



Pillsbury Winthrop Shaw Pittman LLP
50 Fremont Street | San Francisco, CA 94105-2228 | tel 415.983.1000 | fax 415.983.1200
MAILING ADDRESS: P. O. Box 7880 | San Francisco, CA 94120-7880

SAN DIEGO REGIONAL
WATER QUALITY CONTROL BOARD

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Margaret Rosegay
tel 415.983.1305
margaret.rosegay@pillsburylaw.com

VIA FEDERAL EXPRESS

December 7, 2009

David W. Gibson
Executive Officer
California Regional Water Quality Control Board,
San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Re: South Bay Power Plant – Tentative Order No. R9-2009-0178 –
Ratification of Minor Modification of NPDES Permit No. CA0001368

December 16, 2009 Meeting – Agenda Item 14

Refer to: 257829: DBarker WDID 9 000000091

Dear Mr. Gibson:

This letter is timely submitted on behalf of our client Dynegy South Bay, LLC, in connection with Tentative Order (“T.O.”) No. R9-2009-0178 scheduled for consideration by the San Diego Regional Water Quality Control Board at its December 16, 2009 meeting. If adopted, the T.O. would ratify the minor modifications to the NPDES permit for the South Bay Power Plant (“SBPP”) made by the Executive Officer on November 9, 2009. The minor modifications went into effect on November 9 and are not merely proposed. See 40 CFR § 122.63. Among other things, these modifications provide that the discharge from Units 3 and 4 shall cease December 31, 2009, and that thereafter the combined discharge from Units 1 and 2 shall not exceed 225 MGD. In addition, in accordance with Dynegy’s updated application for renewal of its NPDES permit, the discharge from Units 1 and 2 shall cease on December 31, 2010 absent further action by the Board.

Dynegy strongly supports the ratification of these minor modifications. These modifications will reduce the discharge by more than 60% from historic permitted levels, and (absent further Board action) will terminate the discharge altogether four

years earlier than requested in the original renewal application. During the plant's remaining period of operation, the NPDES permit (as so modified) will remain in full force and effect in accordance with regulations applicable to administrative extension of NPDES permits. See 40 CFR § 122.6.

Administrative extension attaches by operation of law where, as here, the discharger timely submitted a complete application for renewal of its permit. The Regional Board has no authority to approve or deny, or terminate, a period of administrative extension once it has attached, and can only act upon the underlying permit application, consistent with the requirements applicable to draft permits, including without limitation, publication of a draft permit and Fact Sheet, the opportunity for notice and comment, and lack of objection by the U.S. Environmental Protection Agency. 40 CFR § 124.6(b).¹

Under the circumstances described above, Dynegy believes that the Executive Officer's decision to leave the permit, as modified, on administrative extension (rather than preparing a draft permit) is reasonable and represents a sound exercise of discretion, particularly given the severe constraints on staff resources, the short period of time SBPP will likely continue to operate, and the lack of any adopted state or federal definition of Best Technology Available ("BTA") for existing power generating facilities that utilize once-through cooling. See 72 Fed. Reg. 37107 (suspending Phase II regulations promulgated under Clean Water Act section 316(b)); see also Entergy Corp. v. Riverkeeper, Inc., et al., 129 S. Ct. 1498 (2009) (upholding EPA's use of cost benefit analyses under CWA section 316(b)). Pending promulgation of new federal Phase II rules or successful adoption of the state's own Once-Through Cooling ("OTC") Policy, NPDES permit writers are instructed to make BTA determinations based on Best Professional Judgment ("BPJ"), as informed by the "wholly disproportionate" test that has been in use around the country for the past 30 years. 72 Fed. Reg. 37107, 37108 (see Attachment 1). Under this traditional analysis, SBPP satisfies the BTA requirements of Section 316(b).

Dynegy also believes that adoption of the T.O. ratifying the Executive Officer's minor modification of the permit, and his related decision to allow the permit to remain on administrative extension during 2010, is fully consistent with the direction

¹ The demands outlined in the November 30, 2009 comment letter submitted by the ad hoc "No More South Bay Power Plant Coalition" ("Coalition"), if met by the Regional Board, would violate applicable notice requirements and Dynegy's due process rights.

provided to staff by the Board at the September 9 meeting. It was clear at the meeting that the Board was not comfortable with an open-ended administrative extension of the permit that could last as long as another five years, i.e., until November 9, 2014.² Since that meeting, however, circumstances have changed significantly, such that Units 3 and 4 will permanently shut down in a matter of weeks, and Units 1 and 2 will operate only until the end of December 2010, absent further action by the Board. This outcome – made possible by the decision of the California Independent System Operator (“CAISO”) and voluntary actions taken by Dynegy, consistent with its contractual obligations – achieves substantially greater, and earlier, reductions in the discharge than could have been achieved had the Board attempted to force shutdown of the plant through improper denial of Dynegy’s renewal application.

Denial of the Renewal Application Would be Contrary to Law

For the record, applicable federal NPDES regulations – which the Regional Board is legally bound to follow – allow denial of an application for renewal of an NPDES permit in only very limited circumstances, **none of which is applicable here**. Under 40 CFR § 122.64, a permit renewal application may be denied only if:

- (1) the permittee is in noncompliance with any condition of the permit;
- (2) the permittee failed to disclose all relevant facts or misrepresented any relevant facts;
- (3) a determination is made that the permitted activity endangers human health or the environment and can only be regulated to acceptable levels by permit modification or termination; or
- (4) there is a change in any condition that requires a temporary or permanent reduction or elimination of any discharge.

² Based on our review of the transcript from the September 9 hearing, we do not believe the Board intended to direct staff simultaneously to draft a tentative order renewing the permit and a competing tentative order denying the application for renewal. Such actions are diametrically opposed to each other, and each would need to be supported by facts that are contradictory to the other, placing staff in an impossible position. Any effort to fulfill such a directive would be arbitrary and capricious *per se*.

None of these findings can be made in this case. The Regional Board may not ignore these regulations and simply invoke BPJ as grounds for denial of an NPDES permit, as suggested by both the Coalition and Coastkeeper in their comment letters. That legal principle has no application in the circumstances, and reliance on BPJ to deny a permit would be patently illegal.

As a factual matter, Dynegy vigorously disputes any assertion that the Regional Board could properly find that the SBPP discharge, whether at the original flowrate of 601 MGD or at a greatly reduced flowrate of 225 MGD, has endangered human health or the environment to any significant degree, and under no circumstance to a degree that would warrant termination of the discharge altogether. Such an action would fly in the face of years of contrary factual findings by this Regional Board, and would be arbitrary, capricious and contrary to law.

Dynegy is aware that its NPDES permit contains several findings that address alleged adverse affects of the discharge on South Bay (these findings are also quoted in Coastkeeper's December 1, 2009 comment letter, at p. 2-3). At the time the permit was issued in November 2004, Duke Energy contested those findings as being unsupported by scientific evidence. Dynegy "inherited" the permit in April 2007, but agrees with its predecessor that these findings are not supported by substantial evidence. See discussion below, at p. 12.³ Regardless, these findings have no relevance to a discharge that will be reduced to less than half of its previously permitted level. And, when actual discharges from the plant over the past five years are evaluated, it is immediately apparent that any potential effects of the actual discharge would be a small fraction of those that might occur at maximum flow. Graphs showing the average monthly flow rate and average monthly differential temperature of the discharge over the past five years are provided in Attachments 2 and 3. These graphs show that the flow has consistently been significantly below 601 MGD and that differential discharge temperatures are only slightly above ambient levels.

The Water Code does not compel the Regional Board to end this discharge, and Water Code section 13243 (cited in the Coalition letter) provides no authority for this proposition. To the contrary, Industrial Service Supply is a recognized beneficial use of the waters of south San Diego Bay, and as explained by John Robertus at the

³ These findings reference loss of eelgrass habitat and a lower diversity or loss of certain species of benthic invertebrates as evidence of adverse effects.

September 9 hearing, was specifically added to the Basin Plan to allow for the use of bay water as cooling water for SBPP. At an absolute minimum, the Regional Board must take into account all beneficial uses of the water and make a determination that fairly balances competing considerations. See NPDES Permit, Finding 27 (identifying the numerous factors considered by the Regional Board in establishing the requirements of the permit, including economic considerations). Significantly, the NPDES permit does not find that beneficial uses have been impaired, but only identifies certain beneficial uses that “may be impaired” due to the effect of the SBPP discharge. NPDES Permit, Finding 15. Similarly, Finding 14 notes that “biotic communities in the immediate vicinity of the discharge point and in the discharge channel have been degraded by exposure to the once-through-cooling water discharge from the SBPP,” but does not describe or assess the degree or ecological significance of that “degradation.”

Under the Porter Cologne Water Quality Control Act, regulation of water quality is not a one-dimensional exercise. In enacting the statute, the Legislature stated that,

the quality of the waters of the state shall be regulated to attain the highest water quality which is reasonable, considering all demands being made and to be made on those waters and the local values involved, beneficial and detrimental, economic and social, tangible and intangible.

Water Code, § 13000 (emphasis added). Based on this legislative directive, the Regional Board is duty-bound to consider all relevant factors, and to make a decision that is reasonable in light of all these circumstances. It would not be reasonable to compel the shutdown of a power plant that has been determined by the CAISO to be necessary for system reliability in order to eliminate the very limited effects of the discharge a year earlier than they will otherwise be eliminated. Even the State Board’s draft OTC Policy does not compel the immediate shutdown of coastal power plants, as advocated by the Coalition and Coastkeeper in the case of SBPP. The draft OTC Policy (for all its many other flaws) recognizes that the technological changes required by the policy must be implemented in a phased manner, consistent with information provided by the energy agencies, so as to protect the state’s power supply and public welfare and safety.

Reliability Must Run

The minor modifications to the SBPP permit implement the recent determination by the CAISO that Units 3 and 4 are no longer needed for system reliability as of January 1, 2010 and thus may be released from “Reliability Must Run” (“RMR”) status. To the contrary, the CAISO designated Units 1 and 2 as RMR for calendar

year 2010, necessitating their continued availability to ensure electrical grid reliability. As explained by Randy Hickok, Dynegy's Managing Director for the Western Region, at the Board's September 9, 2009 meeting (Agenda Item No. 7), Dynegy has no control over the RMR designation of any units at SBPP – it neither applies for RMR designation nor has any role in the designation process. Designation of units as RMR lies exclusively within the jurisdiction and discretion of the CAISO, based on its evaluation of the grid in light of specified factors and criteria, including the availability of new generation and transmission.

Under its Must Run Service Agreement with the CAISO, Dynegy has a binding contractual obligation "to use its best efforts to renew and keep effective its licenses and authorizations and to oppose conditions or modifications which would make continued operation illegal, uneconomical or otherwise impractical." Service Agrmt., § 2.2(b)(v). Based on information provided by the CAISO relating to the conditions that are expected to exist in the San Diego area by the end of 2010, Dynegy determined that it could fulfill its contractual obligation under the Service Agreement by seeking authorization to discharge from Units 1 and 2 until December 31, 2010. In the event that the CAISO were to determine prior to that date that Units 1 and/or 2 are no longer needed, Dynegy would permanently remove the unit(s) from service at such time it receives written notice from the CAISO that they are no longer designated as RMR.

Lease Obligations

As also explained by Mr. Hickok at the September 9 hearing, Dynegy operates the SBPP pursuant to a lease issued by the Port of San Diego. According to its express terms, the lease expires on January 31, 2010, or upon loss of RMR status for all units, whichever is later. Dynegy's application to renew its NPDES permit is not "illegal" as was asserted at the September 9 hearing. To the contrary, had Dynegy not applied for renewal of its permit, it would have breached its contractual obligation to the CAISO. Once the lease has been terminated, Dynegy is obligated to demolish the plant. Demolition of the plant is subject to the permitting and approval of a myriad of federal, state and local governmental agencies, and the planning process for this extensive project is already well underway. Significantly, the project is subject to the requirements of the California Environmental Quality Act ("CEQA"), with the Port serving as lead agency. Dynegy has agreed to provide regular progress reports to the Regional Board staff about the status of the demolition project. Two such letters have already been submitted.

With respect to Units 3 and 4, Dynegy has identified and, beginning January 1, 2010, will implement specific steps to decommission these units. Details of these

decommissioning activities will be described at the upcoming hearing on December 16. Suffice to say that the shutdown of these units will be permanent, and steps will be taken to preclude their return to service at any time in the future.

