UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 9
75 Hawthorne Street
San Francisco, CA 94105

Response to Comments from the City and County of Honolulu

on the Environmental Protection Agency's
December 7, 2007 Tentative Decision
regarding the

City and County of Honolulu's request for a Variance at the
Sand Island Wastewater Treatment Plant under
Section 301(h) of the Clean Water Act

January 5, 2009

Response to CCH comments on Sand Island TDD

This document responds to the comments received from the City and County of Honolulu on the Sand Island tentative decision. A separate document responds to all other comments received from the public on the Sand Island tentative decision. Each comment in this document is given a number with the prefix "C." Comments in the Response to Comments from the Public are given numbers with the prefix "P." Any reference in this document to "public" comments should be interpreted to include both the comments in this document and the other comments received from the public.

Note: Various commenters refer to a section 301(h) "waiver," whereas EPA uses the term "variance." In the context of the Sand Island decision and response to comments document, these terms can be considered interchangeable.

General Comments

Comment C1: The CWA required all publicly owned treatment works (POTWs) to meet effluent limitations based on secondary treatment, as defined by the EPA Administrator, by July 1988. Secondary treatment was subsequently defined in terms of three parameters: biochemical oxygen demand (BOD), total suspended solids (TSS), and hydrogen ion concentration (pH).

Congress amended the CWA in 1977 by adding Section 301(h), giving EPA authority to issue modified NPDES permits for primary treatment by POTW discharges to marine waters. According to Congressional records, Section 301(h) was promulgated: "in order to achieve needed savings in the cost of treatment of municipal wastes[; thus,] the Committee considers it desirable to make the option of ocean discharges available where it can be shown that unacceptable adverse environmental effects will not result" (H.R. Rep. No. 97-270 [1981], reprinted in U.S.C.C.A.N. 2629, 2645).

The modifications allowed by Section 301(h) are focused on potential relaxation of BOD, TSS, and pH criteria. No other relaxations of secondary treatment requirements or environmental standards are allowed. Congress expressly identified nine criteria that the applicant must meet to obtain a Section 301(h) waiver. These criteria include compliance with water quality standards, industrial pretreatment requirements, monitoring programs, and the elimination of toxic substances from nonindustrial sources, among others. In essence, all waiver criteria concern direct or indirect impacts on the marine environment and the public uses thereof; their overarching goal is to prevent ocean degradation by the discharge of primary effluent.

The nine 301(h) waiver criteria are listed in CCH's comments.

Response: EPA agrees that Section 301(h), as added to the Clean Water Act in 1977 and amended by the Water Quality Act of 1987, allows EPA to modify the secondary treatment requirements of CWA section 301(b)(1)(B) for certain dischargers that demonstrate that the

proposed discharge complies with a set of criteria intended to protect the marine environment, including attaining water quality standards. EPA does not dispute the commenter's quotation from the legislative history or general summary of the 301(h) requirements.

Comment C2: CCH has made more than $360 million in upgrades to the SIWWTP since the Permit was issued. These upgrades have improved the overall plant operations and reliability, providing additional assurance that the plant will meet its treatment removal requirements for BOD and TSS.

Specifically, CCH has implemented the following upgrades:

1. Ala Moana Wastewater Pump Station Modifications, 2004; upgraded existing pump station to accommodate higher flows and head, for more than $25 million
2. Hart Street Wastewater Pump Station Modifications, 2002; upgraded existing pump station to accommodate higher flows and head, for more than $27 million
3. Hart Street Wastewater Pump Station Force Main Replacement, 2001; installed new force main, for more than $23 million
4. Sand Island Parkway Wastewater Pump Station Modifications, 2004; upgraded existing pump station to accommodate higher head, for more than $1.5 million
5. SIWWTP, Unit 1, Phase 2A, 2005; constructed new headworks and increased capacity from 82 million gallons per day (mgd) to 90 mgd with the addition of two new primary clarifiers as required by the Sand Island Expansion, for more than $104 million
6. SIWWTP Disinfection Facility, 2007; constructed new ultraviolet (UV) disinfection facility and effluent pump station, for more than $115 million
7. SIWWTP Interim Chemical Treatment Facility Improvements, 2000; upgraded the Chemical Treatment Facility, for more than $1.5 million
8. SIWWTP In-Vessel Bioconversion Facility, 2006; constructed new anaerobic digester, dewatering, and drying facility as required by the Sand Island Expansion, for more than $41 million
9. Kapiolani Trunk Sewer Reconstruction/Rehabilitation, 2008; performed sewer reconstruction and rehabilitation, for more than $23 million

In addition, CCH has encumbered an additional $170 million for the SIWWTP Expansion, Phases 1 and 2a, to complete the remaining plant improvement work in the expansion project.

These improvements evidence CCH's commitment to meet the nine criteria in Section 301(h) of the CWA.

Response: EPA has evaluated the proposed discharge against the regulatory and statutory criteria pertaining to section 301(h). Notwithstanding CCH's completed and planned improvements, EPA finds that the proposed discharge will not meet the regulatory and statutory criteria. Notably, the proposed discharge does not comply with all applicable water quality standards.

To the extent that upgrades affected effluent quality, the effects would have been reflected in the effluent or receiving water data reviewed by EPA in its consideration of the application. For example, EPA determined that the Sand Island facility can meet water quality standards for bacteria based on data collected during use of the UV disinfection system.

Comment C3: EPA issued Section 301(h) waivers for SIWWTP in 1990 and 1998 based on rigorous analysis of volumes of engineering and scientific data. In making its 1998 decision to reissue the waiver, EPA set forth the following findings in the 1998 TD:

> *1. The applicant's proposed discharge will comply with the State of Hawaii's water quality standards for dissolved oxygen (DO), TSS, and pH. [Section 301(h)(1), 40 CFR 125.61]*
> *2. The applicant's proposed discharge, alone or in combination with pollutants from other sources, will not adversely impact public water supplies or interfere with the protection and propagation of a balanced, indigenous population (BIP) of fish, shellfish and wildlife, and will allow for recreational activities. [Section 301(h)(2), 40 CFR 125.62]*
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> *3. The applicant has proposed a monitoring program for the Sand Island discharge. EPA Region 9 worked with the applicant to revise the provisions for monitoring the impact of the discharge contained in the Section 301(h) modified NPDES permit. [Section 301(h)(3), 40 CFR 125.63]*
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> *4. The Hawaii Department of Health has determined that the applicant's proposed discharge will not result in any additional treatment requirements on any other point or non-point source. [Section 301(h)(4), 40 CFR 125.64] (HI DOH March 31, 1997, Letter)*
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> *5. The applicant's existing pretreatment program was approved by EPA on 29 July 1982 and remains in effect. [Section 301(h)(5), 40 CFR 125.66]*
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> *6. The EPA has indicated that the applicant is not at this time required to adopt local limits for the priority pollutants detected in their effluent priority pollutant scan because most of the data showed extremely low or non-detectable amounts. EPA will work with the Hawaii Department of Health to ensure that other urban area pretreatment requirements will be developed in the draft 301(h) permit. [Section 301(h)(6), 40 CFR 125.65]*
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> *7. The applicant has a non-industrial source control program that is basically an educational effort to inform the public about non-point and wastewater issues and household toxic control measures. EPA is reviewing the proposal for continuation of its original 1990 approval. [Section 301(h)(7),40 CFR 125.66(d)]*

8. There will be no new or substantially increased discharges from the point source of the pollutants to which the 301(h) variance will apply above those specified in the permit. [Section 301(h)(8), 40 CFR 125.67]

9. Based on information submitted in the reapplication and recent performance, the applicant has demonstrated that they routinely achieve not less than 30% removal of BOD and 60% removal of TSS from the influent stream, on a monthly average basis. This will be a permit condition. The applicant is presently in compliance with federal water quality criteria, and the receiving marine water does not contain significant amounts of previously discharged effluent. [Section 301(h)(9), Section 303(e) of the WQA (Water Quality Act of 1987), 40 CFR 125.60]

10. The Hawaii Office of Planning of the Department of Business, Economic Development and Tourism (DBEDT) concurred with the City's coastal zone management assessment that the discharge is consistent with the State's Coastal Zone Program. [40 CFR 125.59(b)(3)] (HI Office of Planning and DBEDT February 5, 1997, Letter)

11. The Southwest Regional Office of the National Oceanic and Atmospheric Administration's National Oceanic Service stated, in a letter dated 24 November 1995, that presently no national marine sanctuary is affected by the discharge, but that if and when the boundary of the Humpback Whale National Marine Sanctuary includes the waters off Oahu, federal agency actions that may affect sanctuary resources are subject to further consultation.[40 CFR 125.59(b)(3)]

12. The applicant sought informal section 7 consultation with the U.S. Fish and Wildlife Service (Smith May 13, 1994, Letter) and NOAA's National Marine Fisheries Service (McInnis May 18, 1994, Letter). These agencies replied that, based on available information, the discharge is not likely to adversely affect listed threatened or endangered species or habitat. [40 CFR 125.59(b)(3)]

13. The Hawaii Department of Health (HIDOH) has indicated, in a letter dated 31 March 1997, that it will make its final decision whether or not to concur on the waiver following preparation of a final 301(h) modified NPDES permit.[40 CFR 125.59(b)(3)]

Based on these findings, EPA concluded in the 1998 TD that CCH's proposed discharge from the SIWWTP would comply with the requirements of Section 301(h).

The nine criteria and the EPA guidance used in 1998 remain unchanged and in effect, and should form the same bases for EPA to continue the waiver in 2007. Moreover, since 1998, CCH has made significant improvements to the SIWWTP and conducted almost a decade of additional monitoring and reporting that reaffirm the conclusion that all nine Section 301(h) criteria still are being met consistently.

Despite these facts, EPA has reached a predetermined 2007 TD to deny the waiver, and then attempts to justify it based on very selective and often peripheral or immaterial elements of the

record rather than consideration of the entire weight of evidence. Unlike the 1998 TD, the 2007 TD is based on speculation, a disregard of relevant data, and an arbitrary, unduly narrow, and unsupportable evaluation of the Section 301(h) waiver criteria.

Response: EPA has based its decision on the statutory and regulatory requirements of section 301(h) of the Clean Water Act. In applying the criteria of section 301(h), EPA utilized the data provided by the applicant, and considered factors such as the currently applicable water quality standards, which in some cases have changed since 1998. The 1998 permit included a new methodology for determining whole effluent toxicity (WET). Water quality criteria for protecting recreational users from elevated levels of bacteria have changed since 1998. Additionally, the 1998 decision and ensuing permit led to additional monitoring of the pesticides chlordane and dieldrin. EPA agrees with the commenter that an additional decade of monitoring data are now available for consideration. These monitoring data show that the section 301(h) criteria are not met. Specifically, the available information shows that the water quality standards for WET, chlordane, dieldrin and ammonia nitrogen would not be met by the proposed discharge.

Section 301(h) does not allow for a weight-of-evidence approach. Rather, each of the 301(h) criteria needs to be met for a variance to be granted. EPA's decision was not "predetermined." EPA first analyzed each of the 301(h) criteria. Based on those analyses, EPA determined that because not all the criteria were met, EPA could not grant the variance under the Clean Water Act.

Comment C4: The following list provides examples where in 2007, without explanation or justification; EPA deviated from its 1998 approach to arrive at its predetermined conclusion.

Response: Comment 4 is a summary listing several issues pointing out how the current Sand Island decision denying CCH's application is different from the decision EPA made in 1998 granting a 301(h) variance. Most of the listed issues are covered in more detail in subsequent specific comments. As was noted in responses to comment C3, many relevant factors applicable to these decisions have changed since 1998; for example, more data are now available for EPA to consider, and certain applicable water quality standards have changed. With regard to the rest of the specific points set forth by the commenter, responses are provided after the five summarized points listed below.

Comment C4.1. In 1998, with respect to the WQS, EPA designed and required that CCH implement a monitoring program that uses a broad distribution of monitoring stations, including stations at each of the four corners of the zone of mixing (ZOM), to assess impacts on water quality (EPA Region IX and Hawaii State Department of Health, September 30, 1998).

> *"In the final permit, the EPA designed a monitoring program, with input from the Permittee, to better elucidate the impacts of the effluent discharge on water quality standards and recreational use. The core monitoring program in the final*

> *permit focuses on a grid design that has broader spatial coverage instead of design centered tightly around the outfall (outlined in the existing permit); this grid design allows for better assessment of the gradients of conditions around the outfall and less reliance on comparisons between outfall stations and only one or two control stations. This is critical for an area like Mamala Bay, where the marine environment is impacted from a multitude of sources. When an environment is influenced by a number of different sources, finding suitable control stations can [be] difficult. The final permit redistributed the Permittee's sampling effort from the existing permit and stations around the ZID in the existing permit are relocated to better capture a wider spatial coverage. The final permit's core monitoring program retains monitoring stations around the four corners of the ZOM boundary; these same four stations shall also serve as the nominal ZID stations (Part E.1.c). The EPA finds that four stations around the ZOM boundary are sufficient to determining water quality standards compliance. To maintain monitoring of water quality standards at the ZID boundary, the four ZOM stations shall serve as the nominal ZID stations. Exceedances of standards at the ZOM boundary will automatically be considered an exceedance at the ZID boundary."*

Also in 1998, in its response to comments to the proposed final modified NPDES Permit (EPA Region IX and Hawaii State Department of Health, September 30, 1998), EPA agreed with comments from members of the Water Resources Research Center (WRRC), which underscore EPA's reliance on biomonitoring of ocean conditions in 1998.

> Comment from Anthony Russo, WRRC, University of Hawai'i at Manoa: *"For the past decade, scientists with the Water Resources Research Center at UH Manoa have been monitoring the effects of CCH's sewer outfalls on the surrounding marine communities. To summarize, there is no evidence to indicate a developing problem to the marine environment in the area near or at a distance from the Sand Island WWTP discharge. A move to secondary treatment at this time is unnecessary and would be fiscally unsound."*
>
> Response: *"The EPA agrees and is issuing its final decision and 301(h)-modified NPDES permit for the Sand Island WWTP discharge."*

The position of the WRRC, and of marine researchers and scientists long-affiliated with the WRRC, has not changed. Yet, remarkably, in its 2007 decision, EPA reverses its position and asserts that the absence of monitoring at the ZID is a serious weakness in the monitoring data. EPA, without explanation and justification, also discounts the real-world biomonitoring of conditions in Mamala Bay and relies on the results of WET tests using an unapproved species, speculative conclusions with regard to ammonia nitrogen, and flawed evaluations of chlordane and dieldrin to reach a negative decision.

Response: With respect to the monitoring at the zone of initial dilution (ZID) versus the zone of mixing (ZOM), the commenter is correct that the 1998 permit provides for monitoring at the

boundary of a ZOM, which encompasses a larger area than that of the ZID, and thus allows for more dilution than does the ZID. However, pursuant to Clean Water Act regulations implementing 301(h) variances, all water quality standards must be achieved at and beyond the ZID. (40 CFR 125.62(a)(i) and 125.58(dd); see also discussion p. 18-19 of tentative decision as to the dimensions of the ZID.) In retrospect, monitoring at the ZID boundary would have facilitated making determinations as to whether the proposed discharge would attain water quality standards. In evaluating the data submitted in CCH's application, it is EPA's objective to make conclusions about whether water quality standards would be achieved at the ZID pursuant to the applicable 301(h) regulations. When considering effluent data, and applying dilution ratios (e.g., for WET and pesticides), EPA was able to determine if standards would be attained at and beyond the ZID. However, when evaluating data collected based on samples of marine waters in the vicinity of the outfall, it was necessary to utilize samples taken at the ZOM. Thus, for example, evaluations of attainment of the water quality standards for bacteria and ammonia nitrogen are based on samples taken at the ZOM, at locations that are further from the outfall than the ZID and therefore reflect additional dilution. Determinations made using ZOM data may conclude that standards are attained, when, in fact, samples collected at the ZID boundary would have exceeded standards. Nonetheless, EPA has determined that based on data collected at the ZOM, the discharge does not attain the water quality standard for ammonia nitrogen. As stated in the permit's monitoring program as quoted by the commenter, "exceedances of standards at the ZOM boundary will automatically be considered an exceedance at the ZID boundary."

Regarding the commenter's allegation that EPA discounted "real world biomonitoring," EPA disagrees. To the contrary, EPA considered all available information in making its conclusion that the discharge does not meet the 301(h) criteria. With regard to EPA's conclusion that the applicant has not demonstrated that its discharge will not interfere with the attainment or maintenance of that water quality which assures protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife (BIP), please see response to comment C46. Moreover, even if EPA had concluded that the applicant had met its burden regarding the BIP criterion, section 301(h) also requires that the applicant demonstrate that its discharge will meet all water quality standards. Here, water quality standards for ammonia nitrogen, chlordane, dieldrin, and WET are not attained. The commenter seems to be suggesting that these exceedances of water quality standards should be considered secondary to the results of the WRRC's biomonitoring, and that a renewed variance should be issued based on this biomonitoring. Such an approach would discount the required determination that water quality standards be attained by the discharge, and would be inconsistent with the criteria established in section 301(h).

EPA's response 10 years ago to the one specific comment quoted by the commenter should not be read to imply that the results of biomonitoring are the only 301(h) criterion that must be met. Rather, Congress specifically prescribed a set of criteria, all of which must be met for a 301(h) variance to be granted.

Comment C4.2. With respect to toxicity and the protection of a BIP of fish and shellfish, in the 1998 TD, EPA relied on the Mamala Bay Commission Study and on reports prepared by the WRRC. In relying on these reports, EPA placed great weight on real-world environmental monitoring that demonstrated that the outfall provided for the protection of a BIP of fish and shellfish. However, in 2007, EPA disregards the 17 years of EPA directed monitoring conducted by CCH. Instead, EPA relies on results of a WET test using an unapproved species, rejected by EPA for compliance purposes in its own Permit, and on a speculative conclusion that, because of some WET test failures and ammonia effluent limitation exceedances, CCH has not demonstrated that the SIWWTP outfall can protect the maintenance of a BIP of fish and shellfish.

In the 1998 TD, EPA based its conclusion on a broad-based view of all environmental information, including fish tissue, sediment, benthic infaunal invertebrate communities, nutrients, and other measures of water quality impacts. However, in the 2007 TD, EPA claims that it draws on its TSD guidance document (EPA Office of Water, March 1991) to support its reversal from a scientifically appropriate, broad-based view of all environmental information and comes to a conclusion that is not supported by decades of monitoring. This same guidance was in place at the time of the 1998 TD, at which time EPA reached a positive decision based on real-world monitoring. EPA fails to explain why this TSD guidance (EPA Office of Water, March 1991) did not prevent the issuance of the waiver in 1998 yet somehow supports the negative 2007 TD.

The contrast in the approach used by EPA in 1998, which considered all monitoring information, and in 2007, which inexplicably discounts CCH's extensive EPA-mandated environmental monitoring as "limited" (despite EPA having modified and approved CCH's program), is evidence that the 2007 TD is arbitrary and an attempt to justify a predetermined conclusion.

Response: As noted in response to comment C4.1 above, EPA considered all available information in determining whether the 301(h) criteria are met. EPA is not disregarding environmental monitoring data. To the contrary, EPA has evaluated these data. EPA has also evaluated effluent data and data collected in marine waters in the vicinity of the outfall and determined that not all applicable water quality standards have been attained. A renewed variance can only be issued if all considerations lead to the conclusion that all the criteria in section 301(h) have been met.

Regarding allegations made here by the commenter about the WET test, please see responses to comments C31 and C32.

Regarding the commenter's allegation that EPA justifying its conclusions based on limitations in CCH's monitoring program, please see response to comment C63, which explains that issues related to CCH's monitoring program are not a basis of EPA's conclusion that the discharge does not meet the criteria for a renewed variance.

Comment C4.3. In contrast to the holistic approach taken in 1998, in 2007 EPA relies solely on WET test results associated with the indigenous sea urchin *T. gratilla* (one of the two Permit-required test species) to tentatively conclude that there are toxic compounds in the effluent that may potentially affect the BIP. This was in spite of the fact that the other test species (*C. dubia*) is on the EPA-approved list of sensitive species to be used for WET tests and showed no unacceptable toxicity. Sole reliance on the *T. gratilla* test is unwarranted for a number of reasons, including: (a) this indigenous sea urchin species is not on the EPA list of approved species, (b) the bioassay test guidance is still in draft form, (c) EPA discourages the use of indigenous species that have not been evaluated and approved through a rigorous inter-laboratory testing protocol and water quality impact correlation studies, (d) EPA clearly recognized that results from *T. gratilla* should not be used for compliance purposes, and (e) the other test species used (*C. dubia*) for reporting, as well as additional EPA-approved species tested by CCH, provide clear evidence of no unacceptable toxicity. EPA further concludes that this flawed analysis is evidence that a BIP is not being maintained despite years of intensive and expensive EPA-approved monitoring that contradicts this finding. In doing so, EPA is reaching for a conclusion that is not supported by the weight of evidence CCH provided.

Response: See response to comments C31 through C38 which respond to the commenter's points regarding WET testing.

Comment C4.4. In its 1998 positive Section 301(h) waiver decision, EPA did not find an association between the SIWWTP outfall and bioaccumulation of toxics in fish tissue. Now, EPA ignores more than 17 years of real-world fish tissue analysis showing that there is still no unacceptable bioaccumulation. Instead, EPA speculates that the outfall "may" be contributing to bioaccumulation because of the apparent presence of dieldrin and chlordane in the effluent. Additional recent analysis of the SIWWTP effluent by CCH, using a more precise and definitive analytical technique than that contained in the Permit, indicates that (a) dieldrin is not detectable in the effluent and (b) chlordane is not present at levels that exceed EPA's currently-accepted protective level. EPA speculation that CCH has not demonstrated that it can protect the maintenance of recreational activities is, therefore, unfounded.

