CCN: CTO-0026/0445
FILE: 0208

MEETING MINUTES

Meeting Subject:	Meeting Date: 01 April 1997
Technical Workshop Site 7 - West Basin Long Beach Naval Complex	Meeting Time: 0930 BNI - Norwalk Conference Room 6W

Attendees:

SWDIV	BNI	Agencies
Mike Radecki (RPM)	Krish Kapur (PM)	John Christopher, Cal-EPA/DTSC
Alan Lee	Ömer Kadaster (K) (CTOL)	Alvaro Gutierrez, Cal-EPA/DTSC
Chris Leadon (RTM)	Sharon Ohannessian (K)	Laurie Sullivan, NOAA
Anna Ulaszewski (LBNSY)	Tom McDonnell (BC)	Martin Hausladen, USEPA - Region IX
	Serge Baghdikian	Ned Black, USEPA - Region IX
		Sophia Serda, USEPA - Region IX
		Nancy Musgrove, Weston (USEPA)
		Patricia Velez, Cal-DFG
		Max Puckett, Cal-DFG
		Carol Roberts, USFWS

BC = Brown and Caldwell
K = Kleinfelder

Copies to:		
Walter Sandza, SWDIV	Jim Moe, BNI	Alex Fu, RWQCB-LA
Tony DiDomenico, SWDIV	John Kluesener, BNI	Karla Brasaemle, Weston (USEPA)
	Bong Kown, BNI	
	Noriko Kawamoto, BNI	

Mike Radecki, RPM, welcomed the attendees and called the meeting to order. Mr. Radecki informed everyone that this workshop would be tape recorded for a more complete record of the meeting.

Mr. Gutierrez stated that Michael Lyons was no longer involved with this project; Mr. Alex Fu will be replacing Mr. Lyons.

The objectives of the meeting were to discuss the joint Agency/Trustee memorandum of 04 March 1997, to discuss the remaining Agencies' and Trustees' responses to BNI/SWDIV responses to comments on the Draft RI Report, and to discuss the results of

the additional data evaluations conducted by BNI pursuant to the joint Agency/Trustee memorandum of 05 August 1996.

Regarding the 04 March 1997 memorandum, Mr. Radecki asked the Agencies/Trustees where the remaining concerns stated in the memo fit in to the completion of the RI Report. Laurie Sullivan responded that the purpose of the 04 March 1997 meeting was to ensure that all of the comments contained in the joint memorandum of 05 August 1996 were being covered by SWDIV/BNI. The memorandum resulting from the 04 March 1997 meeting contains information regarding how the Agencies/Trustees would like to see the data presented in the Final RI Report. John Christopher added that each of the 9 concerns in the 04 March 1997 memo may not need to be presented formally in the final document. Alvaro Gutierrez, however, requested that all 9 concerns be responded to in writing. Ms. Sullivan added that the 9 concerns were not meant to be new ideas. BNI disagreed, the 04 March 1997 concerns looked like new concepts in that they appear to move away from the sediment evaluation zone (SEZ) concept and towards a station-by-station data interpretation approach. Only the Reference Station 40010 issue looks familiar. The 9 concerns appear to request a different method for drawing conclusions from the data. Ned Black responded that he did not find that the cluster analysis work was not answering the Agencies questions; the 9 points are meant to be requests for data presentations in addition to the SEZ approach.

BNI then requested from the Agencies/Trustees a distinct statement of the question that the 9 concerns are intended to answer. Martin Hausladen asked if SWDIV/BNI wanted the rationale behind the 9 concerns. BNI responded that both the rationale and the question behind the 9 concerns were important. Mr. Gutierrez interjected that DTSC wants to arrive at a conclusion to the Site 7 RI. There have been too many data analysis iterations on this project.

Nancy Musgrove stated that the EPA would like to have the data analysis effort consolidated and simplified; results of the station-by-station analysis should be the building blocks for the SEZs. Mr. Kadaster pointed out that the definition of SEZ in the risk assessment work plan differs from the definition of SEZ just provided by Ms. Musgrove. Mr. Leadon suggested that the plots of chemistry concentration gradients in Section 4 of the Draft RI Report could be used to create SEZs.

Mr. Christopher stated that the general response of the Agencies/Trustees to the final evaluation matrix presented in the Draft RI Report was that the results could not be correct. Based on a brief review of the SEZ package containing the newly developed clusters and SEZs (only Ms. Sullivan had reviewed the final SEZ package sent by SWDIV/BNI prior to the 04 March 1997 joint Agency/Trustee meeting), Mr. Christopher stated that SWDIV/BNI appears to be headed in the right direction. However, the Agencies/Trustees still requested a different summary of the data (using numbers) in an evaluation matrix, as described in their 04 March 1997 memo. A general discussion ensued regarding how the summary matrix should be constructed.

Mr. Kadaster asked that the Agencies/Trustees explain each of the 9 concerns in the 04 March 1997 memorandum. Ms. Sullivan took the lead in the point-by-point discussion.

Concern Number 1: The Agencies/Trustees request that the maximum reference value be used rather than the upper predictive limit (UPL) to compare against West Basin data, because all calculated UPLs are much higher than the maximum reference data value.

Concern Number 10: The Agencies/Trustees request that Reference Station 40010 not be used in the reference data pool. Mr. Radecki responded that SWDIV/BNI agreed to conduct additional data analyses without Reference Station 40010. However, the rationale/data supporting the Agencies/Trustees stance on Reference Station 40010 has still not been presented to SWDIV/BNI. Mr. Kadaster stated that the rationale/data behind dropping Reference Station 40010 from the reference data pool is very important; the rationale must be included in the Final RI Report. SWDIV/BNI must technically justify why samples were collected at Reference Station 40010 per the Work Plan, but the data are not being utilized in the final analyses. Ms. Musgrove responded that Reference Station 40010 had elevated chemistry and deleterious biological effects. Mr. Puckett suggested SWDIV/BNI re-evaluate the project reference criteria. Mr. Puckett went on to discuss CDFG's sediment monitoring efforts that included Reference Station 40010. The CDFG monitoring data support the allegations that there is a lot of chemistry at Reference Station 40010; some chemicals have been found at very high concentrations. Mr. Christopher agreed that Reference Station 40010 is not representative of regional DDT and PCB contamination, and should not be used. Agencies/Trustees collectively declared that Reference Station 40010 should not be used in the analyses.

Mr. Leadon stated his concern about defining a "pristine" background condition. If near-shore areas are not used as reference conditions, SWDIV may be faced with remediating sediments to near pristine conditions. Sediment representing industrial conditions in San Pedro Bay will eventually be transported back into the West Basin over time.

Mr. Gutierrez asked SWDIV if an Agency/Trustee position paper with supporting documentation regarding not utilizing Reference Station 40010 would be acceptable. Mr. Radecki and Mr. Kadaster responded that such a position paper would be acceptable, and that SWDIV/BNI has been waiting for such a document.

Mr. Christopher reminded the attendees that the RWQCB is the most knowledgeable Agency regarding tolerable contaminant levels for reference stations.

Mr. Puckett discussed CDFG's reference station criteria: the first criterion to be met is a healthy benthic community; the second criterion is minimal contamination; the third criterion is minimal toxicity. Mr. Puckett then stated that he would not drop Reference Station 40010 from the reference data pool if the project was a long-term monitoring program, but because Site 7 sampling event was a "snapshot" and not a long-term monitoring, Reference Station 40010 should not be used in the analyses.

Carol Roberts stated that USFWS preferred to defer to the RWQCB for acceptability of reference stations.

