.2.2 State | 3 |
| 2.3 Screening Process (A/B Criteria) | 4 |
| 3. Technology Description | 5 |
| 4. Criterion Evaluation | 6 |
| 4.1 External Approval and Permitting..... | 6 |
| 4.2 Impingement/Entrainment Design..... | 13 |
| 4.3 Environmental Offsets..... | 13 |
| 4.4 First-of-a-Kind in Scale..... | 17 |
| 4.5 Operability General Site Conditions | 17 |
| 4.6 Seismic and Tsunami Issues..... | 17 |
| 4.7 Structural | 18 |
| 4.8 Construction | 18 |
| 4.9 Maintenance | 18 |
| 5. Conclusion..... | 18 |
| 6. Appendices | 18 |
| 6.1 Input Data..... | 18 |
| 6.2 References | 18 |
| 6.3 Sketches..... | 19 |
| | |
| Table IR-1. Environmental Permit/Approval Assessment: Initial Intake Relocation (Shoreline Intake) San Onofre Nuclear Generating Station | 20 |
| Table IR-2. Offsetting Impacts for the Inshore Intake System San Onofre Nuclear Generation Station..... | 27 |
| Figure IR-1. Layout of Shoreline Intake Concept | 30 |

List of Abbreviations and Acronyms

| | |
|----------|---|
| ATC | Regional Pollution Control District Permit to Construct |
| BLM | Bureau of Land Management |
| Caltrans | California Department of Transportation |
| CDFG | California Department of Fish & Game |
| CEC | California Energy Commission |
| CEQA | California Environmental Quality Act |
| CPUC | California Public Utility Commission |
| EPCRA | Emergency Planning and Community Right-To-Know Act |
| EPRI | Electric Power Research Institute |
| FAA | Federal Aviation Administration |
| fps | foot per second |
| gpm | gallons per minute |
| GWA | Government of Western Australia |
| mgd | million gallons a day |
| NOI | Notice of Intent |
| NPDES | National Pollutant Discharge Elimination System |
| NYSDEC | New York State Department of Environmental Conservation |
| OHP | Office of Historic Preservation |
| PTO | Regional Control District Permit to Operate |
| RC | Resource Commission |
| RCRA | Resource Conservation Recovery Act |
| RWQCB | Regional Water Quality Control Board |
| SCE | Southern California Edison |
| SDRWQCB | San Diego Regional Water Quality Control Board |
| SONGS | San Onofre Nuclear Generating Station |
| SPCC | Spill Prevention and Countermeasure Control Program |
| SWPPP | Storm Water Pollution Prevention Plan |
| SWRCB | State Water Resources Control Board |
| USACE | U.S. Army Corp of Engineers |
| USEPA | U.S. Environmental Protection Agency |
| USMC | U.S. Marine Corps |
| WDR | Waste Discharge Requirement |

**Independent Third-Party Interim Technical Assessment
for the Intake Relocation for
San Onofre Nuclear Generating Station
Report No. 25761-000-30R-G01G-00003**

1. Executive Summary

This study summarizes the findings of the first phase of a detailed evaluation to assess viability of relocating the initial intake to the once-through cooling for San Onofre Nuclear Generating Station (SONGS) from its current offshore location to onshore. This intake relocation is one of the suggested technologies in support of the Nuclear Review Committee's initiative to identify strategies to implement the *California Statewide Policy on the Use of Coast and Estuarine Waters for Power Plant Cooling*. This strategy would comply with the Section 316b, *California Once-Through Cooling Policy*, Phase II rules.

The design and use of an onshore location has been evaluated within this report. This technology does not provide any advantage over the current offshore intake. In fact, there are several negative impacts that have resulted in the rejection of this technology from further consideration. Some of the key factors are:

- The intake point is moved from a less biologically productive point to more productive onshore location.
- The positive features of velocity cap operation will be lost, thereby effectively increasing the impingement and entrainment effects.
- Large areas of the sea bottom will be disturbed and certain areas will be subjected to frequent dredging.
- The current screen and fish removal systems will likely be overloaded.

The external approval and permitting assessment for the onshore intake identified a list of potentially applicable federal, state, and local permits and approvals that, not surprisingly, focused on its significant impacts to the marine environment. The efforts to conduct a successful California Environmental Quality Act (CEQA) review and secure the U.S. Army Corp of Engineers (USACE) Section 404 permit, California Coastal Commission Coastal Development Permit, State Lands Commission Lease, National Pollutant Discharge Elimination System (NPDES) permit modification will represent the primary regulatory challenges.

These permits are all expected to be contentious and have lengthy processes that will be aligned with the CEQA/Environmental Impact Report review process. The primary issue of concern is that the shoreline intake offers no positive operational environmental attributes to offset the construction-related negative impacts associated with the disruption of additional marine habitats and localized water quality degradation.

The onshore intake technology has been reviewed against each of the Phase 1 criterion and the results are summarized below. The overall finding is that this technology will result in less effective environmental performance than the current offshore design and is not recommended for further review during Phase 2.



| Criterion | Status |
|--|--|
| External Approval and Permitting | No fatal flaws |
| Impingement/Entrainment Design | The impingement/entrainment will be substantially worse for this design, so this is considered a fatal flaw. |
| Environmental Offsets | No fatal flaws. |
| First-of-Kind to Scale | Not evaluated. |
| Operability of General Site Conditions | Not evaluated. |
| Seismic and Tsunami Issues | Not evaluated. |
| Structure and Construction | Not evaluated. |
| Maintenance | Not evaluated. |
| Conclusion | Technology is not a candidate for Phase 2 review |

2. Background and Introduction

2.1 Purpose/Scope of Study

This study is performed in accordance with the requirement established by the State Water Resources Control Board (SWRCB) for Southern California Edison (SCE) to conduct a detailed evaluation to assess compliance alternatives to once-through cooling for the San Onofre Nuclear Generating Station (SONGS). This requirement is associated with the *California Statewide Policy on the Use of Coast and Estuarine Waters for Power Plant Cooling*, that established uniform, technology-based standards to implement the Clean Water Act Section 316(b), which mandates that location, design, construction, and capacity of the cooling water intake structures reflect the best technology available for minimizing adverse environmental impacts.

This report describes the detailed evaluation of intake relocation technology for SONGS based on the list of site-specific criteria approved by the review committee. The evaluation process includes critical review of published data and literature, consultation with permitting agencies, and technical assessment supported by engineering experience and judgment. No new field data was collected as part of this effort. The results of the evaluation are used to characterize the feasibility of this technology and its possible selection as a candidate for further investigation in a follow-on phase of this study.

2.2 Regulatory History

2.2.1 Federal

The United States Environmental Protection Agency (USEPA) has proposed standards to meet its obligations under the Section 316(b) of the Clean Water Act to issue cooling water intake safeguards. Specifically, this section requires that NPDES permits for facilities with cooling water intake structures ensure that the location, design, construction, and capacity of the structures reflect the best technology available to minimize the harmful impacts on the environment. These impacts are associated with the significant withdrawal of cooling water by industrial facilities which remove or otherwise impact significant quantities of aquatic organisms present in the waters of the United States. Most of the impacts are to early life stages of fish and shellfish through impingement and entrainment. Impingement occurs when fish and other aquatic life are trapped against the screens when cooling water is withdrawn resulting in injury and often death. Entrainment occurs

when these organisms are drawn into the facility where they are exposed to high temperatures and pressures—again resulting in injury and death. (USEPA, 2011)

In response to a consent decree with environmental organizations, the USEPA divided the Section 316(b) rules into three phases. Most new facilities (including power plants) were addressed in the Phase I rules, initially promulgated in December 2001. Existing power plants were subsequently addressed, along with other industrial facilities, in the Phase II rules, issued in February 2004. Since then the rule has been challenged, remanded, suspended, and repropoed. The current proposed version of the rule dictates that all existing facilities that withdraw more than 2 million gallons per day (mgd) of water from waters of the United States and use at least 25 percent of the water they withdraw exclusively for cooling purposes would be subject to:

- Upper limit on the number of fish killed because of impingement and determining the technology necessary to comply with this limit, or
- Reduce the intake velocity to 0.5 feet per second (fps) (through-screen) or lower, which would allow most fish to avoid impingement.

Large power plants (with actual intake flow of 125 mgd or greater) would also be required to conduct a studies to help their local permitting authorities (SWRCB) to determine site-specific best technology available entrainment mortality control. Note, this version abandoned the original performance standards approach that mandated the calculation of baseline against which reduction in entrainment and impingement can be measured.