Response: See responses to comments C29, C57, C58, and C59 regarding EPA's conclusions regarding the analysis of chlordane and dieldrin, the exceedances of water quality standards for these two pesticides, and the consideration of fish tissue data.

Comment C4.5. In its 1998 positive Section 301(h) waiver decision, EPA redesigned and mandated a monitoring program to evaluate compliance with waiver requirements and to determine impacts to water quality associated with the outfall separate from the discharge of other pollutants to Mamala Bay. CCH accepted and implemented this monitoring program. The Permit specified that EPA or the state could require additional monitoring if it were determined that other parameters or more frequent sampling were needed.

However, in the 2007 TD, EPA concludes that the monitoring program is insufficient and that the data collected are "limited." In so doing, EPA discounts more than 17 years of biomonitoring demonstrating that the outfall discharge has not adversely affected a BIP of fish and shellfish and has not exceeded criteria for toxic impacts to aquatic organisms and to human health. It is, therefore, unjustified and inconsistent for EPA to now assert that the data are too limited to conclude that the outfall does not protect and maintain a BIP of fish and shellfish.

If EPA had had concerns with the monitoring program that it redesigned and approved in 1998, it should have required the additional monitoring it felt it was lacking as contemplated by Special Condition J5 of the Permit. Instead, EPA raised no objections, and now "sandbags" CCH with allegations of insufficient monitoring, turning EPA's failure to use its discretion to amend CCH's monitoring program into justification to tentatively deny the SIWWTP Section 301(h) waiver.

The inconsistencies between the 1998 TD and the 2007 TD demonstrate an abrupt and unjustified change in approach; an arbitrary and inconsistent interpretation of environmental information gathered at EPA's direction; and an apparent attempt to support predrawn conclusions that are contrary to the data CCH provided. Throughout the 2007 TD, EPA demonstrates a consistent failure to consider the weight of evidence—the only appropriate and rational approach, and the approach EPA used in making its positive decision in 1998 and in designing the monitoring program that CCH has implemented. A review of historical and current information provided by the Section 301(h) monitoring program indicates that the conditions observed in the environment today, including those in the mixing zone, are consistent with the data EPA used in the 1998 TD to approve the Section 301(h) waiver. In short, the same weight of evidence approach that justified the waiver in 1998 compels its renewal now. The 2007 TD contains nothing to demonstrate otherwise.

Response: Please see response to comment C63 which explains that issues related to CCH's monitoring program are not a basis of EPA's conclusion that the discharge does not meet the criteria for a renewed variance. See also response to comment C3 regarding the weight-of-evidence approach and the assertion that EPA's decision is "predetermined" or "predrawn."

Comment C5: On March 19, 2008, CCH requested an evidentiary hearing on the 2007 TD. CCH's request was based on its concern that, without an evidentiary hearing, EPA would rescind CCH's waiver without meeting the requirements of procedural due process under the Fifth Amendment to the U.S. Constitution. CCH's request was based on EPA's tentative findings with regard to CCH's credibility, which unquestionably reflect unsubstantiated value judgments on factual issues with regard to CCH's conduct (such as, but not limited to, CCH's ability to consistently achieve WQS). Courts have found, and EPA has acknowledged, that administrative review proceedings under the CWA are designed to conform with the Constitutional right to due process. Under circumstances such as these, where facts are clearly at issue, courts have found that the Due Process Clause requires a full evidentiary hearing.

CCH urges EPA to grant its request. Should EPA deny CCH's request for an evidentiary hearing, EPA would violate CCH's Constitutional rights under the Due Process Clause to CCH's irreparable injury.

Response: The commenter is correct that EPA denied CCH's request for an evidentiary hearing. As discussed in EPA's letter denying the request, evidentiary hearings are neither required nor provided for by either EPA's specific regulations regarding the Section 301(h) process, or by the general regulations for NPDES permitting that are applicable to the Section 301(h) process. Rather, interested persons can rebut, refute, and/or counter EPA's tentative findings by testifying at a public hearing and/or by submitting written comments. EPA is required to consider the comments, and to address them in a written response to comments. EPA's regulations further provide that a final decision may be appealed to the Environmental Appeals Board, which is a prerequisite to judicial review.

The bases for EPA's TDD did not involve the type of credibility determination for which cross-examination may be necessary to provide due process. EPA's tentative decision was based on analysis of data and information submitted by CCH, not determinations regarding the credibility of witness testimony. Specifically, EPA's tentative decision-making regarding achievement of State water quality standards was based on data and analysis provided in the administrative record.

BOD and Turbidity

Comment C6: EPA does not dispute that applicable water quality criteria exist for BOD and turbidity.

Response: As indicated on pages 20 and 21 of the tentative decision, EPA clearly states that the State of Hawaii has established water quality standards for dissolved oxygen and turbidity. Hawaii's water quality standards do not contain criteria for BOD. Instead, dissolved oxygen is assessed as a surrogate for BOD.

Comment C7: As EPA acknowledges, CCH has clearly demonstrated that the SIWWTP can consistently meet the BOD and TSS concentration and mass requirements in the existing Permit, in addition to the 30 percent BOD and 60 percent TSS removal requirements for primary treatment. SIWWTP will continue to meet the existing BOD, TSS, 30 percent BOD removal, and 60 percent TSS removal requirements in the next NPDES permit cycle.

Response: EPA did not assess mass requirements or other requirements of the permit. As discussed on page 20 of the tentative decision, EPA concluded that the discharge has consistently met 30% removal for TSS and there have only been four occasions since 1999 when the discharge did not meet 30% removal for BOD. The discharge has consistently met the 30% removal requirement for BOD since February 2004, and recent data indicate removal of BOD and TSS well above 30%.

Comment C8: The WQS for DO in Class A waters is 5 milligrams per liter (mg/L).

Response: As described on pages 21 and 22 of the tentative decision, the Hawaii water quality standard for Class A, open coastal waters requires dissolved oxygen to not be less that seventy-five per cent saturation, determined as a function of ambient water temperature and salinity. EPA calculated the DO saturation concentration from ambient temperature and salinity values for November 1999 through April 2007 at the upcurrent reference station E6. For the monitoring events conducted from November 1999 through April 2007, DO saturation concentration values ranged from 6.9 to 7.25 mg/L at E6, and the corresponding 75% values ranged from 5.18 to 5.44 mg/L. All measured DO concentrations for each monitoring station at the ZOM (ZID data are not available) were then compared to the 75% DO saturation concentration at the corresponding depth of reference station E6. With one exception, measured DO concentrations ranged from 5.18 to 6.99 mg/L. When compared by event, all reported concentrations were at or above the 75% saturation concentration at the corresponding depth of reference station E6. EPA found that the applicant had demonstrated the ability to meet the Hawaii water quality standards for DO.

Comment C9: In the 2007 TD, EPA states the following: EPA concludes that that proposed discharge would consistently attain the Hawaii water quality standard for DO.

SIWWTP will continue to meet the WQS for DO. EPA does not dispute that SIWWTP will continue to meet DO WQS.

Response: EPA agrees with this comment.

Comment C10: In the 2007 TD, EPA states the following: EPA concludes that the proposed discharge will consistently attain the Hawaii water quality standards for turbidity and LEC.

SIWWTP will continue to meet the WQS for turbidity and light extinction coefficient (LEC). EPA does not dispute that SIWWTP will continue to meet these standards for turbidity and LEC.

Response: EPA agrees with this comment.

<u>Dilution</u>

Comment C11: EPA's conclusion with regard to water quality standards depends, in large part, on EPA's use of conservative dilution values.

Response: EPA's calculation of the critical (i.e., minimum) initial dilution value and the subsequent application of this value to assess water quality standards is in accordance with the

guidance presented in the Amended Section 301(h) Technical Support Document (ATSD) and Hawaii's water quality standards.

Comment C12: EPA's approach to dilution in the 2007 tentative decision differs from the approach used in the positive 1998 tentative decision.

Response: EPA assessed the data presented in the application, in addition to supplemental data submitted by CCH in its annual assessment reports for Sand Island, according to the guidance presented in the ATSD. Specifically, EPA reviewed 33 temperature, salinity, and density profiles provided by CCH in its annual assessment reports. With this large number of profiles available for EPA to assess, it is understandable that EPA's assessment would evolve and not remain identical to the result used in older decisions.

Comment C13: In making its critical initial dilution calculations, EPA used the Visual Plumes model. Visual Plumes has three optional initial dilution routines: UM3, RSB, and DKHW. These routines give somewhat different values, but generally not so different that they would affect overall conclusions concerning the acceptability of an effluent discharge.

Response: EPA agrees with this statement. In making its dilution calculations, EPA used the Visual Plumes model (2003), which supersedes the DOS PLUMES modeling system that CCH had used in its application.

Comment C14: In addition to using a conservative routine (UM3), EPA also chooses to take an unnecessarily conservative approach that is not reflective of actual typical conditions. Specifically, EPA uses the worst-case density profile that occurred when the diffuser was just below a sharp pycnocline.

Response: EPA follows a conservative approach in order to be protective of water quality. EPA followed the ATSD guidance when assessing the initial dilution presented by CCH in its Sand Island application and when calculating a revised critical initial dilution from additional data submitted by the applicant. The ATSD indicates that the lowest (i.e. critical) initial dilution must be computed for each of the critical environmental seasons.

To determine the critical initial dilution, EPA calculated initial dilution from 33 temperature, salinity, and density profiles that were collected by CCH at monitoring station E2 in the Sand Island receiving water. These profiles were collected on a quarterly basis from February 1999 through May 2005. EPA calculated the most critical initial dilution from the profile collected on July 2, 2002. This profile resulted in a critical initial dilution of 103:1.

CCH's application did not present all of the data used in making their estimate of 150:1 as the critical initial dilution value. As stated in EPA's TDD, the application did not contain printouts of modeling results or an overall summary of the critical initial dilution modeling results. CCH's

2003 application made numerous references to older data contained in the 1994 application (for the 1998 decision), but the data applied in the model are not clearly indicated or presented. Therefore, it was not possible to cross reference the two applications in order to derive all the data applied by CCH in determining its estimate of initial dilution. Furthermore, the current application indicated that the initial dilution values determined in the Sand Island annual assessment reports ranged from 106.3 to 523. There is no explanation in the application why 106.3:1 was not presented as the critical initial dilution, but this value is in close agreement with EPA's calculation of 103:1.

Comment C15: For all practical purposes, there is never a zero current speed.

Response: When calculating the critical initial dilution for the Sand Island receiving water, EPA applied a current speed of 0.00001 m/s in the Visual Plumes model. This is the same current speed applied by CCH in the modeling presented in their annual assessment reports. If it had been presented in the application, EPA would have used the current speed applied by CCH in its modeling, if it seemed appropriate. However, this information was not clearly presented in the application. Therefore, EPA applied the same current speed applied by CCH in their annual assessment reports.

Comment C16: The use of highly conservative assumptions, when applied to concentrations of effluent constituents found at the edge of the mixing zone, affects the findings of EPA's evaluation by leading a casual reader to conclude that unacceptable adverse effects are associated with the SIWWTP discharge when it has been documented through years of environmental monitoring that the exact opposite is the actual case.

Response: 40 CFR 125.62 (a)(i) requires water quality standards to be met at the edge of the zone of initial dilution. EPA followed the ATSD, Hawaii's water quality standards at HAR 11-54-4(b)(3), and the HDOH *State Toxics Control Program: Derivation of Water Quality-Based Discharge Toxicity Limits for Biomonitoring and Specific Pollutants* when applying the lowest (i.e., critical or minimum) initial dilution to assess concentrations of toxic pollutants. This critical initial dilution value was also applied, following the ATSD, when determining attainment of water quality standards related to BOD and turbidity. See also response to comment C17.

Comment C17: The unrealistically low initial dilution EPA applies in the 2007 tentative decision represents a substantial change from the approach used by EPA in the 1998 tentative decision. This significantly different approach, which was implemented without the presentation of a technical justification for such a change, demonstrates EPA's attempt to justify a predetermined conclusion that is not supported by the years of complex and expensive environmental monitoring that EPA demanded as a practical measurement of whether actual adverse effects result from the discharge of primary-treated effluent.

Response: EPA determined the initial dilution for the Sand Island according to the guidance provided in the ATSD and with the use of recent data collected from 1999 to 2005. EPA's process to calculate the initial dilution was clearly explained in the 2007 tentative decision and supported by documents contained in the administrative record for the 2007 tentative decision. While the critical initial dilution applied in the 1998 decision was 94:1, the initial dilution calculated for the 2007 tentative decision was 103:1, a slightly larger value. This is the result of assessing a large number of receiving water profiles.

Again, EPA's conclusion was not "predetermined." Additionally, while environmental monitoring is necessary to support a renewed 301(h) variance, it is only one part of the 301(h) assessment. It is also necessary to assess whether water quality standards are met. Water quality standards have been developed to protect beneficial uses of water bodies and prevent severe impacts to the receiving water. Assessing whether or not water quality standards are being attained, as well as the results of current biomonitoring, is necessary to ensure complete protection of the receiving water.

Results of environmental monitoring are specifically considered in EPA's analysis of whether the applicant has demonstrated that the discharge will not interfere with the attainment or maintenance of water quality which assures protection and propagation of a balanced, indigenous population (BIP) of shellfish, fish, and wildlife in areas actually or potentially impacted by the discharge. In making this determination, as described in the TDD, EPA analyzes three types of information: biological data, whole effluent toxicity data, and chemical-specific water and sediment quality data. Here, while available biological data do not demonstrate impacts to species in the vicinity of the outfall, whole effluent toxicity and chemical-specific (ammonia nitrogen) water data results present a different picture. As a result of the toxic effects found in whole effluent toxicity testing, and the potential impacts on wildlife due to exceedances of the water quality standard for ammonia nitrogen, EPA concluded that the applicant had not demonstrated that the discharge under a renewed variance would not interfere with the attainment or maintenance of water quality which assures a balanced indigenous population of shellfish, fish, and wildlife.

Bacteria

Comment C18: Pursuant to BEACH Act requirements, states are to evaluate offshore water use classifications and apply the appropriate Enterococcus limit. HDOH has done so (although formal adoption is still in process), and has proposed revising the WQS to provide for an Enterococcus standard of 35 cfu/100 ml from the shoreline to 3 miles offshore and to a depth of 100 feet (to be applied as a geometric mean) and to establish single-sample maximum values of 100 cfu/100 ml up to a distance of 500 meters offshore and 501 cfu/100 ml at distances greater than 500 meters from shore.

Response: In the TDD, EPA found that the Sand Island facility could meet water quality standards for bacteria, provided the disinfection system was adequately operated and maintained. The final decision retains this finding. Therefore, this comment does not present grounds to

reconsider the tentative decision. Nevertheless, we are providing a detailed response in order to clarify portions of the Sand Island TDD.

In accordance with the Beaches Environmental Assessment and Coastal Health (BEACH) Act of 2000, EPA promulgated bacteria criteria for coastal recreational waters in November, 2004. EPA promulgated a geometric mean of 35 cfu per 100 mL and a range of four single sample maximum values between 104 and 501 cfu per 100 mL. In Hawaii, the promulgated criteria apply to marine waters between 300 meters (1,000 feet) from shore and three miles from shore. (EPA did not promulgate bacteria criteria for Hawaii waters less than 300 meters from shore, because Hawaii already had standards applicable to those waters that were consistent with the BEACH Act requirements.) EPA's promulgated rule expects States to apply the appropriate single sample maximum value based on the use frequency of coastal recreational waters. By letter dated December 15, 2004, EPA specifically asked HDOH to indicate which of the SSM values set forth in the rule will apply to Hawaii's waters more than 300 meters from shore. In its response dated September 6, 2005, HDOH responded that it "intends to propose that the 100 CFU/100 mL SSM be extended to 500 m from shore, and the SSM beyond 500 m be set at 501 CFR/100 mL." Therefore, EPA applied this single sample maximum value when assessing bacteria concentrations of samples collected at monitoring stations located in waters beyond 500 meters from shore. However, EPA also assessed the same sample results against the 104 cfu per 100 mL value, because this is the single sample maximum value applied by HDOH in the Kailua Regional Wastewater Treatment Plant permit (permit number HI0021296) to monitoring conducted in waters beyond 500 meters from shore. Because the Kailua permit was issued after HDOH's 2005 letter, it was unclear whether HDOH still considered the higher SSM number appropriate. HDOH did not submit any comments during the public comment period on the TDD indicating that EPA's approach was inconsistent with Hawaii's water quality standards. Nevertheless, in the tentative decision, EPA concluded that the Sand Island facility could meet these standards with use of its disinfection system.

HDOH has not adopted any of the possible changes to its water quality standards discussed in the comment. EPA understands that HDOH is developing a proposal to change the enterococcus geometric mean standard to 35 cfu/100 mL from the shoreline to three miles offshore, but HDOH has not yet even formally proposed this change. In 2005, the State of Hawaii did propose, as part of a larger revision to HAR Chapter 11-54-8, an amendment that would limit application of the bacteria criteria to a depth of 100 feet. However, this proposed amendment has not been acted on by the State. Any proposed amendment to the criteria in Hawaii's water quality standards must first go through the public review process before being adopted by the State and then submitted to EPA for approval. Only after the approval of amended water quality criteria would EPA consider the revised criteria when assessing water quality data, including in a 301(h) evaluation.

Additionally, any limitation of criteria by depth would also require an amendment to the water use classifications (i.e., the designated uses) in Hawaii's current water quality standards. Without amending the current designated use, the limitation of State criteria to a depth of 100 feet would not mean that no criteria were applicable to depths below 100 feet, but that EPA's promulgated criteria would still apply to depths below 100 feet, because all marine waters

beyond 300 feet from shore are currently designated for recreational use (see discussion of recreation use for Class A open coastal waters in the TDD page 39).

Comment C19: HDOH has specifically informed EPA that it believes that the appropriate single-sample maximum to apply under the existing EPA-promulgated single-sample limitations in the vicinity of the SIWWTP outfall (in waters more than 500 meters offshore) is 501 cfu/100 mL, as allowed for in the EPA-promulgated rules for offshore waters when states have not set limits. EPA evaluates two EPA-promulgated potential standards for offshore waters (104 cfu/100 mL and 501 cfu/100 mL).

Response: As with comment C18 and other comments regarding the bacteria standards, these comments do not require a reevaluation of EPA's bacteria conclusions, as we have concluded that the Sand Island facility can meet WQS so long as disinfection is used.

EPA did evaluate single samples in nearshore and offshore waters against two values (104 cfu per 100 mL and 501 cfu per 100 mL). As discussed in the tentative decision, EPA first assessed the nearshore and offshore sample results based on 501 cfu per 100 mL. Additionally, EPA also assessed the same sample results against the 104 cfu per 100 limit because this is the single sample maximum value applied by HDOH in the Kailua Regional Wastewater Treatment Plant permit (permit number HI0021296), as discussed in response to comment C18.

EPA evaluated the data both ways because the HDOH has not clearly adopted a single sample maximum value for waters beyond 300 meters from shore. HDOH informed EPA, in a letter dated September 6, 2005, that it intended to propose the single sample value of 501 cfu per 100 mL for waters beyond 500 meters from shore; however we are not aware of a formal proposal or adoption, nor does the 501 cfu SSM appear to be consistent with the Kailua permit adopted in 2006. HDOH did not submit any comments during the public comment period on the TDD indicating that EPA's approach was inconsistent with Hawaii's water quality standards.

Comment C20: In making its review, EPA acknowledges that the current HAR Enterococcus criteria for shoreline and recreational waters (geometric mean of 7 cfu/100 mL; single-sample maximum of 100 cfu/100 mL) apply within 1,000 feet of shore and the EPA-promulgated criterion (geometric mean of 35 cfu/100 mL) applies between 1,000 feet and 3 miles offshore. In making its evaluation, EPA apparently failed to recognize that one of the "Recreational" stations (R3) that CCH monitors is more than 1,000 feet from shore and that the EPA-promulgated criterion should have been applied at this station. Therefore, although there were very few exceedances of limits at these "Recreational" stations, EPA concludes that there were approximately twice as many exceedances of Enterococcus criteria at these stations than what were actually the case.

Response: Station R3 is located at the mouth of Keehi Lagoon and outside of the 300 meter mark (see Figure 3 in EPA's Sand Island tentative decision). EPA followed the pattern set by CCH in their annual assessment report and grouped R3 with stations R1 and R2 when assessing

data from these stations. EPA agrees that station R3 could have been assessed against the less restrictive criteria. Ultimately, EPA concluded that the discharge, after adequate disinfection, can meet water quality standards for bacteria so the determination of which enterococcus standard to use for this station does not make a difference.

Comment C21: Although the 2007 TD did not exclude the discharge plume as a potential source of the very occasional Recreational stations' exceedances, it did not define it as the source. CCH believes that no reason exists to make such an association. Moreover, the occurrences are truly minuscule with respect to the potential for human exposure to concentrations above WQS.

Response: It is true that EPA did not exclude the discharge plume as a potential source of occasional exceedances of bacteria criteria at stations R1, R2, and R3. In the Sand Island tentative decision, EPA concluded that exceedances at these three stations occurred mainly in the rainy months and generally in the surface samples. EPA also stated that the contribution from non-point sources of bacterial contamination cannot be ruled out. Overall, EPA concluded that the discharge can meet water quality standards for bacteria, after adequate disinfection.

Comment C22: The 1998 TD granting the Section 301(h) waiver provided for future disinfection in those rare instances when oceanographic conditions exist that might drive the plume onshore. This situation would require the simultaneous occurrence of three factors: a surfacing plume; a Kona Wind condition; and currents that would carry the plume onshore. Preliminary calculations indicate that the simultaneous occurrence of these conditions would occur very infrequently. Therefore, CCH believes that the concept of disinfection when and if needed should be incorporated in future NPDES permits and that it is unnecessary to operate a UV system on a continuous basis to meet WQS.