Mr. Christopher reflected that the acceptability of Reference Station 40010 may be a moot point. Using DDT as an example, not many areas within the West Basin exceed the ER-L for DDT (based on the concentration contour maps presented in Section 4 of the Draft RI Report). Therefore, regardless of whether or not concentrations exceed reference, many chemicals in West Basin sediments do not exceed effects-based concentration guidelines.

Mr. Leadon stated that the Agencies/Trustees must prove that Reference Station 40010 is polluted before he would agree to dropping it from the reference data pool; and that not using Reference Station 40010 is changing the statistical model of the project. Mr. Gutierrez committed to an Agency/Trustee submittal of a position paper and supporting data regarding Reference Station 40010.

Concern Number 2: The Agencies/Trustees request that polychaete bioassay control data be used to compare against West Basin data, because the reference station polychaete data failed the specified performance standard. By comparing West Basin polychaete data to laboratory control data, results from the polychaete bioassays may still be used in the RI. BNI disagreed; it is inappropriate to use laboratory controls in place of general conditions. The polychaete reference data passed QA/QC, they just did not pass reference performance criterion. Mr. Christopher replied that a high weight should not be placed on the polychaete bioassay data, however the data are used. All of the Agencies/Trustees except for EPA expressed a desire to drop the polychaete bioassay data for purposes of developing RI conclusions. Mr. Christopher stated that the only use for the polychaete bioassay data is to determine the extent of West Basin contamination, or as a "tie-breaker" if a station is questionable as to whether it should be classified an area of concern (AOC) or a non-AOC. Mr. Radecki stated that SWDIV/BNI will create a position paper for the Agencies/Trustees regarding the use of polychaete bioassay reference versus laboratory control data for comparing against West Basin data.

Concern Number 3: The Agencies/Trustees request that pier and non-pier stations be separated for purposes of data analysis and presentation. Mr. Leadon disagreed with not using benthos data for interpreting beneath-pier sampling stations. Ms. Sullivan suggested ranking the piers amongst each other using the benthic data (i.e., define an internal reference pier). BNI stated that it would prefer the benthic data remain in the evaluation matrix. Ms. Musgrove suggested defining an internal reference pier as one which had relatively low chemistry and toxicity, and one which had an evenly distributed benthic population of mollusks, amphipods, crustaceans, and polychaetes. Mr. Kadaster asked how "hits" would be determined with no outside reference station. Mr. Black suggested determining a range of pier conditions/biological responses. Ms. Musgrove reiterated that a pier with no chemistry or bioassay hits may be considered an internal reference. Mr. Christopher replied that an internal reference pier cannot be defined because all of the piers exhibited 0% normal echinoderm development. Mr. Christopher then suggested using amphipod bioassay results to determine which piers were worse than others. Mr. Radecki stated that based on chemistry and toxicity, Pier 1 (station 52) could be a reference pier candidate. The Agencies/Trustees stated that defining Pier 1 as an internal reference pier should not be construed to mean that Pier 1 is not impacted and does not need remediation.

Concern Number 6: The Agencies/Trustees request that only the benthic community parameters dominance, richness, major taxa abundance, total abundance, and +/- index be presented, otherwise, the benthic community data presentation becomes too confusing. BNI asked why diversity indices were not included in the request. Ms. Musgrove replied that richness is the most direct measure of diversity. Most of the attendees did not recognize the +/- index. Mr. Puckett explained the index as an indicator species approach to benthic community analysis which does not rely on a pristine reference for comparative purposes. CDFG is in the early stages of utilizing the approach in their monitoring programs; the Los Angeles Harbor area index is based on historical data. Mr. Radecki expressed reluctance to using the +/- index for purposes of the Final RI Report because of its unfamiliarity to SWDIV/BNI and most of the Agencies/Trustees. Mr. Puckett agreed to send additional information to SWDIV/BNI concerning CDFG's development of the +/- index.

Lunch break.

Concern Number 4: The Agencies/Trustees request a station-by-station evaluation matrix showing exceedances over maximum reference and ER-L values. The matrix should also show the number of exceedances, or the sum of calculated ratios above threshold criteria. Mr. Kadaster suggested that fish data be dropped from the matrix as fish were not tied to any sediment sampling station. Agencies/Trustees agreed to drop fish data from the matrix. Mr. Leadon responded that he does not want to use ER-Ls/ER-Ms as action levels. Mr. Kadaster stated that a look-up table is still needed for purposes of classifying West Basin sampling stations. Mr. Black added that a weighting system is also needed. Ms. Musgrove stated that endpoints need to be classified for each station for decision-making purposes. Mr. Puckett asserted that the number of exceedances per station should be used for decision-making purposes. Mr. Black stated that the basic question to be asked is: What do the data tell us?

Mr. Leadon declared that SWDIV/BNI have already completed a lot of work using SEZs; the Agencies/Trustees appear to keep reinventing the study with each workshop. Mr. Puckett replied that since the data set already exists, it should not be difficult to additionally present the data in the manner requested in the 04 March 1997 memorandum.

Mr. Black stated that the evaluation matrix must be prepared prior to defining station classifications. He also stated his dislike of an overall summed index for each station. Mr. Christopher disagreed with Mr. Black regarding when to define classifications. Mr. Christopher does not want to compare the site against itself; he would prefer to define classifications prior to developing the evaluation matrix. BNI responded that no matter when classifications are defined, a weighting system will still be needed.

The Agencies/Trustees agreed that all exceedances above maximum reference values and ER-Ls/ER-Ms should be presented as ratios or quotients. Mr. Christopher proceeded to sketch two example data presentation tables. The first showed the quotients of station chemistry data divided by threshold criteria (e.g., maximum reference, ER-L/ER-M). The second table showed a summary of the number of chemistry and bioassay endpoint

exceedances using ratios (e.g., for chemistry per station, the number of chemicals exceeding a specific threshold criteria would be in the numerator, the total number of chemicals analyzed for would be in the denominator). Ms. Musgrove suggested that for the exceedances table, only the ratios greater than 1 should be presented. Many of the attendees disagreed; eliminating ratios less than 1 would not take into account chemical additivity.

BNI questioned how non-detected chemicals would be accounted for in determining ratios above reference. Mr. Black stated that other studies have used one-half the detection limit to calculate ratios above threshold criteria. Mr. Christopher disagreed with the one-half detection limit approach; he does not want hazard quotients calculated using non-detected chemicals. Ms. Sullivan agreed with Mr. Christopher as long as detection limits meet pre-selected criteria. Mr. Puckett stated that CDFG uses one-half the detection limit in their work, but he would not object if this project chose to leave out non-detected chemicals in calculating ratios.

The Agencies/Trustees requested a break to come to a consensus on how to account for non-detected chemicals and present the evaluation matrix.

The meeting resumed with Mr. Black presenting the Agencies/Trustees stance on non-detected chemicals. If a non-detected chemical's detection limit is equal to or greater than the respective ER-L, then use the detection limit as the value for calculating ratios. If a non-detected chemical's detection limit is less than the ER-L, the value for that chemical should be zero. Mr. Black then proceeded to sketch two tables that the Agencies/Trustees agreed would best suit the data in terms of presentation. The Agencies/Trustees stated that once SWDIV/BNI has completed the preparation of the suggested data tables, they would like to review such tables in addition to the cluster and all other data analyses prior to developing the risk characterization process.

The Agencies/Trustees scheduled their next joint meeting for 15 April 1997. SWDIV/BNI committed to sending the Agencies/Trustees the matrix tables described by Mr. Black by 09 April 1997. The next project workshop was scheduled for 28 April 1997 at the Naval Shipyard, Long Beach. SWDIV/BNI requested a summary of the Agencies/Trustees 15 April meeting prior to the 28 April workshop.