2004 Permit Renewal Proceeding

Contrary to what has been asserted by representatives of the Environmental Health Coalition and others who are steadfastly opposed to any further operation of SBPP, Duke Energy (the operator of SBPP at the time of the last permit renewal) did not “promise” to shut the plant down at the end of the last permit term. Excerpts from the transcript of the September 8, 2004 Regional Board hearing are set forth below and reveal very clearly that (i) Duke Energy made no such representation or commitment, and (ii) Board members understood that the plant could well operate after November 10, 2009 if units were still designated as RMR:

SPEAKER	
Board Member Ghio	Does it look like that plan is that some type of power generation facility will be located there long-term? I’m trying to get a feel for are we talking about a five-year permit or four-year, whatever it is, or are we really... do we need to really think about the long-term power generation at that facility or is that plant going away?
John Phillips (Regional Board staff)	The ISO and the Duke representatives would probably be better to answer that. My understanding is as an RMR plant that is critical to the stability of the power grid, something there has to produce power until they don’t need it any more. How long that is is dependent on many factors; how many more plants are built, how stable can the grid become from other inputs. But I believe there is an independent system operator representative here to provide comments and Duke would certainly be better qualified than I am to discuss that.
***	***
Randy Hickok	My name is Randy Hickok. I’m the vice president of Duke Energy’s operations in California. My last name is spelled Hickok. I thought I would touch briefly on the

<p>(Duke Energy)</p>	<p>future of the plant, its continued presence on the site, if that's the case, and our developmental efforts and answer any questions you have.</p> <p>Duke Energy leases the existing plant from the Port of San Diego. Under the terms of that lease, we are there until January 31, 2010. So, presuming the plant is still economically viable, presuming that it is a must-run facility, the plant would be around until that date at which point <u>unless the plant is required for must-run service</u>, it's the Port determination as to whether they want that plant to continue to run. And if not, Duke has the obligation to demolish the plant and restore the site.</p> <p>So, one of the critical questions to understand about how long the existing plant exists is a function of both market conditions <u>and the must-run contract</u>. Currently, all units at South Bay are must-run, all the units are needed for reliability purposes. The plant is in a good location for the grid as its in the load pocket and to serve contingencies should the southwest power line go out or one of the lines to the north.</p> <p>We expect to remain in our current must-run condition for 2005 and the ISO would know better than Duke, but we expect that in 2006, <u>starting in 2006, the extent to which South Bay remains a must-run facility is largely a function of what else happens regarding other plants that are to be built in the vicinity and what happens with transmission upgrades on SDG&E's system</u>.</p> <p>There are two plants that are part of SDG&E's long-term purchasing plans: Palomar, which I believe is scheduled to be completed in 2006, Otay Mesa, which I believe is scheduled for 2008 but I'm a little less certain on that one. <u>It is unclear to Duke whether the completion of those two plants would entirely obviate the need for South Bay as a must-run facility. We think it's highly likely that some of the units of the plant would lose their RMR status; whether all units of the plant</u></p>
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	<p><u>would lose their RMR status is less clear</u> and again the ISO can give their own opinion on that and I encourage you to ask the ISO those questions, they're better informed on what's necessary for system reliability than Duke is and whether the Otay Mesa project happens, whether some of the transmission upgrades that have been proposed actually take place would be in the purview of the CPUC and, you know, it's difficult for Duke to read the tea leaves for that situation. <u>So, there's a possibility that Duke will lose all must-run status prior to the expiration of the lease, but I don't know if that's certain.</u></p>
***	***
Chairman Minan	<p>*** First, from Lawrence Tobias who represents the ISO and Mr. Phillips, you've indicated that we do have a letter from the ISO in our package of materials so I thought I'd give Mr. Tobias an opportunity to answer any questions concerning the ISO and its relationship to the Duke Energy Plant. I think, Ms. Ghio, you had a question?</p>
***	***
Lawrence Tobias (CAISO)	<p>Okay. For the record, my name is Lawrence Tobias – T O B I A S – and I'm a Senior Group Planning Engineer at the California ISO in Folsom.</p>
Board Member Ghio	<p>*** I think the main question I had was in reference to this ready status, you know, that the four parts of this plant needed to be operated in right now...</p>
Lawrence Tobias	<p>Reliability must-run?</p>
***	***
Board Member Ghio	<p>Yes – the must-run; yeah, the must-run status. And I think – were you here this morning and you heard me</p>

	<p>ask the Duke representative a question, I guess the same question is to you as to I understand the Palomar plant and possibly the South Bay plant will be coming on board and what is the... <u>do you see as the future need to have a plant on the bay in this location for the future, you know, after 2008?</u></p>
Lawrence Tobias	<p>Going at it from a level of a different aspect, I guess, to eliminate one possibility, that would be increased power imported into San Diego. So, for instance, San Diego Gas & Electric had applied for another 500Kv line going up through Riverside County to bring power in from that and the CPUC denied that request. So then you're left pretty much with is there any ability to upgrade their existing lines, increase Port capability and to the extent that can be done, that's what's being done but that's probably minimal as far as what you would see. So the difference in load growth each year, year to year, going the next, say, four to five years, is new generation within the San Diego area.</p> <p>Currently, there are four units in the San Diego area, not under RMR; those are all small peaker units and two of them we probably could get under an RMR contract in the near future, if necessary. The other two are not operating at all and haven't been for some time. And plus their owner that used to be a subsidiary of PG&E is in bankruptcy. So, they would have to be bought by somebody else and then, with certain agreements with us, come back online. But nevertheless, that would mean that, say for instance, you still have ongoing 500mw deficiency without South Bay. So if you look at it from now going forward and then say at what point in time, with load growth, could you allow for the retirement of South Bay. And in saying South Bay, you also have to consider Encina; both power plants are very similar in age and in other aspects.</p> <p>So there is Palomar, there is Otay Mesa; both of those are about 500mw combined-cycle units; you would probably need about twice that looking out to, say, if</p>

	<p>you were to oscillate on retirement of South Bay by the end of 2009. That would translate into a combined-cycle at South Bay and Encina, perhaps, instead of what's there already and the Palomar combined-cycle and the Otay combined-cycle. And at that point in time you probably have, you should have enough capacity within San Diego to allow for these old plants to be gone in addition to continue to serve low growth. But what's being proposed right now, Palomar and Otay Mesa, on an ongoing basis, they will allow you to continue to serve load growth in a reliable manner. But that's about all they will do. They may amount to taking one Encina unit or one South Bay unit off of RMR for a particular year and load growth would bring that unit back the next year. We would need it for reliability; under RMR contract, it allows us to dispatch it to make sure the unit is there when there is a reliability need.</p>
Board Member Ghio	<p>Okay, that was a complicated answer to what I thought was a very simple question...</p>
Lawrence Tobias	<p>There's a lot of uncertainty in the future, and I apologize for that...</p>
Board Member Ghio	<p>Yes, but what I'm trying to do is get to the bottom line, so, bottom line seems to be that even with... because, I mean, this Board is charged with water quality issues, you know. Having energy to operate POTW's and waste water treatment plants that exist throughout the county is part of, one part of water quality that could be perceive... is one of the things that I'm considering or thinking about with this. <u>Is... it sounds to me like there is no given that this plant will... that you will allow this plant to be removed from the must-run, even in 2008-2009, you don't know.</u></p>
Lawrence Tobias	<p><u>That's correct.</u></p>
Board Member Ghio	<p><u>So this plant could be necessary for a longer period of time, either in its present form</u> or, as we heard Duke say, in a new plant being built in the same location that's</p>

	maybe got the upgrades that would mitigate any of the issues that we currently are discussing here today.
Lawrence Tobias	<u>Yes.</u>
Board Member Ghio	But one way or the other, it looks like what I'm hearing from you is we're going to need more power plants.
Lawrence Tobias	Based on what we know today, that's the way it looks – yes.
Board Member Ghio	Okay, that's kind of what I wanted to get to.
Chairman Minan	Okay, are there any other questions? Thank you, Mr. Tobias

Given the above exchange, it is both inaccurate and misleading to assert that anyone “promised” that SBPP would cease operations in 2009.

The determinations of the CAISO are not arbitrary or irrelevant, as claimed in the Coalition's letter, and must be taken into consideration by the Regional Board in its deliberations. Water Code, § 13000. As aptly noted by former Board Member Ghio, a reliable source of power is just as necessary to the maintenance of water quality in San Diego Bay as is the direct regulation of discharges into the Bay.

Effects of Past Plant Operations

It is also alleged in comment letters submitted by the Coalition and Coastkeeper that operation of SBPP over the past 50 years has “devastated” the Bay and that “the evidence is clear – the discharge has major, negative impacts on water quality.” Dynegy strongly disputes both of these contentions. These same arguments have been made by opponents of SBPP in the past and have never been found by the Regional Board to provide a sufficient basis for denial of the plant's discharge permit.

SBPP has operated in strict compliance with the terms and conditions of its NPDES permit, as that permit has been successively renewed by the Regional Board over a period of almost five decades. The discharge complies with effluent limitations for copper and total chlorine residual, and with receiving water limitations for toxicity and a wide array of other physical and chemical characteristics. The discharge has never exhibited toxicity. The effluent limit for copper is set at the water quality

objective, applied end-of-pipe and without the benefit of any dilution. All other heavy metals were eliminated from the discharge more than 10 years ago.⁴ The implication in the Environmental Health Coalition flyer entitled “A Tale of Two Power Plants” – namely, that the SBPP discharge is responsible for heavy metal contamination that may be found in fish consumed by local subsistence fishermen – is not supported by the facts.

Contrary to rhetorical assertions of “devastation,” there is no substantial scientific evidence that operations of the plant have adversely affected water quality to any significant degree. While effects on the benthic community have been identified in the immediate vicinity of the discharge, scientific studies conducted by Duke Energy in accordance with Section 316(a) of the Clean Water Act demonstrate that these effects are extremely limited and of no particular ecological concern. See attached Declaration of David L. Mayer, President, Tenera Environmental LLC, submitted in support of Duke Energy’s Petition for Review filed with the State Water Resources Control Board, dated December 10, 2004 (Attachment 4).⁵

In its technical guidance for existing thermal discharges, the U. S. Environmental Protection Agency recognizes that every discharge will have some impact on the receiving water and that the key question is the magnitude of the impact and its significance on the stability and productivity of the biological community affected. In order to be considered out of compliance with Clean Water Act Section 316(a), the thermal effects would have to cause biological changes so substantial that community imbalance, elimination or replacement would result. As discussed below, the independent scientists who performed the thermal effects study for the SBPP did not find this to be the case.

The most recent thermal effects study findings (Tenera, 2004) are consistent with those of prior studies. Those prior studies were cited by the Regional Board in

⁴ The assertion in the Coastkeeper letter that the plant discharges millions of gallons of water polluted with zinc and nickel is inaccurate. There are no effluent limits for nickel or zinc because “reasonable potential” to discharge these compounds does not exist. See 40 CFR § 122.44. Dynegey is required to conduct monthly monitoring for a few heavy metals, one of which is zinc (monitoring for nickel is not required). Zinc has never been detected in the discharge.

⁵ Citing *People v. Barry* (1987) 194 Cal. App. 3d 158, the State Board declined to hear the Petition on the grounds that it “fail[ed] to raise substantial issues that are appropriate for review” by the State Board. Dismissals on this basis do not address the merits of the petition.

previous NPDES permits as evidence that the discharge met the "balanced indigenous community" ("BIC") standard of Section 316(a). There is no evidence in the most recent study to contradict that finding. In fact, the results of the 2004 Tenera study strengthen the conclusions reached during prior permit cycles that the SBPP discharge complies with Section 316(a):

- The benthic community sampling for the most recent study was done at a finer spatial scale than previous studies and results showed that impacts from the discharge occurred in areas that are smaller than those thought to be affected by the discharge in previous studies.
- The SBPP discharge channel has considerably higher fish densities – even in the warmer summer months – than the South San Diego Bay reference station not subject to the thermal discharge.
- The studies actually showed evidence of seasonal eelgrass growth in an area of the discharge channel where it was assumed that eelgrass would not grow because of temperature extremes. Where evidence of effects on eelgrass was identified, the effects were found to be associated with turbidity and not related to the thermal discharge.
- A Benthic Response Index was calculated for each benthic sample based on taxa and abundance and associated pollution tolerance indexes. This analysis, which was done at the request of the resource agencies, concluded that the benthic communities residing in south San Diego Bay are not degraded.

