Response to Comments on Public Notice NPDES Permit and Tentative Determinations
for Kailua Regional Wastewater Treatment Plant
NPDES Permit No. HI 0021296
January 16, 2014

Comments received from the City and County of Honolulu, Department of Environmental Services

FACT SHEET

1. Page 2, Table of Contents, Correct page numbering.

   Response: The Table of Contents page numbering was updated as requested.

2. Page 4, Item B.1., 3rd Paragraph – Correct diffuser information. The diffuser starts at approximately 4,094 feet from shore. The number of side ports on the diffuser is 81. The diffuser length is approximately 984 feet.

   Response: The diffuser information was revised as requested.

3. Page 13, Table F-5 – Delete Footnote #3. Footnote #3 does not refer to any table.

   Response: The footnote was deleted as requested.

4. Page 15, Item D.2.c.(5)(c) – Remove pH from the listed monitoring parameters that have reasonable potential to cause or contribute to an excursion above state water quality standards.

   Response: pH was removed from this section as requested.

5. Pages 17 and 18, Items D.2.d.(3)(a) and D.2.d.(3)(b) – The analysis for calculating WQBELs and assessing the attainment of water quality criteria for protection of human health from exposure to the carcinogens chlordane and dieldrin through fish consumption is flawed. The analysis used maximum concentration of the pesticide effluent monitoring result based on an annual sample and then adjusted the concentration of the result by incorrectly applying the minimum initial dilution value to the concentrations of priority toxic pollutants for carcinogens, such as chlordane and dieldrin.

   Numeric water quality standards for toxic pollutants listed in Hawaii Administrative Rules (HAR) 11-54-4(b)(3) provide acute and chronic criteria to protect aquatic life and fish consumption criteria to protect human health. The list also identifies toxic pollutants that are carcinogens. In accordance with HAR 11-54-4(b)(3) and DOH State Toxics Control Program: Derivation of Water Quality-Based Discharge Toxicity Limits for Biomonitoring and Specific Pollutants (1989)(STCP), minimum dilution is used when comparing toxic pollutant concentrations in effluent discharges through a submerged outfall to numeric chronic toxicity standards and numeric human health fish consumption standards for non-carcinogens. The

average dilution value is used when comparing toxic pollutants in effluent discharges through a submerged outfall to numeric human-health fish consumption standards for carcinogens. The minimum dilution should not be applied to assess human health criteria for carcinogens such as chlordane and dieldrin.

The water quality criterion for chlordane and dieldrin was based on human health using carcinogenic endpoints in calculation. This calculation is conservative in terms of cancer potency and bio-concentration factors.

On June 16, 2009, the Governor of the State of Hawaii signed legislation that conforms the State Water Quality Standard for chlordane and dieldrin to the current federal standard as set forth in the latest EPA National Recommended Water Quality Criteria (Office of Science and Technology, 2002 & 2006) which incorporate over 20 years of nationwide scientific research concerning the carcinogenicity of toxic pollutants. This amendment was adopted by the Hawaii State Department of Health in December 2009, approved by the Governor on January 25, 2010 and submitted to the EPA for approval in February 2010. Ignoring DOH's rule making and the State's position on water quality standards to develop water quality based effluent limits for chlordane and dieldrin is not justifiable.

Additional reasons why there should not be discharge limitations on dieldrin and chlordane are provided in Attachment A.

Response: The RPA and effluent limitations are based on the applicable water quality standards specified in HAR 11-54 and remain applicable until HAR 11-54 is revised to reflect any updated standards.

6. Page 19, Item D.2.e. Ammonia Nitrogen and Page 21, Item D.2.f. – The determination that a reasonable potential exists to exceed water quality standards for ammonia nitrogen and nitrate + nitrite is contradicted by the fact that the receiving water is not impaired. As the Fact Sheet, page 5, acknowledges "CWA Section 303(d) requires states to identify specific water bodies where water quality standards are not expected to be met after implementation of technology-based effluent limitations on point sources." Treated effluent is discharged to the Pacific Ocean from the Mokapu Outfall Serial No. 001 through a diffuser approximately 3,323 feet offshore and 105 feet below the water. The location of the Mokapu WWTP Outfall Serial No. 001 in the Pacific Ocean is not listed as an impaired water body on either the 2008/10 State of Hawaii Water Quality Monitoring and Assessment Report: Integrated Report of the U.S. Environmental Protection Agency and the U.S. Congress Pursuant to Sections 303(d) and 305(b), Clean Water Act, or in the 2012 Report. TMDLs are the process for evaluating the causes of any impairment. No TMDLs have been established or are contemplated for this water body.

Additional reasons why there should not be an ammonia nitrogen and nitrate + nitrite nitrogen discharge limitation are provided in Attachment A.

Response: The 303(d) list may not reflect water quality within the immediate vicinity of the outfall. Reasonable potential was based on the monitoring results at the boundary of the Zone of Mixing, where water quality standards should be met. The maximum annual geometric mean of the monitoring results at the boundary of the Zone of Mixing showed exceedances of the water quality standards for ammonia nitrogen and nitrate + nitrite nitrogen.

7. Page 21, Item D.2.e.(4) – Delete references to "nitrate+nitrite" and include correct references to "ammonia nitrogen."

   Response: The references to nitrate+nitrite nitrogen was corrected and replaced with ammonia nitrogen.

8. Page 21, Item D.2.e.(4) – The maxiumum effluent ammonia nitrogen reported from calendar years 2008 to 2012 was 14.7 mg/L (14,700 µg/L) reported in May 2012.

   Response: The maximum effluent concentration for ammonia nitrogen reported during the calendar years 2008 to 2012 was revised to 14,700 µg/L.

9. Page 23, Item D.2.j. Enterococcus – There is no justifiable basis for establishing water quality based enterococcus discharge limits in the permit because there is no reasonable potential that enterococcus concentrations in the KRWWTP's effluent cause or contribute to an exceedance of the water quality standards based on the following:

   i) The draft permit specifically allows a Zone of Mixing (ZOM). The ZOM is the proper mixing zone. According to EPA's Technical Support Document for Water Quality-based Toxics Control (TSD) (USEPA, 1991), a mixing zone is an allocated impactzone where water quality criteria can be exceeded.

   ii) DOH indicated that there are no exceedances of enterococcus at the edge of the ZOM.

   iii) Monitoring data from the edge of the ZOM should be used when determining whether Kailua WWTP has complied with enterococcus bacteria criteria of a monthly geomean of 35 cfu/100 mL

   iv) DOH provided the following basis for its reasonable potential determination: "the [KRWWTP] facility is a POTW, and pathogens are characteristic of

treated municipal wastewater[.]" This is not an adequate justification to establish an end of pipe limit for enterococcus. The impact of the discharge to receiving water is measured by compliance with the applicable State Water Quality Standards. No enterococcus exceedances were observed at the Zone of Mixing.

Response: As stated in the Fact Sheet, Section 3.3 of EPA's EPA's Technical Support Document for Water Quality-Based Toxics Control states that the regulatory authority should consider additional information discussed under Section 3.2 (i.e., type of industry, type of POTW, type of receiving water and designated uses, etc.) when evaluating reasonable potential. Reasonable potential can be determined without effluent or receiving water exceedances of applicable water quality criteria. Because the facility is a POTW, and pathogens are characteristic of treated municipal wastewater, and the beneficial uses of the receiving water include recreation where human contact may occur, reasonable potential for enterococcus has been determined.

10. Page 26, Item D.2.k., 2nd paragraph from the bottom - "IWC(100 percent effluent)" should be changed to the appropriate influent wastestream concentration based on the average dilution.

    Response: This equation was revised as requested.