Response: EPA's 1998 decision on CCH's application for a 301(h) variance for the Sand Island WWTP was issued prior to EPA's promulgation of bacteria criteria for coastal recreational waters in November 2004. In the 1998 decision, bacteria criteria were not applied to waters between 300 meters (1,000 feet) from shore and three miles from shore. Since EPA's promulgated criteria now apply to these waters, the next permit will require the geometric mean of 35 cfu per 100 mL and a single sample value to be applied in the vicinity of the outfall. Effluent monitoring data from the Sand Island facility show that the bacteria criteria that now apply to waters beyond 300 meters (1,000 feet) from shore cannot be met without disinfection of the final effluent. In the tentative decision, EPA concluded that the discharge can meet water quality standards for bacteria, provided CCH adequately operates and maintains the UV disinfection system.

<u>Toxics</u>

Comment C23: For the purposes of this evaluation, a correction was made for an admitted 10-fold error inherent in the WQS reported in HAR 11-54-4(b)(3) for chlordane. As EPA knows, the corrected value is 0.00016 micrograms per liter (µg/L), and the HDOH has affirmed its intent to rectify this error. Nonetheless, EPA calculated exceedances based on this undisputedly erroneous standard and refuses to correct the annual average concentration and mass limits for chlordane in the Permit.

Response: The Hawaii water quality standard protective of fish consumption for the carcinogenic pesticide chlordane is 0.000016 µg/L. This is the value that HDOH proposed, presented to the public for review in 1989, and then adopted in 1990. This was the value EPA subsequently approved in 1990 under section 303(c) of the CWA.

Earlier reviews of the Hawaii water quality standards by HDOH did not determine the chlordane fish consumption criterion to be incorrect. HDOH reviewed its water quality standards and presented corrections of inadvertent typographical errors in the State of Hawaii's Office of Environmental Quality Control publication *The Environmental Notice* on November 8, 2000. The fish consumption value associated with chlordane was not mentioned in this correction. In 2003, a package of amendments to the water quality standards, including the correction of inadvertent typographical errors, was distributed for public comment. Again, the fish consumption value associated with chlordane was not mentioned in this 2003 package of draft amendments when it was presented to the public. In 2004, HDOH formalized the correction of the inadvertent typographical errors that were posted for the public's review in 2003. As part of a larger package of amendments, the corrections of these typographical errors in the Hawaii water quality standards were adopted by the State of Hawaii on August 31, 2004, and approved by EPA on October 28, 2004. The fish consumption value associated with chlordane was not amended in this 2004 action by the State of Hawaii.

Although, in October 2007, HDOH stated their intent to amend the fish consumption water quality standard for chlordane, they have not yet conducted the formal process to amend the Hawaii water quality standards. In accordance with 40 CFR section 131.20, this process requires the State to present the proposed amendments and the rational for the amendments, conduct public meetings to explain and discuss the proposed amendments with the public, receive and respond to public comments on the proposed amendments, formally adopt the amendments, and then request and receive EPA's approval for the amendments. Until an alternative criterion is approved, 0.000016 µg/L remains the water quality standard for fish consumption for chlordane and is the appropriate value for the 301(h) evaluation.

Nevertheless, EPA has examined whether or not the levels of chlordane would exceed 0.00016 µg/L, the value CCH asserts is the corrected value. Figures 3a and 3c in the final decision document show that the levels of chlordane in the effluent have exceeded 0.00016 µg/L.

Comment C24: Figure IIB-1 depicts the monthly effluent concentrations reported for chlordane from 2000 through 2007 (bars), as well as the computed running annual average concentrations (pink line). Over the 94-month evaluation period, there were 42 months where the

calculated annual average concentration of chlordane slightly exceeded (by up to 1.5-fold) the corrected Permit limit of 0.076 µg/L (shown as the lower horizontal line)

Response: The tentative decision does not assess compliance with permit limits for toxic pollutants; rather, it assesses whether water quality standards are met. Even if the existing permit limits were the relevant factor, the commenter acknowledges that these limits were not achieved in 42 of 94 months, which is a significant number of exceedances.

In the Sand Island permit, which was issued in 1998, the chlordane permit limit for fish consumption is 0.0076 µg/L. This discharge limitation is based on the Hawaii water quality standard for fish consumption for chlordane, 0.000016 µg/L, multiplied by the average initial dilution from the 1998 tentative decision for Sand Island, which was 476:1.

As discussed in the Sand Island tentative decision starting on page 47, the revised average initial dilution for the Sand Island discharge is 294:1. While the 1998 permit applied the previous average initial dilution value from the 1998 tentative decision, the March 2007 tentative decision applies the updated average initial dilution value, which is based on more recent monitoring data.

In the December 2007 tentative decision, effluent concentrations of toxic pollutants in the Sand Island discharge were assessed against Hawaii's water quality standards, in accordance with HAR 11-54-4(b)(3). In EPA's tentative decision on CCH's application for the Sand Island WWTP, compliance with permit limits was not considered in EPA's assessment of toxic pollutants in the effluent.

In accordance with HAR 11-54-4(b)(4)(A)(iii), the twelve month average concentration of chlordane, a carcinogenic toxic pollutant, in the effluent was assessed against the water quality standard for fish consumption multiplied by the average dilution. The average dilution for the Sand Island discharge is 294:1, and the Hawaii water quality standard for fish consumption for chlordane is 0.000016 µg/L. The product of these two values is 0.0047 µg/L. Therefore, 0.0047 µg/L is the target value EPA used in its analysis, based on the Hawaii chlordane water quality standard for fish consumption and the average initial dilution.

EPA reviewed and assessed effluent monitoring data reported in DMRs as an annual average from December 1998 through August 2007. This period covered 105 months. The annual average chlordane concentrations reported in DMRs for this period ranged from 0.019 to 0.79 µg/L.[1] All of the 105 reported values exceeded the target value.

The other way to view and assess the reported values against the Hawaii chlordane water quality standard for fish consumption is as it was written in the tentative decision. In the tentative decision, the range of reported values was divided by the average initial dilution, and the results were compared to the Hawaii chlordane water quality standard for fish consumption, which is 0.000016 µg/L. As stated on page 49 of the tentative decision, the range of estimated chlordane

[1] The range of reported annual average chlordane concentrations was mistakenly stated in TDD as 0.19 to 0.79 µg/L. The actual reported range is 0.019 to 0.79 µg/L. This is corrected in the final decision.

concentrations at the ZID was 0.000065 to 0.0027 µg/L. All of these values are above the Hawaii chlordane water quality standard for fish consumption, 0.000016 µg/L.

For the final decision and in response to these comments, EPA also analyzed data submitted subsequent to the tentative decision and concluded that the chlordane standard continued to be exceeded. See response to comment C29.

Comment C25: HDOH has not revised its WQS for chlordane and dieldrin since the 1990s. As a result, the WQS for chlordane listed in HAR 11-54-4(b)(3) is derived from an outdated 1980 EPA ambient water quality criteria document: *Ambient Water Quality Criteria for* Chlordane (1980 AWQC; EPA, October 1980).

Since the adoption of the current WQS for chlordane and dieldrin, the 1980 AWQC has been superseded based on significant federal regulatory changes that provide a more reliable protective concentration of chlordane via fish consumption. In 1997, EPA released its *Toxicological Review of Chlordane (Technical*) (EPA, December 1997). EPA's review contained results of several newer toxicological studies, which indicated that the carcinogenic potency of chlordane was about 4.6-fold lower than believed at the time the 1980 AWQC were developed. In addition to updates in toxicity data, in 2002 EPA updated some of the fundamental assumptions used for computing fish consumption criteria. This was done in accordance with the Federal Register announcement on November 3, 2000 (Volume 65, Number 214), entitled *Revisions to the Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health (2000)*. For example, fish ingestion rates previously believed to be 6.5 grams per day were revised upward to the current 17.5 grams per day, based on recent national fish consumption records. Based on these scientific improvements in toxicity and exposure estimation, EPA released updated AWQC in *National Recommended Water Quality Criteria: 2002* (2002 AWQC; EPA Office of Water, November 2002). For chlordane and dieldrin, these 2002 AWQC continue to be in effect (*National Recommended Water Quality Criteria* [2006 AWQC; EPA Office of Water, 2006]). However, HDOH still has not revised its WQS accordingly. On March 5, 2008, CCH formally requested HDOH to update its WQS. EPA's reliance on criteria that have been superseded represents EPA's arbitrary and unjustified attempt to support its predetermined conclusion.

Response: It is not appropriate for EPA to assess the effluent concentrations of chlordane and dieldrin against criteria that may or may not be adopted in the future. In the tentative decision for the Sand Island discharge, EPA assessed the effluent concentrations of chlordane and dieldrin against Hawaii water quality standards contained in HAR 11-54-4(b)(3). See also response to comment C23.

Comment C26: Table IIB-1 (included in the comments) provides a comparison of calculated effluent limits based on the WQS versus the 2006 AWQC. Using the 2006 chlordane AWQC (0.00081 µg/L) currently considered by EPA to be protective of a fish consumption pathway, combined with EPA's calculated ADC of 294 for consumption of fish containing carcinogens,

the protective concentration of chlordane in SIWWTP effluent is calculated to be 0.238 µg/L (0.00081 x 294 = 0.238 µg/L). This updated effluent limit is shown as the upper horizontal line on Figure IIB-1. As can be seen from the figure, the annual average concentration of chlordane in the effluent has never exceeded the protective level over the entire evaluation period of 2000–2007.

Response: The value cited in this comment, 0.00081 µg/L, is not Hawaii's water quality standard. Therefore, CCH's review of the monitoring data against this value is not relevant.

Comment C27: Figure IIB-2 (in the comments) depicts the monthly effluent concentrations reported for dieldrin from 2000–2007 (bars), as well as the computed running annual average concentrations (pink line). Over the 94-month evaluation period, the calculated annual average concentration of dieldrin (based on results reported by CCH using the analytical method specified in the Permit) exceeded the Permit limit of 0.012 µg/L (shown as the horizontal line).

Response: The tentative decision does not assess compliance with permit limits for toxic pollutants; rather, it assesses whether water quality standards are met.

In the Sand Island permit, which was issued in 1998, the dieldrin permit limit for fish consumption is 0.012 µg/L. This discharge limitation is based on the Hawaii water quality standard for fish consumption for dieldrin, 0.000025 µg/L, multiplied by the average initial dilution from the 1998 tentative decision for Sand Island, which was 476:1.

As discussed in the Sand Island tentative decision starting on page 47, the revised average initial dilution for the Sand Island discharge is 294:1. While the 1998 permit applied the previous average initial dilution value from the 1998 tentative decision, the December 2007 tentative decision applies the updated average initial dilution value, which is based on more recent monitoring data.

In the December 2007 tentative decision, effluent concentrations of toxic pollutants in the Sand Island discharge were assessed against Hawaii's water quality standards, in accordance with HAR 11-54-4(b)(3). In EPA's tentative decision on CCH's application for the Sand Island WWTP, compliance with permit limits was not considered in EPA's assessment of toxic pollutants in the effluent.

In accordance with HAR 11-54-4(b)(4)(A)(iii), the twelve month average concentration of dieldrin, a carcinogenic toxic pollutant, in the effluent was assessed against the water quality standard for fish consumption multiplied by the average dilution. The average dilution for the Sand Island discharge is 294:1, and the Hawaii water quality standard for fish consumption for dieldrin is 0.000025 µg/L. The product of these two values, 0.0074 µg/L, is the target value for comparison with the results of effluent monitoring. If the effluent exceeds this value, then the discharged effluent would exceed the water quality standard after average initial dilution.

EPA reviewed and assessed effluent monitoring data reported in DMRs as an annual average from December 1998 through August 2007. This period covered 105 months. The annual average dieldrin concentrations reported in DMRs for this period ranged from 0.013 to 0.047 µg/L. All of the 105 reported values exceeded the target value of 0.0074 µg/L.

The other way to view and assess the reported values against the Hawaii dieldrin water quality standard for fish consumption is as it was written in the tentative decision. In the tentative decision, the reported effluent values were divided by the average initial dilution, and the results were compared to the Hawaii dieldrin water quality standard for fish consumption, which is 0.000025 µg/L. As stated on page 49 of the tentative decision, the range of estimated dieldrin concentrations at the ZID was 0.000044 to 0.00016 µg/L. All of these values are above the water quality standard, 0.000025 µg/L.

For the final decision and in response to these comments, EPA also analyzed data submitted subsequent to the tentative decision and concluded that the dieldrin standard continued to be exceeded. See response to comment C29.

Comment C28: Table IIB-1 (of the comments) provides a comparison of calculated effluent limits based on the WQS versus the 2006 AWQC. Using the 2006 dieldrin AWQC (0.000054 µg/L) currently considered by EPA to be protective of a fish consumption pathway, combined with EPA's calculated ADC of 294 for consumption of fish containing carcinogens, the protective concentration of dieldrin in SIWWTP effluent is calculated to be 0.016 µg/L (0.000054 x 294 = 0.016 µg/L). This updated effluent limit is only slightly higher than the current Permit limit of 0.012 µg/L, and it is still exceeded by the running annual average concentration. However, CCH has strong evidence showing that reported exceedances for dieldrin are false positives resulting from the analytical method required by EPA in the Permit.

Response: The value cited in this comment, 0.000054 µg/L, is not Hawaii's water quality standard. Therefore, CCH's review of the monitoring data against this value is not relevant.

Comment C29: The compliance limits for pesticides, as outlined in HAR 11-54-4(b)(3), are inherently very low because of the conservative assumptions used for their derivation. These include assumptions about the extent and rate of bioaccumulation in fish, assumed fish consumption rates, assumed daily frequency of fish ingestion, and a target of one in one million excess cancer risk. Given these conservative assumptions, the WQS for several pesticides are at levels below or very near the levels of detection using the standard analytical techniques specified in the EPA-approved Section 301(h) monitoring program (EPA Method 608) that uses gas chromatography with an electron capture detector (GC/ECD). The matrix characteristics of compounds typically found in municipal wastewater (that is, co-occurrence of many interfering constituents such as fats and proteins) make it difficult for standard analytical methods to provide reliable results for pesticides such as chlordane, dieldrin, and DDT.

To overcome these deficiencies, a GC/MS method (EPA Method SW8270SIM) was used to provide more sensitivity and, more importantly, better selectivity of analytical response for the individual parameters that are of concern to EPA

To test the benefit of using GC/MS versus the conventional GC/ECD, split samples were analyzed using each method. Twenty split samples were analyzed from the SIWWTP from April 24 to December 16, 2007. The CH2M HILL Applied Sciences Laboratory (an EPA certified laboratory) analyzed the GC/MS samples, and CCH analyzed the GC/ECD samples using its normal compliance testing analytical protocol. The laboratory analytical reports for the GC/MS, and associated QA/QC documentation (CH2M HILL Applied Sciences Laboratory, 2007), are provided in the Appendix.

Figure IIB-3 (of the comments) shows the comparison of the GC/MS and GC/ECD results for dieldrin. As shown on the figure, dieldrin was not detected using GC/MS at a detection limit of 0.002 μg/L, well below the effluent limit of 0.012 μg/L (or the updated effluent limit of 0.016 μg/L, based on the 2006 AWQC). However, the corresponding GC/ECD results showed dieldrin detections over 30-fold higher, up to 0.067 μg/L, and well above the effluent limit of 0.012 μg/L.

These results for dieldrin are supported by corresponding findings for DDT (although it is recognized that DDT is not a basis for denial in the 2007 TD). Results for DDT (Figure IIB-4) indicated that it was not detected using GC/MS in any of the 14 analyzed samples at a detection limit of 0.002 μg/L, although DDT was reported as detectable by GC/ECD at levels more than an order of magnitude higher (up to 0.022 μg/L).

These results prove that dieldrin is not present at detectable levels (less than 0.002 μg/L) in the SIWWTP effluent and that reported dieldrin exceedances are false positives. During this comparative testing series, dieldrin and DDT appeared to be absent from the effluent using GC/MS. CCH believes that the lack of correspondence of results between GC/MS and GC/ECD supports replacing GC/ECD with GC/MS as the most appropriate analytical protocol for pesticides in the next NPDES permit.

It is important to note that these results do not question the quality of laboratory performance conducted by CCH during its compliance monitoring; rather, they reflect only the limitations inherent within the conventional EPA-required analytical method relative to the very low compliance limits set for the SIWWTP

Response: States have flexibility when adopting criteria for toxic pollutants. This flexibility allows states to incorporate conservative assumptions when setting criteria. For example, when developing its numeric standards for toxic pollutants in 1989, the State of Hawaii applied a fish consumption value of 19.9 grams per day. This rate reflected the higher consumption rate of fish by Hawaii residents. At that time, EPA assumed a nationwide average daily consumption rate of 6.5 grams per day. However, in 2000, EPA increased this national average daily consumption rate to 17.5 grams per day but at the same time recognized much higher consumption values for various populations. Regardless of the basis for Hawaii's adoption of State criteria for pesticides, the numeric criteria adopted by the State are the criteria that must be met. See

response to comment C23 for discussion about the formal process for amending State water quality standards.

In conducting its supplemental analysis of pesticides in Sand Island effluent, CCH used an inappropriate test method. As described below, Method 608 and Method 625 are the appropriate methods for the detection of pesticides in wastewater. Use of an alternate test method must follow the steps listed in 40 CFR 136.5, which CCH has not done. Following the requirements of this regulation would ensure that correct and clearly defined laboratory procedures are applied and resulting data are presented in a clear manner for review by EPA.

The Sand Island permit requires the use of EPA Method 608 to detect concentrations of the pesticides chlordane and dieldrin in the Honouliuli final effluent. This is an EPA-approved test method procedure listed in Table 1D of 40 CFR 136.3 for detecting pesticides in wastewater and is the method listed in EPA's Amended Section 301(h) Technical Support Document (ATSD). EPA Method 608 (40 CFR 136, App. A, Method 608) includes clean-up procedures to decrease detection interference from chemicals not targeted for analysis.

The ATSD also lists EPA Method 625 (40 CFR 136, App. A, Method 625) as an approved method for detecting chlordane and dieldrin. EPA Method 608 detects pesticides by use of the gas chromatographic (GC) method with electron capture detection (GC/ECD), and EPA Method 625 detects pesticides with the use of a gas chromatographic/mass spectrometry (GC/MS) method. In its comments on the tentative decision, CCH included a technical memorandum from CH2M HILL Applied Sciences Laboratory discussing the differences between Method 608 and 625. In this technical memorandum, the writer states the following: "The major drawback of Method 625, and GC/MS detection, is that the typical reporting limits are much higher than the typical reporting limits obtained from GC/ECD analysis of organochlorine pesticides." Organochlorine pesticides include chlordane and dieldrin. This memorandum goes on to describe improvements made to Method 625 to decrease the reporting limit. The memorandum also includes the following statement: "…the modified Method 625 meets the acceptance criteria for Method 625 and has greater sensitivity and specificity than GC/ECD for the organochlorine pesticides of concern in the effluent matrix under investigation."

Despite the discussion presented in CCH's technical memorandum on the two EPA-approved methods used to determine pesticide concentrations, CCH disregarded Method 625 and instead presented data using a third detection method for chlordane and dieldrin. In its comments on the tentative decision, CCH provided a comparison of laboratory results determining concentrations of the organochlorine pesticides chlordane, dieldrin, and DDT in the Honouliuli WWTP and Sand Island WWTP final effluent using Method 608 and Method SW8270SIM. The SW- prefix added to Method 8270 indicates that it is published by EPA's Office of Solid Waste. The –SIM ending added to Method 8270 indicates the use of selected ion monitoring (SIM).

Although both methods utilize GC/MS, Method 8270 is not entirely equivalent to Method 625. For example, sample preparation and extraction prior to injection into the GC may be different. Method 8270 cites 5 different preparation methods that may be used. Method 625 utilizes serial

separatory funnel extractions with methylene chloride at a pH greater than 11 and again at a pH less than 2.

SW8270SIM is not an EPA-approved method for determining concentrations of pesticides in wastewater, nor is Method 8270 listed in the ATSD as a method suitable for the detection of pesticide concentrations in 301(h) monitoring programs. Furthermore, the procedure for Method 8270 states the following: "In most cases, this method is not appropriate for the quantification of multicomponent analytes, e.g., Aroclors, Toxaphene, Chlordane, etc., because of limited sensitivity for those analytes. When these analytes have been identified by another technique, Method 8270 may be appropriate for confirmation of the identification of these analytes when concentration in the extract permits." The procedure for Method 8270 also includes the following statement: "The use of SIM is acceptable for applications requiring quantitation limits below the normal range of electron impact mass spectrometry. However, SIM may provide a lesser degree of confidence in the compound identification, since less mass spectral information is available." Therefore, Method 8270 is not an appropriate alternative to Method 608 for the analysis of pesticides, especially chlordane, for wastewater monitoring in the NPDES program.

In addition to the use of a method that was inappropriate, the supplemental analyses conducted by CCH were deficient or misleading for several reasons.

CCH did not provide sufficient information for EPA to confirm that the tests they conducted using Method 608 and Method SW8270SIM were truly based on split samples. In its comments on the tentative decision, CCH asserted that split samples were analyzed using each method (608 and SW8270SIM), where CH2M HILL performed the analysis via Method SW8270SIM, and CCH performed the analysis via Method 608. However, only the CH2M HILL laboratory reports were provided, and the dates of the samples do not correlate with the CCH's monitoring data. Thus, if split samples were analyzed by both methods, EPA was not provided with the CCH (Method 608) data for those samples. Furthermore, the technical memorandum presented in an appendix to CCH's comments suggests that analysis of the Sand Island effluent was conducted using Method 625, but these data were not presented in CCH's comments on the Sand Island tentative decision.