Mitigation and Restoration

Finally, we would like to address the assertion in the Coalition and Coastkeeper letters that the Regional Board should issue a Section 13267 letter requiring Dynegy to prepare a workplan to "restore and rehabilitate" the Bay. As previously indicated, Dynegy is working in close cooperation with numerous governmental agencies – including the Regional Board – to address environmental issues associated with closure and demolition of the SBPP. The process is subject to CEQA and it is expected that a full Environmental Impact Report will be prepared, subject to extensive review and comment by members of the public. On this basis, the Executive Officer has reasonably determined that issuance of a Section 13267 letter is unnecessary.

Apart from that, there is no provision of the NPDES permit which requires the discharger to mitigate past effects of the discharge, whatever those effects might or might not be. While there is a brief discussion of this issue in the 2004 Fact Sheet relating to CWA Section 316(a), no such provision was ever included in the permit itself. Moreover, Dynegy notes for the record that Section 13267 does not provide a proper legal basis upon which to require a discharger to "restore and rehabilitate" receiving waters into which a lawful thermal discharge has occurred pursuant to a duly issued NPDES permit. In fact, we are not aware of any provision of the Water Code or the Clean Water Act which would authorize such a directive, especially in circumstances where, as here, the evidence of any significant adverse effects is non-existent. To the extent there are limited effects in the immediate vicinity of the discharge (as reported by Tenera), these effects can reasonably be expected to dissipate naturally once the discharge ends. Even Coastkeeper notes that once the discharge has ended, "we would expect a resurgence of eelgrass beds."

Even if it could be demonstrated that there is a need for affirmative restoration measures to be undertaken (which is not the case), Dynegy also questions whether these obligations could legally be imposed solely on it, as the last in a long line of operators of the plant. Dynegy assumed operation of the SBPP in April 2007, and has had operational control of the facility for less than three years of its 50-year history.

* * * * *

For all of the foregoing reasons, we strongly urge the Regional Board to adopt Tentative Order R9-2009-0178 as drafted.

Please include this letter and its attachments as part of the administrative record of this matter. Dynegy will attend the December 16 meeting and will offer oral testimony in further support of the Tentative Order.

Thank you for your consideration of these comments.

Very truly yours,



Margaret Rosegay

Attachs.

David W. Gibson
December 7, 2009
Page 16

Cc: Dan Thompson
Randy Hickok
Barb Irwin
Len Cigainero

Catherine Hagan, Esq. (OCC)

- b. In paragraph (a), last sentence, revise "SAF/MIQ" to read "SAF/IEE."
- c. In paragraph (b), third sentence, revise "HQ USAF/ILEB" to read "HQ USAF/A7CI."
- d. In paragraph (b), third sentence, revise "SAF/MIQ" to read "SAF/IEE".

§ 989.36 [Amended]

- 17. In § 989.36, make the following technical corrections:
 - a. In first sentence, revise "NEPA" to read "EIAP" at its first occurrence.
 - b. In first sentence, revise "SAF/MIQ" to read "SAF/IEE".

§ 989.38 [Amended]

- 18. In § 989.38, make the following technical corrections:
 - a. In paragraph (b), revise "HQ USAF/ILEB" to read "HQ USAF/A7CI".
 - b. In paragraph (c), revise "HQ USAF/ILEB" to read "HQ USAF/A7CI".
 - c. In paragraph (c), revise "AFCEE/EC" to read "AFCEE/TDB".
 - d. In paragraph (d), revise "HQ USAF/ILEB" to read "HQ USAF/A7CI" in the four places it appears.

Appendix A to Part 989 [Amended]

- 19. In Appendix A, make the following technical corrections:
 - a. In U.S. Government Agency Publications, revise "(DoDD) 4715.1, Environmental Security" to read "DoDD 4715.1E, Environment, Safety, and Occupational Health".
 - b. In U.S. Government Agency Publications, revise "DoDD 5000.1, Defense Acquisition" to read "Department of Defense Directive DoDD 5000.1, The Defense Acquisition System".
 - c. In Abbreviations and Acronyms, Change acronym definition from "AFCEE" from "Air Force Center for Environmental Excellence" to read "Air Force Center for Engineering and the Environment".
 - d. In Abbreviations and Acronyms, revise "AFCEE/EC" to read "AFCEE/TDB". Change acronym definition from "AFCEE Environmental Conservation and Planning Directorate (AFCEE/EC)" to read "AFCEE Technical Directorate, Built Infrastructure Division (AFCEE/TDB)".
 - e. In Abbreviations and Acronyms, revise "AFLSA/JACE" to read "AFLOA/JACE".
 - f. In Abbreviations and Acronyms, revise "AFLSA/JAJT" to read "AFLOA/JAJT".
 - g. In Abbreviations and Acronyms, revise "HQ USAF/ILE" to read "HQ USAF/A7C".
 - h. In Abbreviations and Acronyms, revise "SAF/MI" to read "SAF/IE." Change acronym definition from

"Assistant Secretary of the Air Force for Manpower, Reserve Affairs, Installations, and Environment" to "Assistant Secretary of the Air Force for Installations, Environment & Logistics".

- i. In Abbreviations and Acronyms, revise "SAF/MIQ" to read "SAF/IEE." Change acronym definition from "Assistant Secretary of the Air Force for Manpower, Reserve Affairs, Installations, and Environment" to "Deputy Assistant Secretary of the Air Force for Environment, Safety and Occupational Health (ESOH)".

- j. In Terms, under "BMPs" revise "40 CFR 1508.22" to read "32 CFR 989.22".

Appendix B to Part 989 [Amended]

- 20. In Appendix B, make the following technical corrections:
 - a. In paragraph A3.1.1, revise "AFLSA/JAJT" to read "AFLOA/JAJT".
 - b. In paragraph A3.1.2, revise "AFLSA/JAJT" to read "AFLOA/JAJT".

Appendix C to Part 989 [Amended]

- 21. In Appendix C, make the following technical corrections:
 - a. In paragraph A3.1.3, last sentence, revise "HQ USAF/ILEVP" to read "HQ USAF/A7CI."
 - b. In paragraph A3.1.3, last sentence, revise "SAF/MIQ" to read "SAF/IEE".
 - c. In paragraph A3.2.2.1, revise "HQ USAF/ILEB" to read "HQ USAF/A7CI".
 - d. In paragraph A3.2.3.3, revise "The name and telephone number of a person to contact for more information" to read "The name, address, and telephone number of the Air Force point of contact".
 - e. In paragraph A3.5.1., revise "AFLSA/JAJT" to read "AFLOA/JAJT".
 - f. In paragraph A3.5.1., revise "military trial judge" to read "hearing officer".
 - g. In paragraph A3.5.1., revise "military trial judge" to read "hearing officer".
 - h. In paragraph A3.8, third to last sentence, revise "SAF/MIQ" to read "SAF/IEE".

Bao-Anh Trinh,
Air Force Federal Register Liaison Officer,
Department of the Air Force.
 [FR Doc. E7-13253 Filed 7-6-07; 8:45 am]
 BILLING CODE 5001-05-P

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 122 and 125
 [EPA-HQ-OW-2002-0049; FRL-8336-9]
 RIN 2040-AD62

National Pollutant Discharge Elimination System—Suspension of Regulations Establishing Requirements for Cooling Water Intake Structures at Phase II Existing Facilities

AGENCY: Environmental Protection Agency (EPA).
ACTION: Suspension of final rule.

SUMMARY: This action suspends the requirements for cooling water intake structures at Phase II existing facilities, pending further rulemaking. The Phase II regulation addressed existing power utilities that use a cooling water intake structure to withdraw cooling water from waters of the United States at a rate of 50 million gallons per day (MGD) or greater.

DATES: Effective July 9, 2007, 40 CFR 122.21(r)(1)(ii) and (5), 125.90(a), (c) and (d) and 125.91 through 125.99 in Subpart J are suspended.

FOR FURTHER INFORMATION CONTACT: Janet Goodwin at (202) 566-1060, *goodwin.janet@epa.gov* or Deborah Nagle at (202) 564-1185, *nagle.deborah@epa.gov*.

SUPPLEMENTARY INFORMATION: This action suspends the Phase II regulations with the exception of 40 CFR 125.90 (b), for cooling water intake structures.

I. General Information

A. Does This Action Apply to Me?

Entities potentially affected by this action are classified under NAIC 22111. Affected categories and entities include:

Category	Examples of regulated entities
Electric Utilities	Electric Power Generating Facilities.
State governments ..	Department of Environmental Protection.

This table is not intended to be exhaustive, but rather provides a guide for readers regarding entities affected by this action. Other types of entities not listed in the table could also be affected. To determine whether your facility is affected by this action, you should carefully examine the definition in § 125.91. If you have questions regarding the applicability of this action

to a particular entity, consult one of the persons listed in the preceding FOR FURTHER INFORMATION CONTACT section.

B. Table of Contents

- I. Legal Authority
- II. Background
- III. This Action
- IV. Statutory and Executive Order Reviews

I. Legal Authority

EPA is issuing this suspension of the Phase II rule pursuant to 5 U.S.C. 553(b) and (d), which authorizes administrative agencies to issue administrative suspensions immediately, where good cause justifies the action. Public comment on this suspension is unnecessary, as a decision issued by the U.S. Court of Appeals for the Second Circuit (Second Circuit), *Riverkeeper, Inc. v. EPA*, 475 F.3d 83 (2d Cir. 2007), precludes EPA from applying the Phase II rule unless and until EPA takes further action and today's suspension action merely carries out the effect of that decision on the Phase II rule. Additionally, the decision has resulted in uncertainty among the regulated community and permitting agencies about how to proceed with ongoing permitting proceedings given the uncertainty as to the status of the Phase II rule. This suspension provides a clear statement by the Agency that the existing Phase II requirements (with the exception of one provision unaffected by the *Riverkeeper* decision that reaches beyond the Phase II rule, addressed below) are suspended and are not legally applicable.

II. Background

On February 16, 2004, EPA took final action on regulations governing cooling water intake structures at certain existing power producing facilities under section 316(b) of the Clean Water Act (Phase II rule). 69 FR 41576 (July 9, 2004). The final Phase II rule applies to existing facilities that are point sources that, as their primary activity, both generate and transmit electric power or generate electric power for sale to another entity for transmission; use or propose to use cooling water intake structures with a total design intake flow of 50 MGD or more to withdraw cooling water from waters of the United States; and use at least 25 percent of the water withdrawn exclusively for cooling purposes (see 40 CFR 125.91).

Under the Phase II rule, EPA established performance standards for the reduction of impingement mortality and entrainment (see 40 CFR 125.94). The performance standards consist of ranges of reductions in impingement mortality and/or entrainment. These

performance standards were determined to reflect the Best Technology Available (BTA) for minimizing adverse environmental impacts at facilities covered by the Phase II rule.

These regulations were challenged by industry and environmental stakeholders. On judicial review, the Second Circuit decision (*Riverkeeper, Inc. v. EPA*, 475 F.3d 83, (2d Cir., 2007)) remanded several provisions of the Phase II rule on various grounds. The provisions remanded to EPA include:

- EPA's determination of the BTA under section 316(b);
- The rule's performance standard ranges;
- The cost-cost and cost-benefit compliance alternatives;
- The Technology Installation and Operation Plan provision;
- The restoration provision; and
- The "independent supplier" provision.

With several significant provisions of the Phase II rule affected by the decision, and with the need to provide timely direction to stakeholders about the continuing application of the Phase II rule, EPA's Assistant Administrator for Water issued a memorandum on March 20, 2007, which announced EPA's intention to suspend the Phase II rule. This memorandum also discussed the anticipated issuance of this **Federal Register** suspension document.

III. This Action

EPA is suspending § 122.21(r)(1)(ii) and (5), and Part 125 Subpart J with the exception of § 125.90(b). This suspension is appropriate for several reasons.

First, the Second Circuit's decision remanded key provisions of the Phase II requirements, including the determination of BTA and the performance standard ranges. This suspension responds to the Second Circuit's decision, while the Agency considers how to address the remanded issues.¹

In addition, the decision has a significant impact on the regulated community and permitting agencies. Both groups have sought Agency guidance on how to proceed to establish cooling water intake structure permit requirements for facilities subject to the Phase II rule in light of this decision. These stakeholders support suspending the Phase II requirements until the Agency has considered and resolved the issues raised by the Second Circuit's remand. Permit requirements for cooling

water intake structures at Phase II facilities should be established on a case-by-case best professional judgment (BPJ) basis.