11. Page 27, Item D.2.k., 1st sentence – Revise the sentence to read, "The acute and chronic biological effect levels (effect levels of 20% and 25%, respectively, or b values of 0.80 and 0.75, respectively) incorporated into the TST define EPA's unacceptable risks to aquatic organisms." Reference to this change can be found in the EPA document (See EPA 833-R-10-003 document).

    Response: This sentence was revised as requested.

12. Page 31, Item E.2.a., Table F-9, Footnote 3 – During the drafting of the draft permit, the water quality standard established in HAR 11-54 applicable within 300 meters from shore was 35 CFU/100mL, not 34 CFU/100mL.

    Response: The water quality standard was revised to 35 CFU/100 mL.

13. Page 32, Item E.2.c, Table F-11 – The methodology for reporting the highest geometric mean as described in footnote #2 is not applied consistently throughout Table F-11 for every listed parameter.

    Response: The values in the table were corrected.

14. Page 39, Item F.4.b., Nearshore Water Quality Monitoring – Please see comment 29 on the draft permit which sets forth the basis for establishing the Mokapu Outfall nearshore stations.

    Response: The nearshore water quality monitoring was deleted as requested.

15. Page 41, Item G.4.a, 2nd paragraph, last sentence – Delete the last sentence. The current draft permit as well as the previous draft permit dated February 20, 2013 did not have a requirement for the City to implement and update a BMP-based program for controlling animal and vegetable oil and grease.

    Response: This sentence was deleted as requested.

16. In general, DOH does not use the same data period consistently throughout the draft permit for all analyses. For example, on Page 11, item 92), DOH states that the RPA was based on effluent monitoring data from January 2008 to June 2012. However, on Page 21 DOH uses data from March 2008 – October 2012 for the RPA on ammonia nitrogen. DOH should provide a rationale for using different time periods in its data analyses.

    Response: The vast majority of data is based on January 2008 through June 2012 (with the exception being nutrients), and represents the data that was available at the time the analysis was conducted. Data from the last five years was collected, summarized, and used for the analyses, at which point the RPA was performed. Additional data does not change reasonable potential, once determined, since the maximum value during the time period is considered for each parameter. The use of additional data, however, could determine reasonable potential where there previously was none. In the case of this permit, data between July 2012 and December 2012 was examined to see if any reasonable potential determination would need to be changed. Based on our examination, there were no additional parameters with reasonable potential and thus to expedite permit processing, the data used in the evaluation was not updated.

    DOH evaluated the application of nutrient data numerous times during the permitting process, using a direct comparison of the maximum annual geometric means of the receiving water concentrations to the applicable water quality standards. In this case, additional data could raise or lower the annual geometric mean. Therefore the data set was updated each time using the most recent data. DOH made no attempt to selective choose the data sets.

17. Page 20, Item D.2.e(4), paragraph 3; Page 22, Item D.2.f.(4), paragraph 2; Page 35, Item E.3.c., Item (1)(b); Page 39, Item F.4.f. – The draft permit states that the purpose of conducting a ZOM Dilution Analysis Study is to establish available

dilution at the edge of the ZOM and verify that assimilative capacity within the receiving water exists for ammonia nitrogen and nitrate + nitrite nitrogen.

The City request the deletion of the ZOM Dilution Analysis Study requirement since the purpose of the study has been fulfilled as follows:

The City engaged HDR | Hydroqual to conduct a technical analysis using the United States Environmental Protection Agency (EPA) Visual Plumes three dimensional Updated Merge (UM3) model to determine the likely dilution available at the edge of the Zone of Mixing. Hydroqual has expertise in pollutant transport, plume dispersion and evaluating a water body's assimilative capacity. Based on historical data submitted to the Department of Health, Hydroqual's Technical Memorandum estimated a conservative critical dilution and far-field dilution credit at the edge of the Zone of Mixing. Hydroqual has determined that a critical dilution of at least 240:1 exists in the immediate neighborhood of the diffuser. As Hydroqual explains, there is a significant additional mixing and dilution from the diffuser to the perimeter of the Zone of Mixing. As explained in the TM, the data demonstrated that the average dilution of the discharged effluent from the Mokapu Outfall is at least 600:1 at the boundary of the ZOM. The City has submitted this dilution Technical Memorandum under a separate cover letter (EMC 13-164, dated October 22, 2013).

i) There is assimilative capacity in the receiving waters. In the Fact Sheet, DOH has indicated that there is assimilative capacity for ammonia nitrogen on Page 20, item (4), 2nd paragraph and for nitrate + nitrite nitrogen on Page 22, item (3), 3rd paragraph, last sentence.

Response: Since the original draft permit was prepared in February 2013 the City has continuously corresponded with our contractor and submitted several documents for our consideration for the draft permit. This courtesy is one of the reasons why the permit has not been issued to date. All pertinent information for the reissuance of the permit should have been submitted with the permit application. Therefore, the DOH will not consider the study at this time. The City may submit the study for compliance with this permit. If appropriate, the City may request a modification to this permit.

DRAFT PERMIT

18. Page 3, A.1., 1st Table of Effluent Limitations and Monitoring Requirements – Remove the reference to footnote 3 from the Measurement Frequency Column in the Flow row.

The BOD and TSS mass emission rates (MERs) should be based on the existing plant design flow of 15.25 MGD. Accordingly, the MERs should be 3,816 lbs/day and 5,723 lbs/day for the average monthly and average weekly discharge limitations, respectively.

Response: Footnote 3 was clarified and remains in the permit. The BOD and TSS mass emission rates remain as calculated in the draft permit. Although the plant design flow was increased prior to the issuance of the previous permit, the limitations in the previous permit as well as this permit are based on the old design flow of 12.7 MGD. This is because an antidegradation analysis for the increase in flow in accordance with Hawaii Administrative Rules, Section 11-54-1.1 was never submitted to DOH.

19. Page 3, A.1., 1st Table of Effluent Limitations and Monitoring Requirements – Correct Footnote 1: Design flow is 15.25 MGD.

    Revise Footnote 2: Delete the word test. The footnote should read "The Permittee shall monitor and report the results."

    Response: The design flow remains at 12.7 - see previous response to comment. Footnote 2 was revised as requested.

20. Page 3, A.1., 2nd Table of Effluent Limitations and Monitoring Requirements – Remove "TUc" from the "units" column in the "Chronic Toxicity" row. There is no unit for a test that is reported either as "Pass" or "Fail."

    Response: The unit for chronic toxicity was removed as requested.

21. Page 3, A.1., 2nd Table of Effluent Limitations and Monitoring Requirements – The City requests deletion of the enterococcus daily and monthly geometric discharge limitations of 6,510 and 93,186 cfu/100mL, respectively. It is inappropriate and unjustifiable for the Department of Health to impose numerical effluent limitations for enterococci. Also see comment 9.

    Response: The DOH's determination of reasonable potential for enterococcus exceedances is in accordance with Section 3.3 of EPA's Technical Support Document for Water Quality-Based Toxics Control, as documented in the Fact Sheet.

22. Page 4, 2nd Table of Effluent Limitations and Monitoring Requirements – The City requests deletion of the ammonia and nitrate+nitrite discharge limitations. It is inappropriate and unjustifiable for the Department of Health to impose numerical effluent limitations for ammonia and nitrate+nitrite. Correcting the reasonable

potential analysis demonstrates that there is no reasonable potential for the City's discharge of nutrients to cause or contribute to an exceedance of State WQS. The City should continue to monitor ammonia and nitrate+nitrite as set forth in the existing permit. Also see comment 6.