Concern Number 8: The Agencies/Trustees request that the station-by-station matrix be sorted by SEZs. Mr. Kadaster requested Agency/Trustee feedback on the SEZs prior to conducting this task.

Concern Number 7: The Agencies/Trustees requested a map of the rejected tributyltin data. Mr. Kadaster showed an illustration of rejected TBT data distribution. Mr. Radecki revealed an inconsistency between the text and the spreadsheet attached to the text of the 04 February 1997 letter from Roger McGinnis to Mr. Hausladen regarding the revised validation of Site 7 organotin data, and asked for a clarification. Mr. Hausladen stated that a clarification will be issued. Mr. Kadaster noted that according to the Weston report, only 5 percent of the TBT data was rejected, not 25 percent as previously mentioned.

Upon learning that those present had not received copies of the Weston report on its validation of the TBT data, BNI distributed copies of the report to the attendees.

Upon concluding the discussion of the 04 March 1997 memorandum, Mr. Radecki solicited from the Agencies/Trustees further responses to SWDIV/BNI responses to comments. CDFG was still waiting for a completion of the SWDIV/BNI responses to their QA/QC comments of June 1996. BNI asked CDFG to identify which documents it was missing. Mr. Puckett stated that he will check and inform BNI.

Mr. Radecki asked the Agencies/Trustees when SWDIV/BNI should expect to receive their final responses to the response to comments of the Draft RI Report. Ms. Velez said that she was still waiting for SWDIVs/BNIs response to the Joint Agency memorandum. Mr. Kadaster responded that the 3 submittal packages of cluster analyses constitute SWDIVs/BNIs response to the Joint Agency memo of 05 August 1996. Ms. Sullivan committed to responding to the comment/response package by 04 April 1997.

Mr. Kadaster then elicited questions regarding the final cluster analysis package. BNI proceeded to discuss the rationale behind the cluster groupings and SEZ definitions based on the additional cluster analyses. It was determined by the Agencies and Trustees that the SEZ approach would be abandoned, and the station-by-station approach would be adopted.

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MEETING MINUTES

Meeting Subject:	Meeting Date: 28 April 1997
Technical Workshop Site 7 - West Basin Long Beach Naval Complex	Meeting Time: 0930 Long Beach Naval Shipyard Building 300 Conference Room 525A

Attendees:

SWDIV	BNI	Agencies
Mike Radecki (RPM)	Ömer Kadaster (K) (CTOL)	John Christopher, Cal-EPA/DTSC
Alan Lee	Sharon Ohannessian (K)	Alvaro Gutierrez, Cal-EPA/DTSC
Chris Leadon (RTM)	Tom McDonnell (BC)	Sharon Lemieux, Cal-EPA/DTSC
Anna Ulaszewski (LBNSY)	Serge Baghdikian	Laurie Sullivan, NOAA
Bill Fisher	Robert Tait	Martin Hausladen, USEPA - Region IX
		Tom Huetteman, USEPA - Region IX
		Ned Black, USEPA - Region IX
		Judith Winchell, USEPA - Region IX
		Nancy Musgrove, Weston (USEPA)
		Patricia Velez, Cal-DFG
		Max Puckett, Cal-DFG
		Hugh Marley, RWQCB
		Carol Roberts, USFWS (by telephone)
	BC = Brown and Caldwell	
	K = Kleinfelder	

Copies to:		
Tony DiDomenico, SWDIV	Jim Moe, BNI	Alex Fu, RWQCB-LA
	John Kluesener, BNI	Karla Brasaemle, Weston (USEPA)
	Bong Kown, BNI	
	Noriko Kawamoto, BNI	

Mike Radecki, RPM, welcomed the attendees and called the meeting to order. Mr. Radecki informed everyone that this workshop would be tape recorded for a more complete record of the meeting.

Mr. Radecki began the discussion with a brief history of how the Site 7 project evolved over the past years. The project began 4 years ago, CLEAN I Work Plans were revised,

sampling was conducted in 1994, samples were sent to the laboratory for analysis, laboratory data were validated by an independent laboratory then revalidated by the Agencies/Trustees and found to be 95% good and useable, data were analyzed from late 1994 through 1995, the Draft RI Report was issued in spring 1996, and then more meetings and workshops with the Agencies/Trustees were conducted. The receipt of comments on the Draft RI Report from the Agencies/Trustees and public (RAB) began the start of a new phase for the project. Comments included allegations that the data were "bad" and statistical analyses were incoherent. SWDIV questioned the intent of such comments and requested that those making such comments and allegations consider where the project was headed. The direction of the project was clarified over the past several months after several technical workshops with the Agencies/Trustees concluded the following: in excess of 95% of the analytical data were accepted by the Agencies/Trustees; several alternative methods of data analyses were requested by the Agencies/Trustees and agreed upon; and the use of all reference stations (n = 7) were accepted by the Agencies/Trustees. SWDIV maintained that for the most part, the information presented in the Draft RI Report was accurate.

The current status of the project includes a presentation to the Agencies/Trustees of the station-by-station data analysis conducted by BNI as agreed upon in the previous workshop (01 April 1997) with the use of Reference Station 40010. Inclusion of Reference Station 40010 (n = 7) did not significantly alter the results when compared with the results of the previously completed station-by-station analysis without the use of Reference Station 40010 (n = 4). SWDIV is ready to close-out the RI and move on, with the following general conclusions: 12 to 14 stations do not warrant further action; 9 to 10 stations warrant further evaluation; all remaining stations fall somewhere in the middle. The appropriate course for decision-making is to conduct a Feasibility Study (FS) which will review remedial alternatives and their impacts. Thus, the Site 7 team must devise a meaningful process to achieve RI closure. Mr. Radecki then asked if the participants had any questions or comments; none were offered.

Omer Kadaster next discussed the project schedule. The Draft Final RI Report is due 01 July 1997, however, this delivery date is contingent on BNI writing the report during May and June, and on the premise that the Agencies/Trustees do not have further requests of other methods of data analyses. Therefore, the outcome of this workshop is important regarding schedule impacts. If the BNI team can begin to prepare the Draft Final Report immediately, the project deadline can still be met, otherwise delays in report delivery will occur. Mr. Kadaster then asked the Agencies to share the results of their joint 15 April 1997 meeting.

Ned Black responded that two objectives were accomplished at their 15 April 1997 meeting: 1) Reference Station 40010 data (obtained from SWDIV and RWQCB) were reviewed, and while in hindsight the Agencies/Trustees would not choose it today as a reference station, they could not oppose its use for purposes of the Site 7 RI; and 2) the Agencies/Trustees internally agreed upon sampling stations within West Basin that represent areas of contamination. Before revealing such stations, however, Mr. Black asked that SWDIV disclose the results of their station-by-station data analyses.

John Christopher revealed that Laurie Sullivan had prepared a memorandum regarding the outcome of the 15 April 1997 joint Agency/Trustee meeting ; that this memo had not been provided to SWDIV as of 28 April 1997; and that the Agency/Trustee upper management had decided not to release it to SWDIV. Mr. Christopher continued by stating that the Agencies/Trustees had examined the station-by-station data (n = 4) provided to them by BNI, and had calculated new ratios of chemistry concentrations to reference station data that included Reference Station 40010 (n = 7). Using comparisons to reference stations and ER-Ms, they then categorized the West Basin stations. PCB and mercury concentrations predominately defined the West Basin, with one or two stations exhibiting silver "hits". The areas with the highest chemistry were stations along the north seawall, the Shipyard area, and adjacent to Site 3 on the Mole. Station 17 was quite unique because of high levels of chemistry. Toxicity data were difficult to interpret due to the broad-based nature of the three bioassays. Therefore the Agencies/Trustees relied more on chemistry concentrations to categorize Site 7, as well as benthic community data as described by the Swartz dominance index. It was Weston's opinion that dominance is the most useful indicator of low species diversity.