CCH did not report the appropriate detection limits for its supplemental analyses using method 608 or copies of the laboratory reports containing the detection limits, as it did for Method SW8270SIM. The minimum level (ML) is the level at which the entire analytical system gives a recognizable reading and acceptable calibration points. The method detection limit (MDL) is the minimum concentration of a substance that can be measured and reported with 99-percent confidence. Quantitation in the range between the MDL and the ML is not as precise or accurate as it is in the range above the ML. In their comments, CCH did not provide the data sheets from the CCH laboratory analysis conducted from April 24, 2007 through December 16, 2007 using Method 608 to determine chlordane and dieldrin concentrations. Without these data, EPA cannot fully assess the data presented in CCH's comments.

Ten of the twenty samples analyzed by CH2M HILL were not equivalent to the samples collected as required by the Sand Island permit. The ten samples collected by CCH from April

24, 2007 through September 4, 2007 were grab samples (i.e. a sample from one point in time). The Sand Island permit requires composite samples for the analysis of pesticides. Collection of a composite sample over a 24-hour period ensures that fluctuating levels of pollutants are captured. A grab sample only captures the pollutants discharged at the moment the sample is collected.

In its comments on the tentative decision, CCH describes CH2MHill's laboratory as EPA-certified. However, EPA only certifies laboratories for drinking water analysis. EPA does not certify laboratories for the analysis of pesticides in wastewater. Consequently, this sentence about the Applied Sciences Lab certification is misleading.

Based on CCH's use of an unapproved and inappropriate test method and the additional deficiencies described above, EPA disagrees with CCH's conclusion that there is a considerable likelihood that those constituents noted by EPA in the tentative decision as exceeding WQS are false positives. Rather, EPA concludes that the additional laboratory data submitted by CCH in its comments do not provide sufficient reason to disregard the existing laboratory data reviewed by EPA in the tentative decision.

Although the supplemental pesticide analysis conducted by CCH using Method SW8270SIM are of questionable reliability, EPA has now reviewed data on the concentration of pesticides in the Sand Island effluent using Method 608 that were not available at the time of the tentative decision and reassessed its conclusions as to whether the proposed discharge would meet water quality standards for pesticides. In the tentative decision, EPA concluded that the reported concentrations of chlordane and dieldrin exceeded the water quality criteria protective of human consumption of fish in all 105 months from December 1998 through August 2007. Since the last annual average reviewed for the tentative decision (for the one-year period ending with August 2007), CCH conducted monthly monitoring of chlordane and dieldrin concentrations in the effluent for the 13 months from September 2007 through September 2008. Annual averages were calculated from these monthly samples.

Chlordane

Of the 105 reported annual averages for chlordane reviewed in the tentative decision, all exceeded the water quality criterion of 0.000016 µg/L, after accounting for average initial dilution. These concentrations ranged from 0.000066 µg/L to 0.0027 µg/L.

In the 13 months from September 2007 through September 2008, all 13 annual average values for chlordane exceeded the water quality criterion of 0.000016 µg/L, after accounting for average initial dilution. Annual average concentrations ranged from 0.0002 µg/L to 0.00028 µg/L.

In total, all of the 118 annual average concentrations for chlordane using Method 608 exceed the water quality criterion, when accounting for average initial dilution. EPA is, therefore, retaining its conclusion that the proposed discharge would not attain the water quality criterion for chlordane protective of human consumption of fish.

Dieldrin

Of the 105 reported annual averages for dieldrin reviewed in the tentative decision, all exceeded the water quality criterion of 0.000025 µg/L, after accounting for average initial dilution. These concentrations ranged from 0.000044 µg/L to 0.00016 µg/L.

In the 13 months from September 2007 through September 2008, all 13 annual average values for dieldrin exceeded the water quality criterion of 0.000025 µg/L, after accounting for average initial dilution. Annual average concentrations ranged from 0.000078 µg/L to 0.0001 µg/L.

In total, all of the 118 annual average concentrations for dieldrin using Method 608 exceed the water quality criterion, when accounting for average initial dilution. EPA is, therefore, retaining its conclusion that the proposed discharge would not attain the water quality criterion for dieldrin protective of human consumption of fish.

DDT

As acknowledged by the commenter, DDT was not a basis for denial in the 2007 Sand Island tentative decision. This comment does not request a reanalysis of EPA's conclusions regarding DDT.

Comment C30: A comparison of the effluent priority pollutant data with chronic WQS protective of marine aquatic organisms indicates that priority pollutants have not been detected at levels exceeding these criteria over the entire evaluation period of 2000–2007. These results provide a strong line of evidence that the effluent is not interfering with the protection and propagation of a BIP of fish, shellfish, and wildlife, supporting CCH's conclusions with respect to the WET test evaluation (the CCH WET test evaluation is provided in Section IIB.II.D) and the many years of marine biological community monitoring around the outfall.

Using the 2006 chlordane AWQC that EPA considers to be protective of a fish consumption pathway, the annual average concentration of chlordane in the SIWWTP effluent has never exceeded the protective level over the entire evaluation period of 2000–2007. Additionally, the analytical methods for pesticides specified by EPA in the Permit led to the reporting of probable false positives for dieldrin. This is entirely consistent with years of evidence from the marine monitoring program indicating that no unacceptable levels of the pesticides of concern are bioaccumulating in the target species or accumulating in the sediment around the outfall.

For these reasons, EPA has reached an inappropriate conclusion concerning the potential for adverse effects of pesticides on human health and maintenance of a BIP beyond the ZID boundary. Therefore, alleged pesticide exceedances do not provide a justification for denial of CCH's waiver application and, in light of this information, EPA should reconsider the negative 2007 TD.

Response: The results of WET testing and ammonia nitrogen monitoring (not the chlordane and dieldrin exceedances) are the primary bases for EPA's conclusion that the applicant has failed to

demonstrate that a modified discharge would not interfere with the attainment or maintenance of that water quality which assures protection of a balanced, indigenous population of shellfish, fish, and wildlife. Please see also response to comment C46.

EPA's evaluation of effluent data has found that the Sand Island discharge contains concentrations of chlordane and dieldrin that exceed water quality standards that were established to protect human health from ingestion of carcinogens through fish consumption. Conclusions made regarding EPA Water Quality Criteria cannot be used to replace the conclusions based on comparisons to Hawaii's water quality standards. EPA does not agree that the data provided by CCH in their application contains false positives for dieldrin. See response to comment C29 for a response to comments on the analytical methods used for chlordane and dieldrin. The cited findings regarding bioaccumulation and sediment accumulation do not change the fact that water quality standards have been exceeded.

Whole Effluent Toxicity

Comment C31: EPA's conclusions are based on WET tests conducted on *T. gratilla*, an indigenous Hawaiian sea urchin that is not on the list of EPA-approved species to be used for bioassay testing in wastewater effluents (*Federal Register* Volume 72 Number 47, 11200-11249, March 12, 2007). The EPA protocol for this species is still in draft form and has not been finalized.

EPA clearly recognizes that, until it gains formal status as an approved WET species, *T. gratilla* should not be used for regulatory compliance purposes at SIWTTP. This was evident during the process of EPA's decision for final approval of the Section 301(h) waiver for SIWWTP in 1998, when EPA addressed CCH comments on the Permit (EPA Region IX and Hawaii State Department of Health, September 30, 1998). As part of these comments, CCH submitted the following as Comment Number 15 (page 19):

> *"The Permittee recommended that the EPA and DOH continue to conduct whole effluent toxicity (WET) testing using the test species* Ceriodaphnia dubia *and* Trypneustes gratilla*; however, because the recommended protocol is still draft, compliance monitoring should not be required using the test species,* T. gratilla, *until the protocol is refined through inter-laboratory testing, etc."*

EPA's response to this comment including the following:

> *"The EPA and DOH concur with the Permittee, that at this time the Permittee should continue testing using* T. gratilla ***for monitoring purposes only****."* (Emphasis added.)

To CCH's knowledge, EPA has not documented that inter-laboratory variability testing has been completed. Therefore, the test retains the same status it had in 1998 when the Permit wording was changed. Based on HAR 11-54-4(b)(4) and the Permit, the *T. gratilla* WET test results are

not to be used to determine compliance with WQS. EPA's contention to the contrary is unfounded.

Response: At least two issues are raised in this comment. Portions of this comment pertain to the issue of whether or not the *Tripneustes gratilla* method should be used prior to listing at 40 CFR part 136, and this response focuses on this issue. Portions of this comment pertain to use of *T. gratilla* for compliance purposes. The use of *T. gratilla* for compliance purposes is addressed in response to comment C32.

The commenter is correct that the *T. gratilla* method has not been listed in 40 CFR part 136; however, this does not mean that the results of monitoring conducted using the method are inappropriate for use in assessing attainment of water quality standards.

The use of *T. gratilla* is consistent with EPA policy and Hawaii's water quality standards. Since first promulgating acute and chronic whole effluent toxicity (WET) methods in 1995, EPA has continued to recommend that NPDES permitting authorities implement chronic WET tests in permits for facilities that discharge into the Pacific Ocean based on test methods and species in *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms* (USEPA, 1995; "West Coast manual") and/or based on other alternative guidance as directed by state permitting authorities. Consistent with this recommendation, HAR 11-54-4(b)(2)(B) specifies that all state waters shall also be free from chronic toxicity as measured using the toxicity tests listed in HAR 11-54-10, or other methods specified by the director. This practice corresponds with EPA's 2002 Final WET Rule (USEPA, 2002b). In the preamble to this rulemaking, EPA states:

> Because test procedures for measuring toxicity to estuarine and marine organisms of the Pacific Ocean are not listed at 40 CFR part 136, permit writers may include (under 40 CFR 122.41(j)(4) and 122.44(i)(1)(iv)) requirements for the use of test procedures that are not approved at part 136, such as the *Holmesimysis costata* Acute Test and other West Coast WET methods (USEPA, 1995b) on a permit-by-permit basis.

Regulations for publicly owned treatment works at 40 CFR 122.21(j)(5)(viii) clarify that West Coast facilities, including those in Hawaii, are exempted from 40 CFR part 136 chronic test methods and species and must use alternative guidance as directed by the permitting authority.

EPA would also note that since 1998 the *T. gratilla* method has become the standard method for use in permits issued by HDOH for discharges to marine waters, including CCH permits such as for its Kailua and Waianae facilities, and is being implemented for compliance determinations in permits.

Comment C32: Accordingly, the Permit at Part B.1.b. explicitly states that the results of the *C. dubia* WET test were to be used for regulatory compliance, but the results of the *T. gratilla* test

were not to be used for regulatory compliance, and were not subject to discharge limitations of the Permit for purposes of HAR 11-54-4(b)(4):

> *"For this discharge, chronic toxicity for* Ceriodaphnia dubia *is defined by an exceedance of a chronic toxicity discharge limitation specified in Part A.1 of this permit.*
>
> *"The chronic toxicity discharge limitation in Part A.1 of this permit does not apply to monitoring results for toxicity tests using* Trypneustes gratilla*."* (Emphasis added.)

EPA concludes in the 2007 TD that there is unacceptable toxicity in the SIWWTP effluent based solely on evaluation of *T. gratilla* WET test data, in spite of the fact that the Permit required species (*C. dubia*) for such evaluation has never exhibited toxicity responses. This ignores EPA's express statement in the Permit that *C. dubia* only shall be used for regulatory compliance purposes, and *T. gratilla* shall not. As such, it is an arbitrary and unjustified basis for EPA's tentative denial of CCH's waiver application and should be reconsidered.

As EPA agreed, EPA must base its evaluation of toxicity on *C. dubia*, not *T. gratilla*. EPA's failure to rely on *C. dubia* data, which is the only approved means of demonstrating compliance for toxicity with the WQS, is arbitrary and again demonstrates EPA's conclusion-driven analysis.

Response: EPA used WET test results from the Sand Island WWTP as part of its assessment of whether or not the proposed discharge would meet the requirements of section 301(h), not to determine compliance with the permit. Specifically, EPA used the test results to assess whether or not the proposed Sand Island WWTP effluent would meet water quality standards. For this reason, results from WET tests of Sand Island effluent were not assessed against the toxicity limit listed in the permit, which is 94 TU_c. Data obtained through the monitoring requirements contained within the permit were instead assessed against the Hawaii water quality standard for toxicity, as described on page 51 of EPA's Sand Island TDD. Consequently, EPA assessed Sand Island WET test results against a TU_c of 103, which is derived from the initial dilution calculated by EPA during review of the 301(h) application. This assessment is in accordance with section HAR 11-54-4(b)(4)(A) of Hawaii's water quality standards. Likewise, whole effluent toxicity data collected by the applicant using *C. dubia* as a test organism were assessed in the same manner in this review of 301(h) criteria and not used for permit compliance purposes.

The Sand Island permit states that the chronic toxicity discharge limitation does not apply to monitoring results for toxicity tests using *T. gratilla*. However, the next sentence in the permit states that chronic toxicity for *T. gratilla* is defined by an exceedance of an average daily chronic toxicity value of 94 TU_c. In its comments on the 301(h) tentative decision, the applicant supplied the first sentence but not the second sentence of the paragraph on page 13 of the permit:

> The chronic toxicity discharge limitation in Part A.1 of this permit does not apply to monitoring results for toxicity tests using *Trypneustes gratilla*. Chronic

> toxicity for *Trypneustes gratilla* is defined by an exceedance of an average daily chronic toxicity discharge value of 94 TU_c.

The second sentence implies that the data collected according to the permit monitoring requirements are valid data that can be assessed for purposes other than permit compliance. For example, the permit also requires accelerated testing when results with *T. gratilla* exceed 94 TU_c, and if accelerated testing indicates additional exceedances, the permitting authority may direct CCH to conduct a toxicity reduction evaluation.

Although EPA and HDOH accommodated CCH's request to not use the *T. gratilla* test for compliance purposes in the 1998 Sand Island permit, EPA notes that subsequently, HDOH has routinely issued permits requiring WET compliance monitoring using *T. gratilla,* including at CCH facilities such as the Kailua and Waianae WWTPs.

Comment C33: EPA's own WET test guidance suggests avoiding the development of WET tests for indigenous species.

EPA's TSD (EPA Office of Water, March 1991) advises:

> *"Sometimes, regulatory agencies require testing on representative resident species under the assumption that such tests are needed to assess impact to local biota. EPA considers it unnecessary to test resident species since standard test species have been shown to represent the sensitive range of all ecosystems analyzed. Resident species toxicity testing is strongly discouraged unless it is required by State statute or some other legally binding factor, or it has been determined that a unique resident species would be far more protective of the receiving water than the EPA surrogate species."*

Response: EPA's 2002 Final WET Rule (USEPA, 2002b), which establishes standard test methods and species for discharges to marine waters of the East Coast, specifically allows the use of test methods on a permit-by-permit basis for marine and estuarine discharges to the Pacific Ocean. The primary reason for this provision was to allow species indigenous to the Pacific Ocean, rather than the Atlantic Ocean, to be used for toxicity testing for discharges to estuarine and marine waters of the Pacific Ocean.

HAR 11-54-4(b)(2)(B) specifies that all state waters shall also be free from chronic toxicity as measured using the toxicity tests listed in HAR 11-54-10, or other methods specified by the director. Accordingly, HDOH routinely issues NPDES permits that require the use of toxicity tests with the *T. gratilla* test method for discharges to marine waters. For estuarine and marine waters of Hawaii and other Pacific islands, EPA supports the use of *T. gratilla*.

Furthermore, the State of Hawaii has strict regulations regarding the import of non-native species. EPA's document *Short-term Methods for Estimating the Chronic Toxicity for Effluents and Receiving Waters to Marine and Estuarine Organisms* (USEPA, 2002a), while discouraging

use of indigenous species in general, allows their use under certain circumstances. Section 6.1.4 (USEPA, 2002a) states the following:

> Some states have developed culturing and testing methods for indigenous species that may be as sensitive or more sensitive, than the species recommended in Subsection 6.1.3. However, USEPA allows the use of indigenous species only where state regulations require their use or prohibit importation of the species in Subsection 6.1.3.

Hawaii's strict regulation of non-native species is one of the reasons HDOH began development of a toxicity test method using a test organism that is already present in Hawaii. EPA supports this method and considers it consistent with the EPA guidance.

Comment C34: The SIWWTP results that are reported in terms of statistical hypothesis testing include a large number of values that create a perception of unacceptable toxicity when that situation does not exist. This perception results from use of a statistical evaluation method that does not effectively consider the biological relevance of the results. Because of the biological variability inherent in the *T. gratilla* test, the hypothesis testing approach generally leads to a much more conservative estimation of the toxic threshold, and is much more likely to result in false positives (that is, inferring biological toxicity when none is present).

The sea urchin results do not consider biological relevance.

A critical deficiency in the use of hypothesis testing for defining "toxicity," using an endpoint such as fertilization success in *T. gratilla*, is that simple ***statistical*** differences do not always represent ***biological*** effects. As commonly happens with this urchin species, when the fertilization success in the control group replicates varies by only small percentages, a statistically significant difference between the control and a test group could be interpreted as a "toxic" response, without respect to biological significance (and, accordingly, resulting in false positives).

In *Understanding and Accounting for Method Variability in Whole Effluent Toxicity Applications under the National Pollutant Discharge Elimination System* (EPA, June 2000), EPA specifically addresses the issue of biological relevance by stating (on p. Appendix D-8) that WET tests with:

> *"[M]inimal variability in all treatments of a test may lead to such high statistical power that detected differences may not be biologically significant. Such tests should be interpreted with caution."*

In *Short-Term Methods For Estimating the Chronic Toxicity of Effluents and Receiving Water to Marine and Estuarine Organisms* (EPA, October 2002), page 41, Section 9, EPA states that for continuous (that is, nonquantal) biological effects

> *"…estimates from a statistical analysis can only be used in conjunction with an assessment from a biological standpoint of what magnitude of adverse effect constitutes a "safe" concentration. In this instance, a "safe" concentration is not necessarily a truly "no-effect" concentration, but rather a concentration at which the effects are judged to be of no biological significance."*

These inherent conditions (very tight control variances relative to test group variances) have consistently resulted in statistically significant reductions in fertilization in treatment groups that have very high fertilization rates. Such a situation results in designation of "toxicity" that is artifactual and does not represent a true measure of biological relevance.

Of the remaining 121 tests with a reported LOEC (determined using statistical significance only), 57.0 percent (69 of 121) were identified where the fertilization rate at the indentified LOEC was greater than or equal to 70 percent fertilization. Of the complete data set, the highest fertilization rate seen at an identified LOEC was 99 percent. These results clearly indicate that more than half of the reported LOECs are not biologically relevant, and they create a perception of unacceptable toxicity when that situation does not exist. That is, using the statistical significance criterion alone, the *T. gratilla* test, which has not yet received EPA approval, is inherently susceptible to type I errors (false positives).

The problem stems largely from the very low variability in the control test fertilization responses. Because of this low variability, a very small difference between test dilutions and controls may be found to be statistically significant and interpreted as "toxic," when, instead, the results may lie within the range of the acceptable biological variability that is considered acceptable for the control replicates.

Response: This comment appears to be combining two issues related to biological relevance. The main focus of the comment appears to be an assertion that hypothesis testing is not a suitable statistical method for interpreting the biological results of WET testing. In addition, the comment appears to be asserting that WET tests generally (which are based on statistical methods) do not have ecological relevance. EPA disagrees with both assertions.

<u>Ecological Relevance</u>

EPA disagrees with the assertion that WET tests do not have ecological or biological relevance. In the TSD (USEPA, 1991), EPA discussed the results of a number of studies that correlated effluent toxicity measurements to receiving water toxicity. The studies included discharges to both freshwater and saltwater. The TSD states:

> "Together, these studies comprise a large data base specifically collected to determine the validity of toxicity tests to predict receiving water community impact. In order to address the correlation of effluent and ambient toxicity tests to receiving water impacts, EPA evaluated the results of the studies discussed above. The results, when linked together, clearly show that if toxicity is present after considering dilution, impact will also be present." [TSD, p.7]

For the studies specific to saltwater, the TSD concludes as follows:

> "The results of the studies at these four sites indicate a 94 percent accuracy when using the marine and estuarine toxicity test to predict receiving water impacts. In only 6 percent of the cases did effluent toxicity tests predict receiving water toxicity that was not present (false positive)." [TSD, p. 9]

False Positive Results in WET Test

In statistical terms, a conclusion that an effluent is toxic when it is not is known as a false positive result or a Type I error. Chapter 5 of EPA's document *Understanding and Accounting for Method Variability in Whole Effluent Toxicity Applications Under the National Pollutant Discharge Elimination System Program* (USEPA, 2000), known as the variability guidance document, specifically addresses false positives. This document defines false positives as follows:

> "A Type I error (i.e., "false positive") results in the false conclusion that an effluent is toxic when it is not toxic. A Type II error (i.e., "false negative") results in the false conclusion that an effluent is not toxic when it actually is toxic. Power (1 - beta) is the probability of correctly detecting a true toxic effect (i.e., declaring an effluent toxic when it is in fact toxic).

WET tests, when properly conducted, are designed to minimize the likelihood of false positive results. As described below, important design parameters include the number of replicates and establishing statistical controls on variability. EPA has addressed concerns related to false positives specifically for hypothesis testing in the variability guidance document (USEPA, 2000) as follows:

> "The hypothesis test procedures prescribed in EPA's WET methods provide adequate protection against incorrectly concluding that an effluent is toxic when it is not. The expected *maximum* rate of such errors is the alpha level used in the hypothesis test. The hypothesis test procedure is designed to provide an error rate *no greater than* alpha when the default assumptions are met. The statistical flow chart provided with each EPA WET method identifies cases when default assumptions are not satisfied and, therefore, when data transformations or alternative statistical methods (e.g., a nonparametric test) should be used."