Response: The DOH's determination of reasonable potential for ammonia nitrogen and nitrate+nitrite nitrogen exceedances is in accordance with of EPA's Technical Support Document for Water Quality-Based Toxics Control, as documented in the Fact Sheet.

23. Page 6, Part B. – DOH should not only consider using *Tripneustes gratilla* exclusively for the Whole Effluent Toxicity Test. The sensitivity of an organism to various pollutants is also an important consideration in the selection of the test organism. No single organism is sufficiently sensitive to all toxicants that using it alone for Whole Effluent Toxicity testing will provide an appropriate degree of protection to all organisms in the receiving water. Including *Ceriodaphia dubia* along with *Tripneustes gratilla* will provide a broader evaluation of the whole effluent toxicity profile of the effluent.

    Response: As documented in the Fact Sheet, based on approximately 4.5 years of data, there is no reasonable potential for *Ceriodaphnia Dubia* to exceed the whole effluent toxicity limitations. Therefore testing requirements for *Ceriodaphnia Dubia* was removed.

24. Page 8, Item B.4.f. – Insert hyphen (-) after "re" for "re sample" and "re test."

    Response: Hyphens have been inserted as requested.

25. Page 9, Item 5.6.e. – Revise the sentence as follows: "Prior to conducting a TIE, the Permittee shall submit a TIE plan to the Director for approval."

    Response: The sentence remains as written in the draft permit. See response to comment 26 below.

26. Page 10, Item B.6.e., middle of page – Revise the sentence as follows: "The Permittee shall incorporate all comments received from the Director within 14 days of receiving comments and commence with the TIE."

    Response: The sentence remains as written in the draft permit. The Permittee is solely responsible in identifying toxicity in their own effluent to comply with their NPDES permit conditions and HAR 11-54. The permit contains 10 minimum requirements to help the City develop the TIE plan.

27. Page 10, Part B.7.a – In its previous response to the KRWWTP draft permit (submitted via a March 13, 2013 letter, EMC13-064), the City suggested changing the "percent mean response at IWC" to "percent effect at IWC." However, EPA did not accept the change because no rationale was provided. Equation E-1, page E-3 of the EPA 833-R-10-003 June 2010 document is the basis for the correction. The proper terminology is mean effect at the IWC expressed in %. These results are used for the reasonable potential (RP) calculations.

    %Effect at IWC = ((Mean Control Response – Mean Response at IWC)/(Mean Control Response)) x 100.

    Response: The equation has been revised as requested.

28. Page 11, Item B.7.c. – Change from "within five (5) calendar days" to "within five (5) business days." The reason for this change is that it will be difficult to meet the calendar deadline for the written submission if there is a weekend or observed holiday around the time of the WET exceedance occurrence.

    Response: The deadline was revised from "five (5) calendar days" to "five (5) business days" as requested.

29. Page 17, Part E, Item 2 – The City requests deletion of this requirement. First, the City cannot establish near shore sampling stations within 300 meters of the shoreline, because the U.S. Navy has designated a 500-yard (or 457.2-meter) prohibited area around the perimeter of Mokapu Peninsula. United States Coast Pilot 7 (45th edition 2013).

    Second, there are there no exceedances of enterococcus that would give rise to such a requirement, and no other data indicating that the KRWWTP's effluent causes or contributes to an exceedance of the water quality standards.

    Third, due to existing hazardous conditions, the City cannot establish nearshore water quality stations within 300 meters from shoreline. A listing of the nearshore stations established for the existing permit and their latitude and longitude locations is attached (Attachment B). Hazardous wind and water conditions including breaking waves, gale winds, swells and inclement weather can create very dangerous situations for conducting water quality sampling within the 300 meters boundary.

    Fourth, the Ocean sampling team established stations MN1 and MN2 at their present location because of the Kaneohe Marine Corps Base Hawaii (MCBH) prohibited area, and in order to minimize direct line of fire from the MCBH Ulupau Crater Weapons Training Range.

The attached nautical map (see Attachment C) shows the shallow water conditions, areas of breaking waves and reef; and prohibited/restricted areas near the nearshore monitoring stations. Note that in this map, the City's nearshore monitoring stations, MN1, MN2 and MN3 lies along the boundary of a prohibited area.

The City Regularly has to cancel water quality monitoring at the existing nearshore stations due to small craft warnings, gale winds or inclement weather. The table below summarizes the number of cancellation incidents by calendar year since 2008:

Summary of Canclellation by Calendar Year at the Nearshore Monitoring Stations Mokapu Ocean Outfall*	
Year	# of cancellation events
2008	22
2009	31
2010	24
2011	28
2012	37

Attachment T provides receiving water sampling cancellation notices from the City's Oceanographic Team

Response: The nearshore water quality monitoring was removed as requested.

30. Page 18, Part E, Item 3, footnote to water quality parameters table – On the grab sample, modify the footnote to read sample within 1 meter below the surface for the top grab sample and to sample within 2 meters above the ocean floor for the bottom grab sample.

    On the continuous depth profile, modify to read "Parameter shall be measured on a CDP basis, from within 1 meter below the surface to within 2 meters above the ocean floor at 1 meter intervals."

    The reasons for the above request is that given the wave motion and difficulty in securing the boat in place, it is difficult to deploy the CTD equipment to measure exactly one meter from the water surface and two meters from the bottom of the ocean floor.

    Response: The change to the grab sample locations were revised as requested.

31. Page 19, Part E, Item 5. – The City requests the removal of the ZOM Dilution Analysis Study requirement. Rationale is provided in comment 17.

    Response: See response to comment 17.

32. Page 20, Part E, Item 6.b. – For the list of examples to provide as to the differences unique to each receiving water monitoring station, the City will provide station location (location map and coordinates). The City does not routinely record ocean bottom conditions when sampling at the receiving water monitoring stations.

    Response: This section was clarified to require that the ocean bottom conditions be recorded at least once per calendar year.

33. Page 23, Part G, Item 4. – In its comments to the previous draft permit dated February 20, 2013, the City requested that the annual report submittal deadline of February 28 be changed to March 31 to be consistent with the City's other NPDES permits with submittal deadlines of March 31. On Page 7-8 of DOH's Response to [the City's] Comments, DOH indicated the draft permit was revised based on the City's comment. However, this revision is not reflected in the current draft permit.

    Response: The pretreatment report deadline was revised to March 31st as requested.

34. Page 26 of the draft permit, Part H, Item 1.a.(1)(a) – The City would like to add H-Power as an acceptable sludge disposal option.

    Response: The City is required to dispose of sludge in accordance with HAR, Chapters 11-58.1 and 11-62; and 40 CFR Parts 257, 258, and 503. H-Power may be an acceptable sludge disposal option if it meets all criteria in the regulations.

35. Page 37, Part I, Item 2.f.(1), table of report deadlines – The City is requesting the removal of the ZOM Dilution Analysis Study requirement. Therefore, the last two rows in the table of reports due should be removed, as they relate to the dilution study. Rationale for the deletion of the dilution study is provided in comment 17.

    Response: The report deadline remains in the permit. See response to comment 17.

36. Appendix 1, Monitoring Methods, page 2 – Appendix 1 incorrectly lists Dichlorobenzene under the "Base/Neutrals Extractable" parameter. These three analytes (1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dochlorobenzene) should be listed under the "Volatile Organics" parameter as 40 CFR 136 allows grab sampling under EPA method 625.

Response: The analytes (1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dochlorobenzene) are listed as Base/Neutral Extractables in 40 CFR Part 136, Appendix A, Method 625, Table 1.