The Section 316(b) Phase II final rule is expected to be issued July 27, 2012. When the final rule become effective, it is likely to include an implementation timeline that would drive the implementation of technologies to address the impingement requirements within 8 years (2020).

2.2.2 State

The SWRCB is responsible for ensuring compliance with the finalized Section 316(b) rules in California and it has been actively pursuing a parallel path regulatory program that is focused on the state's coastal generating stations with once-through cooling systems, including SONGS. The SWRCB's use of Coast and Estuarine Waters for Plant Cooling (Once-Through Cooling) Policy became effective October 1, 2010. This policy established statewide technology-based requirements to significantly reduce the adverse impacts to aquatic life from once-through cooling. Closed-cycle wet cooling has been selected as the best technology available.

Affected facilities, including SONGS, are expected to:

- Reduce intake flow to a level commensurate with that attainable with a closed-cycle wet cooling system and reduce through-screen velocity to 0.5 fps or below—Track 1, or
- Reduce impacts to aquatic life comparably by other means – Track 2

This policy is being implemented through a so-called “adaptive management strategy” which is intended to achieve compliance with the policy standards without disrupting the critical needs of the state's electrical generation and transmission system. A Nuclear Review Committee was later established to oversee the studies, which will investigate the ability, alternatives, and costs for SONGS to meet the policy requirements. This study is a direct outgrowth of adaptive management strategy to implement this Once-Through Cooling Policy (Bishop, 2011).

Current Cooling Water Intake System and Section 316(b) Compliance History – SONGS

SONGS operates two independent cooling water intake structures to provide cooling water to Unit 2 and Unit 3. Each unit's water withdrawal rate is nominally 828,000 gallons per minute or 1,192 mgd. Both units withdraw water from separate, parallel submerged conduits extending 3,183 feet offshore, terminating at a depth of 32 feet in the Pacific Ocean. The submerged end of each conduit is fitted with a velocity cap to minimize fish entrainment by transforming the vertical flow to a lateral flow, which encourages a flight response from fish close to the structure.

The onshore portion of each intake consists of six vertical traveling screens fitted with 3/8-inch mesh panels. Screens are rotated based on the pressure differential between the upstream and downstream faces or manually. A high-pressure spray removes any debris or fish that have become trapped in the screen face. The vertical traveling screens are angled at approximately 30° to incoming flow. This feature, combined with a series of vertical louvers placed in the forebay, guides the fish to a quiet zone at the end of the cooling water intake structure. A fish elevator periodically empties captured fish into a 4-foot-diameter conduit that returns them by gravity flow to a submerged location approximately 1900 feet offshore. (Electric Power Research Institute [EPRI], 2008). Also housed in the cooling water intake structure of each unit are four saltwater cooling pumps, each rated at 17,000 gpm. These pumps are safety-related and located downstream of the traveling water screens. Operation of one pump is sufficient to supply the saltwater cooling needs for one unit. The total saltwater cooling flow needs for both units is 34,000 gpm. (SONGS, 2004)

SONGS is also planning to add a "large marine organism protection device" to reduce the spacing between the exclusion bars to less than 9 inches, in conformance with SWRCB's *Statewide Water Quality Control Policy on the Use of Coastal and Estuarine Water for Power Plant Cooling*. (Enercon, 2012)

The SONGS cooling water intake system's offshore velocity cap, onshore angled traveling screen system collectively help reduce entrainment and impingement impacts to aquatic life. These systems, along with various previous quarterly impingement monitoring programs, have represented SONGS's ongoing measures to demonstrate compliance with previously applicable Section 316(b) regulatory guidance. This guidance can be described as an overarching federal regulation (40 CFR 125.90(b)) and broadly expressed state policies and permit language, which collectively required facilities to implement Section 316(b) rules using professional judgment on a case-by-case basis.

2.3 Screening Process (A/B Criteria)

The technology screening process for the Phase 1 portion of the evaluation will be performed by using a Criteria Set A/B approach that achieves a technically comprehensive assessment, while concurrently minimizing the time and effort required. The screening will be initially performed for Set A criteria. If the technology satisfies all of the Set A criteria, it will be evaluated using Set B criteria.

Set A criteria include the following items that are judged to be critical to the screening process:

- External Approval and Permitting (Nonnuclear Licensing)
- Impingement/Entrainment Design
- Offsetting Environmental Impacts

All remaining criteria are grouped into Set B criteria, which are shown below:

- First-of-a-kind to scale
- Operability general site conditions
- Seismic and tsunami issues
- Structural
- Construction
- Maintenance

During the screening process, if any criterion cannot be met, the screening process is suspended and a summary report for that technology is then prepared

3. Technology Description

At SONGS, the current cooling water system for each unit consists of an 18-foot-diameter buried offshore pipeline system withdrawing seawater via a velocity cap intake located 3200 feet offshore. The 18-foot pipe delivers water to onshore pump intake structure through gravity. The velocity cap intake is a proven technology that reduces the fish entrainment when compared with a shoreline intake system.

Retrofitting the SONGS existing intake to incorporate a shoreline intake technology would require major structural modification and new construction. A shoreline intake technology will involve creating a shoreline basin enclosure to protect the intake structure from direct wave attack. This would necessitate dredging of the sea bottom inside the basin to a depth suitable to support the operation of the cooling water pumps. Considering the existing shallow seabed conditions at the SONGS shoreline and at the intake location, a minimum basin size would be in an order of about 2,000 feet long by 1,500 feet width (seaward) to a depth of greater than 10 below sea level. The basin needs to be formed by use of construction of offshore breakwaters (see Figure IR-1).

The basin's purpose is to encompass the intake, deflect the design waves, and provide the appropriate minimum seabed elevation. The interior of the basin is based on the depth required for operation of the cooling water pumps.

At SONGS a shoreline intake will be inferior compared to the existing offshore velocity cap system because this shoreline system:

- Requires additional substantial seabed property for placement of breakwaters and the construction of shoreline intake basin.
- Requires substantial dredging of the enclosed basin to provide minimal depth for pump operation (minimum 10 feet below sea minimum water level).
- Requires an open inlet to the sea resulting in an open gateway for fish and other marine organisms without the positive benefit of the velocity cap.
- Requires substantial demolition and construction at the shoreline to fit the new system into the existing system.
- Due to the seabed being sedimentary at SONGS, it is anticipated the intake will be subject to regular dredging during the operation phase to maintain the required sea depth.
- Requires a lengthy outage of both units to support initial construction of the system and later outages for maintenance dredging.

4. Criterion Evaluation

4.1 External Approval and Permitting

4.1.1 General Discussion

The external approval and permitting assessment focused on identifying the applicable (required) permits and approvals for construction and operation of a shoreline intake system.

The initial assessment effort focused on developing a comprehensive list of potentially applicable permits and approvals at the federal, California, county, and municipal level (as applicable). This applicability of each permit/approval to the proposed shoreline intake option was evaluated. Those permits and approvals that were deemed applicable were subsequently scrutinized to characterize the expected duration and complexity of the regulatory review process. Special attention was directed to identifying environmental impact issues or criteria that would preclude the applicable permit or approval from ever being issued or granted. That is, the focus was to screen each applicable permit or approval for fatal flaws in the associated regulatory review process which would preclude the shoreline intake system from further consideration.

The assessment also focused on identifying the critical path (longest duration) initial preconstruction permitting processes, that is, those that support site mobilization, physical site access, initial earthwork/foundations for each cooling system technology option. The duration of the permitting and the approval process, while not a definitive fatal flaw, could later serve as a screening tool if combined with specific schedule limitations.

Permits and approvals that support later stages of construction and operation that are not critical path to the start of construction were also included in the assessment since these items could pose significant operational constraints to future SONGS operations.

4.1.2 Detailed Evaluation

This summary list of permits provided the basis for subsequent discussions with key relevant regulatory authorities regarding the applicable permit application needs and the permit review time frames. These discussions were also critical for the identification of potential regulatory or permit-related barriers to implementation—fatal flaws.

The following regulatory authorities contacted:

- U.S. Army Corps of Engineers (USACE)
- U.S. Marine Corps – Camp Pendleton
- California Public Utility Commission (CPUC)
- California Coastal Commission
- California State Lands Commission
- State Water Resources Control Board (SWRCB)
- San Diego Regional Water Quality Control Board (SDRWQCB)
- San Diego Air Pollution Control District
- San Diego County Department of Environmental Health

The following sections describe the relevant key permitting/approval processes for this technology. These processes are summarized in Table IR-1. This table lists the applicable permits and approvals, determines the critical path review processes, and, most importantly, highlights those processes that may be fatally flawed.