EPA evaluated and assessed the false positive rate in its study of interlaboratory variability of WET tests (USEPA, 2001). This study conclusively showed that measured false positive rates were below the theoretical rate of 5% estimated for the methods.

EPA disagrees that hypothesis testing is an unacceptable method for interpreting the biological results of WET tests. Proper test design, including controls and replication, provides adequate protection from false positives, whether the results of the test are interpreted using hypothesis

testing (as required by Hawaii water quality standards) or point estimation (the other statistical method commonly used to interpret WET results). EPA strongly recommends that WET testing laboratories carefully review the statistical procedures used to produce WET test results and other factors (i.e., biological and statistical quality assurance), and verify that test conditions and test acceptability criteria are achieved. If a test is properly conducted and correctly interpreted, either through hypothesis testing or point estimation, the rate of false positives should remain very low.

In its Final WET Rule (USEPA, 2002b), EPA continues to use a nominal error rate of 0.05 for its WET test methods. Reductions in the nominal error rate (reducing false positives) would improve confidence in test results that identify toxicity, but reduce confidence in results that do not identify toxicity, because of the relationship between Type I and Type II errors. This would reduce the power of the test and the chance of identifying toxic discharges, thereby reducing environmental protection. In the Final WET Rule, EPA concluded that there is no scientific justification for recommending reductions in nominal error rates below 0.05 to reduce false positives in order to improve permit compliance.

Number of Replicates

Hypothesis tests can be designed to increase the power to detect differences by decreasing variability. One important design parameter in this regard is the number of replicates tested. The Sand Island WWTP NPDES permit requires a comparison between a dilution water control and different treatments that bracket the instream waste concentration. The different treatments are different concentrations (i.e., different dilutions) of the effluent used to determine which concentrations produce adverse effects on the test species. EPA toxicity test methods recommend a minimum number of replicates per test concentration, but the testing laboratory may increase the number of replicates. The City and County of Honolulu Water Quality Laboratory incorporates one and a half to two times the recommended replicate size by using 6-8 replicates per treatment to increase the power of testing and decrease variability.

Statistical Controls on Variability

The treatment that contains the highest percent of effluent without causing a statistically significant adverse effect is the no observed effect concentration, or NOEC. As discussed in the TDD, page 51, calculation of the NOEC is a critical part of WET testing analysis for wastewater treatment plants in Hawaii, as Hawaii's water quality standard related to submerged outfalls is written in terms of the NOEC.

The percent minimum significant difference (PMSD) is a measure of test sensitivity that establishes the minimum difference required between a control and a treatment in order for that difference to be considered statistically significant. To increase test precision, upper and lower bounds on PMSD can be applied when reporting the NOEC. Upper PMSD bounds are intended to control within-test variability, because high variability can mask toxicity. EPA recommends lower PMSD bounds to avoid penalizing permittees which use laboratories that achieve unusually high precision in their toxicity tests. When variability is very low, a small difference

between a treatment and the control could be found to be statistically significant. Thus, a laboratory that achieves a very high precision, and hence low variability, might find that an effluent sample is toxic when another laboratory would not.

EPA recommends that laboratories track PMSD values over time so that the testing laboratory may assess the normal operating ranges of this parameter in the laboratory and identify periods of decreased consistency. This information is useful in quickly identifying and correcting potential problems and sources of variability. The tracking of PMSD values also is useful for evaluating whether a laboratory needs to increase test replication to consistently achieve the variability criteria.

Minimal variability in all treatments of a test may lead to such high statistical power that detected differences may not be biologically significant, but this can be accounted for by setting a low PMSD criterion for the method. The CCH Water Quality Laboratory has established a lower PMSD bound of 3% for the *T. gratilla* fertilization toxicity tests it conducts, as described in CCH's Standard Operating Procedure #860, Revision #1 (City and County of Honolulu, 2003). Thus, to the extent CCH may have had concerns about the statistical significance of the *T. gratilla* WET tests, it has addressed those through its laboratory setting a low PMSD bound.

If the relative difference between the means for the control and the instream waste concentration treatment is statistically significant, but smaller than the lower bound PMSD, the test is considered acceptable, but determination of the NOEC is more complex. Section 6.4.2 of EPA's variability guidance document (USEPA, 2000), describes the procedures for determining the NOEC in this situation.

The current Sand Island permit does not require analysis of PMSD when interpreting results of WET tests; however, that can be done retroactively. In response to this comment, EPA has re-reviewed the data on WET and taken into consideration information on PMSD, using the lower bound of 3% described in CCH's 2003 Standard Operating Procedure. Although PMSD data are available for tests conducted since April 1999, EPA limited its review of PMSD data to tests conducted after April 23, 2003, the date of CCH's standard operating procedure #860, Revision #1.

In the TDD, EPA focused its review of WET tests using *T. gratilla* on the period from January 1999 through May 2007. During some months, CCH conducted multiple WET tests. Table 6 of the TDD lists the highest of the individual values for each month (i.e., the daily maximum). As listed in Table 6 of the TDD, of the 49 daily maximum values reported by CCH from May 2003 through May 2007, 27 exceeded the target value of 103 TU_c (based on the water quality standard and the minimum initial dilution).

EPA reviewed PMSD data from the detailed data sheets that were submitted by CCH along with its DMRs, for tests conducted from May 2, 2003 through May 22, 2007. The toxicity and PMSD for the daily maximum for each month are listed in the table below (Table 6b in the final decision document). Of the 27 daily maximum values that exceeded the target value during this period, three tests had a PMSD below the lower bound of 3%.

Toxicity and PMSD values for Daily Maximum WET tests for Sand Island WWTP from May 2003 through May 2007. Highlighted tests had a PMSD below the lower bound of 3% and exceeded 103 TU_c.

Month	TU_c	PMSD	Recalculated TU_c
May 2003	357.1	6.30	na
June 2003	> 357.1	3.29	na
July 2003	357.1	11.47	na
August 2003	357.1	8.20	na
September 2003	> 357.1	3.64	na
October 2003	357.1	11.29	na
November 2003	181.8	1.12	181.8
December 2003	90.9	4.23	na
January 2004	181.8	4.62	na
February 2004	45.5	3.23	na
March 2004	22.7	7.05	na
April 2004	22.7	3.46	na
May 2004	45.5	1.73	na
June 2004	22.7	0.99	na
July 2004	90.9	0.85	na
August 2004	90.9	1.46	na
September 2004	45.5	2.41	na
October 2004	45.5	2.68	na
November 2004	90.9	2.07	na
December 2004	90.9	3.66	na
January 2005	45.5	1.34	na
February 2005	45.5	1.03	na
March 2005	181.8	10.79	na
April 2005	90.9	1.19	na
May 2005	181.8	7.64	na
June 2005	357.1	0.19	181.8
July 2005	357.1	3.29	na
August 2005	181.8	1.14	181.8
September 2005	> 357.1	9.29	na
October 2005	90.9	8.65	na
November 2005	45.5	6.30	na
December 2005	181.8	7.44	na
January 2006	181.8	9.97	na
February 2006	90.9	3.15	na
March 2006	45.5	2.09	na
April 2006	22.7	2.16	na
May 2006	45.5	7.51	na
June 2006	181.8	5.19	na
July 2006	90.9	11.17	na

August 2006	> 357.1	5.59	na
September 2006	357.1	3.99	na
October 2006	357.1	8.85	na
November 2006	357.1	6.83	na
December 2006	357.1	6.04	na
January 2007	357.1	4.17	na
February 2007	>357.1	4.66	na
March 2007	357.1	3.89	na
April 2007	357.1	3.76	na
May 2007	357.1	10.47	na

Using section 6.4.2 of the variability document (USEPA, 2000), EPA recalculated NOECs for the three daily maximum tests that had PMSDs below 3% and exceeded 103 TU_c. All three recalculated values (for November 2003, June 2005, and August 2005 tests) still exceed the water quality standard of 103 TU_c when recalculated.

In summary, for the period from May 2003 through May 2007, EPA still finds that 27 out of 49 WET tests exceeded the water quality standard. This remains true when the NOEC values are recalculated according to the procedures in the variability document for those tests where the PMSD was less than 3%.

Comment C35: It is reasonable to assume that, for the sea urchin fertilization WET test, a "biologically significant" effect level is the same as the effect level that defines the test acceptability criterion (TAC). For the EPA-approved sea urchins *Aribacia punctulata* and *Strongylocentrotus purpuratus*, the level of biological response defined as the TAC is a control fertilization rate greater than 70 percent fertilization. Therefore, a control fertilization rate from 100 percent down to 70 percent can be considered an acceptable range for this species, and within the expected level of natural biological variability.

Response:

This comment misinterprets test acceptability criteria (TAC), which set minimum requirements for performing toxicity tests. In its 2002 Final WET Rule (USEPA, 2002b), EPA restricted the term "test acceptability criteria" to biological measurements in test **controls** (i.e., control survival, reproduction, and growth) that independently assess test acceptability (67 Fed. Reg. 69952, 69958). In the context of EPA's WET methods with sea urchins, a TAC is used to invalidate tests where there is inadequate fertilization in controls (i.e., 100% dilution water). For example, if there is 65% fertilization success in the **controls**, then the TAC would be used to reject the test, regardless of the results in the **treatments**. Neither *Arbacia punctulata* nor *Strongylocentrotus purpuratus* fertilization methods published by USEPA (2002, 1995) state that the TAC is intended to be used for interpreting acceptable fertilization in treatments (i.e., mixtures of effluent and dilution water). It would be inappropriate to establish a TAC for the *T. gratilla* method based on fertilization success in treatments.

Hypothesis testing is the appropriate method in Hawaii for assessing the adequacy of fertilization success in **treatments**. Hypothesis testing compares the response in treatments to the response in controls, not to an arbitrary benchmark such as 70% fertilization. For example, if a treatment exhibited 70% mean fertilization and the control exhibited 99% mean fertilization, then hypothesis testing would distinguish whether that particular test exhibits a statistically significant difference between the effluent concentration and the control.

It is Region 9's opinion that a more appropriate approach for ensuring biological significance is by establishing appropriate bounds on the percent minimum significant difference (PMSD), which is the approach taken by the CCH laboratory. Please see response to comment C34.

Comment C36: The *T. gratilla* protocol includes techniques that are inherently sensitive. For example, the protocol specifies a 60-minute sperm exposure, which is three times longer than the 20-minute exposure required for West Coast urchin fertilization tests, as outlined in *Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms* (EPA, 1995). This inconsistency results in exaggerated sensitivity for *Tripneustes gratilla* relative to other West Coast urchin protocols.

Response: The *T. gratilla* method is not the only sea urchin WET method that calls for sperm to be exposed to the treatment (or control) for 60 minutes prior to introduction of the eggs. For example, the sperm exposure period of 60 minutes is consistent with the *Arbacia punctulata* urchin fertilization toxicity test method which specifies a 60 minute exposure (USEPA, 2002a). A 60 minute exposure of urchin sperm compared to a 7-day exposure of *Ceriodaphnia dubia* is a reasonable exposure time to measure endpoints. The measure of whether or not the sperm exposure period is excessive is the fertilization success rate of the controls. Success in control fertilization of *T. gratilla* tests is evidence that exposure time is not excessive.

Comment C37: <u>WET tests using C. dubia have never indicated unacceptable toxicity.</u>

The sea urchin results do not corroborate with more relevant, EPA-approved WET species.

To provide additional lines of evidence for low toxicity, additional WET test on other EPA-approved marine species were conducted in 2007. These tests were run using the mysid shrimp *Mysidopsis bahia* (a sensitive invertebrate) and the sheepshead minnow *Cyprinodon variegates* (a representative fish).

Response: EPA has long recognized that there are species sensitivity differences among different groups of organisms to different toxicants. This is why EPA recommends three-species testing. HDOH's *State Toxics Control Program: Derivation of Water Quality-Based Discharge Toxicity Limits for Biomonitoring and Specific Pollutants* (HDOH, 1989) states the following:

> A major concern about biomonitoring as a means to prevent toxicity is that the organisms used in the test may not be as sensitive as the most sensitive organism which either inhabits the receiving water, or would be present in the absence of pollution. The Technical Support Document contains an extensive discussion of the uncertainty associated with test species. Generally, testing with three diverse species (e.g., from different taxa) is likely to ensure protection of the most sensitive receiving water species. In certain critical cases, testing with additional species may be desirable.
>
> The probability of protecting sensitive species can also be increased, in cases where fewer than three test species are used, by increasing the stringency of the toxicity limit by a factor of 10 for two species, and by 100 for one species.

Test results indicate that *T. gratilla* is more sensitive to toxicants found in the Sand Island effluent than other tested organisms. This is not the result of a deficiency with the *T. gratilla* test method, nor does it mean that the results with *T. gratilla* should somehow be discounted. Rather, it illustrates the reason for conducting WET tests with more than one species. Test results using *T. gratilla* are valid and indicate toxicity that is not detected by other species, such as *C. dubia*, or the two additional test species investigated by CCH, *Mysidopsis bahia* and *Cyprinodon variegatus*. For this reason, in the selection of test species, EPA recommends the use of species from ecologically diverse taxa (see USEPA, 1991, Section 1.3.4). By testing Hawaii effluents with multiple species, including a sea urchin found in tropical waters of the Pacific Ocean, the requirement at 40 CFR 122.44(d)(1)(ii) to consider species sensitivity when evaluating WET in NPDES effluents is satisfied.

In response to these comments, EPA reviewed the results of toxicity tests using *T. gratilla* using effluent from other wastewater treatment plants in Hawaii, to confirm that the method itself does not leads to findings of toxicity with all effluents. EPA found that other permits in Hawaii contain the requirement to conduct toxicity testing with *T. gratilla,* and the permittees, including other CCH facilities, are able to meet target values based on the water quality standard and the appropriate dilution. For example, tests conducted with effluent from the wastewater treatment plants for Kailua, Waianae, and Hilo consistently meet the State of Hawaii water quality standards for continuous discharges through submerged outfalls. Specifically, WET tests reported in DMRs from CCH's Kailua WWTP met the target value of 186 TUc in 53 of the 59 WET tests conducted in the period from January 2003 through December 2007. Results reported in DMRs for CCH's Waianae WWTP indicate that the discharge met the target value of 117.84 TUc in 57 of the 59 tests conducted in the period from January 2003 through December 2007. Results reported in DMRs for the Hilo WWTP indicated that the discharge met the target value of 62.8 TUc in all 16 of the tests conducted quarterly in the period from March 2003 through September 2007 and reported in DMRs. These results indicate that the test method itself is not the cause of the consistent failure of the Sand Island WWTP effluent to meet the WET criterion using *T. gratilla*.

Results from WET tests using *T. gratilla* clearly indicate that the Sand Island WWTP effluent routinely exerts a toxic effect that is predicted under critical conditions to exceed water quality

standards at the boundary of the zone of initial dilution. EPA continues to conclude that the proposed discharge will not attain water quality standards for WET and that the proposed discharge will contain substances at levels sufficient to be toxic to aquatic life, in violation of HAR 11-54-4(a)(4), and therefore is not protective of uses for Class A waters in Hawaii.

Comment C38: It is important to note that these results do not question the quality of laboratory performance CCH conducted during its compliance WET test monitoring. Rather, they reflect only the deficiencies inherent within the methods themselves, relative to the biological variability inherent in this indigenous sea urchin. This issue can be addressed by switching to an EPA-approved species.

Response: EPA does not question the performance of the CCH laboratory, but EPA disagrees that CCH's failure to meet WET tests is due to deficiencies in the *T. gratilla* toxicity test. The data presented by the CCH Water Quality Laboratory demonstrate their ability to conduct the *T. gratilla* toxicity test well. The PMSDs for the CCH Water Quality Laboratory are consistently low, indicating excellent precision. Consistent results represented in the CCH reference toxicity control charts also indicate the reliability of the *T. gratilla* toxicity test. This consistency refutes any claims of unacceptable biological variability in the *T. gratilla* test.

Using *T. gratilla* is allowed, under EPA's current rules, for discharges to the Pacific Ocean, when authorized by the permitting authority (see the response to comment C31).

Nutrients

Comment C39: The criteria noted by the EPA relate to the geometric mean concentration. There is nothing in the criteria that stipulates over what timeframe the geometric mean is to be calculated. The decision by the EPA to calculate annual geometric means appears to be completely arbitrary. Since sampling was normally done on a quarterly basis, in most cases only four numbers were averaged at a given station and depth.

Repeatedly calculating geometric means based on an average of only four numbers leads to a misleading representation of water quality.

Response: EPA's use of an annual geometric mean to assess nutrient and chlorophyll *a* data was not arbitrary. It was based on the method used in the 1998 tentative decision for Sand Island and the same method applied by HDOH when assessing data produced under HDOH's NPDES permits. When the NPDES permit for the Kailua WWTP was reissued in 2006, nutrient and chlorophyll *a* data collected quarterly from the receiving water were assessed on an annual basis for each monitoring station and by each depth. An annual geometric mean was developed for each depth at each monitoring station based on four samples collected quarterly. Although CCH commented on other issues in the draft Kailua NPDES permit, it did not comment on the use of a geometric mean for nutrients and chlorophyll *a* developed on an annual basis. For the Waianae WWTP permit, an annual geometric mean for nutrients and chlorophyll *a* was calculated based

on samples collected in the receiving water on a monthly basis. If CCH would have collected samples more frequently in the Sand Island receiving water, EPA would have used them to develop an annual geometric mean.

Comment C40: EPA based its tentative decision on water quality data collected in the vicinity of the outfall from 1999 through 2006. Considering for the moment the six stations (D1, D4, D5, E1, E4, and E5) beyond the zone of mixing (ZOM) that were taken into consideration by the EPA, I find that the geometric mean ammonia nitrogen concentrations calculated over the eight-year period from 1999 through 2006 were below 3.5 μg N per liter at all stations and depths (Table 1). Yet for at least one depth at each station the Hawaii Class A open coastal water quality standard of 3.5 μg N per liter is exceeded when the geometric mean is calculated based on data from a single year. My conclusion is that the standard of 3.5 μg N per liter is in fact being satisfied at all of the stations beyond the ZOM and that the EPA's analysis is flawed.

When all data collected over the eight-year study period are included in the calculation of geometric means, it becomes clear that the water quality standard is being satisfied at stations beyond the ZOM.

Response: EPA assessed ammonia nitrogen data on an annual basis. See response to comment C39 for an explanation of why EPA used an annual basis for the geometric mean, rather than a longer averaging period, such as the eight-year period used by the commenter. There were exceedances of the Hawaii water quality criterion for ammonia nitrogen at stations located at the ZOM (D2, D3, E2, and E3) and at stations located beyond the ZOM (D1, D4, D5, E1, E4, and E5).

Comment C41: The EPA's analysis is further flawed by the fact that it included data from all sampling depths. An analysis of the data in Table 1 shows that there is a statistically significant depth dependence in ammonia N concentrations (Kruskal-Wallis test, $p = 0.02$). The surface concentrations are consistently as low as or lower than the concentrations measured from mid-depth and bottom samples. It is therefore wrong to assume that all the numbers from a particular station were drawn from the same distribution function, and the EPA's analysis is consequently invalid.

Response: EPA's assessment was conducted in two steps. As in the 1998 tentative decision for the SIWWTP, an annual geometric mean was developed for the entire water column at each station. An annual geometric mean was then developed for each depth at each station. As noted in the TDD, when the data were assessed using both approaches, it was determined that the water quality standard for ammonia nitrogen was exceeded.

Comment C42: Dr. Edward Laws reviewed the tentative decision and stated the following: "*My conclusion from this analysis is that there is no evidence that the Sand Island outfall is having any discernable effect on chl* a *concentrations in the vicinity of the outfall, including the*

ZOM stations. Furthermore, there is no evidence that the geometric mean water quality standard of 0.3 micrograms per liter chl a *is being violated at any stations or depths.*

"Because of the impact of currents and mixing and the fact that phytoplankton can grow no more rapidly than roughly one doubling per day, the outfall is having no discernable impact on chlorophyll a *concentrations at any stations or depths. There is no reason to believe that the balanced indigenous phytoplankton community is being impacted by the outfall."*

Response: EPA has not concluded that the Hawaii water quality criterion for chlorophyll *a* has been exceeded.

Comment C43: In light of Dr. Laws' expert review, the EPA conclusion in the 2007 TD that CCH failed to demonstrate that it can consistently attain WQS for ammonia nitrogen is unfounded. In particular, ammonia levels do not result in measurable biological responses with respect to either nutrient enrichment or toxicity. In fact, at the March 12, 2008, public hearing, Dr. Hans Krock, primary author of the ammonia standards of the WQS, indicated that EPA had misapplied the ammonia standards and the basis of the calculations used by EPA is flawed. As a result, the 2007 TD to deny the waiver based on ammonia WQS is unjustified and should be reconsidered.

Response: EPA has concluded that the water quality criterion for ammonia nitrogen is not met, because receiving water data from stations at the ZOM and beyond exceeded the State of Hawaii's promulgated water quality standards on an annual basis. A determination that there have not been measurable biological responses does not change the fact that water quality standards have been exceeded.

<u>pH</u>

Comment C44: EPA did not take exception to the pH of the SIWWTP discharge, and CCH has not requested a variance for pH.

Response: EPA concluded it is likely that the projected discharge will not exceed the State water quality standard for pH in the receiving water.

<u>Public Water Supplies</u>

Comment C45: 40 CFR 124.62(b), which implements Section 301(h)(2), requires that the discharge must allow for the attainment and maintenance of water quality that ensures protection of public water supplies.

EPA concludes that this criterion is satisfied.

Response: EPA agrees that this criterion is satisfied.

Shellfish, Fish, and Wildlife

Comment C46: 40 CFR 124.62 also requires that the SIWWTP not interfere with the attainment of a BIP at and beyond the edge of the ZID. In the following subsections, CCH addresses EPA comments in the 2007 TD with regard to the potential for impacts on the protection and propagation of a BIP of shellfish, fish, and wildlife from discharge of the SIWWTP effluent.