Comments Received From Mr. James S. Kumagai

I am responding as a concerned citizen and taxpayer in the city and County of Honolulu, State of Hawaii, USA, to your notice of September 25, 2013, on the matter of the draft NPDES Permit for the Kailua Regional Wastewater Treatment Plant. I am neither affiliated with the permittee in any way or form nor with any of the enforcing agencies. I am concerned with the outcome of the permit decisions as a citizen who cares about the quality of our environment and one who must pay for, and bear the consequences of, any action or inaction on this matter.

While this response focuses on the permit for the Kailua Regional Wastewater Treatment Plant discharges, my comments and recommendations are intended to be fundamental and applicable to all other point discharges on Oahu that may be subjected to similar conditions for ocean outfall discharges.

I am familiar with the environment issues and their history to the extent of my experience: (1) as a registered professional engineer in the State of Hawaii (PE2977C) practicing in environmental engineering, (2) my academic background (BS 1962 University of Hawaii, MS 1965 Washington University St. Louis, PhD 1969 University of California Berkeley), (3) my specific work experience: (a) as the lead engineer for Sunn Low Tom and Hara Inc. as part of the team that developed the Water Quality Program for Oahu, 1969–1972, (b) as a NAUI certified (1971) SCUBA diver who actually observed first hand, the real world underwater end-of-pipe conditions at all of the ocean outfall disposal sites existing at that time, (c) as Deputy Director of Environmental Health at the DOH, 1975-1980, (4) as representative of the Hawaii Water Pollution Control Association appearing before the US Senate Subcommittee on Environmental Pollution (Senator Muskie, Chairman) of the Committee on Public Works, Ninety-Third Congress, march 18, 1974, to present testimony and support for amending the Federal Water Pollution Control Act Amendments of 1972 which later passed into law as Section 301H to the CWA.

There are three major categories of effluent limits proposed that are objectionable for the following reasons. They are contrary to 1) science, 2) real word experience, and 3) the public interest. It is emphasized here that the effluent limits and not the monitoring and reporting requirements that are objectionable.

It is recognized that the draft permit is an instrument of regulatory action under statutory authority. However, it should be acknowledged by all that the authority is obligated to

serve the public interest. The regulation is a means to an end, and that end is environmental quality control holistically involving the land, air, water, and people. It is in this spirit that comments and recommendations are offered for consideration.

The objectionable categories in the proposed draft are the following:

A. Nutrients: ammonia and nitrate/nitrite (Part A. Effluent Limitations. Outfall Serial 001)
B. Chlordane (Part A, Effluent Limitations. Outfall Serial 001)
C. Dieldrin (Part A, Effluent Limitations. Outfall Serial 001)
D. Whole effluent toxicity using T. Gratilla (Part B. Whole-Effluent Toxicity Requirements)

APPLICABLE SCIENCE AND EXPERIENCE

A brief history of the environmental movement is reviewed here to define the context for the comments and recommendations presented here for consideration.

The City and County of Honolulu adopted the Water Quality Program for Oahu (WQPO, 1972). The development of the program started in 1969 even before the passage of the PL92-500, or the Federal Water Pollution Control Amendments of 1972. Nevertheless, the public debate over the provisions of the law was well underway early in the decade of the 1960s. What emerged in the public forefront were the laws of ecology as aptly stated by Barry Commoner (1971).

1. Everything is connected to everything else
2. Everything must go somewhere.
3. Nature knows best.
4. There is no such thing as a free lunch.

The decade of the 1960s was action-packed for the country and for Hawaii. Following statehood in 1959 and the subsequent economic-boom and urban growth on Oahu, there were 45 individual wastewater treatment plants constructed on Oahu to treat the increased wastewater discharges resulting from a booming population. All effluent discharges went into inland streams and water bodies or nearshore coastal waters. Treatment systems were designed by the then "10-State Standards" of the Upper Mississippi River Basin.

The design and regulatory culture of that day was technology-based, i.e., build more treatment plants. Continue discharging effluent at least cost into the inland and nearshore waters of the island. It met all regulatory requirements and became a mindless routine. However, public concerns and outcry grew over the water quality impact of some of the discharges. The system was not working. There were already

questions about the wisdom of continuing this wastewater treatment and disposal strategy into the future of Oahu, regardless of its compliance with the regulatory requirements of that day.

The City and County of Honolulu commissioned a team of consulting engineering firms in 1969 to develop of the Water Quality Program for Oahu to study the issues and recommend a plan for a program. What emerged immediately was the principle of discharging effluent where it would do the least harm. The City and County of Honolulu commissioned a team of consulting engineering firms in 1969 to develop of the Water Quality Program for Oahu to study the issues and recommend a plan for a program. What emerged immediately was the principle of discharging effluent where it would do the minimum harm to the environment or where it might do some good as in reclamation and reuse. Everything must go somewhere. In an island community with limited land resources and an ecosystem in the middle of the Pacific, the choice for the backbone of the water quality program was the deep ocean outfall disposal systems. Here, space, time, and energy are virtually unbounded for stabilization of wastewater discharges according to nature's way. Nature knows best. The ultimate boundary conditions of our ecosystem were seen to be limitless compared to those of the Continental USA.

Response: DOH acknowledges the commenter's discussion. The discussion does not appear to necessitate a response.

Learn from experience: how WQPO resolved the issue of effluent discharges into Kaneohe Bay and into the shoreline at Kailua Bay.

In 1970, the discharges into Kaineohe Bay included the then MCBH flow of 1.0 mgd primary effluent and flows from the City and County treatment plants at 2.5 mgd trickling filter effluent from Kaneohe STP and 0.1 mgd package aeration plant from Ahuimanu STP. There were already water quality problems noted in Kaneohe Bay with eutrophication and coral toxicity. WQPO determined from field monitoring studies and laboratory assays from biostimulation of selected primary producers and for toxicity on coral planulae. It was concluded that more treatment even to tertiary levels would not eliminate the risk of adverse impact on the local ecosystem. The recommendation was to divert the point discharges completely out of Kaneohe Bay and combine them with the diversion of the then shoreline outfall discharge from Kailua into the Mokapu outfall system extending far into the open coast regime. That is where space, time and energy were available to allow the progression of the stabilization process as nature knows best. That plan was the zero risk alternative for both Kaneohe Bay and for the shoreline coastal waters fronting Kailua Bay. More significantly, that plan represented a net positive environmental gain for the region.

Besides, WQPO evaluated the water quality issue holistically and identified the reality of nutrients and sediment runoff from the tributary stream as nonpoint flows to influence

the ecosystem in the bay to negate whatever gains that might have arisen from advanced treatment technology to meet nutrient limits. Money would have been spent on treatment technology to achieve nothing, except perhaps for political expediency.

Response: DOH acknowledges the commenter's discussion. The discussion does not appear to necessitate a response.

NUTRIENT LIMITS IN THE PERMIT: THERE IS NO FREE LUNCH.

Nutrient limits proposed in the draft permit will do nothing in water quality enhancement but will harm the environment in the broader holistic sense.

The problem may be with the regulatory artifacts of the nutrient standards. It is not a real environmental problem for us, but it can be made to become a problem artificially, or bureaucratically, as it appears to be the case here. For one thing, there is no real-world impairment of beneficial uses of the local, open coastal waters from nutrients. There is no scientific basis for imposing effluent limits for nitrogen, nitrate/nitrate and/or ammonia.

Instead, an environmental problem can be created by imposing the effluent limits for nutrients as it is being proposed in the draft permit to force expensive remedial action to solve a non-issue or to resolve an artifact of the regulatory system.