4.1.2.1 Shoreline Intake System

The shoreline intake system involves essentially abandoning the existing offshore intake system (velocity cap system in 32 feet of water and associated piping) and then modifying the existing pump house to receive cooling water in a shoreline intake system.

U.S. Army Corps of Engineers

The USACE is the lead agency for Clean Water Act Section 404 and Section 10 permitting processes, which are focused primarily on impacts to waters of the United States and waterborne navigation. The shoreline system will involve near-shore construction activities, which will pose significant impacts to USACE jurisdictional waters.

For minor impacts, the USACE has established a general permit program (nationwide permit) for a host of less significant work processes involving waters of the United States. The significant marine work associated with this cooling system option is likely to preclude any nationwide permit permitting process. SONGS, therefore, may be faced with securing the more complex individual Section 404/10 permit.

While individual Section 404 permit review periods can often be lengthy, the USACE representative for the SONGS area explained that all USACE facilities have goals to issue an individual Section 404 permit within 120 days of deeming the associated application complete (Lambert, 2012). This period is a goal, not a statutory commitment. Consequently, in many cases, this goal is not realized. These delays are often associated with the mandated consulting processes that need to be pursued with the State Historic Preservation Office, U.S. Fish and Wildlife Service, or National Marine Fisheries Service. In other cases, there are extensions of public notice periods or scheduling complications for the public hearing. The applicant for the Section 404/10 permit has to directly pursue consultations with California Coastal Commission and SWRCB. Receipt of an individual Section 404 permit is contingent on previous receipt of permits from the California Coastal Commission and SWRCB.

This difficult situation with the permitting process is impeded further by under the staffed local USACE office (two to three permit writers), so permit review durations have been getting longer. For the more complex and contentious situations, the permitting process can extend to 1 to 2 years. Hence, the USACE permits are often characterized as the critical path permitting process. Given the significant new marine work associated with this cooling technology option, it is likely that the Section 404 will represent a critical path item to the completion of permitting.

Despite the potential for review periods longer than the 120-day target, the USACE did not see any specific barriers or fatal flaws regarding the Section 404 permitting process for the new shoreline intake system.

U.S. Marine Corps – Camp Pendleton

SONGS is located on leased property that is part of the U.S. Marine Corps Camp Pendleton. Any significant physical improvements to the SONGS facility, such as the addition of closed cooling systems, are potentially subject to a formal review and approval process by the U.S. Marine Corps and U.S. Department of the Navy.

SONGS resides on land that is subdivided into two leases and 9 easements. The SONGS lease grants the U.S. Marine Corps and the U.S. Department of the Navy authority to review and improve physical improvements on the subject property (Rannals, 2012). While this authority does not formally extend to offshore properties,

the U.S. Marine Corps is also interested in near-shore work in the area, since it could potentially impact their marine training activities.

The shoreline intake system would demand additional coastline seaside federal land for placement of off-shore breakwaters and dredging of the seabed, and it is possible that the addition of this cooling system technology will trigger a formal review and approval process. If required, the related application is initially submitted to the U.S. Marines/Camp Pendleton (with appropriate site plan drawings and associated written descriptions). This application would be reviewed by the Camp Pendleton staff and the staff would subsequently compile their findings and make a recommendation to the Camp Pendleton Base Commander regarding the application. With this input, the Base Commander would then develop and submit a recommendation to the U.S. Marine Corps headquarters and subsequently to the U.S. Department of Navy. The U.S. Department of the Navy would provide the final approval/denial of the proposed new SONGS facility on leased Camp Pendleton property.

Because the shoreline intake system will trigger a formal review and approval process, the associated significant offshore work could be viewed negatively by the U.S. Marine Corps, if it appears to compromise their marine training regimen. It is unclear whether the U.S. Marine Corps can (or would choose to) exert influence through their land-based lease and easement arrangement for work carried outside of their lease area.

California Public Utility Commission

SCE's SONGS is regulated by the CPUC, which is charged with overseeing investor-owned public utilities. Given the lack of significant county involvement on this federal property, the CPUC will likely be designated the lead agency for the CEQA review process. CEQA is regulatory statute, which requires state or local regulatory agencies to identify, assess, avoid, or otherwise mitigate the significant environmental impacts from the proposed action—the addition of new cooling system technology.

The proposed new shoreline intake system will certainly trigger preparation of an Environmental Impact Report). The Environmental Impact Report is a detailed report that identifies the potentially significant environmental effects the project is likely to have; identifies feasible alternatives to the proposed project; and indicates the ways in which significant effects on the environment can be mitigated or avoided. This Environmental Impact Report will also be used by other state agencies to support their respective review and approval processes.

Following finalization of the Environmental Impact Report, the CPUC will evaluate whether to certify CEQA compliance. This certification then supports their subsequent decision regarding whether the costs associated with the new cooling system can be reclaimed via a consumer rate base adjustment.

While the CPUC-sponsored review process and decision regarding cost recovery will likely be a lengthy, complex, and contentious process, there are no definitive environmental barriers that preclude the successful completion of the CEQA review and a positive record of decision.

California Coastal Commission

The California Coastal Commission has a broad mandate to protect the coast resources of California which include the SONGS facility, including the Mesa Complex. Consequently, the Commission's environmental concerns address a broad range of subject matter include visual resources, land and marine-based biological resources, land use and socioeconomic concerns (for example, recreational use/access). Despite this compre-

hensive focus, the Commission has little in the way of specific, objective criteria that could be used to effectively screen any of the cooling system technology options from further consideration.

The California Coastal Commission representatives (Detmer & Luster 2012) indicated that the Commission recognized that there were no great options to the existing once-through cooling system at SONGS. The Commission believes that almost all of the cooling system technology replacement options present some sort of negative impacts. Given that basis, the Commission appears to be resigned to consider options that may present additional onshore or different offshore impacts to help mitigate the offshore environmental consequences of the existing once-through cooling. The Commission mandate to protect the coastal resources offers this agency some latitude to balance one set of impacts versus another. This evaluation process is on a case-by-case basis, which can be translated into the conclusion that there are few triggers that would automatically preclude any cooling system options from consideration. That being said, the benefits of relocating an existing offshore intake system in a less biological rich environment using a velocity cap compared to an shoreline system in more sensitive intertidal and sub-tidal lands (even with considering a more thoroughly screened system) are difficult to discern.

The shoreline system would essentially abandon the existing offshore piping and intake infrastructure and develop a new near-shore system with attendant near-shore construction activities that will impact sensitive marine resources (for example, local fish, shellfish, vegetation, hard marine substrate, commercial fishing). The offsetting positive benefits of this effort from an operational point of view appear to be limited, since the current system already uses an angled traveling screen system. Visual impacts in the coastal zone, a typical key California Coastal Commission subject area, may be an important factor for this expected low profile near-shore system. Entrainment or thermal discharge impact matters will also be sideline issues, since they remain largely unchanged with this cooling system option.

The California Coastal Commission consideration of these issues and their follow-on approval process is mostly aligned with the CEQA process. That is, any application for a Coastal Development Permit will depend on information that is generated by associated Environmental Impact Report development process. Consequently, the Commission permit review process will also be aligned with CEQA and consequently its duration will mirror the CEQA timeline (6 months – 1 year). That period offers evidence that the Coastal Development Permit could be a critical path permitting process.

California State Lands Commission

Construction efforts in subaqueous lands associated with any cooling system modifications will be evaluated/approved by the California State Lands Commission. This review and associated lease approval process can follow three different tracks, as shown below:

- **Categorical Exemption** — applicable to those situations where there are no significant environmental impacts and there are no substantive changes in the existing land use. It is unlikely that this option would apply to any of the potential cooling system options that require marine work.
- **Mitigated Negative Declaration** — applicable for work that poses minor environmental impacts, during noncritical seasons, for limited period of time.
- **Environmental Impact Report/CEQA Process** — applicable for work that could potentially generate significant environmental impacts, uses heavy construction equipment, and/or will continue over a significant time period (months). This review process is not fast-track and could extend for a year.

The State Lands Commission evaluates each project individually and determines the appropriate review/approval path. As the shoreline intake option will obviously result in a significant addition of cooling

system infrastructure to subaqueous lands, SONGS will not be able to pursue the largely administrative *Categorical Exemption* path or the streamlined *Mitigated Negative Declaration* process. This option will invoke the longer, more complex Environmental Impact Report/CEQA review process.