Pursuant to 5 U.S.C. 553(b) and (d), EPA has determined for good cause that notice and public comment procedures are unnecessary. As noted, the Second Circuit's decision found key provisions of the Phase II rule to be inconsistent with the Clean Water Act and remanded most of the rule to the Agency. As a result, under the decision, EPA is precluded from applying the rule unless and until it takes further action to address the decision. Thus, today's action simply effectuates the legal status quo and public comment is therefore unnecessary.

Notably, EPA by this action is not suspending 40 CFR 125.90(b). This retains the requirement that permitting authorities develop BPJ controls for existing facility cooling water intake structures that reflect the best technology available for minimizing adverse environmental impact. This provision directs permitting authorities to establish section 316(b) requirements on a BPJ basis for existing facilities not subject to categorical section 316(b) regulations. Establishing requirements in this manner is consistent with the CWA, case law, and the March 20, 2007 memorandum's direction to do so. Phase II facilities are not subject to categorical requirements under Subpart J while this suspension is in effect, and therefore this provision applies in lieu of those requirements. In addition, this provision applies to other types of existing facilities subject to section 316(b) requirements (e.g., existing facilities addressed in EPA's section 316(b) Phase III rule). Moreover, this provision is an analogue to the provision in the 316(b) Phase I new facility rule providing for BPJ permitting where a facility is not subject to categorical requirements under Subpart I. See 40 CFR 125.80(c). Finally, this provision was not addressed, and is therefore not affected, by the Second Circuit's decision in *Riverkeeper*. Retaining it is therefore consistent with the approach EPA took in response to a judicial remand of its original section 316(b) regulations. See 44 FR 32854, 32956/1 (June 7, 1979) (withdrawing remanded regulations, but leaving intact a provision that had not been remanded).

IV. Statutory and Executive Order Reviews

Under Executive Order 12866 (58 FR 51735, October 4, 1993) this action is not a "significant regulatory action" and is therefore not subject to review under

¹ In the event that the court's decision is overturned after today's action, the Agency will take appropriate action in response.

the Executive Order. This action does not impose any new requirements and does not impose costs or impacts on the regulated industry and thus does not meet the requirements for Executive Order 12866 review. This action is not subject to the Regulatory Flexibility Act (RFA) since this rule is exempt from notice and comment rulemaking requirements for good cause which is explained in section I. Additionally, this rule will not significantly or uniquely affect small governments. EPA has determined that this rule would not contain a Federal mandate that may result in expenditures of \$100 million or more for State, local, and tribal governments, in the aggregate, or the private sector in any one year. Thus, this rule is not subject to sections 202, 203, or 205 of the Unfunded Mandates Reform Act of 1999 (Pub. L. 104-4). In addition, the EPA has determined that this action does not have Tribal implications, as specified in Executive Order 13175 (63 FR 67249, November 9, 2000). This action will not have federalism implications, as specified in Executive Order 13132 (64 FR 43255, August 10, 1999) because it does not establish any requirements on State or local governments. This regulation is not subject to Executive Order 13045 because it is not economically significant as defined under Executive Order 12866, and because the Agency does not have reason to believe the environmental health and safety risks addressed by this action present a disproportionate risk to children. This action is not subject to Executive Order 13211, "Actions Concerning Regulations that Significantly Affect Energy Supply, Distribution, or Use" (66 FR 28355, May 22, 2001), because it is not a significant regulatory action under Executive Order 12866. This action does not involve technical standards; thus, the requirements of section 12(d) of the National Technology Transfer and Advancement Act of 1995 (15 U.S.C. 272 note) do not apply. This action does not impose any new information collection burden under the provisions of the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.). The existing Information Collection requirements in this regulation were approved by the Office of Management and Budget under OMB control number 2040-0257.

List of Subjects

40 CFR Part 122

Environmental protection, Administrative practice and procedure, Confidential business information, Hazardous substances, Indians-lands, Intergovernmental relations, Penalties,

Reporting and recordkeeping requirements, Water pollution control.

40 CFR Part 125

Environmental protection, Cooling water intake structure, Reporting and recordkeeping requirements, Waste treatment and disposal, Water pollution control.

Dated: July 2, 2007.

Stephen L. Johnson,
Administrator.

■ For the reasons set forth in the preamble, EPA is amending 40 CFR parts 122 and 125 as follows:

PART 122—EPA ADMINISTERED PERMIT PROGRAMS: THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

■ 1. The authority citation for part 122 continues to read as follows:

Authority: The Clean Water Act, 33 U.S.C. 1251 et seq.

§ 122.21 [Amended]

- 2. Section 122.21 (r)(1)(ii) is suspended.
- 3. Section 122.21(r)(5) is suspended.

PART 125—CRITERIA AND STANDARDS FOR THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

■ 4. The authority citation for part 125 continues to read as follows:

Authority: Clean Water Act, 33 U.S.C. 1251 et seq. unless otherwise noted.

§ 125.90 [Amended]

- 5. Section 125.90(a), (c) and (d) are suspended.
- 6. Sections 125.91 through 125.99 are suspended.

[FR Doc. E7-13202 Filed 7-6-07; 8:45 am]

BILLING CODE 6560-50-P

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 131

[EPA-HQ-OW-2007-0467; FRL-8337-2]

RIN NA2040

Withdrawal of Federal Marine Aquatic Life Water Quality Criteria for Toxic Pollutants Applicable to Washington State

AGENCY: Environmental Protection Agency (EPA).

ACTION: Direct final rule.

SUMMARY: EPA is proposing to amend the Federal regulations to withdraw its

1992 federally promulgated marine copper and cyanide chronic aquatic life water quality criteria for Washington State, thereby enabling Washington to implement its current EPA-approved chronic numeric criteria for copper and cyanide that cover all marine waters of the State.

In 1992, EPA promulgated Federal regulations establishing water quality criteria for priority toxic pollutants for 12 States, including Washington, and two Territories that had not fully complied with the Clean Water Act (CWA). These regulations are known as the "National Toxics Rule" or "NTR." On November 18, 1997, Washington adopted revised chronic marine aquatic life criteria for copper and cyanide, the only two marine aquatic life priority toxic pollutants in the NTR applicable to Washington. These revisions included a chronic marine aquatic life water quality criterion for copper for all marine waters and a chronic site-specific cyanide criterion for the Puget Sound. EPA approved these criteria on February 6, 1998. On August 1, 2003, Washington adopted revisions to its water quality standards, including a chronic marine criterion for cyanide for all marine waters except the Puget Sound. EPA approved this criterion on May 23, 2007. Since Washington now has marine copper and cyanide chronic aquatic life criteria effective under the CWA that EPA has approved as protective of Washington's designated uses, EPA is proposing to amend the NTR to withdraw the federally promulgated criteria.

DATES: This rule is effective on September 7, 2007 without further notice, unless EPA receives adverse comment by August 8, 2007. If EPA receives such comment, EPA will publish a timely withdrawal in the *Federal Register* informing the public that this rule, or the relevant provisions of this rule, will not take effect.

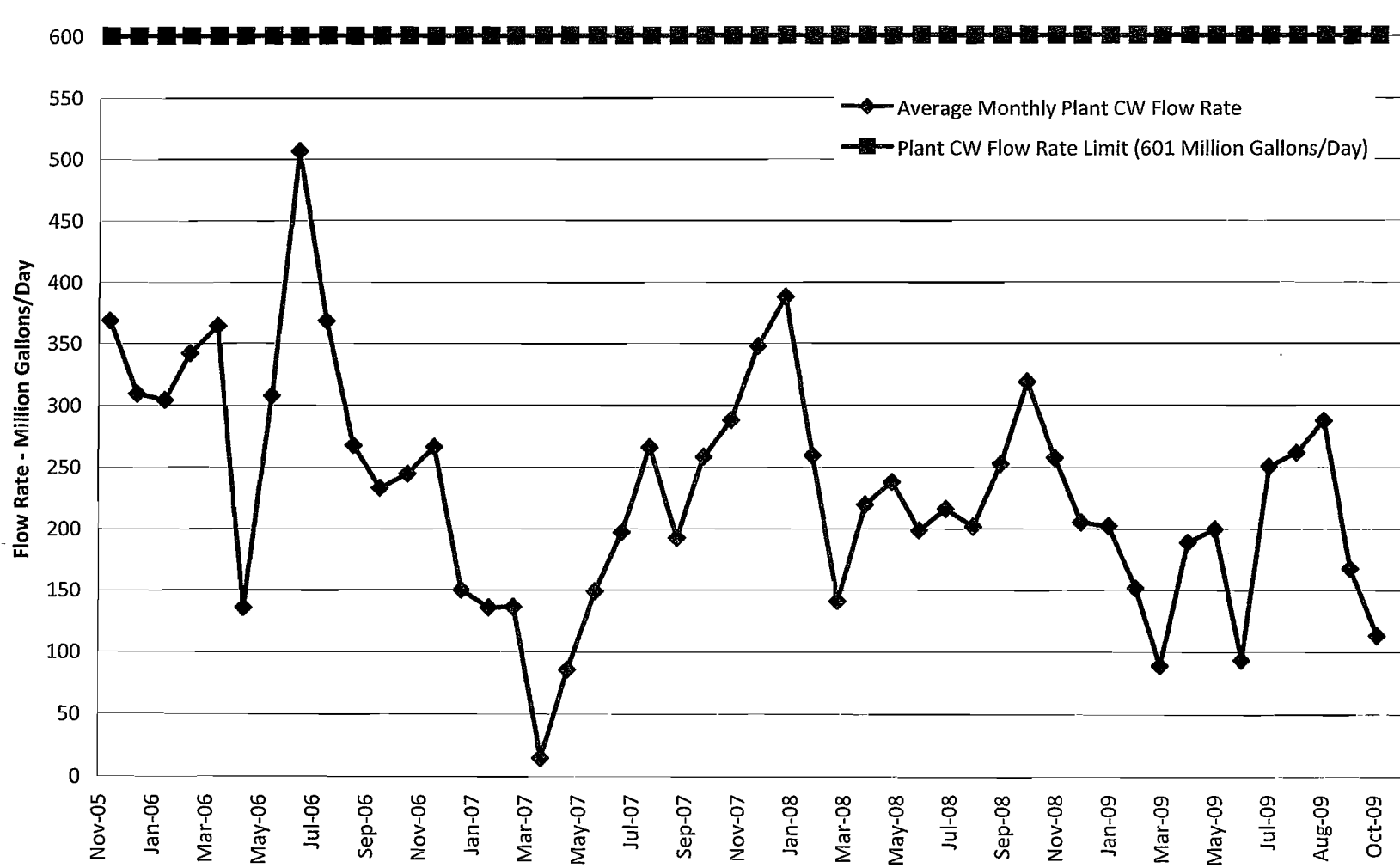
ADDRESSES: Submit your comments, identified by Docket ID No. EPA-HQ-OW-2007-0467, by one of the following methods:

- www.regulations.gov: Follow the on-line instructions for submitting comments.

- E-mail: ow-docket@epa.gov.