Fundamentally, nitrogen and other nutrients are essential for primary productivity in the coastal waters. For Kaneohe Bay, the problem was eutrophication and coral toxicity. In the open coast regime, the ecosystem functions efficiently within the available limits of space, time, and energy. Primary productivity involves photosynthesis where sunlight is amply available for energy to drive the process. (In a situation of limited sunlight in the deep ocean there is no photosynthesis.) Photosynthesis utilizes carbon dioxide for synthesis and gives off free oxygen. Carbon dioxide no is receiving considerable attention nationally and internationally as a greenhouse gas leading to adverse climate change. Carbon dioxide uptake by primary producers is highly desirable for this purpose. Granted, the extent of primary productivity from nutrients from the Kailua discharge may be relatively small in the global context, but in principle, it gives a net positive environmental outcome. Every little bit counts. Nutrients in our open coastal waters in general will be good by promoting primary production with attendant reduction in greenhouse gas emissions consistent with national and international policy. It is unlikely that problems of eutrophication would ever occur in the open coast regime for Oahu as it could in an embayment, considering the scale of urbanization and population growth physically possible for Oahu.

The ultimate boundary condition for the open coast regime referred to here is best described in Mark Denny (2008) as two layered ocean stratified by stable thermocline

derived from glacial water flow and tropical climate temperature giving turnover rates of the inner ocean layer on the order of 500 to 1000 years. The time scale is not hours, not days typical of technology, but centuries. That is not to say, that the advocacy here is to extend the disposal system to the middle of the Pacific. This characterization is made to show that for the open ocean disposal systems, space, time, and energy is virtually boundless for our island ecosystem, limited only by our ability to engineer the system cost-effectively. For all practical purposes, there are no physical limits to our boundary conditions for water quality management and we can rely on nature as a partner to the maximum extent feasible to give a net positive environmental gain.

On the contrary, imposing effluent limits for nutrients, nitrate+nitrite nitrogen and ammonia nitrogen will diminish or eliminate completely the positive environmental effects of primary productivity on green house gas emissions. Worse yet, we will be actually building a greenhouse gas manufacturing plant in the process of lapplying technology for treatment. Fossil fuel derived energy is typically needed to drive that technology with corresponding greenhouse gas emissions. With an activated sludge anoxic selector plant for nitrogen removals typically to nitrogen gas, there will also be a contribution of nitrous oxide which is produced in the biochemical pathway to the nitrogen end product (Wrigglesworth, 1997). Although likely to occur in small quantities, the global warming potential of nitrous oxide is significant, 310 times the carbon dioxide value! Even that little bit could have a significant impact. There is no free lunch in ecology.

The discharge from the Kailua outfall by itself is small by comparison to the sum of all other point discharges on the island. But considering that sum of all point discharges for Oahu, the cost for compliance with the effluent limits in capital and operating expense over the lifetime of all the facilities could well add up to a billion dollars. And for what? To solve a problem artificially created? That is absurd. We, as a community, will look awfully foolish attempting to solve an environmental non-issue while adding to the problem of climate change in the process that our nation and the rest of the world are trying to forestall. It is certainly not in the public interest, to put it mildly. Putting it more emphatically, it would be criminal to force us to pay for this foolishness as citizens.

By comparison, it will cost nothing to remove the effluent limits as proposed from further consideration

For more complete treatise on the science of nutrients in the marine environment refer to Mark Denny (2008), and John Wrigglesworth (1997) in the list of references at the end. Mark Denny's book is very readable. Wrigglesworth is more technical but informative. In addition, to gain a better perspective of what the discharge conditions are like in the receiving waters, go out for an onsite visit and look.

Recommendation:

1. Remove the proposed effluent limits.
2. Design our management and regulatory system based on natural systems to control water quality impacts from effluent discharges in our coastal waters. Nature knows best.
3. Apply technology for effluent limits only as a last resort as necessary.
4. Emphasize monitoring in situ performance of nutrient concentrations and mass emissions in space and time and the corresponding indices of primary productivity.

Response: DOH is obligated to implement applicable water quality standards within NPDES permits for parameters for which the Permittee has demonstrated reasonable potential to cause or contribute to an exceedance of water quality criteria. Further, as previously discussed in this response to comments, the effluent limitations for ammonia nitrogen and nitrate + nitrite are based on estimated current treatment performance, and costly facility upgrades are not expected to be necessary for the Permittee to comply. Applicable effluent limitations for ammonia nitrogen and nitrate + nitrite have been included in the proposed permit based on the requirements and HAR 11-54 and 11-55.

CHLORDANE AND DIELDRIN

Chlordane and dieldrin are banned from use. Their residues in the environment come from past usage remain and will persist in the environment well into the distant future.

Like the rest of the persistent synthetic organic chemicals, they will eventually permeate the earth's ecosphere following the second law of thermodynamics (entroph). DDT is an example that has been documented. The pathways and kinetics are often unclear but the end result is certain.

It is likely that groundwater infiltration into the sewer is a source of chlordane and dieldrin concentrations. As such, they represent but a leakage from a pool that is the major contributor of contaminants into our coastal environment as they naturally permeate the nearshore coastal waters and eventually the offshore waters. Ultimately, chlordane and dieldrin will reach equilibrium in concentration uniformly over space. It may degrade in time in the distant future well beyond the half life of the compounds.

Given the observed mass emissions rates of chlordane and dieldrin in sewage, that leakage is small and insignificant by comparison to the pool based on their mass applied on land over the years. Placing effluent limits on chlordane and dieldrin would only incur cost to achieve the effect of a removing a drop-in-the-bucket and transferring it somewhere else in the environment where it might do still more harm. It must go somewhere. Effluent limits will serve no useful purpose other than to claim we are doing something about it and hope we are not creating more harm than good elsewhere.

It is more important to assure through monitoring that no new sources of contamination are contributing and that there are no "hotspots" in the environment that require local remedial action to safeguard public health.

Recommendation:
Remove the effluent limits for chlordane and dieldrin but leave the monitoring and reporting requirements in place.

Response: DOH is obligated to implement applicable water quality standards within NPDES permits for parameters for which the Permittee has demonstrated reasonable potential to cause or contribute to an exceedance of water quality criteria. HAR 11-54, 11-55, the STCP, or applicable federal regulations do not provide an exception for legacy pollutants within permittee's effluent.

WHOLE EFFLUENT TOXICITY

The use of T. Gratilla should be discontinued and replaced by a more stable test organism. The results would always be suspect since the test organism appearls to be overly sensitive to the test conditions beyond the parameters being tested.

Experience with the WQPO (1972) suffered the same predicament using oyster larvae and nehu. They were overly sensitive and simply confused the results. The issue was resolved by choosing damsel fish and tilapia. Stickleback was also attempted to correlate mainland effluent results but there was an issue going outside of the local environment for the test organism or importing a non-native animal and risking escape to, and proliferating in, our environment. Bioassays for toxicity are not deterministic procedures. They are probabilistic/stochastic, intended as indicators of risk or the odds of a toxic property being present. There are many uncertainties in interpretation. The analytical "noise" and resulting confusion are the distractions that could lead to more questions than answers.

In an case, the in situ monitoring of the biological communities will be the necessary data/information to supplement decisions on adequacy or acceptance.

Recommendation:
Choose an alternative test organism that can cost-effectively satisfy the requirement for whole effluent toxicity.