Commission representatives (DeLeon & Oggins, 2012) explained the current process for nonnuclear coastal power plant lease holders to develop and implement their “implementation plan” to meet California’s Once-Through Cooling Policy performance goals has been very slow. Most of these facilities have requested extensions to continue to evaluate the potentially available mitigation strategies. This experience offers evidence that the associated CEQA review will not be an expeditious process. A review period of at least a year is a distinct possibility.

Despite this expected lengthy review process, the shoreline intake marine work in subaqueous lands does not appear to offer any specific impacts or regulatory considerations that represent fatal flaws.

State Water Resources Control Board - San Diego Regional Water Quality Control Board

While the SWRCB has overall permit authority for California’s two active nuclear power stations, the SDRWQCB has the follow-on inspection and enforcement role for the issue permits. For SONGS, the SWRCB expects to modify the existing NPDES permit in support of the proposed shoreline intake system. The lack of significant disruption to local land surfaces is expected to negate any need for new waste discharge requirements permit for construction impacts to jurisdictional streambed areas and possibly avoid the need to seek coverage under the general storm water permit for construction activity.

Shoreline intake system construction activities will potentially generate significant, temporary, and permanent water quality and marine habitat (intertidal and subtidal) impacts. Reconfiguring shoreline intake system, installing breakwaters, and dredging requirements will result in significant localized turbidity impacts and some temporary and permanent loss of the biological productive near-shore marine habitat area.

Operationally, the shoreline intake system in itself will not reduce impingement-related cooling system impacts and it has the potential to create a condition that reduces the impingement and entrainment protection since the advantages provided but the current velocity cap will be lost. This system will not, by itself, reduce the overall water withdrawal or discharge rates. Consequently, the entrainment impacts may be more significant given its new shoreline location and the thermal discharge impacts to aquatic life will remain largely unchanged.

Given that the cooling water withdrawal and discharge rates will remain essentially unchanged, any revisions to the current SONGS NPDES permit will be limited to compliance provisions of Section 316b Phase II requirements. There will ostensibly be no changes to the current water treatment system, as this option is still a once-through system that now boasts an shoreline intake system.

Both the SWRCB and SDRWQCB representatives (Jauregui, 2012 and Morris, 2012) explained that there are no obvious regulatory barriers regarding issuance of this revised NPDES permit for any of the cooling system options currently under consideration, including the relocation of the SONGS offshore intake to a shoreline location. While the SDRWQCB and SWRCB indicated that they would not necessarily preclude cooling system options from consideration, even if these options fall short of full compliance with the performance criteria tied to Section 316b Phase II rules (that is, through-screen velocity less than 0.5 fps and entrainment/impingement levels equivalent that associated with a closed cooling cycle system), the shift to a shoreline intake offers no benefits over the existing offshore intake system and certainly falls well short of the attributes of a closed-cycle cooling system.

The SWRCB is ultimately a political body (9 members), interested in reviewing as much information/evidence from the applicant and from their own technical staff regarding the feasibility and impacts of various cooling system alternatives. Consequently, none of the SWRCB permits represent a fatal flaw or critical path permitting process to shoreline intake system despite its failure to even compare favorably with the existing system at SONGS.

San Diego Air Pollution Control District

SONGS is located within the San Diego Air Pollution Control District, a state-designated, non-attainment area for PM-10 and PM-2.5, i.e., the Air Pollution District has failed to achieve compliance with the state ambient air quality standards for these pollutants (Annicchiarico, 2012). In addition to this air quality compliance issue, there are also local concerns regarding visibility impacts on the nearest visibility sensitive areas, so-called Class I areas that are comprised of national parks (over 6000 acres), wilderness areas (over 5000 acres), national memorial parks (over 5000 acres), and international parks that were in existence as of August 1977. While these situations may have ramifications for those cooling system options that generate significant particulate emissions (closed cooling cycle systems), air quality permits/approvals are not expected to play an appreciable role for the shoreline intake system—a system that is not expected to generate any additional operational air emissions.

San Diego County Department of Environmental Health

Because SONGS is located entirely on leased federal property that is part of the U.S. Marine Corps Camp Pendleton, any significant physical improvements to the SONGS facility are not subject to San Diego County review. The review process is essentially delegated to the U.S. Marine Corps and U.S. Department of the Navy. Consequently, most of the county departments (of Planning and Land Use, Public Works, and Building Division), do not directly regulate SONGS.

Despite the fact that the county oversight for SONGS is constrained, there are six separate ongoing county lead regulatory programs at this facility (Mache, 2012). The County Environmental Health Department has received California Environmental Protection Agency approval to be the Certified Unified Program Agency responsible for managing the following programs:

- **California Aboveground Storage Tank Program** — mandates development and implementation of a Spill Prevention and Countermeasure Control Program and tank inspections.
- **California Underground Storage Tank Monitoring Program** — addresses fuel storage and leak detection in Mesa Complex and power block area.
- **Hazardous Waste Storage and Treatment** — includes small proprietary oil separation facility.
- **Medical Waste Disposal** — a county ordinance makes this an Environmental Health Department responsibility.
- **Clean Air Act 112r Risk Management Plan** — addresses onsite aqueous ammonia storage
- **Hazardous Material Business Plan** — addresses storage of greater than 55 gallons of chemicals with potential for offsite impacts and addresses the facility's Emergency Planning and Community-Right-to-Know (EPCRA) responsibilities.

The shoreline intake system will likely not demand any additional chemical additives or force the relocation of any existing chemical and fuel storage systems. Routine maintenance and cleaning of the intake system could produce an additional waste stream composed primarily of debris and vegetative materials around that

facilities screen system. These maintenance wastes and other aspects of the shoreline intake system operation will not present any obvious county-sponsored regulatory barriers or represent critical path permitting processes.

Other Regulatory Agencies

In addition to the key regulatory agencies described above, there are a number of regulatory agencies that could potentially play a role in the permitting of the various cooling system technology options. The U.S. Fish and Wildlife Service, California Department of Fish & Game (CDFG), and California Office of Historic Preservation, for example, often play significant regulatory roles in power plant upgrade projects. Construction and operation of the shoreline intake system will temporarily and permanently disturb sensitive marine habitat and could actually increase impingement and entrainment impacts to local fish and shellfish. These attributes will make the U.S. Fish and Wildlife Service and CDFG service key parties to CEQA review process, but they are not expected to trigger the need to secure a 2081 Incidental Take Permit because of the lack of marine-based endangered species (Enercon). Since this option primarily involves near-shore work and underwater facilities, it is unlikely the cultural or historic resources (land-based) will be impacted.

Installation of this partly submerged screening system will not alter the overall profile of the SONGS facility and will certainly not require significantly tall or large construction equipment. These considerations will preclude significant interactions with the California Department of Transportation (Caltrans) (roadway crossings, encroachments, oversized vehicles) and the Federal Aviation Administration (FAA), whose focus would be limited to aviation obstruction impacts posed by tall new permanent or temporary features (less than 200 feet above ground level).

Finally, the California Energy Commission (CEC) will be largely excluded from the permitting processes primarily because relocation of the intake to a near-shore location will provide only a very limited improvement in the overall efficiency of the SONGS facility that will fall well short of the 50 MW thresholds for CEC review.

4.1.2.2 Summary

The external approval and permitting assessment for the shoreline intake system identified a list of potentially applicable federal, state, and local permits and approvals that, not surprisingly, focused on its significant impacts to the marine environment. The efforts to conduct a successful CEQA review and secure the USACE Section 404 permit, California Coastal Commission Coastal Development Permit, State Lands Commission Lease, NPDES permit modification will represent the primary regulatory challenges.

These permits are all expected to be contentious and have lengthy processes that will be aligned with the CEQA/Environmental Impact Report review process. The primary issue of concern will be that the shoreline system poses significant construction impacts to the sensitive and productive marine habitats, and offers no reductions of impingement or entrainment impacts that are already partially mitigated by the existing offshore velocity cap intake system. Despite failure to show tangible environmental improvements, the consistent message from all of the interested regulatory agencies was that there were no environmental impact issues or criteria that would preclude this technology option from securing the necessary construction and operating permits and approvals. That is, there were no fatal flaws in the associated regulatory review process, which would preclude the shoreline intake screen system from further consideration.

The assessment also indicated that the Section 404 permit and the CPUC-sponsored CEQA review process will likely represent the critical path review and approval processes (approximately 12 month) for the shore-

line intake system. This critical path process does not represent a barrier to development of this cooling technology system.