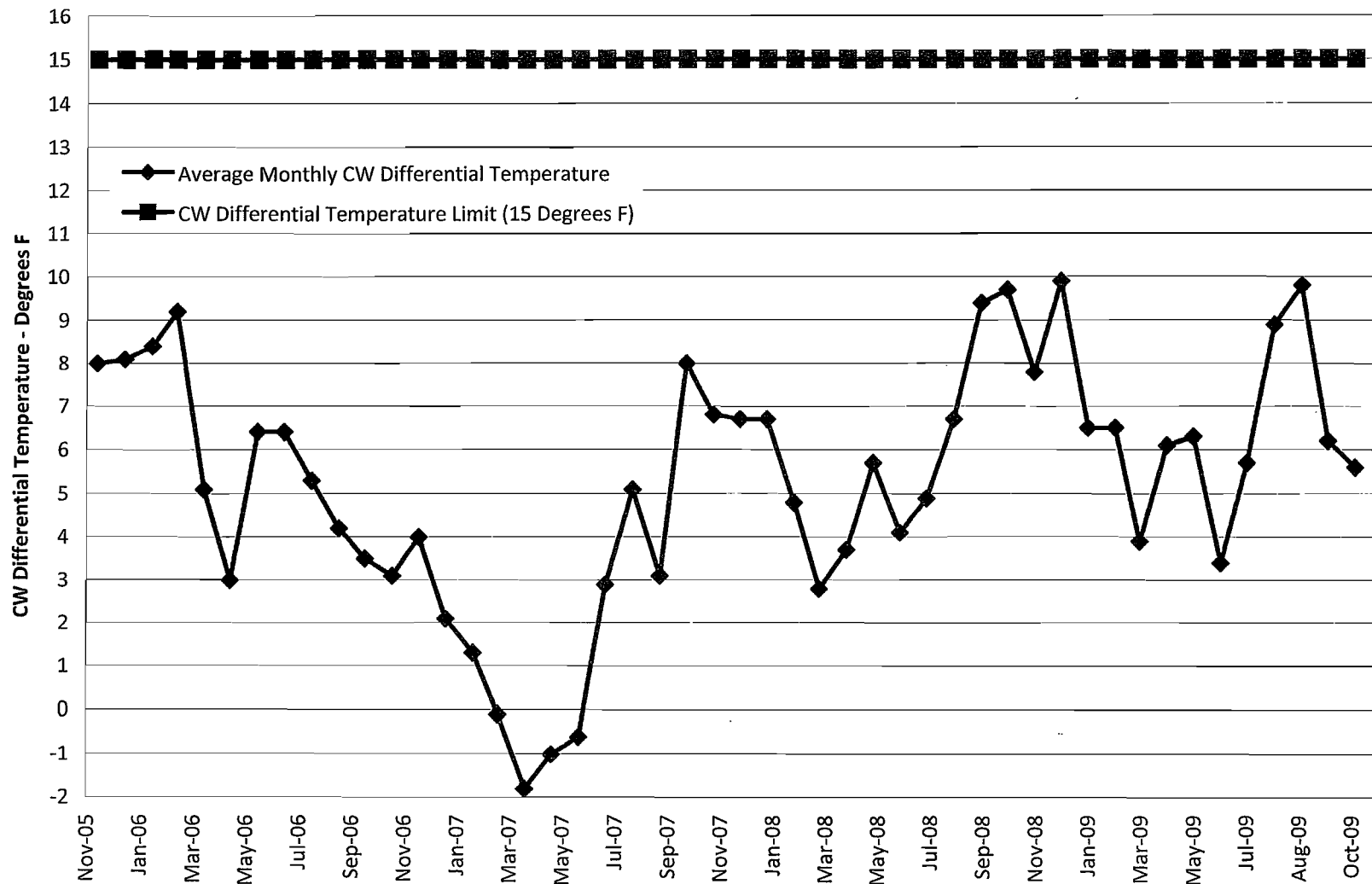
- Mail to either: Water Docket, USEPA, Mailcode: 2822T, 1200 Pennsylvania Ave., NW., Washington, DC 20460 or Becky Lindgren, Washington Marine Aquatic Life NTR Removal, U.S. EPA, Region 10, OWW-131, 1200 Sixth Avenue, Seattle, WA 98101, Attention Docket ID No. EPA-HQ-OW-2007-0467.

South Bay Power Plant Average Monthly Plant CW Flow Rate



South Bay Power Plant

Average Monthly CW Differential Temperature



1 PILLSBURY WINTHROP LLP
MARGARET ROSEGAY #96963
2 50 Fremont Street
Post Office Box 7880
3 San Francisco, CA 94120-7880
Telephone: (415) 983-1000
4 Facsimile: (415) 983-1200

5 Attorneys for Petitioner
DUKE ENERGY SOUTH BAY LLC
6
7

8 STATE WATER RESOURCES CONTROL BOARD
9 OF THE STATE OF CALIFORNIA

10 In the Matter of the Petition of) No.
11 DUKE ENERGY SOUTH BAY LLC)
12 Order No. R9-2004-0154) DECLARATION OF DAVID L.
13 Waste Discharge Requirements, NPDES) MAYER IN SUPPORT OF VERIFIED
Permit No. CA0001368) PETITION FOR REVIEW AND
14 California Regional Water Quality Control.) REQUEST FOR HEARING
15 Board, San Diego Region)
16 _____)
17

18 I, David L. Mayer, declare as follows:

- 19 1. I am President at Tenera Environmental LLC (“Tenera”), a private
20 consulting firm that specializes in analysis of marine resource assessments and
21 environmental impact monitoring. I have held this position since 2003. Except where
22 stated to be based upon information and belief, the statements made in this declaration are
23 based upon my personal knowledge. If called as a witness to testify with respect to matters
24 stated in this affidavit, I could and would competently do so under oath.
- 25 2. I have a Ph.D. in Fisheries and Quantitative Sciences from the University of
26 Washington, with a focus on analyzing and modeling the relationships of water
27 temperatures and hydrodynamics on aquatic communities. I have over 33 years experience
28

1 in environmental consulting, specializing in studies of marine and freshwater systems. I
2 have particular expertise in the areas of aquatic temperature and flow regimes, and their
3 effects on ecological systems. I have provided expert advice and testimony in agency
4 hearings and workshops on the results of water quality, thermal and ecological modeling,
5 and have conducted field research, prepared reports and testified on thermal discharge
6 effects at a majority of California's power plants including Humboldt Bay, Pittsburg,
7 Contra Costa, Potrero, Moss Landing, Morro Bay, Diablo Canyon, Ormond Beach, Long
8 Beach, Huntington Beach, San Onofre, Encina and South Bay. My research at Diablo
9 Canyon Power Plant included the design and operation of California's largest thermal
10 effects laboratory and implementation of the longest continuous monitoring program of
11 thermal effects. In my capacity as President of Tenera, I direct a group of research
12 scientists and engineers who provide contract services of environmental assessments and
13 computer analysis in the disciplines of air quality, water quality, ecology, hazardous
14 materials, and environmental risk assessment.

15 3. Tenera was retained by Duke Energy South Bay LLC in May 2002 to
16 evaluate the thermal effects of the discharge from the South Bay Power Plant ("SBPP") on
17 benthic (mud-dwelling) communities in the vicinity of the discharge.¹ The study was
18 conducted in connection with Duke Energy's application for renewal of the National
19 Pollutant Discharge Elimination System ("NPDES") permit for SBPP, in accordance with
20 the directives set forth in a Water Code section 13267 letter issued by the Executive Officer
21 of the San Diego Bay Regional Water Quality Control Board ("Regional Board") on May
22 24, 2002. The purpose of the study was to update the Clean Water Act section 316(a)
23 studies previously conducted by San Diego Gas & Electric Company ("SDG&E"), and in

24
25 ¹ Benthic marine organisms reside within and on the surface of unconsolidated bottom sediments
26 and typically include numerous species of annelid worms, bivalve and gastropod mollusks,
27 various types of crustaceans, echinoderms, and lesser known but equally important groups such
28 as nematode, nemertean, and phoronid worms. Together they comprise the first step in the food
chain, converting organic matter from the overlying water column into secondary food
production for higher trophic level predators such as fishes and shorebirds.

1 particular to determine whether a “balanced indigenous community” exists in south San
2 Diego Bay. A draft workplan was submitted to the Regional Board, the U. S. Fish &
3 Wildlife Service and the National Marine Fisheries Service, and was revised in accordance
4 with comments received from the agencies. The workplan was approved on October 19,
5 2002.

6 4. In addition, Duke Energy retained Merkel & Associates to conduct a study
7 of eelgrass distribution in south San Diego Bay. This study was also required by the
8 Regional Board’s May 24, 2002 section 13267 letter and was designed to follow up on
9 eelgrass studies conducted in 2000 by SDG&E.

10 5. A draft 316(a) report was submitted to the Regional Board and the resource
11 agencies for review and comment on March 20, 2004, and a final report, entitled “Duke
12 Energy South Bay Power Plant Cooling Water System Effects on San Diego Bay, Vol. 1:
13 Compliance with Section 316(a) of the Clean Water Act,” was submitted to the Regional
14 Board in May 2004. The final report included the results of Tenera’s study, which was an
15 analysis of empirical data collected in the field, and Merkel’s study, which involved
16 modeling potential distributions of eelgrass based on temperature and turbidity of the water.

17 6. In adopting Order No. R9-2004-0154, the Regional Board found that the
18 temperature of the power plant’s cooling water discharge did not adequately protect
19 receiving water beneficial uses. See Findings 14, 15 and 19 of the Order. These findings
20 appear to have been based on a gradient of declining species diversity index values of
21 benthic organisms in the immediate vicinity of the SBPP discharge.

22 **I. SUMMARY OF 2003 STUDY.**

23 7. This declaration reviews the 2003 study data and findings for purposes of
24 (i) highlighting the nature and extent of SBPP thermal effects based on species diversity
25 indices; (ii) creating an understanding of the statistical and scientific meaning and
26 significance of diversity indices; and (iii) comparing the effects observed at SBPP with
27 discharge-related changes in benthic diversity indices that have been found by other
28

1 California regional boards to afford reasonable protection of beneficial uses at other
2 California shoreline thermal discharges. The 2003 study results do not support the
3 Regional Board's findings regarding impairment of beneficial uses in south San Diego Bay.

4 8. Changes in the productivity and persistence of benthic infauna are related to
5 natural and anthropogenic factors such as water quality, pollutant loading, substrate
6 composition, organic matter content, temperature, oxygen concentration, and interspecific
7 community interactions (Weisberg et al. 1997). Benthic communities have been widely
8 used as pollution indicators because populations are sedentary and respond to local changes
9 in ambient conditions (Smith et al. 2001). The effects of the SBPP discharge on the
10 receiving water benthic community have been investigated in a series of field studies and
11 statistical analyses spanning nearly 30 years.² These historical studies all reached
12 essentially the same conclusions: (i) the presence of the discharge has altered the species
13 diversity of mud-dwelling organisms in the discharge channel; and (ii) the nature and extent
14 of thermal effects, based on species diversity indices, is confined to a small nearfield area
15 of the discharge region. Prior studies, however, did not address the question of what
16 significance, if any, these reported changes have for the benthic community in south San
17 Diego Bay, especially given the moderate degree of change and the very small area of
18 marine habitat that is affected.

19 9. Our understanding of discharge effects has become more refined over the
20 30-year period. Though science is able to contribute a factual basis and some theory in
21 addressing the issue of significance, in the end the answer is one of reason and judgment.
22 Generally speaking, discharge-related changes (alteration, disturbance) are considered of a
23 reasonable nature if a population is not threatened and the areal extent of the affected
24 receiving water is relatively small. It is my belief that the changes in the benthic
25 community, though clearly detectable, do not necessarily represent a significant change in

26 _____
27 ² Benthic invertebrate populations in south San Diego Bay have been quantified in various studies
28 since 1968 (Tenera 2003 V1, p 3.3-2).

1 the ecological function and productivity of the changed community. Species which are
2 indigenous to San Diego Bay and present in reasonably normal abundances are present in
3 the discharge-altered community and are still functioning in their normal ecological roles as
4 secondary producers, converting organic matter into benthic biomass and food for the
5 higher trophic levels such as fishes and birds.

6 10. The purpose and design of the Tenera 2003 study was to further investigate
7 the nature and extent of the SBPP discharge effects on benthic communities of marine
8 worms, crustaceans, and mollusks by sampling the kinds of species and their individual
9 abundances as a function of the distance from the discharge, a surrogate for discharge
10 temperature exposure. The studies were conducted during June, July and August (the
11 warmest months of the year) in order to evaluate the effects of the plant's discharge under
12 "worst case" conditions. Given the "worst case" nature of the study design, it must be
13 noted that effects measured during the warmest months of the year are not representative of
14 the cooler months, and can lead to an overestimate of overall discharge effects.

15 11. The 2003 study entailed an extensive investigation of the influence of the
16 SBPP discharge plume on benthic communities of south San Diego Bay. In order to
17 improve the density of spatial data and thereby increase the study's chances of detecting
18 such community gradients, the study design doubled the number of sampling locations used
19 in the previous studies, and located sampling stations across both vertical and horizontal
20 changes in the bottom elevation where they would be exposed to various discharge
21 temperatures. The data collected from this array of sampling locations allowed a much
22 finer-scale examination of changes in the benthic community closer to SBPP discharge.
23 This element of the study was intended to provide better definition of both the nature and
24 extent of the expected gradient of change in the bottom and intertidal communities than was
25 obtained through prior studies. From the study's results, it is now known that the discharge
26 plume effects are strongly three dimensional due to the buoyant nature of the warm
27 discharge water and the increasing depth of the discharge basin as one moves offshore,

28

1 away from the shoreline. The gradient of discharge effects on the bottom community
2 disappears much more rapidly (closer to the point of discharge) than discharge effects in the
3 intertidal community which exists along the refuge island shoreline that parallels the path of
4 the discharge plume as it moves bayward.