Response: The commenter does not support the assertion that the use of *T. gratilla* is "overly sensitive". The use of *T. gratilla* is appropriate because it is a local species that has demonstrated sensitivity to toxicity present effluents discharged in Hawaii. The narrative toxicity limitation contained in HAR 11-54-4 requires all waters shall be free of

substances attributable to domestic, industrial, or other controllable sources of pollutants, including: toxic substances at levels or in combinations sufficient to be toxic or harmful to human, animal, plant, or aquatic life. To evaluate compliance with this requirement, HAR 11-54-4(b) establishes the use of whole effluent toxicity testing. To ensure the protection of aquatic life from toxic substances, a species sensitive to toxicity should be selected. The use of a robust species does not ensure compliance with the narrative toxicity standard established in HAR 11-54. *T. gratilla's* sensitivity to toxicity within effluents, combined with it being a local species, is exactly what makes the selection of *T. gratilla* appropriate for evaluating compliance with the applicable water quality standards. The use of *T. gratilla* is continued in the proposed permit.

WHERE DO WE GO FROM HERE? BACK TO THE FUTURE

The federal initiative is to upgrade standards and press for ever more stringency in permit conditions. The intention is well meant, but it appears to be creating an ever more complex system to regulate and administer. The danger is getting mired in attempts to sort out the complexities of the means while ignoring the ends.

Historically, after the passage of NEPA in 1969, the environmental laws for air, water, drinking water, hazardous materials, toxic substances, etc. were passed in rapid succession piecemeal by Congress at different times, by different committees, following different environmental criteria, while all professing to be for the good of public health and the environment. The result is a fragmented set of environmental programs, although well intentioned.

Imposing the effluent limits is a case in point. It appears short sighted and operating in a silo. At the very outset of the environmental ground-swell in the 1960s, many argued for a holistic approach. Barry Commoner's laws of ecology is a classic result. The creation of a single federal agency to bring all the programs under one roof was once thought to be a way to overcome the effects of fragmentation in the environmental programs. The idea of the unity of nature was also brought out in the announcement of the then President Nixon when the US EPA was formed in 1970. The President said…"Despite its complexity, for pollution control purposes the environment must be perceived as a single related system." He went on to announce, "A far more effective approach to pollution control would identify pollutants; trace them through the entire ecological chain, observing and recording changes in form as they occur; determine the interactions among forms of pollution; (and) identify where on the ecological chain interdiction would be most appropriate." (Ruckelhaus, 1985)

Instead, things got even more complex as time went on. We now have a mixed bag of issues involving science and the law. It appears we have lost sight of our real environmental goals and objectives. The idea of coordination through a single agency at the federal level has not been happening. Instead, Ruckelshaus (1985), the first

Administrator of the newly formed US EPA under President Nixon, in hindsight, recommended taking Rene Dubos' suggestion to heart in resolving the environmental complexity by:

"Thinking globally, acting locally."

Case in point: Nutrient limits. We cannot apply Continental USA solutions to environmental problems to Hawaii. We must act locally to deal with our own issues. The corollary is to say one-size-fits-all approach does not work for the environmental issues remaining for our future. Maybe at one time it did, but not anymore. Centralized administration of programs obvisouly does not, and cannot, respond to the reality of this world of diverse ecosystems and cultures. The only wayt to deal with the real world is to think globally but acting locally. The goals and objectives of the federal and state legislation for environmental quality are not compromised at all by doing so. It is time that we go back to advocacy of the early initiators of the country's environmental movement. That is, going back to the future.

Recommendation:

1. Do it.
2. Keep it simple and relevant.
3. Think globally, act locally.
4. Revise the effluent limits and regulatory procedures to serve our own local needs for our own island ecosystem and culture.

Response: DOH is obligated to implement applicable water quality standards within NPDES permits for parameters for which the Permittee has demonstrated reasonable potential to cause or contribute to an exceedance of water quality criteria. Further response to the commenter's opinion on environment solutions and current regulations are outside the scope of this response to comments.

Comments received from Mr. Roy K. Abe, P.E.

1. Chlordane and Dieldrin (Page 3, Par. A.1) – The proposed effluent limits of 0.030 µg/L (annual average) and 0.74 µg/L (maximum day) for Chlordane and 0.0047 µg/L (annual average) and 0.35 µg/L (maximum day) for Dieldrin should be eliminated. Chlordane and Dieldrin are legacy pesticides that were widely used to treat for ground termites. The use of Chlordane and Dieldrin has been banned in the U.S. for about 25 years. Chlordane and Dieldrin are carcinogens and the lower limits in the WQS are based on possible carcinogenic effects from human consumption of fish containing the pesticide due to bioaccumulation in the food chain.

   The Chlordane and Dieldrin found in the effluent is likely due to the pesticide leaching into the sewer system via groundwater infiltration. Past sampling of urban

streams has shown highest levels of contamination when all the stream flow was from groundwater discharge. Chlordane and Dieldrin contaminated groundwater infiltrating via sewer pipe defects are likely to be primary sources o these chemicals. Since the chemicals are relatively insoluble and binds readily to soil particles, contaminated soil infiltrating through defects in service lateral lines located in pesticide treated oil may be an added source of Chlordane and Dieldrin during heavy rainfall. Cast iron and clay pipe lateral sewers servicing older homes in areas which experience high rainfall, corrosive soils and ground settlement often exhibit holes, separated joints, and other structural defects.

Removal of Chlordanee and Dieldrin through conventional treatment processes is difficult and likely to be ineffective. Specialized treatment processes would be very costly and are likely to have no direct public health benefits. Rehabilitation of sewer lines to reduce infiltration and minimize entry of Chlordane and Dieldrin to the sewer system would be a more logical corrective action than implementing treatment to remove the pesticide from the wastewater. The extent of infiltration that can be removed from the collection system, however, is uncertain.

There is no evidence that Chlordane and Dieldrin bioaccumulates in the marine life at or near the outfall. It is highly unlikely that substantial bioaccumulation is occurring in the marine life at the outfall due to strong and varying currents that dilute and transport the trace amounts of the chemicals. Unlike river discharges, which consistently flow in the same general direction, currents in the open ocean constantly change directions in a largely unconfined environment. If bioaccumulation did occur in certain fishes congregating near the outfall, it is unlikely that sufficient amounts of these fishes would be caught and consumed to have a noticeable carcinogenic effect. In the unlikely event that affected fishes were proven to be a health concern, a more cost effective mitigative measure would be to simply discourage fishing near the outfall. Simply delineating the limits of the ZOM with buoys to indicate the location of the outfall would likely discourage fishing in the area. Knowledge of the outfall location would probably be appreciated by the public.

Since Chlordane and Dieldrin may be present in groundwater that discharges to streams and nearshore waters, bioaccumulation in fishes caught in nearshore waters with limited circulation, such as bays and coastal Hawaiian fishponds, would appear to pose a greater health concern. In past studes (see http://www.epa.gov/region9/water/npdes/pdf/sand-island/SI-appl-appxD-chlordane-dieldrin.pdf) for Sand Island WWTP basin, the chemicals were found in urban streams at higher levels than the wastewater collection system. The highest level of Dieldrin measured in streams was about twice the highest level found in the wastewater collection system.The studies also indicated that the maximum level of Chlordane found in stream sediments was 600 times the maximum level found in ocean sediments. It was suspected that the Chlordane found in the sediments

within the Sand Isalnd zone of mixing may have been caused by Chlordane bound to grit and sludge discharged through the outfall between 1976 and 1979 prior to completion of the Sand Island solids handling facilities.

It might be argued that the dispersal of trace amounts of Chlordane and Dieldrin far offshore via sewer infiltration and the outfall could potentially be a benefit by reducing the discharge of the carcinogen in nearshore waters where bioaccumulation is much more likely to occur.

Response: DOH is obligated to implement applicable water quality standards within NPDES permits for parameters for which the Permittee has demonstrated reasonable potential to cause or contribute to an exceedance of water quality criteria. HAR 11-54, 11-55, the STCP, or applicable federal regulations do not provide an exception for legacy pollutants within permittee's effluent.