4.2 Impingement/Entrainment Design

4.2.1 General Discussion

The current SONGS offshore velocity cap system reduces the entry of fish into the intake system by establishing a radial flow field around the inlet, which reduces fish entrainment to some degree when compared to a shoreline open channel intake. The application of a new shoreline will no longer retain the marine resource benefits associated with the current offshore intake system.

4.2.2 Detailed Evaluation

The detailed evaluation of impingement and entrainment impacts realized by the onshore intake are:

- The shoreline intake technology offers no impingement or entrainment mitigation benefits when compared to the existing velocity cap technology. The system withdraws water from a more biologically productive near-shore area.
- Maintains an open channel to the open ocean environment for fish and other organisms to enter the pumphouse.
- Offers no reduction in water withdrawal rates.
- Includes a screen system that will be prone to overloading and failure.

4.3 Environmental Offsets

4.3.1 General Discussion

The environmental offsets are an environmental management tool that has been characterized as the “last line of defense” after attempts to mitigate the environmental impacts of an activity are considered and exhausted (GWA, 2006). In some cases, significant unavoidable adverse environmental impacts may be counterbalanced by some associated positive environmental gains. Environmental offsets, however, are not a project negotiation tool, that is, they do not preclude the need to meet all applicable statutory requirements and they cannot make otherwise “unacceptable” adverse environmental impacts acceptable within the applicable regulatory agency.

In some cases, regulatory agencies may be so constrained by their regulatory foundation that offset opportunities are limited or unavailable. The San Diego Air Pollution Control District, for example, has the regulatory authority to offset new air emissions in their district from previously banked emission reductions as long as the new emission sources meet appropriate stringent emission performance criteria. The Air Pollution Control District cannot offset new air emissions with reductions in the impingement and entrainment impacts to aquatic life or reductions in land disturbance. In other cases, the regulatory agencies, such as the California Coastal and State Lands Commissions, have a more broad-based, multidisciplinary review process that supports a more flexible approach to using environmental offsets to generate the maximum net environmental benefit.

With these considerations in mind, the following assessment of offsetting environmental impacts focuses on identifying both positive and negative construction and operational environmental impacts associated with construction and operation of shoreline intake system from a broad range of environmental evaluation criteria.

4.3.2 Detailed Discussion

The following sections evaluate the air, water, waste, noise, marine and terrestrial ecological resources, land use, cultural and paleontological resources, visual resources, transportation, and socioeconomic issues associated with construction and operation of the shoreline intake system. Given the wide range of environmental impact subject areas under consideration, the systematic approach used in the SONGS License Renewal Application process was used (PG&E, 2009). Consequently, following discussion of the individual environmental subject areas, the related consequences are categorized as having either positive or negative small, moderate, or large impact significance. The specific criteria for this categorization are shown below:

- **Small:** Environmental effects from not detectable or minor such they will not noticeably alter any important attribute of the resource
- **Moderate:** Environmental effects are sufficient to noticeably alter, but not significantly change, the attributes of the resource.
- **Large:** Environmental effects are clearly noticeable and are sufficient to change the attributes of the resource.

The results of these evaluations and impact categorization are subsequently summarized in Table IR-2.

Air

The air quality impacts associated with installation of the shoreline intake system are small given that the primarily marine-based nature of the associated construction activities. There will be little or no opportunity to generate fugitive dust from land disturbance activities, as the primary activity will involve marine work. Some additional vehicles-related air emissions can be expected from the small number of outage workforce personal vehicles and over-the-road project construction vehicles. Self-propelled earthmoving equipment will be unnecessary, but there may be some emission sources on temporary offshore platforms or barges. Construction supplies and shoreline intake and piping-related equipment deliveries may be significant in the early phases of construction.

The shoreline intake system may result in minor improvement in the SONGS overall plant efficiency due to decrease in pumping power demand associated with shoreline intake versus existing offshore velocity cap system. The resulting power generation improvement is not expected to produce any tangible increase in greenhouse gas or other pollutant emissions from replacement of fossil power sources.

Surface Water

Shoreline system construction activities are primarily marine-based and they have the potential to generate significant water quality impacts. Construction of the shoreline intake system, offshore massive breakwaters, and associated dredging will result in significant turbidity impacts from disruption of the local seabed—a significant negative impact. These construction efforts are not expected to result in any land-based disturbance or storm water-related impacts.

The shoreline intake system will not change the overall cooling water withdrawal or discharge rates.

Groundwater

Given the primarily marine construction environment associated with the installation of the shoreline intake system, no significant additional groundwater resources will be needed.

The shoreline intake system is not expected to require any additional groundwater resources.

Waste

Constructions-related waste, including marine bed sediment and recyclable metals associated with surplus piping and the shoreline intake system, will be generated during the outage. Marine dredge spoil volumes would be considerable. The final disposition of these materials has not been determined. Most of the piping and related wastes are expected to have salvage value and, therefore, will not represent a burden to offsite disposal facilities. Disposal of the marine sediment, whether directed to an onsite or offsite disposal area, will represent a moderate construction negative impact.

Physical inspection and cleaning of this intake system as part of the maintenance program is likely to generate additional biological wastes. The new shoreline location may make this increase significant. Collection and disposal of these marine wastes, therefore, can be categorized a moderate operational negative impact.

Noise

Previous studies have concluded from consultations with the County of San Diego County, City of San Clemente and Camp Pendleton, that noise levels are expected not to exceed 70 dBA at the nearest public receptor (Tetra Tech, 2008). Noise impacts from construction activities for the shoreline intake system are not expected to be significant for land-based locations, since the primary work areas will be well offshore. Buffer areas around offshore construction zones will likely be established for safety reasons, but will also serve to reduce noise impacts to offshore noise receptors (watercraft) and shoreline recreational areas (for example, San Onofre State Beach). Given the remaining potential for noise impacts to the public along the immediate shoreline recreational areas, the construction activities could pose a small negative impact.

Operational noise levels are expected to be largely unchanged following installation of the new shoreline intake system.

Land Use

Construction activities associated with this system are primarily near- or onshore and these activities could temporarily preclude normal recreational activities in waters in the immediate construction areas. As mentioned above, buffer zones will be created and maintained during the course of construction for the safety of the workforce and the public. The potential temporary restriction of normal public access in these marine areas represents a small negative impact for this cooling technology option.

The shoreline intake system may represent a change in land use in areas occupied by the previous intake system (which includes some near-shore components) and in previously undeveloped subaqueous areas. The shoreline location of the intake is not expected to impact waterborne traffic. Given these impacts, operation of this underwater system is expected to offer a small-term negative impact.

Marine Ecological Resources

Reconfiguring shoreline intake system that includes construction of massive breakwater system and near-shore dredging of sea bottom will result in significant localized turbidity impacts and temporary and permanent loss of the biological productive near-shore marine habitat area—a significant negative impact.

Operationally, the shoreline intake system will increase the impingement-related cooling system impacts since the benefits derived from the offshore velocity cap are lost. Without improvements in screening, the impingement losses are expected to get worse. This system will not, by itself, reduce the overall water withdrawal or discharge rates. Consequently, the entrainment impacts may be more significant given its new shoreline location and the thermal discharge impacts to aquatic life will remain unchanged. Collectively, this system will, operationally, offer a negative impact relative to the current condition.

Terrestrial Ecological Resources

Construction activities associated with the shoreline intake system are primarily marine-based and consequently present little impact to land areas. There will be no construction impacts to terrestrial natural habitat areas or areas with significant ecological value or sensitivity. Operation of the shoreline intake system will similarly present no new threat to these resource areas.

Cultural and Paleontological Resources

Because installation of the shoreline intake will be confined to subaqueous lands, there is little or no potential to discover new cultural or paleontological resources in these developed areas. Operation of this system will similarly pose no new threat to cultural or paleontological resources.

Visual Resources

All construction equipment will be low profile, that is, the construction support features and equipment will not extend above the height of local facility structures. However, some of the construction activities associated with development of new breakwater features will be very visible from the ocean. This activity can be characterized as a small negative impact.

The breakwaters associated with the shoreline intake system will present permanent change in external profile of the facility, as seen from the ocean. These features, though low profile, represent an operational small negative impact.

Transportation

Increased commuting traffic from the construction workforces and construction deliveries could worsen the existing level of service on local roads during the plant outage. While the associated construction period means that related traffic impacts will not be transitory, the necessary workforce is not expected to be large. Consequently, the transportation-related construction impacts should be considered a small negative impact.