In the 2007 TD, EPA notes the following:

"Although the results of EPA's analysis are mixed, EPA concludes that the applicant has failed to demonstrate that a modified discharge would not interfere with the attainment or maintenance of that water quality which assures protection of a balanced, indigenous population of shellfish, fish, and wildlife."

Apparently, EPA's position is based on its opinion that:

"[T]he scope of the biological monitoring is limited; only portions of the marine community are sampled. [and *T]he samples that were collected may not have been collected during critical conditions, for example when initial dilution was at critical levels."*

CCH disagrees with this finding, based on the results of 17 years of in-field and in-laboratory biological and chemical monitoring that have been performed in accordance with the EPA-approved Section 301(h) monitoring plan. In the Permit, EPA revised the monitoring program to include expanded core monitoring, and a regional monitoring program (to take into account the potential environmental effects to Mamala Bay from both the SIWWTP and the Honouliuli WWTP discharges). In addition to the expanded core monitoring, CCH conducted this 2-year regional Mamala Bay monitoring program in years 3 and 5 of the Permit. EPA approved the details of the joint EPA/CCH-developed regional program (EPA Region 9 Water Division [Alexis Strauss], June 14, 2001):

"We have reviewed the modifications and additional details of the monitoring effort for summer 2001 and give the City and County of Honolulu approval to implement the Mamala Bay Regional Monitoring Plan (RMP)."
…
"We appreciate your working with us on providing a comprehensive monitoring effort in Mamala Bay."

CCH submitted the data and reports of the regional program to EPA. This information was to have been used to determine whether the regional program would replace the core monitoring. EPA did not make a determination or provide further direction. In the 2007 TD, EPA does not claim that CCH has not complied with its EPA-approved monitoring programs. EPA never

requested CCH to modify its monitoring program despite its authority under the Permit to do so. Having failed to take action contemplated by the Permit to modify CCH's EPA-approved monitoring program should it have had any concerns, EPA cannot now, in good faith, claim it is too "limited" to support a Section 301(h) waiver.

For all of the reasons specified previously, it is unreasonable for EPA to claim that the monitoring program is insufficient to answer the questions that are posed by the Section 301(h) criteria with respect to maintenance of a BIP and recreational activities at or beyond the edge of the ZID. Its conclusion in this regard, after years of silence implying satisfaction with the very program that it approved, is arbitrary and capricious, and should be reconsidered.

In fact, EPA had no need to seek modifications of CCH's approved monitoring program. The following subsections summarize 17 years of extensive biological monitoring that CCH conducted. The weight of evidence overwhelmingly supports the conclusion that the BIP is protected. These results indicate that, using methods that represent "state of the practice" for biological monitoring, ***no evidence exists indicating that the BIP is adversely affected by the SIWWTP effluent***.

Response: The primary basis for EPA's conclusion that the applicant has failed to demonstrate that a modified discharge would not interfere with the attainment or maintenance of that water quality which assures protection of a balanced, indigenous population of shellfish, fish, and wildlife is not limitations of the monitoring program. EPA's *Technical Support Document for Water Quality-based Toxics Control* states that an integrated approach to water quality-based toxics control consists of whole effluent, chemical-specific, and biological assessments (EPA, 1991). Exclusive use of one approach alone cannot ensure required protection of aquatic life. EPA has considered the available information on WET, specific chemicals, and the biological data collected near the outfall and found that the proposed discharge would not attain water quality standards established to protect aquatic life, specifically WET and ammonia nitrogen. Thus, the primary basis for EPA's conclusion that the applicant has failed to demonstrate that a modified discharge would not interfere with the attainment or maintenance of that water quality which assures protection of a balanced, indigenous population of shellfish, fish, and wildlife is that the proposed discharge would not attain these water quality standards.

Comment C47: The Permit requires the following biological and chemical monitoring to demonstrate compliance with the BIP requirements of the Section 301(h) waiver: (a) annual monitoring of benthic infaunal diversity and abundance near the outfall, (b) annual priority pollutant analyses of sediment near the outfall, (c) annual priority pollutant analyses of tissues (both muscle and liver) of two species of fish from near the outfall, (d) quarterly offshore monitoring of nutrients and chlorophyll *a* near the outfall, (e) monthly chlordane and dieldrin analyses of effluent, (f) semi-annual priority pollutant analyses of effluent, and (g) monthly WET testing of effluent using three species for acute testing and one species for chronic testing. CCH also performs an annual evaluation of health metrics (that is, necropsy and histopathology) of fish from near the outfall.

The data resulting from these surveys and studies demonstrate through a cumulative weight of evidence that a BIP exists beyond the edge of the ZID, as supported by the following discussion.

Response: EPA agrees that the SIWWTP NPDES permit contains these monitoring requirements. However, EPA does not agree that the data from these surveys and studies demonstrate that the discharge does not interfere with the attainment or maintenance of that water quality which assures protection of a BIP.

Comment C48: Benthic Infaunal Abundance and Diversity: In accordance with the Permit requirements, benthic fauna have been sampled at 15 offshore locations. The biomonitoring of marine life in the vicinity of the SIWWTP Ocean Outfall in 2006 marked the 17th year of a study that began in 1990. Five sampling stations are located on each of three transects located on isobaths of approximately 20 meters, 50 meters, and 100 meters. Each transect includes two stations near the diffuser at or inshore of the boundary of the ZOM and three stations beyond the diffuser.

The response patterns of benthic fauna near the SIWWTP ocean outfall in 2006 showed little or no indication of a significant influence from the discharge of the diffuser effluent. Most statistically significant differences in nonmollusks among the 15 stations were associated with differences between the three depth ranges at which the samples were collected, and reflect the influence of depth-related factors. When stations were pooled by proximity to the outfall, no significant differences existed between these stations and those distant from the outfall in the abundance or taxa richness of polychaetes, crustaceans, and all nonmollusks. Taxa composition, diversity, and evenness of nonmollusks were also more closely associated with water depth than proximity to the outfall. In addition, no significant differences in mollusk abundance or taxa richness existed among transects or in abundance between the near-diffuser stations and the beyond-diffuser stations. However, mollusk taxa richness was significantly greater at near-diffuser stations than at beyond-diffuser stations. Based on comparative analysis of data over the course of monitoring for the 17 study years, there is no indication of a negative temporal trend of the diffuser effluent on the macrobenthos.

Benthic communities continue to be diverse and variable from station to station and from year to year. There is strong evidence of normal cyclic variations at most stations, but no strong evidence of effects from the SIWWTP outfall. For additional details, see *Benthic Faunal Sampling Adjacent to Sand Island Ocean Outfall, O'ahu, Hawai'i, August 2006* (WRRC, February 2007), a copy of which was submitted to EPA and to HDOH. This report concludes the following:

"[T]here is very little evidence of adverse effects from sewage effluent discharged through the Sand Island Ocean Outfall on the macrobenthic community in 2006. Sediments near the outfall have not been enriched by organic material. Significant differences in the abundance and taxa richness of polychaetes, crustaceans, and all nonmollusks among stations were related primarily to differences among transects and reflected the influence of ecological factors associated with water depth. There were no significant differences between near-diffuser and beyond-diffuser

stations in the abundance and taxa richness of mollusks, polychaetes, crustaceans, and all nonmollusks. Changes in the macrobenthos since 1986 do not reflect any long-term temporal trends related to the outfall. A diverse and abundant macrobenthos was present at stations near the diffuser of the Sand Island Ocean Outfall in 2006."

Response: EPA does not disagree with the data collected in these benthic studies. These results, however, must be considered in conjunction with the available data on WET and specific chemicals in the discharge. See also response to comment C46.

Comment C49: Sediment Monitoring: CCH has collected and analyzed offshore sediment samples each year since 1993 under its monitoring program. The Permit specifies monitoring once per year at each of 15 offshore stations, at the same locations described previously for benthic diversity. Annual monitoring is conducted in duplicate at 10 of these stations, and once at the other 5. Approximately 375 sediment samples have been taken over the 15-year period. Each of these sample analyses includes more than 140 target analytes on the EPA priority pollutant list. The database of priority pollutants contains more than 15,000 analytical records.

The following evaluation of sediment data is based on the recent 5-year period between August 29, 2002, and August 26, 2007. To provide a perspective on the potential for risk to benthic infauna, constituents detected in sediment over this period were compared with the following screening-level sediment quality benchmarks, available from the National Oceanic and Atmospheric Administration (NOAA) Screening Quick Reference Tables (SquiRTs) (NOAA, 2006):

• The NOAA Effects-Range-Median (ERM). This benchmark represents the chemical concentration above which adverse effects would be expected to occur (Long et al., 1995).

• The State of Washington Apparent Effects Threshold (AET). The State of Washington considers this benchmark to be predictive of toxicity.

The results of the sediment screening evaluation indicate that, over the last 5 years, none of the detected constituents (metals or organics) exceeds these risk-based screening benchmarks at the ZID edge or beyond. In the most recent sampling in 2007, no detected constituents exceeded screening benchmarks at any station (even within the ZID). Most important, neither dieldrin nor chlordane (which EPA cited in the 2007 TD as exceeding WQS in the SIWWTP effluent) has ever (1993–2007) been found in sediment at levels above the NOAA-sponsored toxicity benchmarks. This is consistent with EPA's conclusion in the 2007 TD:

"[T]hat sediment chemistry data do not show that the proposed discharge is likely to cause adverse effects due to contamination of sediment around the outfall."

Contrary to EPA's assertion, this affirmatively demonstrates that the modified discharge does not interfere with the attainment of a BIP.

Response: EPA has not found specifically that concentrations of toxic pollutants in the sediments surrounding the outfall have adversely affected benthic infauna. EPA finds that the proposed discharge could result in bioaccumulation in fish at levels that would pose a significant threat to persons who consume fish caught near the outfall, based on levels of chlordane and dieldrin observed in the effluent. EPA has also found that the proposed discharge would likely exceed water quality standards for WET and ammonia nitrogen and concluded that this could result in adverse impacts to marine life surrounding the outfall (see also response to comment C46).

Comment C50: Fish Health Metrics: Researchers at the University of Hawaii's WRRC continue to annually monitor the health of fish from around the ocean outfall at SIWWTP, and to evaluate the fish for skin or liver neoplasms (tumors) and pre-neoplastic changes. In the most recent available results from 2007 (WRRC, January 2008), necropsy and liver histopathology were conducted on 30 specimens each of two different fish species, collected live, to assess potential exposure to pollutants in waters near the terminus of the SIWWTP. Gross necropsy and liver histopathology were performed on bluestripe seaperch (*Lutjanus kasmira*) and bigeye scad (*Selar crumenophthalmus*). Findings were compared with parallel tests performed on the same species collected live at reference stations FR1 and FR2 in Maunalua Bay.

The 2007 necropsy and liver histopathology study included 60 total fish collected during July 2007, 10 of each species collected at the SIWWTP outfall and 10 of each species collected from each of station FR1 and station FR2. The incidences of spores, parasites, and hyperplasia were not higher at the outfall station than at the reference stations. Results indicated that neither gross nor microscopic evidence tumors or tumor-like lesions were seen in any internal or external organs of any of the fish collected at either the reference stations or the outfall station. Therefore, no reason exists to hypothesize adverse effects on fish health as a result of the outfall discharge. For additional details, see the report: *Necropsy and Liver Histopathology for Fish Sampled in the Vicinity of the Sand Island Ocean Outfall and at Reference Stations in Maunalua Bay, O'ahu, Hawai'i, July 2007* (WRRC, January 2008).

Response: EPA does not disagree with the findings of the 2007 investigation. These results, however, must be considered in conjunction with the available data on WET and specific chemicals in the discharge. See also response to comment C46.

Comment C51: Fish Tissue Residue Effects: To provide an additional line of evidence with regard to potential influences of SIWWTP effluent on a BIP, fish tissue levels were evaluated to determine whether any constituents have accumulated at levels reported in the scientific literature to be potentially toxic to fish (as opposed to their potential effects on people consuming fish, as evaluated in Section IIC). Databases on fish tissue residue versus effects relationships were obtained from the following readily available federal agency sources:

• EPA MED-Duluth Toxicity/Tissue Residue Database (derived from A.W. Jarvinen and G.T. Ankley, 1999) http://www.epa.gov/med/Prods_Pubs/tox_residue.htm

• Army Environmental Residue Effects Database (ERED)
http://el.erdc.usace.army.mil/ered/Index.cfm

The fish tissue residue versus effects data, summarized in Table IIC-1, were obtained only for those chemicals that were (1) detected in tissue within the last 5 years (2002–2007) and (2) found at higher levels in fish from the outfall than in those from the control stations. The literature search included data from tissue residues in both fish muscle (fillets) and whole body. The literature sources of these studies (as cited in the databases listed previously) are summarized in Table IIC-2.

The results indicated that none of the constituents evaluated are present in fish caught from the outfall area at concentrations exceeding tissue-residue effects benchmarks derived from studies where adverse effects were actually observed. These results support the conclusion that outfall constituents are not accumulating at concentrations that pose risks to marine fish populations.

Response: WET testing and ammonia nitrogen monitoring results are the primary bases for EPA's conclusion that the applicant has failed to demonstrate that a modified discharge would not interfere with the attainment or maintenance of that water quality which assures protection of a balanced, indigenous population of shellfish, fish, and wildlife. EPA's *Technical Support Document for Water Quality-based Toxics Control* states that an integrated approach to water quality-based toxics control consists of whole effluent, chemical-specific, and biological assessments (EPA, 1991). The fish tissue data alone do not demonstrate that the discharge does not interfere with a BIP.

Comment C52: Nutrient-Related Impacts: As discussed in the Nutrients subsection of Section IIB, no reason exists to believe that discharge of nutrients from the SIWWTP outfall is causing any deleterious effects on the marine environment with respect to water quality or marine organisms. Ammonia levels, when measured over the time frame since issuance of the Permit, have not exceeded WQS for stations beyond the ZOM. In addition, there is no indication that ammonia nitrogen is, in any way, resulting in algal blooms or other eutrophic conditions, even in the direct vicinity of the discharge. EPA speculates that the discharge may stimulate algae blooms and that the proposed discharge may have nutrient-related effects beyond the ZID. EPA should reconsider its evaluation of nutrient-related impacts by taking into account the relationship between the phytoplankton (chlorophyll a) measurements and the presence of ammonia. In his review of the same data that EPA reviewed, Dr. Laws (February 1, 2008) notes:

"If the outfall is responsible for producing geometric mean total ammonia N concentrations as high as 4.0 micrograms per liter (Table 2), why are the chlorophyll concentrations not elevated? The answer is that the growth rate of phytoplankton is at most roughly one doubling per day. Currents and mixing in the vicinity of the Sand Island outfall transport the nitrogen away from the outfall and dilute its concentration so rapidly that the phytoplankton have no chance to respond to the nutrients in the effluent."

Response: EPA has concluded the water quality criterion for ammonia nitrogen is not met, because receiving water data from stations at the ZOM and beyond exceeded the State of Hawaii's promulgated water quality standards on an annual basis. A determination that there have not been measurable biological responses does not change the fact that water quality standards have been exceeded.

Comment C53: Water Quality Monitoring Data: As discussed in the Toxics subsection of Section IIB of the comments, comparison of the effluent priority pollutant data with chronic WQS protective of marine aquatic organisms indicates that no levels of priority pollutants exceeding these criteria have been detected over the entire period of 2000–2007. These results provide a strong line of evidence that the effluent is not interfering with the protection and propagation of a BIP of fish, shellfish, and wildlife.

Response: EPA's conclusion regarding the protection and propagation of a balanced, indigenous population of fish, shellfish, and wildlife is based largely on the results of whole effluent toxicity testing. EPA has determined that the discharge likely would have toxic impacts beyond the ZID. See also response to comment C46.

Comment C54: Whole Effluent Toxicity: The Whole Effluent Toxicity subsection of Section IIB of the comments summarizes the evaluation of test results for the SIWWTP effluent. For the reasons noted in that section, CCH believes that continued use of *T. gratilla*, a species not on the list of EPA-approved WET test species and prohibited from consideration for regulatory compliance purposes in the Permit, is inappropriate for the next permit cycle. Specifically, EPA stated expressly in the Permit that *T. gratilla* was not to be used to determine regulatory compliance, instead identifying *C. dubia* as the only appropriate species to be used for that purpose. As discussed in Section IIB, the WET tests performed on *C. dubia* indicate that the effluent does not contain unacceptable levels of toxicity. In fact, WET test results for chronic toxicity for three sensitive EPA-approved species (the water flea [*C. dubia*], the mysid shrimp [*M. bahia*], and the sheepshead minnow [*C. variegatus*]) that are considered representative of the types of organisms residing near the SIWWTP outfall indicate that no toxicity exists at effluent concentrations found at the ZID edge.

Response: *T. gratilla* is an appropriate test species for assessing attainment of the water quality standard for WET. Tests using *T. gratilla* consistently demonstrate levels of toxicity that exceed the standard. See responses to comments C31, C32 and C37.

Comment C55: The purpose of this evaluation is to determine whether any evidence links discharges of SIWWTP effluent with potential adverse ecological effects at the edge of or beyond the ZID. This determination is made based on both quantitative and qualitative evaluations. To provide confidence in any decision making for marine resources near the outfall, potential effects to aquatic and/or benthic communities are assessed using an approach that

considers multiple lines of evidence collectively, in accordance with EPA guidance in *Guidelines for Ecological Risk Assessment* (EPA, April 1998).

Based on the available biological monitoring data, all lines of evidence lead to a conclusion that no measurable impact to a BIP of fish, shellfish, and wildlife at and beyond the edge of the ZID exists.
The weight of evidence includes the following:

1. No changes have been observed in benthic infaunal abundance and diversity that are attributable to the outfall

2. Sediment monitoring indicates that detected concentrations of constituents found in the effluent are below risk-based screening levels

3. Fish health metrics results show no indication that there are gross or histopathological changes that relate to the outfall discharge

4. Effluent constituents are not accumulating in fish tissue at concentrations that pose risks to fish resources (or to human fish consumption pathways)

5. Ammonia concentrations are not causing excessive phytoplankton growth or eutrophic conditions and are below any concentrations that could be considered to be toxic

6. Effluent monitoring indicates that, over the entire evaluation period of 2000–2007, no detected levels of priority pollutants have exceeded WQS for protection of marine aquatic life

7. WET test results using sensitive EPA-approved species that are required by the Permit and/or are considered representative of the types of organisms residing near the outfall indicate that no toxicity at effluent concentrations is found at the ZID edge

When considering the collective weight of evidence using these seven lines of evaluation for potential risk to fish and invertebrates, more than ample evidence exists to conclude that the effluent is not resulting in ecologically significant impacts to these communities in the vicinity of the SIWWTP outfall. Further, a review of historical information indicates that the conditions observed at the edge of the ZID today are consistent with the data considered by EPA in its 1998 decision to approve the Section 301(h) waiver.

In reaching its predetermined conclusion, the 2007 TD ignores the many independent lines of evidence set forth previously and EPA's TSD (EPA Office of Water, March 1991), which states:

"The results of one assessment technique should not be used to contradict or overrule the results of the other(s)."

Based on the foregoing discussion, EPA's denial of CCH's waiver application on the basis of alleged interference with sustaining a BIP of fish, shellfish, and wildlife at the edge of the ZID is

not supported by the data that EPA required to be gathered; is arbitrary and capricious; and should be reconsidered.

Response: The commenter's basic argument here appears to be that because current data do not show that actual adverse effects on aquatic organisms have already occurred, and because, in the commenter's opinion, whole effluent toxicity should be evaluated differently, that CCH has demonstrated that its discharge would not interfere with the attainment or maintenance of that water quality which assures protection of a balanced indigenous population of fish, shellfish, and wildlife. EPA has addressed the comments regarding whole effluent toxicity in responses to comments C31 through C38. Those test results cannot be ignored, nor can the data related to ammonia nitrogen.

The weight of evidence approach proposed in this comment is not appropriate for evaluating whether CCH has met the 301(h) criterion related to maintaining water quality which assures protection of a BIP. Rather, as discussed in the tentative decision, EPA has issued guidance that addresses the integration of various types of available data. Specifically, EPA's *Technical Support Document for Water Quality-based Toxics Control* states the following with respect to the integration of chemical specific, whole effluent toxicity, and bioassessment data:

> It is EPA's position that the concept of "independent application" be applied to water quality-based situations. Since each method has unique as well as overlapping attributes, sensitivities, and program applications, no single approach for detecting impact should be considered uniformly superior to any other approach. For example, the inability to detect receiving water impacts using a biosurvey alone is insufficient evidence to waive or relax a permit limit established using either of the other methods.

In the case of Sand Island, this approach leads to a conclusion that the proposed discharge could adversely affect aquatic life. EPA remains concerned that the proposed discharge could adversely affect aquatic life, notwithstanding the current biological data, given the available information on WET and ammonia nitrogen.

See also response to comment C46.

Recreational Activities

Comment C56: In the 2007 TD, EPA notes the following: *"EPA concludes that fishing (fish consumption) may be adversely affected by the proposed SIWWTP discharge…. Given the possible impacts to fishing, EPA finds that the applicant has not demonstrated that its proposed discharge will not interfere with the attainment or maintenance of water quality which allows for recreational activities in and on the water at and beyond the ZID."*

EPA further states that the SIWWTP discharge: *"Could cause bioaccumulation at [a] level that would pose a significant threat to persons who consumed fish near the outfall."*

CCH disagrees with these conclusions and believes that the long-term monitoring program of fish tissue, fish catchment data, and the results of bacteria sampling at surface stations (summarized in the following subsections) support the conclusion that recreational activities remain protected by discharge of primary treated wastewater at a depth of 235 feet approximately 1.7 miles offshore. The weight of evidence is clear that recreational activities have been and remain protected. EPA has chosen to ignore this large body of monitoring data to reach a conclusion that is not supported by the evidence.