2. Enterococci (Page 3, Par. A.1) – The proposed effluent enterococci limits of 6,510 CFU/100 mL (average monthly) and 93,186 CFU/100 mL (maximum daily) should be eliminated. A costly upgrade of the disinfection system to lower enterococci levels should be justified by presenting data showing that water quality violations are occurring and that the violations can be attributed to the discharge. Expenditure of funds for effluent disinfection would provide little measurable benefit and waste funds that could be used for more effective public health protection actions.

   Both enterococci concentrations and outfall dilution factors can vary considerable. The assumption that the maximum enterococci concentration and minimum dilution occurs at the same time is overly conservative. Furthermore, there may be enterococci die-off occurring during transmission of the flow from the KRWWTP to the zone just outside the outfall diffuser ports. Exposure of the enterococci in the effluent to rapid changes in osmotic pressure from differences in salinity of the KRWWTP, the Marine Corps Base Hawaii's effluent, and saline seawater would tend to promote some enterococci die-off. It would appear that additional monitoring and statistical analysis of the data to support the proposed enterococci limits is justified.

   Response: DOH is obligated to implement applicable water quality standards within NPDES permits for parameters for which the Permittee has demonstrated reasonable potential to cause or contribute to an exceedance of water quality criteria. The discharge consists of treated sewage which may contain pathogens at elevated concentrations if not properly disinfected, sufficient to impact human health or the beneficial uses of the receiving water. Consistent with 3.3 of EPA's TSD, the regulatory authority should consider additional information discussed under Section 3.2 (i.e., type of industry, type of POTW, type of receiving water and designated uses, etc.) when evaluating reasonable potential. Reasonable potential can be determined without effluent or receiving water exceedances of applicable water

quality criteria. Because the facility is a POTW, and pathogens are characteristic of treated municipal wastewater, and the beneficial uses of the receiving water include recreation where human contact may occur, reasonable potential for enterococcus has been determined. To ensure the protection of human health, this permit establishes effluent limitations for enterococcus.

HAR, Section 11-54-8(b) establishes water quality objectives for marine recreational waters within 300 meters (1,000 feet) of shore. As discussed in Part E.3.a of the Fact Sheet, the proposed permit establishes receiving water limitations for marine recreational waters within 300 meters (1,000 feet) from shore based on State regulations contained in HAR, Chapter 11-54. Federal regulations at 40 CFR 131.41(c)(2) establish water quality standards for bacteria in marine waters beyond 300 meters from shore, based on CWA Section 304(a). 40 CFR 122.44(d)(1)(vi)(B) states that where a State has not established a water quality criterion for a specific pollutant with reasonable potential, the permitting authority must establish effluent limitations on a case-by-case basis, using EPA's water quality criteria published under Section 304(a) of the CWA. Since Outfall Serial No. 001 is beyond 300 meters (1,000 feet) off shore, there is no applicable State water quality objective for the discharge, and EPAs criteria for enterococcus specified in 40 CFR 131.41 is applicable.

As described in the fact sheet, the use of a minimum initial dilution of 185:1 was used to calculate the proposed effluent limitations for enterococcus. Although human contact with the receiving water may be infrequent, human contact within the zone of mixing may occur, thus for the protection of human health due to the potential for acute illness from pathogens the initial dilution was determined to be appropriate. The use of the initial dilution is intended to be protective of water quality standards, beneficial uses, and human health. Human health may be impacted from short term exposure to elevated concentrations of pathogens, thus the provided dilution must be conservative to account for all reasonable discharge scenarios. Further, the initial dilution used to calculate the proposed effluent limitation currently represents the only known dilution for the outfall.

Currently, the "simple ban of recreational activities in the vicinity of the outfall" is not a viable option, and results in an immediate impact on the beneficial uses of the receiving water, which include recreation.

3. Ammonia (Page 4, Par. A.1) – The proposed ammonia limit of 10,800 µg/L (single sample maximum) is unreasonable and should be eliminated. Continued receiving water monitoring should be adequate to detect and evaluate adverse impacts from the discharge.

The use of a single sample maximum limit is not consistent with the intent and basis of the WQS. The basis of the standards is explained in the report, "Water Quality Program for Oahu with Special Emphasis on Waste Disposal, Final Report, Work Area 4, Water Quality Standards and Criteria," City and County of Honolulu, April 1972, prepared jointly by Engineering Science, Inc.; Sunn, Low Tom and Hara, Inc.; and Dillingham Corporation. An excerpt from this report is presented in Attachment No.1. The WQS clearly recognizes that measured water quality parameters will vary due to many factors and that high values will occur periodically.

Another important document that addresses the basis of the WQS is the 208 Plan report, "An Ecosystem Approach to Water Quality Standards, Report of the Technical Committee on Water Quality Standards," December 1, 1977, prepared by Department of Health, State of Hawaii. Relevant excerpts from the report are presented in Attachment No.2. The report recommends obtaining sufficient samples taken over a year to be 95 percent confident that the measured geometric mean is within about 20 percent of the true geometric mean. The Fact Sheet does not discuss the adequacy of the data in meeting this confidence level.

Compliance with WQS and the need for additional treatment should be based on long term trends as well as evidence of adverse impacts. The Fact Sheet provides no evidence of adverse water quality or ecosystem impacts.

Due to development in the region, changes to the ambient water quality and background constituent levels are possible. The WQS was based on relatively small sampling data set that was obtained over 40 years ago. Comprehensive collection and analysis of new water quality data is long overdue. The WQS limits and pollution control strategies must be periodically reevaluated to include consideration of possible changes in background levels and the causes of the changes. There is a clear need to examine both the original data and current water quality conditions for the control and ZOM stations to evaluate whether any water quality degradation can be attributed to the outfall discharge. If water quality is being degraded by stormwater, pollution control funding should be focused on improving stormwater quality.

It is imperative to understand that our marine outfalls, current structure, bathymetry, and receiving water inhabitants and ecosystems differ from what is encountered in the continental U.S. The WQS are based monitoring and investigations conducted in the early 1970's as part of the previously mentioned Water Quality Program for Oahu. The deep ocean outfalls are designed to meet the WQS, and together with other water quality programs, have proven to be effective in protecting public health and the environment over the many decades since the WQS have been implemented.

Determinations of non-compliance and justification for any additional treatment must be based on analyses that are consistent with the statistical basis and intent of the

WQS, which clearly recognizes that conditions can vary significantly in the natural environment. While application of standard accepted procedures used elsewhere may facilitate development of permit limits, application of a statistically invalid approach would not be beneficial to the public or the environment.

Removing nutrients as well as other constituents when it is not necessary is actually detrimental to the environment and is a heavy finical burden. Nutrient removal processes require significant additional infrastructure, funding, and expenditure of energy. Both capital and annual operating costs associated with new nutrient removal process would be significant. These funds could clearly be used for more effective environmental protection and enhancement projects.

Increased energy use would result in increased production of green house gases, which has grown to be a significant environmental concern. Since the environmental benefits would be negligible, the funds for nutrient removal would essentially be spent to harm the environment. There is clearly a dire need to revise and update the water pollution regulations to consider impacts on air quality and long-term sustainability.

Response: DOH is obligated to implement applicable water quality standards within NPDES permits for parameters for which the Permittee has demonstrated reasonable potential to cause or contribute to an exceedance of water quality criteria. Further, as previously discussed in this response to comments, the effluent limitations for ammonia nitrogen is based on estimated current treatment performance, and costly facility upgrades are not expected to be necessary for the Permittee to comply. Applicable effluent limitations for ammonia nitrogen have been included in the proposed permit based on the requirements and HAR 11-54 and 11-55.