Mr. Kadaster asked to see the Agencies/Trustees categorization of West Basin stations, so that the team could compare it to SWDIV/BNI interpretation.

The Agency/Trustee station categories were then presented by Mr. Christopher as follows:

- PCBs: Stations 10, 13, 17, 22, 27 (ratio to reference [RTR] > 1 and ratio to ER-M [RTERM] > 2).
- DDT: Station 17 (RTR > 1 and RTERM > 1).
- Total PAH: No stations had RTERM > 1.
- Total PAH: Stations 10 and 21 (RTR > 1 and ratio to ER-L > 1).
- Metals:
  - a) individual metal RTERM > 1:
    - Stations 3, 4, 11, 21, 27, and 41 (mercury).
    - Station 17 (copper, mercury, silver, and zinc).
    - Stations 26 and 28 (silver).
  - b) sum of metal RTERM > 2:
    - Stations 2, 10, and 22 (copper, mercury, and silver).
- Dominance: Stations 5, 9, 10, 12, 15 (Swartz benthic community dominance index< 0.5)

Mr. Kadaster remarked that the Agencies/Trustees had appeared to have used ER-Ls and ER-Ms to define "hits". Ms. Sullivan commented that a ratio to ER-M of greater than 2 (instead of 1) was used to categorize stations with elevated PCB concentrations because of the inherent uncertainty in the PCB ER-M value (per Ed Long of NOAA).

Weston commented that the low benthic community dominance observed at Stations 9, 12, and 15 was probably due to physical impact (e.g., prop wash and scour).

The Agencies concurred that the stations were basically categorized by exceedances of ER-Ms. Mr. Black reiterated that the bioassay data were not without value; the data were incorporated in the Agency/Trustee categorization process. However, they were at cross-roads with the echinoderm bioassay results. If the Agencies/Trustees used such data in their decision-making process, the result would greatly increase the number of stations on their "hot" list. Un-ionized ammonia and hydrogen sulfide data should hopefully explain some of the echinoderm bioassay results.

SWDIV/BNI held a brief caucus prior to presenting their station categories.

Mr. Radecki resumed the workshop by stating that SWDIV/BNI's categorization of West Basin stations is in general similar to that of the Agencies/Trustees. The departure point between the two methods is the use of ER-Ms. Chris Leadon stated that at a recent Navy Installation Restoration (IR) workshop, the NAVFAC chief of IR programs did not want ER-Ls/ER-Ms used as clean-up goals. These values are derived using data from all over the country, not just the Southern California or even Pacific Coast area. Even Long and Morgan (1995) write that ER-Ls/ER-Ms should be used as informal screening tools and are not intended to preclude site-specific data. Mr. Leadon reminded the participants that the Site 7 RI is a 5 year scientific study, and the data collected from the West Basin, not data collected from other parts of the country, should be used for purposes of risk characterization. Mr. Radecki said that Agencies/Trustees and SWDIV/BNI were not that much apart, except the two had looked at the data from different perspectives.

Mr. Black responded that the Agencies/Trustees were not setting clean-up levels, only defining areas where risk is present and therefore it was appropriate to use ER-Ms. Mr. Leadon replied that ER-Ms were already used to identify the site for placement into the IR Program.

Mr. Christopher interjected that the Agencies/Trustees compared West Basin data to ER-Ms and the highest concentrations at the reference stations, therefore the ER-Ms were not used blindly. The stations that the Agencies/Trustees delineated at their 15 April 1997 meeting are areas of interest where a problem may exist; the Agencies/Trustees are not dictating anything to SWDIV. Alvaro Gutierrez and Martin Hausladen agreed with Mr. Christopher.

Ms. Sullivan reiterated that the Agencies/Trustees did use all of the RI data and that ER-Ls/ER-Ms are toxicity based values. Although she agreed that such values are based on nation-wide data, she said they are good indicators of toxicity.

Mr. Hausladen questioned whether Mr. Leadon's statements regarding ER-Ls/ER-Ms were SWDIV's official position; if so, the meeting should be stopped, according to USEPA. Mr. Radecki responded that SWDIV has agreed to use ER-Ls/ER-Ms as screening tools, but SWDIV/BNI staff were hearing the use of these values in conjunction with dredging

during the workshop. An agreement has previously been made between the EPA, SWDIV, and NAVFAC at a sediment workshop in 1994 regarding the use of ER-Ls and ER-Ms.

Mr. Kadaster expressed that he was concerned at the elevation of ER-Ls/ER-Ms to a decision-making criteria, and that the RI design was different from the approach taken by the Agencies/Trustees in that the design did not include the use of ER-Ls and ER-Ms in the manner they were being used by the Agencies/Trustees. He then asked the Agencies/Trustees what conclusions they had drawn from their station categorizations. Mr. Black responded that the Agencies/Trustees had only categorized the stations, but had not made any observations or conclusions as to what the categories meant, and that it was SWDIV/BNI's job to tell the Agencies/Trustees the approach needed to form conclusions. Mr. Radecki stated that SWDIV/BNI had been showing the approach to the Agencies/Trustees over the past four years.

Mr. Christopher explained that the Agencies/Trustees did not use ultra cautious criteria to categorize the West Basin stations because 1) they made virtually no use of ER-Ls and therefore did not screen stations at a "No Effects" level, 2) they used reference station concentrations in conjunction with ER-Ms, and 3) they sometimes used 2 times the ER-M as a cut-off.

BNI asked Mr. Christopher why the Agencies/Trustees decided not to use the bioassay data. Mr. Christopher replied that if the Agencies/Trustees had used the echinoderm data in the categorization process, it would have resulted in more stations being placed on the "problem" list (three-quarters of the West Basin had echinoderm hits). The chemistry data do not show a similar pattern. BNI responded that a preliminary look at the pore water chemistry revealed Stations 12, 13, 15, and 16 may have had elevated ammonia concentrations and Stations 24, 25, 31, and 32 may have had elevated hydrogen sulfide concentrations. Total ammonia and sulfide concentrations were measured at the initiation of the echinoderm bioassay. Max Puckett stated that measurements taken at the end of the bioassay would have allowed for a better indication of ammonia or hydrogen sulfide exposure. Mr. Black restated that the echinoderm development results cast a large shadow over the entire West Basin. BNI stated that un-ionized ammonia and hydrogen sulfide calculations were partially completed, and ongoing.

BNI continued the workshop by discussing SWDIV/BNI categorization of West Basin stations. The approach was to assign relative risk at each station based on observations of chemical concentrations exceeding the maximum project reference station value (n =7); ER-Ls/ER-Ms were not used. SWDIV/BNI defined three categories of stations:

- Category 1: Stations with chemistry greater than reference station values (i.e., exceeding the RTR breakpoint of 40, determined by graphing the stations ranked according to cumulative RTRs) and observed biological response from one of the four effects tests (3 bioassays and benthic community analysis). These stations would be moved to the FS for potential remedial action alternatives screening and analyses. These stations include 10, 11, 17, 18, and 41.

- Category 2: Stations with chemistry greater than reference station values, but not exceeding the breakpoint , and an observed biological response from at least some of the four effects tests. This category includes a broad range of characterization, and therefore these stations require further evaluation as to whether they belong in Category 1 or Category 3 (i.e., a lack of consistency exists between chemistry and biological effects). These stations include: 1, 2, 4, 5, 6, 7, 8, 13, 14, 19, 25, 31, and 33.