Response: EPA continues to conclude that the applicant has not demonstrated that its discharge will not interfere with the attainment or maintenance of water quality which allows for recreational activities in and on the water at and beyond the ZID due to the possible impacts to recreational fishing. This conclusion is based primarily on the expected failure of the proposed discharge to attain water quality criteria for chlordane and dieldrin, which HDOH has adopted at levels set to protect persons from adverse effects of consuming fish. See also response to comment C57.

Comment C57: Fish Consumption and Fish Tissue Data: The Permit requires annual monitoring of tissue concentrations from fish harvested near the outfall, and at two control (or reference) stations. Because natural (such as minerals) or anthropogenic (such as urban runoff) background sources unrelated to the outfall contribute to detected constituents in fish tissue, the Permit assumes that the degree of bioaccumulation attributable to the effluent can be evaluated by comparing the tissue results from fish caught in the outfall area with those from fish caught in the reference area.

CCH has collected and analyzed offshore fish tissue samples since at least 1990. The annual monitoring includes analysis of tissue residues (both muscle and liver) in two species of common, somewhat sedentary fish of edible size: Akule (bigeye scad; *S. crumenophthalamus*) and Ta'ape (bluestripe seaperch; *L. kasmira*). These species of fish were selected with EPA approval to be representative of those caught by commercial and sport fishermen. To ensure representativeness, each fish sample consists of a composite of 10 individual fish.

More than 120 composite fish and liver tissue samples have been collected, representing more than 600 individual fish. Each of the sample analyses includes more than 130 target analytes on the EPA priority pollutant list. The database of priority pollutants over the period of August 20, 1993, to February 9, 2007, contains more than 15,000 analytical records for muscle and liver tissue. This large database shows that no long-term potential exists for unacceptable bioaccumulation in fish from near the outfall.

Fish tissue analytical results generated over the 5-year period from March 15, 2002, through February 9, 2007, were evaluated to provide the best representation of current conditions. To provide a perspective on the potential for fish consumption risk, constituents detected in the edible fish muscle were compared with the risk-based screening concentrations (RBCs) obtained from EPA Region 3 in its *Updated Risk Based Concentration Table* (EPA Region III, October

2007). These RBCs equate to an excess cancer risk of one in one million for constituents suspected of being carcinogenic. They conservatively assume consumption of an average of 54 grams of fish per day, every day for 30 years. It should be noted that the consumption rate of 54 grams per day is approximately three times the current "national average" of 17.5 grams per day used for derivation of ambient water quality criteria for the protection of human health (EPA Office of Water, October 2000), providing added conservatism to this screening evaluation.

The results of the fish tissue screening evaluation indicated that, of those constituents detected in the last 5 years, only a single detection of heptachlor epoxide in 2003 was found in fish from the outfall station at a level above both the screening-level RBC and corresponding results from the reference stations. However, the low concentration detected (0.0012 milligrams per kilogram [mg/kg] wet weight basis) was only slightly above the level of detection (0.0010 mg/kg) noted in the reference area fish. In addition, this chemical was not detected in the other fish samples collected concurrently from the outfall area. Therefore, the single detection of heptachlor epoxide is not interpreted to be a meaningful contributor to risk.

These results indicate that, over the entire 5-year evaluation period, none of the detected constituents (metals or organics) has been present at levels that exceed risk-based screening benchmarks that can be attributable to the effluent.

An important finding from this screening evaluation is that neither dieldrin nor chlordane, cited by EPA in the 2007 TD as exceeding fish consumption WQS in the SIWWTP effluent, has ***ever*** (1993–2007) been found in edible fish tissue at levels above EPA-sponsored RBCs that would indicate a probability of fish consumption risk. Over the last 5 years, dieldrin has not been detected at all in fish tissues, and chlordane has been detected only once at the outfall, in 2005 at a level of 0.00082 mg/kg (as alpha-chlordane). However, chlordane was detected at even higher levels (although still below the RBC of 0.009 mg/kg) at a control station in 2006, at a level of 0.0066 mg/kg, indicating a potential noneffluent source. These results clearly support the conclusion that neither dieldrin nor chlordane from the outfall poses unacceptable fish consumption risk.

Moreover, these actual fish tissue results suggest that the conservative assumptions inherent in the derivation of the fish consumption WQS for chlordane and dieldrin (e.g., use of laboratory-derived bioaccumulation factors that assume long-term equilibrium conditions) are not occurring in the real world near the SIWWTP outfall. Also, as previously discussed, the WQS use outdated input data that EPA has since updated using scientific improvements in toxicity and exposure estimation.

Response: Hawaii has established numeric criteria for toxic pollutants in water to ensure the fish caught by anglers in Hawaii's waters will be safe to eat. EPA's conclusion that the proposed discharge would not protect recreational fishing (fish consumption) is based on the expected failure of the proposed discharge to meet water quality standards specifically adopted by the state of Hawaii for two pesticides, dieldrin and chlordane, to protect against carcinogenic effects. Based on the exceedances of Hawaii's water quality standards, EPA continues to conclude that pollutants discharged from the Sand Island outfall could contribute to bioaccumulation in fish in

the vicinity of the Sand Island outfall that could be harmful to persons eating the fish. As a result of these exceedances, we find that the applicant has not demonstrated that the discharge is protective of recreational activities, specifically fishing. Although available fish tissue data do not, in and of themselves, point to current adverse impacts from the discharge, the absence of detections of these pesticides in fish tissue sampling does not change the fact that water quality standards have been exceeded. Water quality standards are set at protective levels that prevent unacceptable levels of bioaccumulation. The degree of protection built into the water quality standards is designed to ensure that adverse effects will not exist in the receiving water. The objective of the Clean Water Act is to restore *and maintain* the chemical, physical, and biological integrity of the Nation's waters. CWA section 101(a). Under section 301(h), the applicant's burden is to show that its discharge will not interfere, alone or in combination with pollutants from other sources, with the attainment *or maintenance* of that water quality which allows recreational activities.

Comment C58: Fish Consumption and Effluent Quality Data: Effluent quality data were reviewed previously. Concentrations of chlordane and dieldrin reported in the effluent, which EPA noted as exceeding fish consumption WQS, have been reinterpreted in light of more reliable EPA-derived risk-based criteria (2006 AWQC) based on improved science and new testing information obtained using more suitable, sensitive, and definitive analytical methods than those used in the past. These new results indicate that the previously reported dieldrin exceedances are false positives, resulting in EPA's misconstrued conclusion of noncompliance. During this new testing, dieldrin was not detectable in the effluent using the GC/MS analytical technique, although it continued to be misidentified as present in split samples when using the method that EPA approved for the Section 301(h) monitoring. For chlordane, annual average levels in effluent since 2000 have not exceeded the most current (2006) AWQC published by EPA and have been within protective levels for a fish consumption pathway.

Response: In this 301(h) analysis, protection of recreational uses must be analyzed in terms of the particular water quality standards adopted by the state of Hawaii to protect persons consuming fish caught in Hawaii waters. Please also see response to comment C57. EPA disagrees with the commenter's assertions regarding analytical methods, including the description of measured dieldrin levels as "false positives." Please see response to comment C29 for a comprehensive discussion of alternative analytical methods.

Comment C59: Fish Consumption and Sediment Quality Data: Sediment quality data were reviewed previously. On the basis of evaluation of the offshore sediment samples that CCH collects for priority pollutant analysis on an annual basis, it is important to note that dieldrin and chlordane, cited by EPA in the 2007 TD as exceeding fish consumption WQS in SIWWTP effluent, have not been detected in the sediments around the outfall at levels that would pose a bioaccumulation risk in recreationally caught fish. Dieldrin and chlordane have not been detected in sediment since the Permit was issued, indicating that neither of these pesticides has been accumulating in sediment. These results indicate that these pesticides are not a source for bioaccumulation, as verified from the fish tissue results previously described.

Response: Please see responses to comments C57 and C58. Hawaii's water quality standards for dieldrin and chlordane apply to water samples, not sediment samples.

Comment C60: In accordance with the Permit, fish catch statistics from the State of Hawaii Department of Land and Natural Resources, Division of Aquatic Resources are reviewed annually to detect changes in fish abundance and distribution in the vicinity of the outfall. These records are available for the years 1970 through 2006, a 37-year period. Although normal year-to-year changes are expected, the presence of long-term trends might be indicative of potential influences from wastewater discharge. Representative fish species of various trophic levels and habitat (pelagic, benthic, coastal/pelagic, and reef communities) are evaluated. The SIWWTP outfall is located within inshore catchment Area 400. The Barbers Point ocean outfall is located within inshore catchment Area 401. Adjacent inshore catchment Area 402 is a control site used to compare fish takes of species naturally plentiful in Oahu waters. Fish abundance is determined by totaling commercial fishing questionnaire data (in total pounds) in each fish category for each catchment area.

Regarding fish catchment statistics, in the 2007 TD, EPA states its finding as:

"From this limited amount of data, EPA concludes that the information from fish catchment areas and the remotely controlled video camera do not indicate that the proposed discharge would adversely affect fish health or community structure."

Response: This comment accurately summarizes EPA's conclusion regarding these data.

Comment C61: Bacterial standards (currently implemented based on *Enterococcus* concentrations) are risk-based standards and assume direct-use contact with affected waters by activities such as swimming, snorkeling, and diving. The outfall is approximately 2 miles offshore (which precludes swimming and snorkeling) and discharges at a depth of 235 feet (which precludes recreational diving). The effluent plume undergoes rapid initial dilution and then the prevailing currents further dilute it and carry it away from the nearest recreational areas, which are primarily the beaches and shallow water less than 100 feet deep and less than 1,500 feet offshore. This makes it implausible that the public will be exposed to the plume, and less likely still that bacterial concentrations would be problematic if exposure occurred.

Available bacterial data were reviewed previously. EPA agrees that these data show that water-contact recreational users are not affected by discharge from the SIWWTP outfall. Moreover, the offshore stations near the outfall are at a distance and depth that put them well beyond all direct-contact recreational use. CCH therefore concludes the following:

• There is essentially no reason for concern for bacterial concentrations interfering with water contact recreation

• In the unlikely event that a combination of oceanographic and atmospheric conditions might exist that could potentially drive the plume onshore, these conditions could be monitored in real time and the UV disinfection system used as long as those conditions persist

The Permit contemplates and the bacterial data confirm that limited operation of the UV system may be appropriate. After one full year of continuous UV system operation (which was completed in December 2007), CCH may request EPA approval to operate the UV system at times when predetermined ocean conditions would drive a surfacing effluent plume toward shore. CCH believes that this option is the correct course of action and that it should be incorporated in the new NPDES permit. CCH has requested to meet with EPA to discuss the appropriate operation of the UV system.

Response: Hawaii's marine waters are designated for recreation. Therefore, bacteria criteria to protect this use must be met at all times in all locations beyond the boundary of the zone of initial dilution. On page 46 of the tentative decision, EPA concluded that bacterial concentrations associated with the discharge of wastewater from the Sand Island outfall do not meet current water quality standards without disinfection at all locations beyond the boundary of the zone of initial dilution. To meet EPA's promulgated criteria for bacteria in coastal waters, EPA concluded CCH must adequately operate and maintain the UV disinfection system at all times. In their comments, CCH did not submit any information that would lead EPA change its conclusion that continuous disinfection is needed to meet bacteria criteria at the edge of the zone of initial dilution.

EPA expects that CCH will continue to operate the UV disinfection system at all times.

Comment C62: The purpose of this evaluation is to determine whether any evidence links discharges of SIWWTP effluent with potential impacts to the attainment or maintenance of recreational activities at and beyond the ZID. This determination is made based on both quantitative and qualitative evaluations. To provide confidence in any decision making with regard to recreational activities, multiple lines of evidence are considered collectively. Based on the available monitoring data, as summarized previously, these lines of evidence include the following:

1. None of the detected constituents (metals or organics) in fish tissue over the entire period of monitoring has been found at concentrations that exceed risk-based screening benchmarks or that can be attributed to the SIWWTP effluent. Neither of the pesticides (dieldrin and chlordane) cited by EPA in the 2007 TD as exceeding fish consumption WQS in the SIWWTP effluent has ever (1993–2007) been found in edible fish tissue at levels above EPA-sponsored RBCs that would indicate a probability of fish consumption risk.

2. Effluent monitoring indicates that historical exceedances of WQS for dieldrin are likely false positives resulting from analytical procedures that are not sufficiently sensitive or selective to make logical regulatory compliance decisions, leading to a misinterpretation on the part of EPA

of noncompliance with WQS. Further, for chlordane, annual average levels in effluent since 2000 have never exceeded the most current and protective AWQC endorsed by EPA.

3. Dieldrin and chlordane have not been detected in sediment since the Permit was issued, indicating that these pesticides have not been accumulating in the sediment and are not a source of bioaccumulation.

4. EPA has noted that information from fish catchment areas does not indicate that the SIWWTP discharge adversely affects fish health or community structure, indicating that this area continues to provide a good fishing ground for all communities.

5. Bacterial data indicate that water contact recreation is not adversely affected by the SIWWTP discharge.

When considering the collective weight of evidence (using these five lines of evidence) for potential risk to recreational activities, no evidence exists that the SIWWTP outfall is interfering with recreational activities at or beyond the ZID.

In addition to disregarding the universe of evidence that the outfall has no adverse effects, EPA also ignores its explicit language in the Permit that requires fish tissue analyses in order to determine the threat to public health. The following is an excerpt from the Permit:

"The two fish species shall be somewhat sedentary (e.g., bridled triggerfish, taape, opelu, akule) and ***representative of fish caught by recreational and commercial fishermen near the Sand Island ocean outfall****."* (Emphasis added.)

Implicit in this language is the expectation that the annual fish tissue surveys would serve as a real-world measure of whether fish caught near the outfall could pose unacceptable risk or "threat" to fish consumers. However, in the 2007 TD, EPA ignores this powerful line of evidence, that it required be gathered, and instead relies on perceived exceedances of WQS for two pesticides in the SIWWTP effluent, one of which (dieldrin) almost certainly is not there and the other of which (chlordane) has never exceeded the 2006 AWQC. As a result, EPA inexplicably concludes that bioaccumulation of pesticides in fish may be still possible as a result of the SIWWTP discharge and that, therefore, the discharge may not protect recreational fishing. In so doing, EPA grasps for a technically indefensible conclusion in the face of all the evidence collected under CCH's EPA-approved Section 301(h) monitoring program.

The evidence compels the opposite conclusion. Monitoring of fish tissue establishes that, with respect to the organic chemicals of concern to EPA (chlordane and dieldrin), neither is detectable in fish tissue at levels that pose unacceptable risk. These data lead to the conclusion that the discharge does not result in harmful bioaccumulation. Moreover, the reported levels of dieldrin in effluent are false positives, not exceedances of WQS, and chlordane levels do not exceed levels determined by EPA to pose fish consumption risk. Therefore, no demonstrable impact on recreational fishing exists. EPA's speculative conclusion to the contrary does not justify its

arbitrary and unsupported tentative denial of CCH's waiver application. EPA should reconsider the 2007 TD.

Response: This comment reiterates several points that have been made elsewhere in these comments. Commenter's point number 1 here was made previously as comment C57. Point number 2 here was made previously as part of comment C29. Point number 3 here was made in comment C59. Point number 4 here was made in comment C50. Please see the responses to these specific comments.

EPA agrees that as long as the UV disinfection system is operating properly, that water contact recreation is not adversely impacted by the SIWWTP as the commenter noted in point 5 here.

EPA's conclusion that the proposed discharge would not protect recreational fishing is based on the expected failure of the proposed discharge to meet water quality standards specifically adopted by the state of Hawaii for two pesticides, dieldrin and chlordane, to protect against carcinogenic effects and ensure that the fish caught by anglers in Hawaii's waters will be safe to eat. The absence of detections of these pesticides in fish tissue sampling does not change the fact that water quality standards have been exceeded. Water quality standards are set at protective levels that prevent unacceptable levels of bioaccumulation. The degree of protection built into the water quality standards is designed to ensure that adverse results will not exist in the receiving water. Please also see response to comment C57, and also response to comment C55 regarding the commenter's proposed weight of evidence approach.

Monitoring Program

Comment C63: While EPA did not deny CCH's reapplication for a modified NPDES permit on the basis of its monitoring program, EPA states in the 2007 TD:

> *"EPA's review has determined that the current monitoring program is not sufficient. For example, the current monitoring program does not assess ZID stations."*

EPA's conclusion in the 2007 TD with regard to monitoring at the ZID contradicts its conclusions in 1998 and the specific monitoring program EPA prescribed. In its Response to Comments on the Permit (EPA Region IX and Hawaii State Department of Health, September 30, 1998), EPA elucidated its decision on the form of the monitoring program. CCH commented that:

> *"The City noted that the proposed core monitoring program in the draft permit lacks stations at the boundary of the zone of initial dilution (ZID) and zone of mixing (ZOM). The City has requested statements in the permit to identify the monitoring stations that will be used for determining compliance to ZID and ZOM limitations."*

In response, EPA stated that:

> *"In the final permit, the EPA designed a monitoring program, with input from the Permittee, to better elucidate the impacts of the effluent discharge on water quality standards and recreational use. The core monitoring program in the final permit focuses on a grid design that has broader spatial coverage instead of design centered tightly around the outfall (outlined in the existing permit); this grid design allows for better assessment of the gradients of conditions around the outfall and less reliance on comparisons between outfall stations and only one or two control stations. This is critical for an area like Mamala Bay, where the marine environment is impacted from a multitude of sources. When an environment is influenced by a number of different sources, finding suitable control stations can [be] difficult. The final permit redistributed the Permittee's sampling effort from the existing permit and stations around the ZID in the existing permit are relocated to better capture a wider spatial coverage. The final permit's core monitoring program retains monitoring stations around the four corners of the ZOM boundary; these same four stations shall also serve as the nominal ZID stations (Part E.1.c). The EPA finds that four stations around the ZOM boundary are sufficient to determining water quality standards compliance. To maintain monitoring of water quality standards at the ZID boundary, the four ZOM stations shall serve as the nominal ZID stations. Exceedances of standards at the ZOM boundary will automatically be considered an exceedance at the ZID boundary."*

Thus, it is disingenuous for EPA now to complain that the current monitoring does not assess ZID stations. Moreover, a review of the volume of data collected should not lead to the conclusion that the monitoring program is inadequate. In fact, extensive data have been collected from a variety of sources, including the Mamala Bay Study, indicating that the SIWWTP discharge has no adverse effects on the marine environment or the human use thereof.

CCH recognized in its application for a Section 301(h) waiver that the monitoring program might need to be adjusted over time. For example, CCH understood that modifications might prove necessary in response to resolution of toxicity testing requirements and the outcome of the Mamala Bay Study. CCH's cooperative and flexible relationship with EPA with regard to its monitoring programs can be seen from the Permit itself (at Part E, page 29 of 30) that requires CCH to engage in Regional Monitoring Activities, which incorporate a random monitoring site selection process. This program also evaluates the effects of the SIWWTP discharge, defined in the Permit as follows:

> *"The Permittee shall participate in a regional monitoring effort in Mamala Bay to evaluate the effects of wastewater discharged from the Sand Island WWTP and the Honouliuli WWTP, and their effects relative to other sources of contaminants flowing into Mamala Bay. The primary objective of the regional monitoring program is to assess the spatial extent and magnitude of ecological disturbances within the Mamala Bay, and to describe the relative conditions among different regions within the Bay. Monitoring stations shall be selected randomly to ensure they are representative of conditions in the study area.*

> *"The concept of the regional monitoring program for the Permittee is to use a comparable level of effort, as required under the core monitoring program, to sample more broadly in Mamala Bay. Some activities required under the core monitoring program will be replaced with activities of comparable value under the regional monitoring program. The regional monitoring plan will be designed to investigate Mamala Bay between Diamond Head on the east and Barber's Point on the west. The Permittee shall design a detailed plan for regional monitoring in Mamala Bay in conjunction with the EPA and as much as possible other participating agencies, various levels of government and private entities. The Permittee, the EPA and other participating monitoring agencies and entities shall constitute the coordinating committee for the Mamala Bay Regional Monitoring Program. In the event that such a committee is non-functional, the Permittee shall work cooperatively on the regional monitoring plan with the EPA. The Permittee with the EPA shall determine its portion of the regional plan. The final monitoring plan must be approved by the EPA prior to its implementation. The exact shoreline, recreational water, nearshore and offshore station locations required under regional monitoring and to be completed under the Sand Island WWTP permit, will be designated by either a coordinating committee or, if no committee is functional, the EPA in coordination with the Permittee. The regional monitoring plan will also be included and supported in a similar manner in the Honouliuli WWTP's NPDES permit."*

CCH worked cooperatively with EPA to define these requirements and fulfilled the Regional Monitoring Activities in years 3 and 5 of the Permit, understanding that this effort was part of a western regional effort. CCH suggested to EPA and EPA concurred in 2001 that EPA could evaluate these Regional Monitoring Activities for inclusion in a future SIWWTP Section 301(h) monitoring program (as well as the Honouliuli permit) if the Regional Monitoring approach proved to be a better monitoring activity. EPA has never responded to the efficacy of the Regional Monitoring approach, despite its apparent intent to implement this approach as stated in its letter to CCH in 2001 (EPA Region 9 [Alexis Strauss], June 14, 2001):

> *"However, because the RMP is designed to supplement and eventually replace the usual core monitoring covered by both the Sand Island and Honouliuli permits at certain times during a permit term, EPA would allow the substitution of the RMP for the summer 2001 sampling."*

In the 2007 TD, EPA concludes:

> *"If EPA's final decision is to grant the variance and issue a renewed modified permit, then EPA will work with the applicant to develop an appropriate monitoring program, and will include revised requirements in the draft permit issued for public review."*

CCH appreciates EPA's stated intent to work with it to develop a modified monitoring program, and CCH is willing to consider additional monitoring and studies. As evidenced by its substantial undertaking with the Mamala Bay Study, CCH has consistently demonstrated its

commitment to working with EPA to conduct the necessary monitoring to ensure the protection of the marine environment, and will continue to do so.