5 12. The sampling stations were located in subtidal and intertidal areas both
6 inside and beyond the zone of contact with the warm water discharge. Because data on the
7 kinds of benthic dwelling species that existed in south San Diego Bay before the SBPP was
8 constructed are not available, a before-and-after measure of SBPP-induced changes cannot
9 be made. Accordingly, the study was designed to measure gradients of change from the
10 point of the shoreline discharge to areas offshore.³

11 13. The area of affected intertidal and subtidal habitat lies between the discharge
12 and sampling stations E7 and T1 (see attached Figure 2.3-1a), a distance of approximately
13 600 feet. The discharge effects on species diversity are more noticeable in the intertidal
14 area. Intertidal habitat near the discharge is more frequently in contact with warmer water
15 at distances further away from the point of discharge as the plume becomes a buoyant
16 surface phenomenon. The plume's buoyant separation from the bottom also reduces the
17 frequency and extent of warm water contact with the subtidal benthic community. Results
18 from the recent fine-scale monitoring and modeling of SBPP receiving water temperatures⁴
19 illustrate the three-dimensional nature of the SBPP discharge plume. The patterns of
20 thermal plume distribution and dispersion found in these analyses were consistent with the
21 area and pattern of the limited discharge effects. It is reasonable to conclude that periods of

22 ³ The assumption underlying the gradient-style study design is that changes in the benthic
23 community that occur with increasing proximity to the point of discharge are primarily
24 attributable the SBPP discharge. However, there is some reason to believe that this may not be
25 the case, since previous dredging to deepen the discharge channel has altered the geology of the
26 channel's bottom sediment, and the character and quality of sediments are well known from the
27 scientific literature to have a potentially profound influence on the species composition and
28 abundance of benthic communities. It is also possible that the hypersaline conditions and
drainage of the neighboring salt ponds have influenced the benthic habitat and communities in
the vicinity of the SBPP discharge.

27 ⁴ Tenera 2003, page 3.3-4.

1 elevated discharge temperatures, particularly in the late summer, have caused most of the
2 change in the benthic community species diversities observed at stations E7 and T1.⁵
3 However, it is also reasonable to expect that the discharge flow has altered the composition
4 and distribution of sediment and waterborne organic matter, habitat characteristics that are
5 also important factors in the species composition and diversity of benthic communities.

6 14. The lower benthic species diversity as noted above at stations E7 and T1 in
7 the immediate vicinity of the SBPP discharge is reflected by both a small reduction in the
8 number of species and a significant increase in the abundance of a few of the species.⁶
9 Specifically, the study concluded⁷

- 10 ■ There was no clear gradient in total number of taxa per station as a function
11 of distance from the discharge at subtidal stations. The station nearest the
12 discharge, SE7, had a relatively high number of species (46) in August
13 compared to the average at all stations for the same period (38.1 per station)
14 (see report Table 3.3-1).⁸
- 15 ■ There was no clear gradient in total numbers of individuals per station as a
16 function of distance from the discharge at subtidal stations. Abundances at
17

18 _____
19 ⁵ A species diversity index is a mathematical measure of species diversity in a community.
20 Diversity indices provide more information about community composition than simply the
21 number of species present by taking into account the relative abundances of different species.
22 As an example, two communities of 100 individuals each are composed of 10 different species.
23 Community A has 10 individuals of each species; and Community B has one individual each of
24 nine species, and 91 individuals of the tenth species. Although both communities have exactly
25 the same number of species and individuals, by taking into account the relative abundance of
26 each species, Community A has the highest species diversity index. The species diversity index
27 of a community does not depend on the number of species, but on the evenness with which
28 individuals are distributed among the different species.

⁶ Even so, the resulting diversity indices at these two stations are not unusually low for shallow
marine embayments (about 50 percent of normal for this area of San Diego Bay).

⁷ A summary of community parameters including species richness, total number of taxa, biomass,
diversity, evenness, and a benthic response index is presented for the subtidal and intertidal
stations during July, August, and September 2003 in Tables 3.3.1 and 3.3.2.

⁸ Tenera 2003, p 3.3-7.

1 the four stations closest to the discharge were generally less than half those
2 of the reference stations (see report **Table 3.3-2**).⁹

- 3 ▪ There was no consistent pattern in the distribution of total subtidal biomass
4 and no obvious gradient as a function of distance from the discharge. A lack
5 of pattern resulted from lower marine worm biomass near the discharge,
6 combined with offsetting biomass of other types of benthic organisms.
- 7 ▪ Intertidal biomass showed no consistent trends related to distance from the
8 discharge.¹⁰
- 9 ▪ Mean diversity at subtidal stations was generally low at the two stations
10 closest to the discharge, SE7 and ST1. During all months sampled there was
11 a significant trend of decreasing diversity within the discharge channel as
12 distance from the discharge decreased ($p < 0.05$; **Figure 3.3-3**).¹¹
- 13 ▪ The lowest intertidal faunal diversities were also recorded at stations closest
14 to discharge (see report **Table 3.3-2**), but there was no significant trend
15 among sampling stations as a function of distance from the discharge.

16 15. The results of the 2003 Tenera study demonstrate and agree with all of the
17 previous investigators' reported findings that the extent of SBPP discharge-related changes
18 in subtidal benthic communities is limited to a near-field area extending approximately
19 100 m (300 ft) from the discharge. Thermal effects measured in the intertidal area extended
20 approximately 600 feet from the point of discharge, or twice the distance of the subtidal
21 effects. An analysis of data collected from 1977–1980 concluded that there were “no
22 undesirable or adverse ecological effects to the soft bottom benthos associated with the
23 operation of the SBPP” (LES 1981). A complete summary review of the long-term
24 receiving water monitoring data included surveys over a 17-year period from 1977–1993

25 _____
26 ⁹ Tenera 2003, page 3.3-8.

27 ¹⁰ *Ibid.*

28 ¹¹ Tenera 2003, page 3.3-9.

1 (Ogden Environmental and Energy Services Co., Inc. 1994) concluded that the stations
2 within the discharge channel and nearest the power plant (E5 and E7) had lower numbers of
3 infaunal taxa and lower species diversity than control stations, indicating a localized effect
4 of the power plant. (See **Figure 2.3-1a**)

5 16. None of the previous studies or the 2003 study found discharge-related
6 effects which suggested changes in the SBPP receiving water benthic community that were
7 unreasonable or unexpected given the size and location of the permitted discharge. Nor
8 was evidence found that the observed changes indicated an ecological loss of beneficial use
9 of the receiving water as marine habitat. To the contrary, evidence was found that even in
10 the nearfield discharge area, a normal range of fully functioning marine habitat exists. This
11 evidence is apparent in both the results of SBPP benthic community studies that focus on
12 the very small area of marine habitat that is affected by the discharge, and in the results of
13 the 2003 fisheries studies (and many previous studies) that have demonstrated a highly
14 abundant and diverse fish community in the immediate vicinity of the discharge, well
15 within the nearfield area where we have found changes in the benthic community. The
16 presence of such a productive and fully functioning marine habitat in the vicinity of the
17 SBPP discharge would be expected given the highly localized, limited extent of
18 discharge-related change.

19 17. Results of the 2003 SBPP receiving water studies found no evidence of
20 ecological impairment of the receiving water beneficial uses, including intertidal and
21 subtidal habitat at discharge-affected stations E7 and T1. Fishes¹², birds, and wildlife were
22 observed in abundance throughout the discharge area. The presence of the abundant fish

23
24 ¹² Tenera 2003, page 3.4-14. The discharge channel is a unique environment that shows some
25 similarity to other back-bay environments, while also providing conditions that allow for unusual
26 species occurrences, atypical juvenile abundances, and seasonal use patterns. The unique
27 temperature environment of the channel may provide a warm water refuge area for several Bay
28 species during the winter, but may similarly preclude some species from full use of the area
during the hottest portions of the summer months. The site provides a warm haven for fish and
for green sea turtles in winter, as well as for interesting Panamic province species such as the
diamond stingray, California halfbeak, California needlefish, bonefish, and shortfin corvina.

1 populations in the SBPP discharge flow provides a valuable prey base for the successful
2 U.S. Fish and Wildlife (USFWS) refuge for least terns that is immediately adjacent to the
3 SBPP discharge. Results of the 2003 comparison of the number of species, density, and
4 biomass of fish populations between the SBPP discharge and three other similar southern
5 California bay settings are shown in attached **Figure 3.4-4**. In every comparison, the
6 measures of fisheries resources in the SBPP discharge are as great or greater than the
7 comparison sites.

8 18. Findings 14, 15 and 19 of Order No. R9-2004-0154 concluded that the low
9 species diversity index of benthic organisms, primarily marine worms, indicated that the
10 SBPP discharge temperature limits do not protect receiving water beneficial uses.
11 However, Tenera's 2003 study and analysis of benthic species diversity in the SBPP
12 discharge area in fact reported a very localized change in the diversity of benthic species.¹³
13 These localized changes are clearly seen at the two stations closest to the discharge, SE7
14 and ST1 (see attached **Figure 3.3-3**, which summarizes the results of both intertidal and
15 subtidal species diversity analyses). As also seen in **Figure 3.3-3**, there is no evidence of
16 discharge-related effects on average benthic species diversity among all of the other
17 intertidal and subtidal sampling locations including those in the SBPP discharge area and
18 reference stations, which are graphically lower on average than the discharge area species
19 diversities.¹⁴

20 19. In summary, the 2003 study corroborated the conclusions reached in the
21 prior SBPP studies and concluded that the benthic community in the vicinity of the SBPP
22 discharge, though composed of slightly more of one indigenous species than another, is
23 fully functional and typical of similar south Bay benthic communities. This Regional
24 Boards findings do not comport with this conclusion.

25 _____
13 *Ibid.*

26 ¹⁴ A low evenness index of species diversity in July, August and September at Station E7 was
27 mainly due to the dominance of nematodes, oligochaetes, and *Musculista senhousia* in the
28 samples even though the overall number of taxa was higher than the average.

1 II. COMPARISON OF SBPP DISCHARGE EFFECTS WITH THOSE OF
2 OTHER COASTAL POWER PLANTS IN CALIFORNIA.

3 20. Other NPDES-permitted shoreline cooling water discharges in California
4 that exhibit near-field changes in receiving water species have been found to be acceptable
5 by other regional boards and regulatory agencies. These relevant precedents were not
6 taken into account by the Regional Board. The significance of the SBPP discharge-related
7 effects may be assessed by comparing these effects to cooling water discharge-related
8 effects of the Morro Bay Power Plant (MBPP) and Diablo Canyon Power Plant (DCPP) in
9 the Central Coast Region.

10 21. The elevated cooling water temperatures of the MBPP's shoreline discharge
11 have altered the shallow intertidal community for a distance of approximately 700 feet
12 along the base of Morro Rock. The extent of this change has been judged to be of a
13 reasonable extent by the Central Coast Regional Board, the California Energy Commission
14 (CEC), the California Department of Fish and Game (CDFG), and a number of experts
15 from several academic institutions. Similarly, the intertidal and subtidal benthic changes
16 due to the elevated temperatures of the DCPP shoreline cooling water discharge have been
17 extensively studied and analyzed. The receiving waters include Diablo Cove, an open coast
18 rocky shore habitat that supports luxuriant kelp forests and other subtidal kelps, attached
19 algae, fish and abalone. In determining the reasonable extent of discharge-related change,
20 the Regional Board allowed significant change in a distance of 1,400 feet from the
21 discharge, taking into account the size of the discharge. By comparison, the size of the
22 SBPP affected intertidal area is approximately 600 feet from the discharge (subtidal effects
23 are limited to half the distance of intertidal effects, or 300 feet). This represents less than
24 one percent (by area) of the south bay marine habitat.

25 22. Not only is the extent of SBPP discharge-related change in species diversity
26 significantly smaller than reasonable and acceptable changes at California's other shoreline
27 discharges, but the South Bay species that comprise the diversity indices are by necessity
28

1 species that are able to tolerate the great range of environmental conditions of typical of
2 California's enclosed bay, sloughs and estuaries. Many of these species also have short life
3 cycles, producing many generations in a single year.^{15, 16, 17} Species of marine worms that
4 live in bay mud, including those species that the Regional Board cited as evidence that the
5 SBPP receiving water beneficial uses are not being protected, are able to tolerate extremes
6 of salinity, temperature and dissolved oxygen through their unique physiological and
7 behavioral adaptations. In this sense they need less environmental stability (receiving water
8 quality protection) to flourish than the open coast benthic species found in the DCPD and
9 MBPP receiving waters. Yet the SBPP permit affords more protection to the South Bay
10 species.