- Category 3: Stations with no chemistry greater than reference station values or no observed biological response. These stations are recommended to be moved to the FS under the "No Action" remedial alternative as further action at these locations was not indicated. These stations include: 3, 9, 12, 15, 16, 20, 21, 22, 23, 24, 26, 27, 28, 29, 30, and 32.

Mr. Puckett asked if SWDIV/BNI used tributyltin (TBT) data in this approach. BNI responded no, the TBT data were listed as measured but not detected; detection limits were based on blank concentrations.

Mr. Hausladen questioned as to why the Category 3 stations were being planned to be moved to the FS. Mr. Radecki responded that in recent discussions with DTSC on "No Further Action" sites which were to be transferred, DTSC had requested that a FS be conducted for all sites that were to be transferred. Accordingly, since West Basin (Site 7) would be transferred, a FS was being planned for it.

Mr. Radecki reminded the workshop participants that an FS does not automatically mean "clean-up". Mr. Kadaster supported that statement and stated that as an example, Category 1 stations are not immune from a "No Action" recommendation in the FS, and that SWDIV/BNI applied the same criteria to all stations when categorizing them.

Ms. Sullivan asked SWDIV/BNI which benthic community index was used to determine a biological response. BNI responded that the prevailing pattern at each station was used (e.g., Station 18 had reduced mollusk and crustacean abundance as compared to reference stations). Ms. Sullivan stated that the Agencies/Trustees did not list Station 18 because, although PCB concentrations were 10 times the reference station concentrations, the concentrations did not exceed 2 times the ER-M value.

The Agencies/Trustees held a brief caucus to discuss the acceptability of SWDIV/BNI station categories.

The workshop resumed by Mr. Black stating that the Agencies/Trustees realize the need for a "holistic" approach to conclude the RI, and then requested a discussion of the pier stations.

BNI had originally intended to place all of the piers in Category 1. However, Dr. Donald Reish had recently provided SWDIV/BNI with theoretical information regarding beneath-pier benthic habitats. Without the benefit of any knowledge of the RI data, Dr. Reish had described to SWDIV/BNI a beneath-pier environment of accumulated shell hash and

sediment, which was similar to what the RI has revealed. He also described that, because of the many mussels growing on the pilings and on the underside of the piers which had double decks (a measure to correct areal subsidence effects on the piers) where the undersides of the lower decks were intermittently under water depending upon the tide levels, a large amount of mussel organic matter (live and dead mussels as well as mussel excrement) would fall on to the sediment beneath the piers. Such a situation would result in reduced dissolved oxygen concentrations in the sediment as well as at the sediment-water column interface, and with opportunistic benthic species being predominant. SWDIV will rely on Dr. Reish's experience to determine the ultimate fate of sediments beneath the piers.

Mr. Christopher said that he liked the idea of having Dr. Reish's expert opinion on this subject, and relying on Dr. Reish's theoretical construction of a beneath-pier benthic community as a "reference pier". Mr. Hausladen and Ms. Sullivan asked SWDIV for a briefing by Dr. Reish. Mr. Puckett stated that he would check for any under-pier studies conducted by SCWRP.

Ms. Sullivan asked if the BPTCP collects mussels from West Basin piers as part of the Mussel Watch program. Mr. Puckett replied yes, they did. Ms. Sullivan then stated that such data may be useful for purposes of the Site 7 RI. BNI countered that it would be difficult to connect water column exposure (as indicated by mussel tissue chemistry) to sediment exposure. Mr. Puckett stated it may be useful for Dr. Reish to review the *Macoma* results from underneath the piers.

BNI then discussed the possible impacts of ammonia and hydrogen sulfide concentrations on the beneath-pier echinoderm and amphipod bioassay results. Hydrogen sulfide did not seem to have a major impact on the echinoderm test, but showed in the chemistry. Sulfide in pore water data were not collected during the amphipod tests. Max Puckett stated that amphipods were tolerant to hydrogen sulfide. It appears that echinoderms exposed to Stations 42 through 46 and 49 through 52 pore water may have been adversely impacted by ammonia. Amphipods exposed to Stations 44, 45, 46, 48, and 49 sediments may also have possibly been adversely impacted by ammonia. Mr. Puckett asked if ammonia was measured in water overlying the sediment or pore water during the amphipod bioassay. BNI responded that overlying water was measured for ammonia.

A general discussion ensued regarding the comparison between the Agencies/Trustees and SWDIV/BNI station categories. Mr. Christopher requested that all PCB stations (identified by the Agencies/Trustees as Stations 13, 22 and 27) be placed in the SWDIV/BNI Category 1. The bioassays utilized in this RI were not long enough in duration, and therefore would not necessarily indicate the chronic adverse effects of PCBs. (Mr. Puckett stated that long-term bioassays that could measure the adverse impacts of PCBs do exist.) Therefore, Stations 13, 22, and 27 should be placed into Category 1 to protect for the bioaccumulation potential of PCBs (the Agencies/Trustees do not want to underestimate the ecological risk at these stations). In addition, Agencies/Trustees questioned as to how Station 21 and Station 26 were placed in Category 3, and stated that these stations should be placed in Category 2 because of high chemistry and high silver concentrations, respectively.

BNI stated that at Station 21, even though high chemistry was shown, there was no observed toxicity, and no benthic community "hits". Nancy Musgrove checked her records and agreed that there was no observed toxicity at Station 21. BNI then stated that Station 26 showed high levels of silver, but similar to Station 21, there was no observed toxicity. Nancy Musgrove agreed that there was no observed toxicity at Station 26. Agencies/Trustees asked that Stations 13, 21, 22, 26 and 27 be placed into Category 1 or Category 2, but not into Category 3. BNI pointed out that even though there was chemistry at these stations, there was no observed response (low risk). Mr. Black said that these stations warrant a second review due to the high levels of chemistry measured. At the conclusion of the discussion all participants agreed that these five stations could be placed into Category 2.

BNI inquired about a recent EPA Contaminated Sediments newsletter which revisited PCB risk levels that apparently referred to clean-up levels. Weston stated that the article basically discussed the revision of human health protective limits to analytical detection limits, which are between 15 and 20 part per billion (ppb). Ms. Sullivan thought that the U.S. FWS had a protective limit of 30 ppb for the bald eagle. EPA and Weston surmised that the PCB article was not relevant to Site 7.

Mr. Christopher proposed an Agency/Trustee / SWDIV/BNI combined definition of the three station categories:

- Category 1: The sum of the chemistry RTRs exceed the breakpoint and biological response observed.

- Category 2: The sum of the chemistry RTRs exceed the breakpoint or biological response observed.

- Category 3: The sum of the chemistry RTRs do not exceed the breakpoint and no biological response observed.

The Agencies/Trustees reiterated their concern over recommending no further action for sites that had no biological response with high chemistry.

SWDIV/BNI held a brief caucus to discuss the impact of the Agencies/Trustees proposed combined station categorization approach.

Mr. Radecki continued the workshop by stating that, in utilizing Mr. Christopher's proposed combined categorization approach, very little would change from SWDIV/BNI proposed categories. The changes would include: the movement of Stations 25 and 31 from Category 2 to Category 3, the movement of Stations 16, 21, 22, 23, and 27 from Category 3 to Category 2, and the placement of all pier stations into Category 1. In summary, the categories would include the following stations:

- Category 1: Stations 10, 11, 17, 18, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, and 52.