Operationally, the shoreline intake system will increase maintenance and service requirements for the various submerged screen modules, but any related maintenance staff increases are expected to be minimal. Therefore, there are limited or no operational transportation impacts for this system.

Socioeconomic Issues

While there will be some additional construction-related employment opportunities, these opportunities are not expected to significantly strain local community resources (for example, housing, school, fire/police services, water/sewer).

Operational maintenance staff levels may increase slightly in response to increase cleaning and marine waste management demands associated with the shoreline intake, but will not result in any related community service or resource concerns.

4.3.3 Summary

Table IR-2 summarizes the air, water, waste, noise, marine and terrestrial ecological resources, land use, cultural and paleontological resources, visual resources, transportation, and socioeconomic environmental offsets for the shoreline intake system. The construction impacts could be characterized as having moderate negative impact significance in that some of this work may be conducted on previously disturbed subaqueous land. Construction practices will involve significant marine-based work that will generate increased turbidity in the local seawater, could produce a sizeable marine spoils waste, and result in permanent and temporary losses of additional biologically productive near-shore marine habitat. These impacts are not offset by the limited employment opportunities that may be gained during this same period.

Operationally, there are negative impacts related to shifting from the existing offshore velocity cap system to a shoreline intake system due to the expected increase in fish impingement and entrainment, debris handling, and maintenance dredging. The existing velocity cap technology is situated in fairly deep water and is designed to mitigate some of the impingement and entrainment impacts. The shoreline system draws from the biologically more rich intertidal and sub-tidal zones. There is no coincident reduction of cooling water withdrawals, so there are no change in thermal discharge impacts. Collectively, we have identified no positive operational environmental attributes with the shoreline intake system to offset the moderate construction-related negative impact associated with the disruption of additional marine habitats and localized water quality degradation

4.4 First-of-a-Kind in Scale

This criterion has not been evaluated because this technology has been determined to be technically unacceptable in Section 4.2 for this application.

4.5 Operability General Site Conditions

This criterion has not been evaluated because this technology has been determined to be technically unacceptable in Section 4.2 for this application.

4.6 Seismic and Tsunami Issues

This criterion has not been evaluated because this technology has been determined to be technically unacceptable in Section 4.2 for this application.

4.7 Structural

This criterion has not been evaluated because this technology has been determined to be technically unacceptable in Section 4.2 for this application.

4.8 Construction

This criterion has not been evaluated because this technology has been determined to be technically unacceptable in Section 4.2 for this application.

4.9 Maintenance

This criterion has not been evaluated because this technology has been determined to be technically unacceptable in Section 4.2 for this application.

5. Conclusion

As described in Sections 3 and 4, because the shoreline intake technology is less effective in mitigating fish entrainment impacts when compared to the existing offshore velocity cap system technology, this technology should not be considered for further evaluation. Additionally, there is no data to support that abandoning the current offshore intake and installing an onshore intake at SONGS will provide any improvements in fish entrainment and impingement compared to the existing offshore velocity cap system.

6. Appendices

None.

6.1 Input Data

The input data as cited in this section are from the references listed in Section 6.2.

6.2 References

Annicchiarico, J., San Diego Air Pollution Control District (personal communications, April 6, 2012)

Bishop, J., *Policy on Use of Coastal and Estuarine Waters for Power Plant Cooling* – CalEPA, SWRCB

California's Coast Power Plants: Alternative Cooling System Analysis, Section N. San Onofre Nuclear Generating Station, Tetra Tech

DeLeon, J., California State Lands Commission (personal communications, April 16, 2012)

Design of Large Organism Exclusion Device for San Onofre Nuclear Generating Station Units 2 and 3, Enercon, May 2012.

Detmer, A., California Coastal Commission (personnel communications, April 17, 2012)

Environmental Offsets Position No. 9, Government of Western Australia (GWA), January 2006



EPRI, *Comprehensive Demonstration Study for Southern California Edison's San Onofre Nuclear Generating Station*, January 2008

Feasibility Study for Installation of Cooling Towers at San Onofre Nuclear Generating Station, Enercon Services, Inc.

Jauregui, R., State Water Resources Board (personnel communications, May 2, 2012)

Lambert, J., U.S. Army Corps of Engineers (personal communication, April 11, 2012)

Luster, T., California Coastal Commission (personal communication, April 17, 2012)

Mache, Manon, San Diego County Department of Environmental Health (personal communications, May 1, 2012)

Morris, R., San Diego Regional Water Quality Control Board (personal communications, April 19, 2012)

Oggins, C., California State Lands Commission (personal communications, April 16, 2012)

Proposed Regulations to Establish Requirements for Existing Cooling water Intake Structures at Existing Facilities, EPA – 820-F-11-002, USEPA, March 2011

Rannals, L., USMC, Camp Pendleton (personnel communication, April 3, 2012)

SONGS, 2004. *Saltwater Cooling System*, System Description, Rev. 7

SONGS, 2008, *Circulating Water System Description*, SD-S023-280, Rev. 14

6.3 Sketches

Figure IR-1. Layout of Shoreline Intake Concept

**Table IR-1.
Environmental Permit/Approval Assessment: Initial Intake Relocation (Shoreline Intake)
San Onofre Nuclear Generating Station**

| Permit/Approval | Assessment | Permit Review Period (Preconstruction) | Critical Path (Yes/No/NA) | Fatal Flaw (Yes/No/NA) |
|---|---|--|--------------------------------------|-----------------------------------|
| National Environmental Policy Act – Bureau of Land Management (BLM) or Other Responsible Lead Federal Agency (Record of Decision, Right-of-Way) | Not applicable — the addition of the shoreline intake system does not constitute major federal action (federal land, funding). | Not applicable | NA | NA |
| U.S. Department of Navy and U.S. Marine Corp – Camp Pendleton Lease | Not applicable — U.S. Marine Corps Camp Pendleton and ultimately the U.S. Department of Navy approvals are needed to amend the lease for significant additions to the SONGS leased property or adjacent Camp Pendleton lands. The intake system will not demand any additional land, nor involve any exterior changes to existing structures. | Not applicable | NA | NA |
| Section 404/10 Permit – U.S. Army Corps of Engineers (USACE) | Installation of the shoreline intake system will generate significant impacts to waters of the United States. | 120 days from complete application (goal) ~12 months (expected) | Potential | NA |
| Section 401 Water Quality Certificate – U.S. Army Corp of Engineers (USACE) & Regional Water Quality Control Board (RWQCB) | Section 401 permit process will parallel Section 404 permit process. | ~12 months (expected) | Potential | NA |
| Nationwide Permit – U.S. Army Corps of Engineers | Not applicable — the installation of the shoreline intake system will generate significant impacts to waters of the United States that cannot be addressed by the nationwide permitting process. | Not applicable | NA | NA |
| Section 7 Consultation with U.S. Fish and Wildlife Service (Endangered Species Act of 1973) | Installation of the shoreline intake system poses significant impacts to local marine habitat and aquatic life, but does not offer any tangible reductions in impingement or entrainment impacts. | Connected to CEQA process | No | No |
| Notice of Proposed Construction or Alteration – Federal Aviation Administration (FAA) | Not applicable — the addition of the addition of the shoreline intake system will not result in any significant exterior changes to existing structures. | Not applicable | NA | NA |

Table IR-1.
Environmental Permit/Approval Assessment: Initial Intake Relocation (Shoreline Intake)
San Onofre Nuclear Generating Station (cont.)