11 23. The reasonable and allowable extent of discharge-related at the MBPP and
12 DCPD is not only larger than SBPP, but the nature of reasonable change includes shifts in
13 abundant populations of attached algae to invertebrate dominated benthic communities.
14 However the modified communities at both sites are fully functional in an ecological sense,
15 and there is no indication that the beneficial uses of either of the receiving water marine
16 habitats have not been protected. Similar to the nature of SBPP discharge-related changes
17 reported in over 30 years of benthic studies, changes at the MBPP and DCPD locations
18 reflect warm water discharge conditions favoring one indigenous species over another. At
19 the MBPP discharge site, the sand-tube dwelling polychaete, *Phramatopoma californica*,
20 has colonized the rocky shore for several meters from the point of discharge. The striking

21 _____
22 ¹⁵ Warren (1976) noted that spawning occurred throughout the year in, with all oocytes being
23 released at a single spawning. Warren, L.M., 1976. A population study of the polychaete
Capitella capitata at Plymouth. *Marine Biology*, 38, 209-216.

24 ¹⁶ The opportunist polychaete *Capitella capitata* has both benthic and planktonic larvae and breeds
25 throughout the year; this means it is able to colonize impacted or stressed areas very quickly.
Pearson, T.H. & Barnett, P.R. (1987). Long-term changes in benthic populations in some west
European coastal areas. *Estuaries* 10 (3), 220-226.

26 ¹⁷ The amphipod *Corophium volutator* displays one or two generations per year depending on
27 environmental conditions at its location. Olive, P.J.W. (1978). Reproduction and annual
gametogenic cycle in *Nephtys hombergi* and *N. caeca* (Polychaeta: Nephtyidae). *Marine
Biology*, 46, 83-90.

1 sand colonies of this intertidal species are common along California's rocky coast, usually
2 occurring in protected and possibly warmer embayments. It appears that the MBPP
3 discharge temperatures favor the abundance of this habitat-forming species. As found in
4 the SBPP studies where the increased abundance of a few species of worms lowered the
5 benthic community's species diversity indices, the abundance of *P. californica* lowered the
6 benthic community species diversity index at the MBPP discharge without harming, and
7 indeed enhancing, the beneficial use of marine habitat at the site. See attached **Figure 5-8**.

8 24. A few miles down the coast from the MBPP discharge, the much larger
9 DCPD cooling water discharge has similarly favored the presence and abundance of
10 attached and colonial invertebrate species over species of attached upright algae normally
11 found in Diablo Cove, the power plant's primary discharge receiving water area. These
12 changes favoring the abundance of warm water species over other less tolerant species have
13 also caused lower species diversity without harming the receiving water's beneficial use as
14 marine habitat, albeit by warmer water species.

15 III. SAN DIEGO BAY COUNCIL STUDIES.

16 25. Other technical reports that seek to refute the 2003 Tenera report were
17 submitted to the Regional Board by the San Diego Bay Council, an informal coalition of
18 various public interest organizations. These reports were prepared by the British firm,
19 Pisces Ltd., and by Dr. Robert Ford, a retired professor from San Diego State University
20 who previously conducted thermal effects studies for SDG&E. Neither the Pisces report
21 nor Ford's report reviewed, analyzed or even commented upon the lower species diversity
22 of mud-dwelling organisms that the Regional Board relied upon as evidence that receiving
23 water beneficial uses are not protected in the vicinity of the SBPP discharge. Similarly,
24 neither Pisces nor Ford considered the clearly three-dimensional effects of the discharge
25 plume, or the sharp gradient of diminished effects as the warm plume lifts and separates
26 from contact with the benthic community.

27

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1 26. However, in prior studies conducted by Ford in 1970, 1972 and 1973, Ford
2 found essentially the same type of discharge-related gradient in the benthic community that
3 is identified and discussed in the 2003 Tenera report. Ford’s main conclusion from this
4 series of studies was that significant effects on benthic invertebrate assemblages were
5 “restricted primarily to the cooling channel area and to warmer periods of the year” (Ford et
6 al. 1973). An annual SBPP benthic monitoring program from 1977–1993 continued after
7 Ford’s initial studies. A subset of Ford’s (1972) original 28 stations was monitored at
8 11 locations during this period. An independent analysis of Ford’s studies and the data
9 collected from 1977–1980 concluded that there were “no undesirable or adverse ecological
10 effects to the soft bottom benthos associated with the operation of the SBPP” (LES 1981).
11 A second independent analysis of all of the SBPP benthic data collected through 1993
12 found again that the stations within the discharge channel and nearest the power plant
13 (stations E5 and E7) (see **Figure 2.3-1**) had lower numbers of infaunal taxa and lower
14 species diversity than control stations, indicating a very localized effect of the power plant.
15 All of the results from this long series of SBPP benthic studies, which include the results of
16 the 1994 independent summary analysis, concluded that the discharge has caused a very
17 localized effect that can be detected as a change in the species diversity of the nearfield
18 benthic community.

19 27. The author of the Pisces report concludes that “Even if species live within
20 this zone, they **might be** living sub-optimally and **possibly** not be able to reproduce.¹⁸
21 (emphasis added) This conclusion amounts to no more than speculation or guessing. The
22 author’s evidence for this statement — that temperature effects such as increased growth
23 and prolonged growth season are “deleterious” — is not supported by field or laboratory
24 evidence of harm to a balanced indigenous community. In any case, it is not clear how
25 “increased growth and prolonged growth season” would be regarded as an impairment of

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¹⁸ Pisces 2004, page 16.

1 beneficial uses. To the contrary, the discharge provides a unique and productive ecological
2 base for the fishes, birds, and wildlife of South Bay ecoregion of San Diego Bay. Pisces
3 also omitted several studies from their review and conclusions.^{19,20,21}

4 28. The Board should not be misled by Pisces' bad science citations to outdated
5 and irrelevant information on the effects of both the DCPD and MBPP discharges. The
6 author of the Pisces report presents findings and a graph from a 1969 siting study for DCPD
7 prepared by Pacific Gas and Electric Company for the Atomic Energy Commission (now
8 the Nuclear Regulatory Commission). We are aware of this "gray" literature even though
9 copies no longer exist; the Pacific Coast Electrical Association has not existed for many
10 years. The study was a hypothetical extrapolation of data for the purposes of estimating the
11 effects of the DCPD cooling water discharge. The actual data and findings on the effects of
12 the DCPD cooling water discharge have been reported in over 30 different reports spanning
13 the last three decades. The effects of the MBPP discharge were exhaustively studied in
14 2001 and reported in numerous reports and testimony before the CEC. The Central Coast
15 RWQCB recently issued a Tentative Order (TO) with specific findings on the MBPP
16 thermal discharge based on contemporary studies rather than the Pisces paper study. The
17 Central Coast TO and summary of these studies is available on the Internet. Studies of the
18 MBPP thermal discharge were analyzed and presented in reports and expert testimony
19 before the CEC and are available in Duke Energy's Application for Certification of the

21 ¹⁹ Adams, J. R., D. G. Price and F. L. Clogston. 1974. An evaluation of the effect of Morro Bay
22 Power Plant cooling water discharge on the intertidal macroinvertebrate community. PG&E,
Department of Engineering Research, San Ramon, California. 32 pp.

23 Pacific Gas and Electric Company and Cal Poly San Luis Obispo conducted a study in 1971–
24 1972 to examine the relationship between increased water temperatures along the beach north of
the discharge and the community structure (species composition, abundance, and diversity) of
the intertidal sand beach fauna.

25 ²⁰ Pacific Gas and Electric Company. 1973. An evaluation of the effect of cooling water
26 discharges on the beneficial uses of receiving waters at the Morro Bay Power Plant.
San Francisco, CA.

27 ²¹ Tenera 2001 op cit.

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1 Morro Bay Power Plant Modernization Project and the CEC's recent approval (June 2004)
2 of certification.²²

3

4 I declare under penalty of perjury under the law of the State of California that the
5 foregoing is true and correct. Executed this 10th day of December, 2004 at Lafayette,
6 California.



David L. Mayer

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26 ²² TENERA.. 2001. Morro Bay Power Plant Modernization Project Thermal Discharge Assessment
27 Report. Prepared for Duke submittal to California Energy Commission, Regional Water Quality
Control Board, California Department of Fish and Game, California Coastal Commission.

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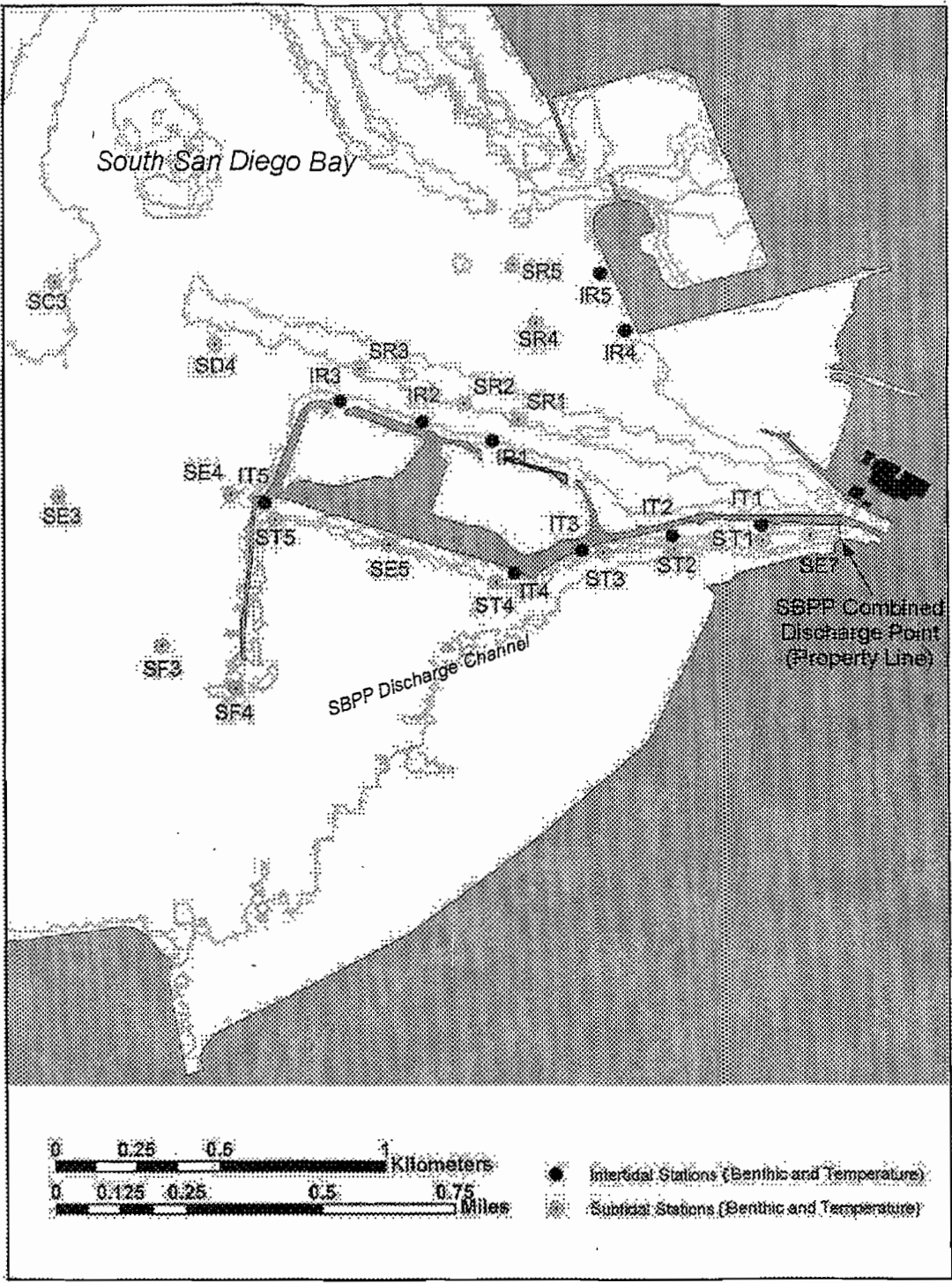


Figure 2.3-1a. Station location map of *in situ* temperature recorders, sediment grain size samples, and benthic biological samples: all stations shown.