- Category 2: Stations 1, 2, 4, 5, 6, 7, 8, 13, 14, 16, 19, 21, 22, 23, 27, and 33.

- Category 3: Stations 3, 9, 12, 15, 20, 24, 25, 26, 28, 29, 30, 31, and 32.

These definitions of categories, and the stations assigned to each category were accepted and adopted by all attendees for inclusion in the RI. Mr. Kadaster stated that Category 3 means that Agencies/Trustees agree and accept that these are "No Action" stations; and that stations in Category 1 or Category 2 could eventually move into Category 3 if new information became available. All agreed. Mr. Kadaster stated that the attendees had just discussed and agreed on the conclusion of the RI. All agreed.

The next workshop topic discussed was TBT data validation. Nancy Musgrove stated that Roger McGinnis reiterated his 07 February 1997 memo, but changed the total number of rejected data values (25% of the TBT data should be rejected). Mr. Radecki responded that the matrix attached to the memo and the text of the memo still remain inconsistent. Ms. Musgrove then replied that the issue appeared to not be resolved. Mr. Hausladen stated that the EPA will resolve the TBT issue with SWDIV within a week.

Regarding the project schedule, Mr. Radecki stated that SWDIV/BNI will adhere fairly close to the original delivery date of the Draft Final RI Report. Mr. Hausladen stated the EPA would rather receive a good document; therefore, as long as the report is received by Labor Day, SWDIV/BNI should take their time in preparing the document.

Mr. Christopher requested from BNI the final station category definitions. BNI agreed to prepare the definitions based on the discussions of this workshop and send to the Agencies/Trustees.

Mr. Radecki told the Agencies/Trustees that SWDIV/BNI responses to their comments on the Draft RI Report were considered as final, and will be issued as such within the next few weeks. Mr. Kadaster said that SWDIV/BNI would provide a formal written response to the 05 August 1996 joint Agency/Trustee memorandum and the 04 March 1997 joint Agency/Trustee list of data analysis requests within the next few weeks.

The workshop concluded with a visit to Site 7 (West Basin) for all those interested in attending.

Echinoderm Bioassay Water Quality Parameters for 100% Porewater Concentration

	Initial								Day 0						Day 2					
Station ID	Temperature (°C)	Dissolved Oxygen (mg/L)	pH	Salinity (g/kg)	Total Ammonia[a] (mg/L)	Total Sulfide[a] (mg/L)	NH_3[b] (mg/L)	H_2S[b] (mg/L)	Temperature (°C)	Dissolved Oxygen (mg/L)	pH	Salinity (g/kg)	NH_3[b] (mg/L)	H_2S[b] (mg/L)	Temperature (°C)	Dissolved Oxygen (mg/L)	pH	Salinity (g/kg)	NH_3[b] (mg/L)	H_2S[b] (mg/L)
1	15.0	7.7	7.10	33	0.79	0.003	0.0018	0.0012	14.9	7.6	7.52	33	0.0047	0.0006	14.6	8.3	7.66	34	0.0063	0.0005
2	15.0	7.8	7.17	33	0.49	0.001	0.0013	0.0004	14.9	7.6	7.75	33	0.0049	0.0001	14.6	8.0	7.58	34	0.0033	0.0002
3	15.0	7.6	7.12	33	0.63	0.001	0.0015	0.0004	15.0	7.5	7.55	33	0.0041	0.0002	14.7	7.7	7.65	34	0.0050	0.0002
4	15.0	7.9	7.14	33	0.84	0.001	0.0021	0.0004	15.0	7.5	7.55	33	0.0054	0.0002	14.8	7.6	7.66	34	0.0068	0.0002
5	15.0	7.6	7.46	33	1.51	0.002	0.0079	0.0004	14.9	7.6	7.75	33	0.0152	0.0003	14.7	6.4	7.56	34	0.0097	0.0004
6	15.0	6.5	7.57	30	0.51	0.003	0.0034	0.0006	15.0	7.6	7.71	31	0.0047	0.0004	14.5	7.7	7.60	32	0.0035	0.0005
7	15.0	5.4	7.19	30	0.59	0.005	0.0017	0.0018	15.0	7.6	7.38	30	0.0026	0.0013	14.9	7.8	7.87	31	0.0078	0.0005
8	15.0	6.6	7.33	29	1.24	0.005	0.0049	0.0014	15.0	7.5	7.48	31	0.0068	0.0011	14.7	8.0	7.65	32	0.0098	0.0008
9	15.0	5.2	7.21	31	1.68	0.002	0.0050	0.0007	15.0	7.4	7.50	31	0.0097	0.0004	14.8	8.1	7.73	31	0.0161	0.0003
10	15.0	5.8	7.32	31	1.06	< 0.001	0.0040	---	15.0	7.5	7.59	31	0.0075	---	15.0	7.9	8.05	32	0.0213	---
11	15.0	5.3	7.13	31	0.78	0.016	0.0019	0.0062[d]	15.0	7.4	7.25	32	0.0025	0.0052	14.8	7.7	7.98	32	0.0132	0.0013
12	15.0	5.9	7.30	32	2.47	0.003	0.0090	0.0009	15.0	7.5	7.46	32	0.0129	0.0007	14.8	7.9	8.12	32	0.0572[c]	0.0002
13	15.0	5.9	7.19	32	1.80	0.004	0.0051	0.0014	15.0	7.5	7.58	32	0.0124	0.0007	14.8	7.9	7.98	33	0.0304[c]	0.0003
14	15.0	5.7	7.26	30	0.66	0.006	0.0022	0.0019	15.0	7.5	7.48	31	0.0036	0.0013	15.1	6.7	7.64	31	0.0053	0.0010
15	15.0	5.2	7.23	30	1.97	0.004	0.0061	0.0013	15.0	7.4	7.43	30	0.0097	0.0010	14.8	8.0	8.05	30	0.0391[c]	0.0003
16	15.0	6.3	7.31	30	2.34	0.009	0.0087	0.0027	15.0	7.5	7.36	30	0.0098	0.0024	14.8	8.0	8.03	31	0.0443[c]	0.0007
17	15.0	5.7	6.99	31	1.16	0.004	0.0021	0.0019	15.0	7.1	6.98	31	0.0020	0.0019	15.2	8.2	7.82	32	0.0141	0.0004
18	15.0	6.2	7.32	32	0.67	0.002	0.0025	0.0006	15.0	7.6	7.35	33	0.0027	0.0005	14.8	8.0	8.00	34	0.0118	0.0002
19	15.0	5.2	7.12	32	1.48	0.005	0.0036	0.0020	15.1	7.5	7.36	33	0.0062	0.0013	14.8	7.8	8.03	33	0.0279	0.0004
20	15.0	5.8	7.13	31	0.98	0.006	0.0024	0.0023	15.0	7.3	7.35	31	0.0040	0.0017	15.2	8.6	8.00	32	0.0179	0.0005
21	15.0	5.9	7.04	32	0.99	< 0.001	0.0020	---	15.0	7.2	7.17	31	0.0027	---	15.8	8.4	7.98	32	0.0181	---
22	15.0	5.1	7.19	32	0.86	0.002	0.0024	0.0007	15.1	7.5	7.20	33	0.0025	0.0007	14.9	7.8	7.93	34	0.0130	0.0002
23	15.0	5.5	7.19	32	1.27	0.004	0.0036	0.0014	15.1	7.6	7.47	33	0.0069	0.0009	14.9	7.9	8.02	34	0.0236	0.0003
24	15.0	6.7	7.56	30	1.39	0.016	0.0092	0.0030	15.0	7.5	7.91	31	0.0204	0.0015	14.7	4.5	7.46	32	0.0071	0.0036
25	15.0	6.4	7.39	30	1.78	0.019	0.0080	0.0049	15.0	7.3	7.52	31	0.0107	0.0039	15.8	6.9	7.83	32	0.0231	0.0020
26	15.0	5.2	7.32	31	0.87	0.012	0.0033	0.0035	15.0	7.4	7.33	30	0.0034	0.0034	16.1	8.3	8.00	30	0.0170	0.0009
27	15.0	6.6	7.16	33	0.69	0.015	0.0018	0.0056	15.0	7.5	7.28	33	0.0024	0.0046	15.4	8.6	8.00	33	0.0128	0.0011
28	15.0	6.4	7.21	33	0.96	0.011	0.0028	0.0038	15.0	7.5	7.21	32	0.0028	0.0038	15.4	8.6	8.01	33	0.0182	0.0008
29	15.0	6.2	7.28	30	0.42	0.005	0.0015	0.0016	15.0	7.5	7.47	32	0.0023	0.0011	14.5	8.1	7.60	32	0.0029	0.0009
30	15.0	6.9	7.23	28	0.55	0.005	0.0017	0.0017	15.0	7.5	7.37	29	0.0024	0.0013	16.1	8.4	7.93	29	0.0092	0.0004
31	15.0	6.3	7.59	33	0.78	0.038	0.0055	0.0067[d]	15.0	7.5	7.78	31	0.0085	0.0046	15.8	7.1	7.86	33	0.0108	0.0038
32	15.0	5.8	7.39	28	0.58	0.02	0.0026	0.0052	15.0	7.4	7.70	27	0.0053	0.0029	16.0	8.2	7.94	28	0.0099	0.0017
33	15.0	6.6	7.34	30	0.56	0.009	0.0022	0.0025	15.0	7.5	7.43	30	0.0027	0.0022	16.1	7.4	7.81	30	0.0071	0.0010
41	15.0	6.7	6.99	30	0.77	0.009	0.0014	0.0043	14.0	7.2	7.72	32	0.0068	0.0013	13.3	8.2	8.04	33	0.0134	0.0007
42	15.0	5.8	7.65	32	6.91	0.003	0.0559[c]	0.0005	14.5	7.2	7.75	33	0.0675[c]	0.0004	14.4	8.6	8.04	33	0.1294[c]	0.0002
43	15.0	4.4	7.70	31	3.05	0.014	0.0277	0.0020	15.7	6.8	7.70	31	0.0293	0.0020	15.5	6.9	8.00	31	0.0570[c]	0.0011
44	15.0	5.2	7.59	32	4.12	0.005	0.0291	0.0009	14.2	8.2	7.77	32	0.0412[c]	0.0006	14.5	9.5	8.19	32	0.1092[c]	0.0003
45	15.0	5.5	7.65	33	5.15	0.015	0.0416[c]	0.0024	14.2	8.3	7.76	33	0.0503[c]	0.0019	14.2	8.9	8.09	33	0.1063[c]	0.0010
46	15.0	4.5	7.55	32	5.31	0.018	0.0342[c]	0.0034	14.1	8.1	7.76	32	0.0516[c]	0.0023	14.2	7.8	7.96	31	0.0820[c]	0.0016
47	15.0	7.3	7.72	31	1.04	0.02	0.0099	0.0028	15.6	7.3	7.87	30	0.0146	0.0020	15.5	5.0	7.63	30	0.0084	0.0033
48	15.0	6.8	8.06	28	1.03	0.001	0.0214	0.0001	15.6	7.1	8.15	27	0.0275	0.0001	15.5	6.7	8.07	28	0.0227	0.0001