The fact sheet provides a comparison of annual geometric means to applicable water quality standards. Annual geometric means represent a reasonable period to observed season variations within the receiving water, and determine negative impacts on the receiving water (exceeding water quality standards at the edge of the ZOM). Comments regarding the water quality standards are outside the scope of this response to comments, and are appropriate during revisions of the water quality standards.

The use of a single sample maximum in the proposed permit is based on observed facility performance, and is being applied to maintain the current treatment performance demonstrated by the Permittee over the last several years to minimize the potential for additional exceedances of water quality standards at the edge of the ZOM. Because an applicable dilution is not currently known for the edge of the ZOM, water quality-based effluent limitations using a dilution and water quality criteria

cannot be calculated. A requirement to evaluate dilution and assimilative capacity has been established in the permit, and may be used during future permitting efforts to calculate appropriate end-of-pipe effluent limitations. Until that information is available, maintaining current treatment capabilities, and evaluating compliance at the edge of the ZOM is reasonable to protect water quality and implement water quality standards without establishing direct end-of-pipe effluent limitations for ZOM parameters without dilution (since one is not known), or initial dilution (which may be overly stringent at the edge of the ZOM).

4. Nitrate+Nitrite Nitrogen (page 4, Par. A.1) – The proposed nitrate + nitrite nitrogen limit of 15,000 ug/L (single sample maximum) is also unreasonable and not beneficial to the environment. Upgrading treatment to meet this limit potentially requires a tremendous capital outlay and will not result in any benefit to the environment. There is no evidence that nitrate + nitrite nitrogen discharged through the outfall has any adverse impacts on the marine environment. Financial and adverse environmental impacts and reasons for eliminating the proposed limit discussed above for ammonia similarly apply for nitrate + nitrite nitrogen

   A dilution factor for the ZOM should be determined and evaluated Establishment of unreasonable and unjustified effluent limits that could result in tens of millions of dollars in additional capital and operating costs due to the absence of dilution factor calculations is unconscionable. The need to meet a stringent nitrogen limit such as the one being proposed will cause wastewater treatment costs to escalate significantly. The KRWWTP uses a trickling filter/solids contact process that probably cannot be economical modified to meet the proposed limit.

   The primary purpose of limiting nitrate + nitrite nitrogen in the receiving water is to curtail excessive algal growth. There is no evidence of excessive algal growth caused by the discharge from the outfall. It should be noted that algal blooms, instead, have occurred at the mouths of Windward Oahu streams as a result of nutrients in stormwater runoff. If any funds are to be expended, they should be directed to improving stormwater quality, where at least some benefits may be realized.

   Attachment No.3 provides a brief summary of marine ecosystem monitoring work performed by University of Hawaii researchers. Although the summary was prepared in 2000, it provides a good synopsis of the intensive biological monitoring that has been performed and the lack of adverse impacts. Monitoring to evaluate compliance with WQS limits is helpful, but these in-depth studies present a more accurate picture of actual impacts, or in this case, the absence of impacts. Hawaii's very stringent WQS were focused on protecting sensitive tropical reef systems and the results of extensive monitoring and research work verifies that the deep ocean effluent discharges are not contributing to degradation of the sensitive ecosystems.

Response: DOH is obligated to implement applicable water quality standards within NPDES permits for parameters for which the Permittee has demonstrated reasonable potential to cause or contribute to an exceedance of water quality criteria. Further, as previously discussed in this response to comments regarding ammonia nitrogen, the effluent limitations for nitrate + nitrite are based on estimated current treatment performance, and costly facility upgrades are not expected to be necessary for the Permittee to comply. Applicable effluent limitations for nitrate + nitrite have been included in the proposed permit based on the requirements and HAR 11-54 and 11-55.

The use of a single sample maximum in the proposed permit is based on observed facility performance, and is being applied to maintain the current treatment performance demonstrated by the Permittee over the last several years to minimize the potential for additional exceedances of water quality standards at the edge of the ZOM. Because an applicable dilution is not currently known for the edge of the ZOM, water quality-based effluent limitations using a dilution and water quality criteria cannot be calculated. It is the responsibility of the Permittee to provide all relevant information during the permitting process. A requirement to evaluate dilution and assimilative capacity has been established in the permit, and may be used during future permitting efforts to calculate appropriate end-of-pipe effluent limitations. Until that information is available, maintaining current treatment capabilities, and evaluating compliance at the edge of the ZOM is reasonable to protect water quality and implement water quality standards without establishing direct end-of-pipe effluent limitations for ZOM parameters without dilution (since one is not known), or initial dilution (which may be overly stringent at the edge of the ZOM).

5. Concluding Statements – It is recommended that a comprehensive water quality monitoring program be implemented to obtain updated water quality data. This could serve as the basis for preparing a much needed update to the WQS and also facilitate evaluation and verification of impacts from the various outfalls and nonpoint sources. The WQS should be revised to include detailed information on appropriate statistical analyses procedures to be used in analyzing monitoring data to ensure that the data is properly interpreted.

   There are significant consequences of imposing excessively stringent effluent limits without strong justification and comprehensive analyses of pollutant sources, water quality data, and ecosystem impacts. It will be difficult to relax the limits in the future despite subsequent availability of supporting data due to the anti-backsliding provisions. Furthermore, unreasonable effluent limits will only lead to an appeal and possible litigation that will further consume the limited manpower and financial resources of the stakeholders. It would be in the best interest of the stakeholders

and the environment to defer establishment of the new effluent limits discussed above during this permit cycle.

I would urge the permit writers to keep an open mind, and take a scientific and common sense approach to developing effluent limits for the KRWWTP and other treatment plants throughout the state. Please allow our utility agencies to direct limited financial resources to pollution and public health enhancement projects that will result in measurable benefits.

Response: Comment acknowledged.

Comments received from Mr. Lee Mansfield, P.E.

I wish to submit these comments as a concerned citizen and tax payer residing in the Kailua community. I am a licensed professional chemical engineer in the State of Hawaii with 25 years of consulting experience in the area of water and wastewater treatment and I have 12 years of managing the operations of a 5.2 MGD wastewater treatment plant on the island of Oahu.

My educational background includes a B.S. degree in chemical engineering from Ohio University and a M.S. degree in chemical engineering from Case Western University. My area of expertise is plant design and operations. In my career, I have designed three major wastewater treatment plants, including the secondary plant serving the Kailua and Kaneohe communities.

The technical and scientific concerns with the proposed changes have been very well presented in the comments prepared by Dr. James Kumagai and Roy Abe. I share their views and concur with their recommendations. In addition to these, I wish to offer the following:

The proposed limits for nutrients, Chlordane and Dieldrin will require a very major investment in plant upgrades and a significant increase in operational costs is a fact that is certainly not in dispute. Moreover, these upgrades will result in significant environmental impacts of their own, such as increased solids disposal and the production of greenhouse gas resulting from the generation of electricity needed for the additional, or expanded, plant processes. I feel strongly that before such standards are promulgated, a detailed cost-benefit study be completed. We all must realize that resources are limited and to allocate capital and incur significant ongoing expenses without producing a benefit commiserate with the investment would be a grievous error. Only by the completion of such a study can one rest assured that resources will be allocated appropriately to address real environmental issues and produce tangible results of value to our community.

In my lifetime and throughout my career, I have seen the Clean Water Act bring real improvements to the environment, such as the dramatic improvement of water quality in our Great Lakes, Honolulu Harbor, and Kaneohe Bay. Only through the proper allocation of our limited resources will we be able to continue to improve our environment and as such respect and honor the spirit of the Clean Water Act.

Response: Please see responses to comments prepared by Dr. James Kumagai and Mr. Roy Abe above.