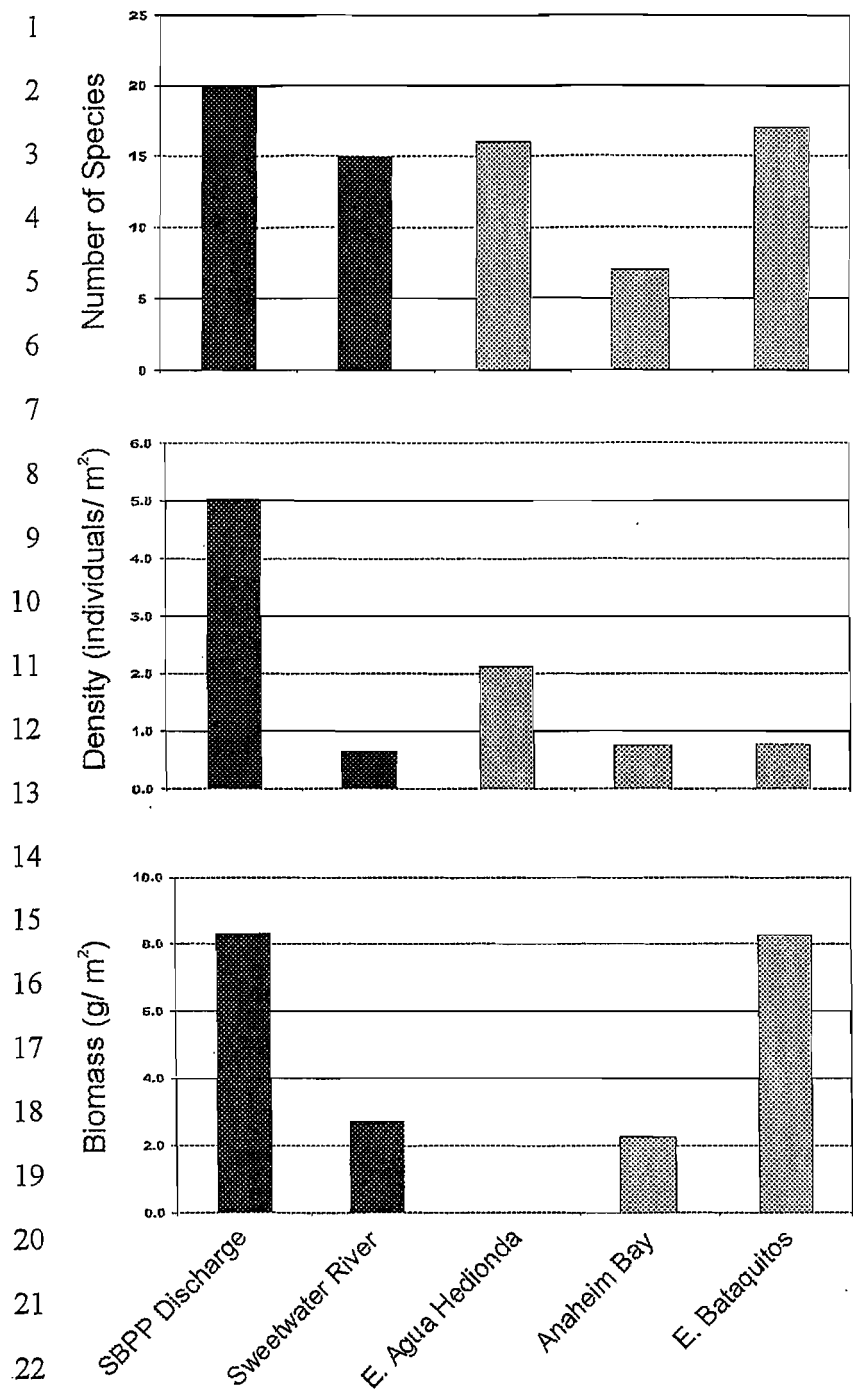


Figure 3.4-4. Number of fish species, density, and biomass at study sites and three reference sites. Agua Hedionda Lagoon data from July 1994 (MEC Analytical Systems 1995) (no biomass reported); Anaheim Bay data from Sept. 1994 (MEC Analytical Systems 1995); Bataquitos Lagoon data from July 2003 (Merkel & Associates 2003, unpublished data).

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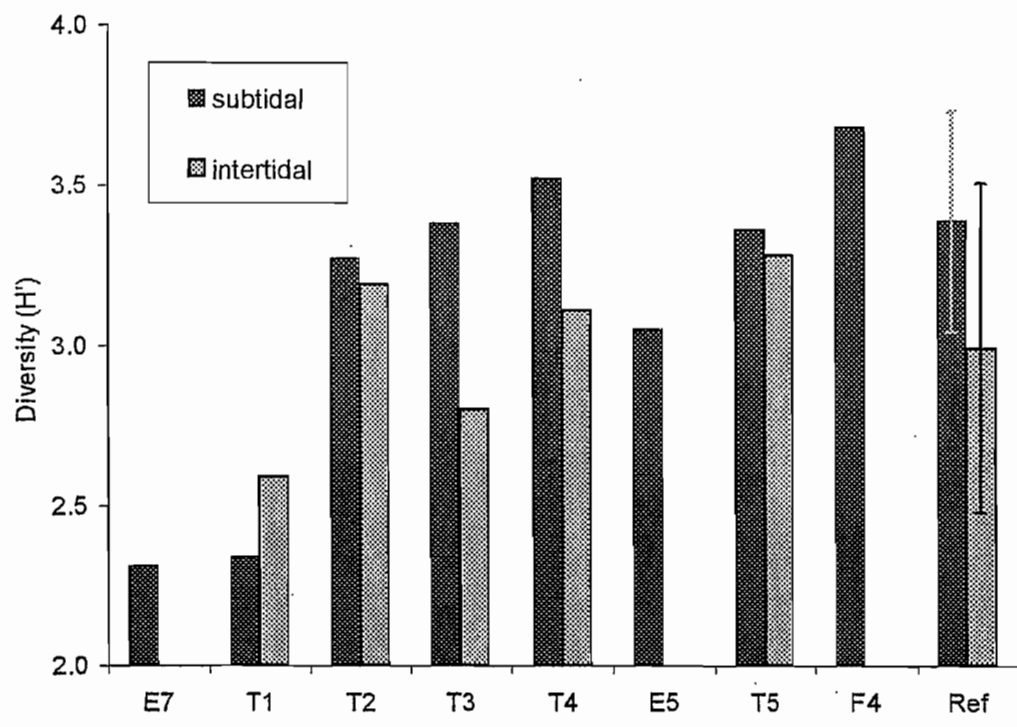


Figure 3.3-3. Infaunal diversity (H') mean per station at SBPP discharge channel stations, August 2003. Reference diversity values are the mean and standard deviation of other sampled subtidal ($n=13$) and intertidal ($n=5$) stations in south San Diego Bay.

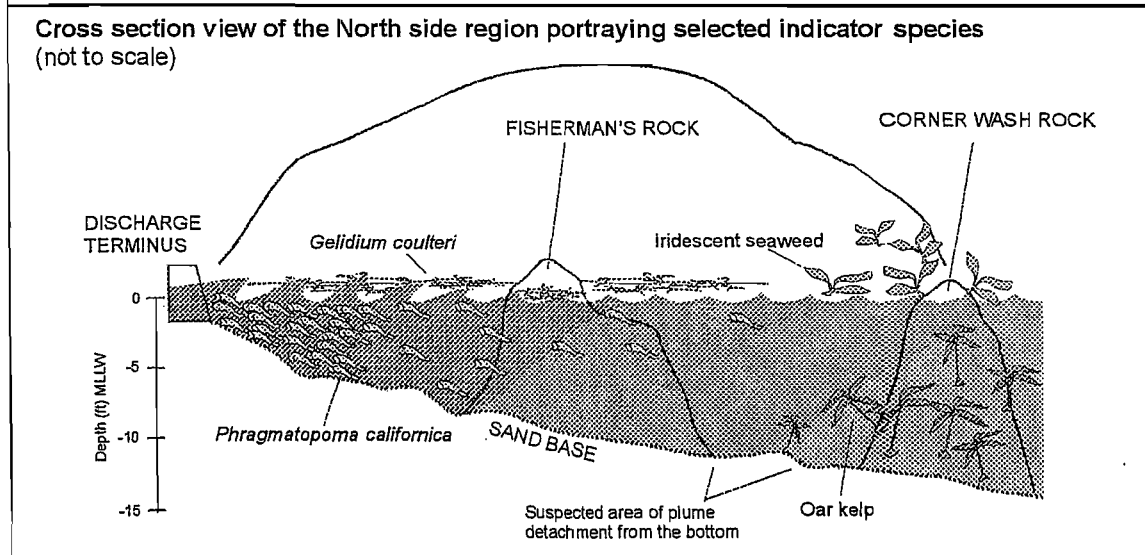
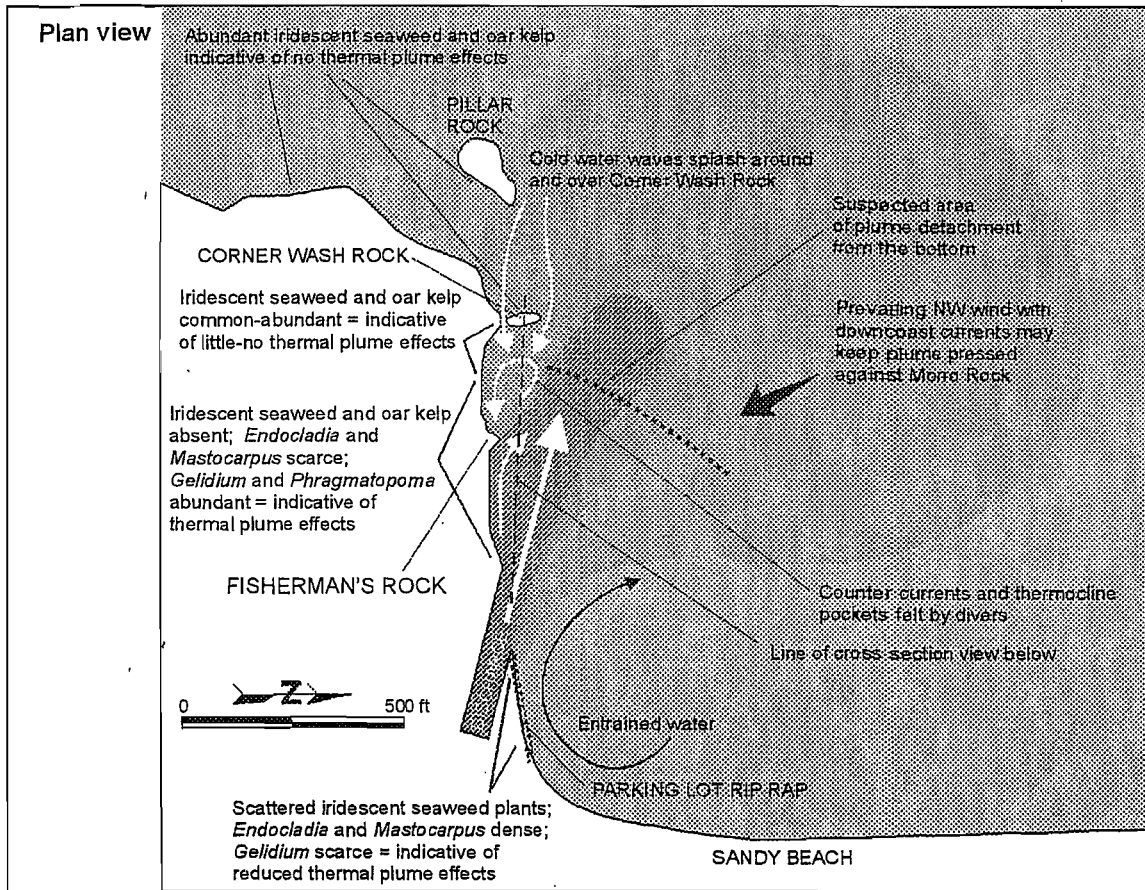


Figure 3. Morro Bay Power Plant discharge area effects. Darker shaded water represents warmer temperatures. Species noted from subtidal horizontal and vertical transect sampling, observations outside the sampling areas, and intertidal observations. (Source Tenera 2001, Figure 5-8.)