Echinoderm Bioassay Water Quality Parameters for 100% Porewater Concentration

	Initial								Day 0						Day 2					
Station ID	Temperature (°C)	Dissolved Oxygen (mg/L)	pH	Salinity (g/kg)	Total Ammonia[a] (mg/L)	Total Sulfide[a] (mg/L)	NH_3[b] (mg/L)	H_2S[b] (mg/L)	Temperature (°C)	Dissolved Oxygen (mg/L)	pH	Salinity (g/kg)	NH_3[b] (mg/L)	H_2S[b] (mg/L)	Temperature (°C)	Dissolved Oxygen (mg/L)	pH	Salinity (g/kg)	NH_3[b] (mg/L)	H_2S[b] (mg/L)
49	15.0	6.2	7.57	32	1.76	0.002	0.0119	0.0004	15.6	7.0	7.85	31	0.0236	0.0002	15.4	6.8	8.07	31	0.0382[c]	0.0001
50	15.0	6.2	8.07	31	3.65	0.014	0.0768[c]	0.0009	14.2	8.0	8.08	32	0.0738[c]	0.0009	14.4	9.6	8.08	32	0.0750[c]	0.0009
51	15.0	5.1	7.59	33	6.49	0.033	0.0457[c]	0.0058[d]	14.2	4.3	7.95	32	0.0978[c]	0.0029	14.3	9.6	8.27	33	0.2022[c]	0.0014
52	15.0	6.2	7.69	33	2.03	0.004	0.0180	0.0006	14.2	7.2	7.79	33	0.0212	0.0005	14.5	9.2	8.01	33	0.0358[c]	0.0003
40101.1	15.0	6.8	7.36	32	0.39	< 0.001	0.0016	---	15.5	7.5	7.68	31	0.0035	---	15.2	7.1	7.95	31	0.0064	---
40101.2	15.0	6.6	7.35	32	0.23	0.001	0.0009	0.0003	15.6	7.6	7.61	31	0.0018	0.0002	15.4	7.0	7.96	31	0.0039	0.0001
40101.3	15.0	6.3	7.32	32	0.17	< 0.001	0.0006	---	15.6	7.6	7.60	32	0.0013	---	15.2	7.0	7.95	32	0.0028	---
40102.1	15.0	5.5	6.90	32	0.17	0.002	0.0002	0.0011	14.2	8.2	7.32	32	0.0006	0.0006	14.2	10.0	7.99	33	0.0028	0.0002
40102.2	15.0	6.3	7.00	31	0.10	0.009	0.0002	0.0042	15.6	7.6	7.40	30	0.0005	0.0022	15.4	6.9	7.91	30	0.0015	0.0008
40102.3	15.0	6.3	7.05	33	0.12	0.002	0.0002	0.0009	15.7	7.6	7.47	32	0.0007	0.0004	15.6	6.9	7.99	32	0.0022	0.0002
40103.1	15.0	4.5	6.97	32	0.10	0.002	0.0002	0.0010	14.2	8.0	7.15	32	0.0002	0.0008	14.4	10.1	8.06	32	0.0020	0.0001
40103.2	15.0	6.4	6.89	31	0.12	0.008	0.0002	0.0043	15.5	7.4	7.23	30	0.0004	0.0027	15.4	6.9	7.99	30	0.0022	0.0006
40103.3	15.0	6.1	6.93	32	0.10	0.006	0.0002	0.0030	15.6	7.3	7.08	32	0.0002	0.0025	15.3	6.9	8.03	32	0.0020	0.0004
40181	15.0	6.8	7.04	31	0.52	0.005	0.0010	0.0022	15.5	7.4	7.37	30	0.0023	0.0013	15.3	6.6	7.86	30	0.0070	0.0005
40182	15.0	6.2	6.81	31	1.07	0.002	0.0013	0.0012	14.0	7.7	6.93	30	0.0015	0.0010	13.5	7.9	7.84	31	0.0120	0.0002
40183.1	15.0	5.7	6.82	32	1.68	0.001	0.0020	0.0006	14.0	7.7	7.09	32	0.0035	0.0004	14.4	9.8	8.03	32	0.0308[c]	0.0001
40183.2	15.0	5.5	6.91	32	1.51	< 0.001	0.0022	---	14.2	7.9	7.01	31	0.0027	---	14.5	10.1	8.00	32	0.0261	---
40183.3	15.0	5.6	6.97	33	2.42	0.003	0.0041	0.0014	14.2	7.5	6.97	33	0.0039	0.0015	14.4	10.1	7.81	33	0.0269	0.0003
40321	15.0	6.9	7.84	26	2.00	0.018	0.0254	0.0020	14.0	6.5	7.85	26	0.0241	0.0020	13.3	6.6	7.85	27	0.0228	0.0021

Notes:

[a] Total ammonia and sulfide concentrations were only measured at the initiation of the bioassay (i.e., prior to dilutions), not on days 0 or 2.