Response: The commenter is correct that although EPA has now concluded that changes to the monitoring program would be necessary if the 301(h) variance were renewed, EPA's concerns with the monitoring program are not a basis for denial of the 301(h) application. As a fundamental matter, Clean Water Act regulations implementing 301(h) variances require that all water quality standards must be achieved at and beyond the zone of initial dilution (ZID). (40CFR125.62(a)(i)). While EPA's intent in the 1998 permit was to redistribute these monitoring stations to capture a wider spatial coverage, we now are of the opinion that in a 301(h)-modified permit, there should be monitoring performed at the ZID boundary to facilitate analysis of compliance with water quality standards if a renewed variance is requested. That said, CCH has not been adversely affected in EPA's analysis by submission of monitoring data from the ZOM stations. Please see response to comment C4.1.

Also, conditions related to the discharge have changed since the last permit was issued. For example, water quality criteria for bacteria now apply at the edge of the ZID, whereas they were not applied in offshore waters in the existing permit. CCH is now disinfecting the discharge from the Sand Island WWTP using a UV system, and monitoring for pathogen indicators at the ZID boundary may be important to assess the effectiveness of the disinfection system.

EPA also has increased concerns with the toxicity of the Sand Island effluent. We are concerned about the high level of toxicity observed in the effluent, and with the failure of CCH to identify the pollutant or pollutants responsible for the toxicity. It is EPA's opinion that changes to the monitoring program to require timely identification of the pollutant(s) responsible for the toxicity are needed.

As EPA is denying the 301(h) variance, however, EPA will not be the permitting authority for the next NPDES permit for the Sand Island WWTP. HDOH is now the permitting authority and is responsible for issuing an NPDES permit that incorporates secondary treatment requirements and an appropriate monitoring program. EPA encourages CCH to work cooperatively with HDOH on the development of the monitoring program. EPA also intends to work with HDOH and CCH in this process.

Comment C64: Further, CCH has hosted several training sessions on Data Quality Objective (DQO) and Statistical Sampling. CCH, EPA, HDOH, and several private-sector organizations attended the training. CCH understands that the DQO process is supported by EPA (e.g., EPA's *Data Quality Objectives and Statistical Design Support for Development of a Monitoring Protocol for Recreational Waters* [August 24, 1999]) as a new approach for regional water monitoring. In addition, CCH and HDOH are investigating a new sampling approach (multi-increment sampling, also known as Gy Sampling Theory). Unlike the random sampling approach incorporated in the Regional Monitoring Activity of the Permit, the multi-increment sampling appears to better represent the water quality of a region. The approach obtains several subsamples in a designated region and analyzes the "composite" sample for the parameter(s) of

interest. This approach removes the "hot spots" issue, addresses outliers, reduces the variability of the data, and can easily incorporate statistical evaluations, without the random aspect of the Regional Monitoring approach. Multi-increment sampling appears to be a significant improvement over the current grab sample approach.

Response: This comment does not request any changes in EPA's decision. EPA will consider CCH's views on monitoring approaches when we engage in future monitoring efforts.

Impact of Modified Discharge on Other Point and Nonpoint Sources

Comment C65: EPA states the following in the 2007 TD: *"It does not appear that the applicant's proposed discharge would result in any additional treatment requirements on any other point or nonpoint source. [Section 301(h)(4); 40 CFR 125.64]"*

CCH agrees with EPA that the discharge has not resulted in any additional pollution control on any other point or nonpoint source.

Response: EPA agrees with this comment.

Toxics Control and Pretreatment

Comment C66: EPA agrees that CCH is in compliance with Criterion 6 (Toxics Control).

Response: EPA concluded that the applicant met the requirements of CWA section 301(h)(5), (6) and (7).

Comment C67: EPA concludes that Criterion 6 (Urban Area Pretreatment Program) is satisfied.

Response: EPA concluded that the applicant met the requirements of CWA section 301(h)(5), (6) and (7).

Comment C68: EPA concludes in the 2007 TD that CCH is in compliance with pretreatment requirements as required by Section 301(h)(5), (6), (7); 40 CFR 125.65, 125.66, 125.67.

Response: EPA concluded that the applicant met the requirements of CWA section 301(h)(5), (6) and (7).

Comment C69: EPA concludes in the 2007 TD that:

"The applicant proposes no new or substantially increased discharges from the point source of the pollutants to which the 301(h) variance will apply above those specified in the current permit. [Section 301(h)(8); 40 CFR 125.67]"

EPA agrees that CCH is in compliance with this criterion.

Response: This statement is correct.

Miscellaneous comments

Comment C70: CCH will obtain appropriate concurrence with other applicable laws at the time of the final decision.

Response: Comment noted. As the final decision is to deny the renewed variance, these concurrences or determinations are not necessary at this time.

Comment C71: CCH will obtain appropriate concurrence from the State at the time of the final decision.

Response: Comment noted. As the final decision is to deny the renewed variance, State concurrence is not necessary at this time.

Comment C72: Congress enacted 301(h) in order to avoid the unnecessary cost of constructing secondary treatment facilities by municipalities that can discharge to an active ocean environment. In a 1981 decision in the case of the *Natural Resources Defense Council v. U.S. EPA*, the District of Columbia Court of Appeals stated: "The purpose of section [301(h)] is to permit some coastal municipal sewage treatment plants to avoid costs associated with secondary treatment as long as environmental standards can be maintained. If a treatment plant can discharge a pollutant and meet the criteria of section [301(h)] unnecessary expenditures may be avoided." To proceed with a denial of the 301(h) application would be in direct contradiction to the stated intent and purpose of Section 301(h) to avoid unnecessary costs where other projects with greater environmental benefit can be achieved.

Response: Financial considerations are not included in the statutory criteria listed in section 301(h) of the CWA, and EPA cannot make secondary treatment variance decisions based on cost considerations. In the case of the Sand Island facility, water quality standards are not being maintained, and the statutory criteria in section 301(h) of the CWA are not being met. The statute is clear that unless the specified criteria -- which do not include cost considerations -- are met, a variance from secondary treatment may not be granted by EPA.

Neither the court decision cited by the commenter nor the legislative history of section 301(h) suggests in any way that a 301(h) variance can be granted because of cost considerations, when

the applicant fails to satisfy the specific statutory criteria. The preamble to EPA's implementing regulations discusses the history of section 301(h): "…[A] number of municipalities … argued to both Congress and EPA that secondary treatment of municipal ocean discharges is not necessary to protect the marine environment or to assure the attainment and maintenance of water quality in ocean waters. … [T]hese municipalities have maintained that they should be exempted from the Act's secondary treatment requirement, and the associated capital, maintenance, and operating costs. These municipalities also claimed that they had accumulated sufficient evidence to demonstrate the scientific basis for exemptions from the secondary treatment requirements. As a result of their testimony, Congress … added section 301(h), which allows a municipal marine discharger to present its case to EPA." See EPA 1979 Final Rule, 44 Federal Register page 34784 (June 15, 1979). Thus, while EPA agrees that Congress favored elimination of unnecessary expenditures in general, this was not the overriding concern as to a specific facility; rather, the key to obtaining a variance was presenting sufficient evidence to demonstrate the scientific basis for an exemption for the specific facility. See also statement by Sen. Muskie, p. 447 of Conference Report No. 95-830 accompanying H.R. 3199 (Dec.6, 1977).

Similarly, the Court of Appeals decision cited by the commenter clearly notes that the statutory criteria in section 301(h) must be met in order for a variance to be granted (see quotation above in comment). Additionally, elsewhere in the same case, the Court of Appeals describes the purpose of section 301(h) as follows: "The purpose of section [301(h)] is to allow treatment plants that can discharge into marine waters and meet certain environmental standards to demonstrate those facts to the Agency and receive a permit [citations omitted]. Although fiscal concerns are not paramount under section 301(h), Congress has determined to allow some savings in sewage treatment through harmless marine discharges. The overriding purpose of the Act is still the prevention of water pollution." *NRDC v. EPA*, 656 F. 2d 768 at 780.

Thus, while we do not disagree with the commenter that a motivation for enacting section 301(h) was to avoid unnecessary costs, this does not mean that a particular facility must be granted a variance because conversion to full secondary treatment would be expensive, nor that costs can even be considered in EPA's decisions on whether or not to grant specific variances. Rather, the Act is clear that a variance cannot be granted unless all the statutory criteria – which do not include consideration of cost – are met.

Comment C73: The CWA involves a balancing of economic and environmental impacts, as evidenced by EPA's 1997 guidance document "Combined Sewer Overflows – Guidance for Financial Capability Assessment and Schedule Development." In analyzing CCH's situation, local conditions are the primary factors in determining economic capability; financial capability must be assessed holistically; and permittees' fiduciary responsibilities dictate that environmental investments must yield the highest available returns per dollar of expenditure. Investment in secondary treatment is economically insupportable given other demands on Honolulu's limited financial resources.

Response: The EPA guidance document cited by the commenter does not address 301(h). Rather, it addresses Combined Sewer Systems (CSS), which are present in the United States

primarily in the Northeast and Great Lakes region. (There are two cities with CSS in EPA Region 9, San Francisco, and Sacramento.) Unlike the Separate Sewer Systems used in Honolulu and most U.S. cities, in CSS both storm water and sewage travel together in single pipes to wastewater treatment plants. When heavy storm flows exceed the capacity of either the collection system or treatment plant, CSS are designed to overflow to surface water. These events are known as Combined Sewer Overflows (CSOs). In order to minimize the impacts of CSOs, in 1994, EPA developed a national CSO Control Policy. This Policy includes provisions which allow for the phasing in of CSO controls in consideration of the financial condition of municipalities operating the CSS. To assist with implementation of this Policy, EPA developed the 1997 guidance cited by CCH. The cited guidance is beneficial for establishing schedules for how cities control CSOs.

The cited EPA guidance does not consider whether or not it is appropriate to grant a variance from secondary treatment under section 301(h) and is not relevant to the variance decisions for the Sand Island treatment plant. However, EPA does believe that the financial model in the EPA guidance could be a relevant tool in determining the schedule under which CCH makes wastewater infrastructure improvements to both its collection system and its treatment plants. Similarly, the factors such as local conditions could be relevant to schedule development, but not regarding the threshold question of whether a variance under 301(h) should be granted.

Comment C74: CCH's already-approved rate increase programs will have acute impacts on Oahu residents, and further rate or tax increases to support financing of secondary treatment are untenable. Oahu residents face some of the highest costs for shelter in the world; comparably high costs for other cost-of-living categories such as groceries, utilities, and transportation; unprecedented rate increases for water and wastewater; and high local and state tax burdens. Hawaii had the highest increase among all states in poverty rates from 1990 to 2000, although the poverty rate has been relatively stable since. In order for Hawaii to compete in the global market, environmental investments must yield tangible enhancements to Hawaii's competitiveness. Limited public resources must be directed towards investments yielding the highest returns and promoting the economic well-being of all Hawaii residents. Priority should be given to investment in sewer collection system improvements and transportation infrastructure, rather than to no-return secondary treatment at Honolulu's major wastewater treatment plants, which significantly increases energy costs and carbon emissions, produces excess solid wastes that have to be disposed of on land or by incineration, and provides no documented benefit to the marine environment or its users.

Response: See responses to comments C72 and C77. The factors discussed in this comment do not go to the statutory criteria for granting a 301(h) variance. However, although these points are not relevant to the decisions made pursuant to section 301(h) of the CWA, they do provide information that is relevant for determining schedules for future treatment plant upgrades. During the development of schedules for system upgrades, it is EPA's intention to consider the financial capability of CCH, and the relative priorities for the various wastewater infrastructure challenges CCH faces. The statements made in the comments regarding poverty rates suggest

that CCH may want to consider developing fee structures which take into account income inequalities as other cities have done.

In response to the comments regarding energy costs, carbon emissions, excess solid wastes, and benefit to the marine environment or its users, please see response to comment P44.

Comment C75: Financial impacts must be considered holistically. One must consider the potential costs of secondary treatment in the context of CCH's other environmental investments, particular water quality. Additionally, there are EPA-mandated stormwater management measures and recommended asset management initiatives. These costs will impose significant financial, economic and social risks, which diminish CCH's fundamental capability to finance water quality investments, especially secondary treatment. These risks are generally treated as "additional considerations" in EPA guidance, but they represent important potential impacts on Oahu residents and businesses.

Response: See response to comment C72. Secondary treatment variance decisions may not be based on financial considerations, as such considerations are not included in the statutory criteria listed in section 301(h) of the CWA. The statute is clear that unless the specified criteria -- which do not include cost considerations – are met, a variance from secondary treatment may not be granted by EPA. However, EPA considers it appropriate to take into consideration information such as that presented in this comment in determining the schedule under which CCH makes wastewater infrastructure improvements to both its collection system and its treatment plants.

Comment C76: Fixed schedules for water quality investments should be assigned only to the highest priority, immediate projects, because later investments are subject to market dynamics, such as increasing construction costs. Changes in construction costs have been unpredictable. CCH's total water quality investments will impose significant rate increases, could lower demand and thus total revenues, and could impact CCH's credit rating. One consideration in municipal credit analysis is plant and line maintenance; CCH's capital program, even without secondary treatment costs, will strain the extent to which the program is "manageable and affordable." CCH is now focusing, in parallel with its expenditures on major repairs, on the plant and maintenance that will enable it to reduce major repair needs in the future. Beyond appeasing regulatory bodies' focus on treatment processes, and at the risk of diverting attention and resources from more critical collection system improvements, there is little to commend secondary treatment from a municipal credit perspective.

Response: See responses to comments C72 and C79. The factors discussed in this comment do not go to the statutory criteria for granting a 301(h) variance. However, EPA considers it appropriate to consider information of the type included in this comment in determining the schedule under which CCH makes wastewater infrastructure improvements to both its collection system and its treatment plants.

Comment C77: Utility rate increases may have a dampening effect on local economic vitality. Honolulu residents already are affected by shelter, cost of living, and tax costs that are among the highest in the country. Wastewater rate increases will exacerbate this situation and compromise individual residents' financial capabilities. Requiring extraordinary amounts of construction work to be executed within a limited time frame will distort Oahu's resident engineering and contractor market.

Response: See responses to comments C72 and C79. The factors discussed in this comment do not go to the statutory criteria for granting a 301(h) variance. However, EPA considers it appropriate to consider information of the type included in this comment in determining the schedule under which CCH makes wastewater infrastructure improvements to both its collection system and its treatment plants.

Comment C78: Rate increases will disproportionately affect low-income residents. Upgrading to secondary treatment will exacerbate CCH's financing challenges, and the resulting impacts on low-income residents should be recognized. These risks are not addressed in EPA's Financial Capability Assessment methodology.

Response: As a fundamental matter, discussed in response to comment C72, secondary treatment variance decisions may not be based on cost considerations. The statute is clear that unless the specified criteria, which do not include cost considerations, are met, a variance from secondary treatment may not be granted by EPA.

EPA is aware that sewage fee increases may potentially have a disproportionate effect on Honolulu's low income residents. Other municipalities have developed fee structures addressing this potential inequity. For example, the City of Atlanta faces huge expenses repairing its drinking water and wastewater infrastructure. Recognizing the impacts resulting rate increases would have on portions of its population, Atlanta established discount programs for low income senior citizens, and financial assistance to those having difficulty paying their bills. EPA urges CCH to follow up on its stated intent to consider options to address low-income affordability issues, and offers to facilitate communications with other municipalities that are successfully addressing this challenge.

The comment makes reference to EPA's Financial Capability Assessment Guidance, implying that this guidance is relevant to this 301(h) variance, and that it should take into account impacts on low income residents. As noted in response to comment C73, the referenced EPA Guidance is a tool for considering the financial condition of a municipality when sewer system upgrades are needed. The financial condition assessed is that of the municipality as a whole, not the financial status of individual residents. This guidance does not consider whether or not it is appropriate to grant a variance from secondary treatment under section 301(h), and is not relevant to the variance decision for the Sand Island treatment plant. However, EPA does believe that the Cost and Financial Capability guidance could be a relevant tool in determining the schedule under which CCH makes wastewater infrastructure improvements to both its collection system and its treatment plants.

Comment C79: Secondary treatment must be assigned a lower priority among CCH's water quality investment objectives as other major components of CCH's water quality investment program have substantially higher water quality benefits. Full secondary treatment is infeasible through the 301(h) waiver renewal period. Other options may represent a higher-return water quality investment.

Response: See responses to comments C72 and C75. The factors discussed in this comment do not go to the statutory criteria for granting a 301(h) variance. However, although these points are not relevant to the decisions made pursuant to section 301(h) of the CWA, they do provide information that is relevant for determining schedules for future treatment plant upgrades. During the development of schedules for system upgrades, it is EPA's intention to consider the financial capability of CCH, and the relative priorities for the various wastewater infrastructure challenges CCH faces.

Comment C80: Full secondary treatment represents an untenable water quality investment, both because it will yield limited (if any) environmental benefit and because of other claims on CCH resources. Honolulu's current administration has demonstrated an extraordinary financial commitment to improved water quality, including approving a 4-year rate increase plan, which does not contemplate financing of secondary treatment. This will result in monthly residential bills that will exceed EPA's threshold of 2 percent of median household income by 2014, and will place Honolulu's wastewater rates among the highest in the US. The fact that residential bills will exceed 2 percent of MHI within the next 5 years suggests that, under EPA's Financial Capability Assessment guidance, a 20-year capital program implementation schedule (without inclusion of secondary treatment) is warranted.

Response: EPA does not disagree that Honolulu's current administration has taken valuable steps forward towards addressing CCH's wastewater management challenges. However, the demonstration of a commitment to address other priorities cannot be used to justify a variance under section 301(h). It is EPA's intention to consider all wastewater management priorities in determining schedules future treatment plant upgrades.

Regarding the contention that full secondary treatment will yield limited environmental benefit, please see response to comment P50.

Comment C81: The fundamental challenge to CCH, EPA and community stakeholders is to determine the appropriate selection and pace of investments that maximize environmental benefits within the financial capabilities and logistical constraints that prevail in Honolulu. CCH does not have unlimited financial capacity to fund improvements; choices are required. A holistic perspective is required for determining the priorities and schedule for water quality improvements. Important financial and project delivery realities must be considered in defining requirements collectively. There are practical limitations on the extent to which such investments can be realistically and cost-effectively delivered, given prevailing construction market conditions, physical constraints, and potential community impacts.

Sand Island's primary discharge does not harm the marine environment and meets all 301(h) criteria. To proceed with a denial of the 301(h) application would be in direct contradiction to the stated intent and purpose of Section 301(h) to avoid unnecessary costs were other projects with greater environmental benefit can be achieved.

The enormous cost to design, build and operate a secondary treatment facility at Sand Island is unjustified. It would cost approximately $800 million, and operating costs would more than double. Secondary treatment has a large energy demand. The carbon emissions resulting from the additional energy requirements would be equivalent to adding 6,000 automobiles per day. Secondary treatment is an unnecessary additional burden on the impacts associated with climate change. At a time when CCH has committed to a major rehabilitation program to repair, replace, and otherwise upgrade its conveyance system to provide direct and significant environmental and public health benefits, the cost of converting Sand Island to secondary treatment is unnecessary.

In light of the clear intent of Congress, EPA must include in its evaluation the considerations of cost, necessary, and financial capability of CCH to proceed with secondary treatment at Sand Island. Any consideration of secondary treatment must be deferred given the CCH commitment of available resources (within its financial capabilities) to other, higher priority, water quality investments.

Response: Regarding cost considerations in general, please see responses to comments C72. EPA disagrees that the Sand Island discharge meets all 301(h) criteria, as discussed in responses to specific comments regarding the specific criteria. Regarding the comment that Sand Island's primary discharge does not harm the marine environment, see response to comment P46. With regard to carbon emissions and energy demands, see response to comment P44.

As discussed in the referenced responses, considerations such as costs for constructing and operating secondary treatment facilities, the energy demands associated with secondary treatment, and carbon emissions resulting from this estimated energy production are not relevant to the determination of whether a variance may be granted. Nevertheless, it is important to note that EPA does not necessarily agree with the cost or emission estimates cited in CCH's comments. These are matters which must be reviewed in detail during the design of treatment plant upgrades. As an example of a point that needs further evaluation, many modern wastewater treatment plants utilize gases created during secondary treatment to general electricity, thus reducing operating costs and energy demand at wastewater treatment plants. It appears that such efficiencies have not been factored into CCH's estimates. Additionally, the energy costs and carbon emissions associated with the electricity demands for UV disinfection will be decreased when this disinfection is used on secondary-treated wastewater. EPA looks forward to working with CCH to ensure that treatment plant upgrades are made in a manner that takes advantage of state-of-the-art cost and energy efficiencies used throughout the U.S.

Comment C82: The negative 2007 TD is unjustified in light of the data and scientific evidence; contrary to the permit; contrary, without justification, to EPA's findings in the 1998 TD; contrary

to EPA's current guidance and technical support documents; contrary to public policy; not supported by the administrative record; arbitrary and capricious; speculative; and conclusory.

Response: EPA disagrees. This list of allegations is CCH's conclusion at the end of its comments on the Sand Island TDD. Where CCH has provided specific comments with articulated rationale for its comments, responses are provided elsewhere in this response to comments document. EPA based its tentative decision, and is basing its final decision, on the information provided in CCH's application for a renewed permit for the Sand Island facility in consideration of the 301(h) criteria. All of EPA's findings are fully supported in the administrative record.

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