| Permit/Approval | Assessment | Permit Review Period (Preconstruction) | Critical Path (Yes/No/NA) | Fatal Flaw (Yes/No/NA) |
|---|---|--|---------------------------|------------------------|
| Notice of Proposed Construction or Alteration – FAA | Not applicable — the addition of the shoreline intake system will not demand the services of a crane or other construction equipment in excess of 200 feet above ground level. | Not applicable | NA | NA |
| Multiple-Use Class L Limited Land Use Designated Utility Corridor – Bureau of Land Management (BLM) or Other Responsible Federal Agency | Not applicable — superseded by U.S. Department of Navy lease arrangement with SONGS. The addition of the shoreline intake system will not require any additional land, nor involve any significant exterior changes to existing structures | Not applicable | NA | NA |
| California Public Utility Commission (CPUC) Approval | CPUC will likely be the lead agency for the California Environmental Quality Act (CEQA) review process regarding the proposed shoreline intake system. The CEQA review process triggers development of a comprehensive Environmental Impact Report. | ~12 months | Potential | No |
| California Energy Commission (CEC) – Final Decision | Not applicable — the addition of the shoreline intake system will not result in a net power capacity (increase) >50 MW, the threshold for CEC review. | Not applicable | NA | NA |
| Coastal Development Permit California Coastal Commission/Local Coastal Programs | Applicable because of the considerable near-shore development within the Coastal Zone. While there are no specific fatal flaws with the shoreline intake system, the significant construction-related marine habitat impacts and inability to appreciably reduce impingement or entrainment losses are likely to make for a contentious approval process. | Connected to CEQA (~12 months) | Potential | NA |
| Coastal Development Lease – California States Lands Commission | Applicable because of the considerable offshore development on subaqueous lands. While there are no specific fatal flaws with the shoreline intake system, the significant construction-related marine habitat impacts and associated limited reduction in operational impingement losses are likely to make for a contentious approval process. | Connected to CEQA (~12 months) | Potential | NA |
| Regional Pollution Control District Permit to Construct (ATC) – San Diego Regional Air Pollution Control District | Not applicable — the shoreline intake system will not generate any additional operational air emissions. | Not applicable | NA | NA |

Table IR-1.
Environmental Permit/Approval Assessment: Initial Intake Relocation (Shoreline Intake)
San Onofre Nuclear Generating Station (cont.)

| Permit/Approval | Assessment | Permit Review Period (Preconstruction) | Critical Path (Yes/No/NA) | Fatal Flaw (Yes/No/NA) |
|--|--|--|---------------------------|------------------------|
| Regional Control District Permit to Operate (PTO) – San Diego Air Pollution Control District | Not applicable — the shoreline intake system will not generate any additional operational air emissions. | Not applicable | NA | NA |
| Title V Federal Operating Permit – San Diego Air Pollution Control District and USEPA | Not applicable — the shoreline intake system will not generate any operational additional air emissions. | Not applicable | NA | NA |
| Title IV Acid Rain Permit - USEPA | Not applicable — the shoreline intake system will not generate any additional operational air emissions. | Not applicable | NA | NA |
| Dust Control Plan – San Diego Air Pollution Control District | Not applicable — construction of the shoreline intake system expected to disturb little ground surfaces and so there is little potential to generate significant dust emissions. The system itself will not generate any additional air emissions. | Not applicable | NA | NA |
| NPDES Industrial Discharge Permit – Regional Water Quality Control Board (RWQCB) and State Water Resources Board | The shoreline intake system will not change the cooling water withdrawal or blowdown rates. This system is not expected to demand any changes in the water treatment system. Any subsequent required alteration of the current NPDES permit will be minor. | ~6 months | No | No |
| Notice of Intent (NOI) – National Pollutant Discharge Elimination System General Permit for Storm Water Discharges Associated with Construction Activity, San Diego Regional Water Quality Control Board (SDRWQCB) | Land disturbances associated with the development of new breakwaters will substantially exceed the 1-acre threshold level necessitating the submittal of Notice of Intent (NOI) and development of a Storm Water Pollution Prevention Plan. | Electronic submittal – 1 week process | No | No |
| Storm Water Pollution Prevention Plan (SWPPP) – National Pollutant Discharge Elimination System General Permit for Storm Water Discharges Associated with Construction Activity – San Diego Regional Quality Control Board (SDRWQCB) | Land disturbances associated with the development of new breakwaters will substantially exceed the 1-acre threshold level necessitating the submittal of Notice of Intent (NOI) and development of a Storm Water Pollution Prevention Plan. | SWPPP development process (3-months) | No | No |

Table IR-1.
Environmental Permit/Approval Assessment: Initial Intake Relocation (Shoreline Intake)
San Onofre Nuclear Generating Station (cont.)

| Permit/Approval | Assessment | Permit Review Period (Preconstruction) | Critical Path (Yes/No/NA) | Fatal Flaw (Yes/No/NA) |
|---|--|--|---------------------------|------------------------|
| Notice of Intent (NOI) – National Pollutant Discharge Elimination System General Permit for Storm Water Discharges Associated with Industrial Activity, San Diego Regional Water Quality Control Board (SDRWQCB) | Not applicable — SONGS NPDES permit addresses operational storm water. No changes to existing storm water management system are expected from addition of the shoreline intake system. | Not applicable | NA | NA |
| Storm Water Pollution Prevention Plan (SWPPP) – National Pollutant Discharge Elimination System General Permit for Storm Water Discharges Associated with Industrial Activity, Regional Quality Control Board (RWQCB) | Not applicable — SONGS NPDES permit addresses operational storm water. There is no separate operational phase SWPPP. | Not applicable | NA | NA |
| 2081 Permit for California Endangered Species Act of 1984 (Fish and Game Code, §2050 through 2098) – California Department of Fish & Game (CDFG) | The installation of the shoreline intake system is expected to impact marine habitat areas, but there are no threatened or endangered species in the immediate marine area. | Not applicable | NA | NA |
| Lake and Streambed Alteration Agreement - California Department of Fish & Game (CDFG) | Not applicable — the addition of the shoreline intake system will not result in impacts to jurisdictional streambed areas (waters of the state). | Not applicable | NA | NA |
| Waste Discharge Requirements (WDR) – San Diego Regional Water Quality Control Board | Not applicable — the addition of the shoreline intake system will not result in impacts to jurisdictional streambed areas (waters of the state). | Not applicable | NA | NA |
| Section 106 Review – Office of Historic Preservation (OHP) | Not applicable — the shoreline intake system will not demand any additional land nor generate any new surface disturbances. | Not applicable | NA | NA |

**Table IR-1.
Environmental Permit/Approval Assessment: Initial Intake Relocation (Shoreline Intake)
San Onofre Nuclear Generating Station (cont.)**

| Permit/Approval | Assessment | Permit Review Period (Preconstruction) | Critical Path (Yes/No/NA) | Fatal Flaw (Yes/No/NA) |
|---|---|--|---------------------------|------------------------|
| Notification of Waste Activity – RCRA Hazardous Waste Identification Number (Small Quantity Generator) – Construction Phase - Department of Toxic Substance Control, USEPA, San Diego County Department of Environmental Health - California Unified Program Agency | Installation of the shoreline intake system could potentially require an identification number to support management or construction wastes, unless current SONGS identification will be used. | 1-2 weeks | No | No |
| Notification of Waste Activity – RCRA Hazardous Waste Identification Number (Small Quantity Generator) – Operation - Department of Toxic Substance Control, USEPA, San Diego County Department of Environmental Health - California Unified Program Agency | Not applicable — the addition of the shoreline intake system will allow for the continuing use of the existing hazardous waste identification number. There will be not impacts to the onsite hazardous treatment facility (oil separation unit). | Not applicable | NA | NA |
| SPCC Plan – 40 CFR 112 and Aboveground Petroleum Storage Act – San Diego County Department of Environmental Health – California Unified Program Agency and USEPA | Not applicable — the addition of the shoreline intake system is not expected to require additional water treatment chemicals. | Not applicable | NA | NA |
| Underground Storage Tank Permit – San Diego County Department of Environmental Health – California Unified Program Agency and State Water Resources Board | Not applicable —the addition of the shoreline intake system is not expected to require the relocation of underground tanks. | Not applicable | NA | NA |
| Risk Management Plan (Clean Air Act 112r) – San Diego County Department of Environmental Health – California Unified Program Agency and USEPA | Not applicable — the addition of the shoreline intake system will not require the addition of any new volatile chemicals. | Not applicable | NA | NA |



**Table IR-1.
Environmental Permit/Approval Assessment: Initial Intake Relocation (Shoreline Intake)
San Onofre Nuclear Generating Station (cont.)**

| Permit/Approval | Assessment | Permit Review Period (Preconstruction) | Critical Path (Yes/No/NA) | Fatal Flaw (Yes/No/NA) |
|---|---|--|---------------------------|------------------------|
| Emergency Planning and Community Right-to-Know Act (EPCRA) – 40 CFR 311 & 312 - San Diego County Department of Environmental Health - California Unified Program Agency and USEPA | Not applicable — the addition of the shoreline intake system is not expected to require any new chemicals stored in quantities that exceed applicable thresholds (e.g., 10,000 lbs for hazardous chemicals, 500 lbs for extremely hazardous chemicals). | Not applicable | NA | NA |
| Land Use Zones/Districts Approval – San Diego County Department of Planning and Land Use | Not applicable — the SONGS property is entirely situated on federal property (U.S. Marine Corps Camp Pendleton property) and the offshore subaqueous lands are the responsibility of the California States Lands Commission. | Not applicable | NA | NA |
| Conditional Use Plan Amendment – San Diego County Department of Planning and Land Use | Not applicable — the SONGS property is entirely situated on federal property (U.S. Marine Corps Camp Pendleton property) and the offshore subaqueous lands are the responsibility of the California States Lands Commission. | Not applicable | NA | NA |
| Grading Plan Approval or Permit – San Diego County Department of Public Works & Planning and Land Use | Not applicable — the SONGS property is entirely situated on federal property (U.S. Marine Corps Camp Pendleton property) and the offshore subaqueous lands are the responsibility of the California States Lands Commission. | Not applicable | NA | NA |
| Erosion and Sediment Control Plan (Rain Event Action Plan) – San Diego County Department of Public Works | Not applicable — similar to the construction-phase SWPPP. No separate submittal is expected to be directed to the county since the SONGS property is entirely situated on federal property (U.S. Marine Corps Camp Pendleton property) and the offshore subaqueous lands are the responsibility of the California State Lands Commission. | Not applicable | NA | NA |
| Building Permit (including plumbing and electrical) – San Diego County Building Division | Not applicable — the SONGS property is entirely situated on federal property (U.S. Marine Corps Camp Pendleton property) and the offshore subaqueous lands are the responsibility of the California State Lands Commission. | Not applicable | NA | NA |
| Domestic Water Supply Permit (public potable water) – San Diego County Department of Environmental Health | Not applicable — no new potable water systems are planned. | Not applicable | NA | NA |

Table IR-1.
Environmental Permit/Approval Assessment: Initial Intake Relocation (Shoreline Intake)
San Onofre Nuclear Generating Station (cont.)

| Permit/Approval | Assessment | Permit Review Period (Preconstruction) | Critical Path (Yes/No/NA) | Fatal Flaw (Yes/No/NA) |
|---|---|---|---------------------------|------------------------|
| San Diego County Well Water Permit – San Diego County Department of Environmental Health | Not applicable — no new wells to be developed. | Not applicable | NA | NA |
| California Department of Transportation (Caltrans) – Oversize/Overweight Vehicles | Not applicable — the shoreline intake elements and associated piping are expected to be oversized. | Not applicable | NA | NA |
| Caltrans Heavy Haul Report (transport and delivery of heavy and oversized loads) | Not applicable — the shoreline intake elements and associated piping are expected to be oversized. | Not applicable | NA | NA |
| Resource Conservation (RC) Land Use Management Approval | Not applicable — while local municipality rules may supersede this regional land use/watershed protection-related project approval process, this is not the case for SONGS. | Not applicable | NA | NA |
| Temporary Power Pole – Local municipality or San Diego County Public Works Department | Not applicable — the installation of the shoreline intake system is not expected to require local power poles. | Not applicable | NA | NA |
| Fire Safety Plan Approval, Certificate of Occupancy, Flammable Storage – San Diego County Fire Department | The addition of shoreline intake system may require minor revisions to the existing Fire Safety Plan. | 1 month for approval of Fire Safety Plan. | No | No |
| Sewer and Sewer Connections – San Diego County Environmental Health Department | Not applicable — no new sanitary connections are envisioned. | Not applicable | NA | NA |
| Road Crossing or Encroachment Permit (Caltrans) | Not applicable — the addition of shoreline intake system will not pose any road crossing or encroachment issues. | Not applicable | NA | NA |

**Table IR-2. Offsetting Impacts for the Inshore Intake System
San Onofre Nuclear Generation Station**

| Category | Impacts – Construction | Impacts – Operations | Magnitude | Construction Impact Significance | Operation Impact Significance |
|---------------|--|---|---|----------------------------------|-------------------------------|
| Air | <p>Minor increase in greenhouse gases, NOx, volatile organic compound, CO, and particulate matter from construction equipment, material deliveries, commuting workforce.</p> <p>Increased greenhouse gas emissions from replacement fossil fuel generation to offset the short-term loss of SONGS generation during the plant outage to install this system.</p> | While the inshore system could result in some minor improvements in plant efficiency, there should be no significant changes in overall air quality impacts or greenhouse gas emissions during operation. | Insignificant temporary increase in CO ₂ greenhouse gas emissions from temporary increase in commuting traffic during associated plant outage. | Small Negative | None |
| Surface Water | Construction activities are primarily marine-based and they have the potential to generate turbidity impacts from disruption of near-shore habitats. | Operational cooling water withdrawal and discharge rates will be remain largely unchanged. | Marine area impacted (pending subsequent assessment phase, if any) | Moderate Negative | None |
| Groundwater | No additional groundwater resources will be needed to support construction. | No additional groundwater resources will be needed to support operations. | Not applicable | None | None |
| Waste | Significant marine sediment wastes will be generated to facilitate installation of the offshore piping system. | Minor increase in waste generation from maintenance activities on the submerged modular screen systems. | Marine Spoil Wastes (pending subsequent assessment phase, if any) | Moderate Negative | None |
| Noise | Buffer areas around offshore construction zones will serve to reduce noise impacts to offshore noise receptors (watercraft) and shoreline recreational areas, but there is the potential for impacts to the shoreline areas. | Operational noise levels are expected to be largely unchanged as a result of the inshore intake system. | Noise impacts above the 70 dBA threshold value may occur along shoreline during construction. | Small negative | None |
| Land Use | Construction activities are primarily near-shore and they may temporarily preclude normal recreational activities in nearby waters. | The reconfiguration of the inshore intake system represents a change in land use of some near-shore areas, but will not preclude waterborne activities. | Work Schedule (pending subsequent assessment phase, if any) | Small negative | None |

**Table IR-2. Offsetting Impacts for the Inshore Intake System
San Onofre Nuclear Generation Station (cont.)**

| Category | Impacts – Construction | Impacts – Operations | Magnitude | Construction Impact Significance | Operation Impact Significance |
|--------------------------------------|--|---|---|----------------------------------|-------------------------------|
| Marine Ecological Resources | Construction will potentially generate significant, temporary water quality and marine habitat impacts (localized turbidity impacts and loss of marine habitat). | No improvements in impingement or entrainment impacts are expected given the shift of the intake to more biologically productive near-shore areas. Overall water withdrawal or discharge rates are unchanged. Thermal discharge impacts to aquatic life will remain largely unchanged | Marine bed area (pending subsequent assessment phase, if any) | Moderate Negative | Small Negative |
| Terrestrial Ecological Resources | Since construction will be confined to previously disturbed land, there is no potential to disturb natural habitats or other areas with significant ecological value or sensitivity. | No permanent loss of natural habitat areas or other areas with significant ecological value or sensitivity. | Not applicable | None | None |
| Cultural & Paleontological Resources | Since construction will be confined to previously disturbed land, there is little or no potential to discover new cultural or paleontological resources in these developed areas. | No permanent loss of cultural or paleontological resources. | Not applicable | None | None |
| Visual Resources | All construction equipment will be low profile, i.e., not extend above the height of local facility structures. However, there will be work areas visible from the ocean as new land features are developed. | The inshore intake system will include new land features that will be visible from the ocean. | Not applicable | Small negative. | Small negative. |
| Transportation | Increased traffic from the construction workforce and construction deliveries could temporarily worsen the existing level of service on local roads during the plant outage. | The inshore intake system will not significantly alter the current number of plant deliveries or operating personnel. | Workforce, Level of Service (pending subsequent assessment phase, if any) | Small Negative | None |

**Table IR-2. Offsetting Impacts for the Inshore Intake System
San Onofre Nuclear Generation Station (cont.)**

| Category | Impacts – Construction | Impacts – Operations | Magnitude | Construction Impact Significance | Operation Impact Significance |
|----------------------|---|---|---|----------------------------------|-------------------------------|
| Socioeconomic Issues | While there will be some additional construction-related employment opportunities, these opportunities are not expected to significantly strain local community resources (e.g., housing, school, fire/police services, water/sewer). | Maintenance staff levels may increase slightly in response to the increase cleaning and marine waste management duties associated with the inshore intake system. | Workforce (pending subsequent assessment phase, if any) | Small Positive | None |

Notes: Levels of Impact of Significance

Small: Environmental effects from not detectable or minor such they will not noticeably alter any important attribute of the resource

Moderate: Environmental effects are sufficient to noticeably alter, but not significantly change, the attributes of the resource.

Large: Environmental effects are clearly noticeable and are sufficient to change the attributes of the resource.



Figure IR-1. Layout of Shoreline Intake Concept