[b] Calculated concentrations.

[c] Concentration equals or exceeds the LC_{50} of 0.03 mg/L NH_3 for *Dendraster excentricus* (U.S. EPA 1993).

[d] Concentration equals or exceeds the 96 hour NOEC of 0.0057 mg/L H_2S for *Strongylocentrotus purpuratus* (Knezovich 1996).

Amphipod Bioassay Surface Water Quality Parameters

	Day 0						Day 1						Day 2						Day 3					
Station ID	Temperature (° C)	Dissolved Oxygen (mg/L)	pH	Salinity (g/kg)	Total Ammonia (mg/L)	NH_3[a] (mg/L)	Temperature (° C)	Dissolved Oxygen (mg/L)	pH	Salinity (g/kg)	Total Ammonia (mg/L)	NH_3[a] (mg/L)	Temperature (° C)	Dissolved Oxygen (mg/L)	pH	Salinity (g/kg)	Total Ammonia (mg/L)	NH_3[a] (mg/L)	Temperature (° C)	Dissolved Oxygen (mg/L)	pH	Salinity (g/kg)	Total Ammonia (mg/L)	NH_3[a] (mg/L)
1	17.4	9.4	7.91	31	0.27	0.0048	15.5	7.5	8.02	32	0.31	0.0061	15.9	7.5	8.06	32	0.29	0.0064	16.2	8.8	8.15	31	0.59	0.0163
2	16.6	9.3	7.98	31	0.20	0.0039	16.5	7.2	8.02	32	0.22	0.0046	15.2	7.6	8.05	32	0.24	0.0049	16.6	9.5	8.12	31	0.49	0.0130
3	18.2	9.2	7.94	31	0.17	0.0034	16.9	7.1	8.07	32	0.16	0.0039	15.4	7.4	7.98	32	0.10	0.0018	15.9	9.6	8.05	31	0.33	0.0071
4	17.9	7.3	8.07	31	0.13	0.0034	17.6	7.6	8.14	30	0.26	0.0078	17.1	9.5	8.15	32	0.24	0.0071	16.9	7.8	7.96	32	0.23	0.0044
5	16.5	9.6	7.97	31	0.26	0.0049	17.6	7.1	8.06	32	0.41	0.0103	15.2	7.6	8.07	32	0.41	0.0088	17.2	8.9	8.19	32	0.81	0.0264
6	16.7	9.7	7.97	32	0.20	0.0038	16.4	7.3	8.10	32	0.28	0.0070	15.9	7.4	8.06	32	0.31	0.0068	16.1	9.7	8.15	31	0.57	0.0156
7	18.3	7.0	8.06	31	0.15	0.0040	17.4	7.5	8.11	31	0.24	0.0066	17.4	9.5	8.12	32	0.28	0.0079	17.0	8.1	7.86	32	0.30	0.0046
8	18.5	9.4	7.97	31	0.21	0.0046	17.7	7.0	8.11	32	0.30	0.0085	15.2	7.6	8.04	32	0.33	0.0066	16.2	9.0	8.16	31	0.72	0.0203
9	18.0	7.1	8.07	31	0.10	0.0026	17.6	7.3	8.12	31	0.16	0.0046	17.2	9.5	8.11	32	0.16	0.0044	17.0	8.0	7.91	32	0.14	0.0024
10	17.4	7.3	8.05	31	0.22	0.0053	17.5	7.5	8.07	31	0.22	0.0056	17.5	9.3	7.96	32	0.29	0.0058	17.6	7.9	8.04	32	0.24	0.0057
11	17.9	7.2	8.07	31	0.15	0.0039	17.4	7.6	8.16	31	0.23	0.0071	17.0	9.3	7.96	32	0.26	0.0050	17.0	8.0	7.92	32	0.23	0.0040
12	17.6	7.3	8.07	30	0.24	0.0062	17.7	7.7	8.14	31	0.31	0.0094	16.9	9.4	8.14	32	0.35	0.0100	16.9	7.9	8.04	32	0.47	0.0107
13	17.7	7.3	7.94	31	0.12	0.0023	17.4	7.6	8.10	31	0.22	0.0059	17.2	9.6	8.16	32	0.19	0.0058	17.0	8.0	8.03	32	0.25	0.0056
14	18.2	9.4	7.96	31	0.16	0.0033	15.5	7.4	8.08	32	0.24	0.0054	15.5	7.6	8.05	32	0.27	0.0056	16.4	9.9	8.14	31	0.53	0.0145
15	17.3	7.3	8.11	31	0.18	0.0049	17.7	7.6	8.18	31	0.27	0.0089	17.2	9.5	8.12	32	0.24	0.0067	17.2	7.9	7.99	30	0.20	0.0042
16	18.0	7.1	7.99	30	0.12	0.0027	17.9	7.7	8.15	31	0.22	0.0069	17.1	9.5	8.19	32	0.20	0.0065	17.2	8.0	7.94	32	0.23	0.0043
17	17.2	8.6	8.13	30	0.20	0.0057	17.7	7.4	7.99	30	0.13	0.0028	17.5	7.6	8.04	30	0.49	0.0117	17.4	9.6	8.08	31	0.27	0.0070
18	17.6	7.2	8.01	30	0.24	0.0054	17.5	7.6	8.09	31	0.32	0.0085	17.1	9.5	8.09	32	0.35	0.0090	17.6	8.1	7.95	32	0.27	0.0053
19	17.6	7.2	8.09	31	0.23	0.0062	18.3	7.6	8.17	31	0.26	0.0088	17.0	9.1	8.09	31	0.36	0.0092	16.9	8.0	7.96	32	0.33	0.0063
20	18.2	8.1	8.02	30	0.22	0.0053	18.0	7.4	7.99	31	0.21	0.0046	17.5	7.6	8.11	30	0.45	0.0125	17.6	9.2	7.97	32	0.47	0.0096
21	17.0	8.3	8.12	30	0.33	0.0091	18.0	7.6	8.01	30	0.24	0.0055	17.6	7.6	8.00	31	0.46	0.0101	16.7	9.3	7.98	32	0.19	0.0037
22	17.9	8.4	8.06	30	0.17	0.0044	18.0	7.5	7.94	30	< 0.10	---	17.7	7.5	7.97	30	0.33	0.0068	16.7	9.5	8.12	31	< 0.10	---
23	17.4	7.4	8.09	31	0.25	0.0066	17.4	7.6	8.24	30	0.35	0.0129	17.3	9.5	8.20	32	0.39	0.0131	16.9	7.9	7.94	32	0.48	0.0087
24	16.7	16.7	7.95	31	0.26	0.0048	15.5	7.4	8.09	32	0.40	0.0091	15.5	7.5	8.10	32	0.11	0.0026	17.4	8.9	8.21	32	0.22	0.0076
25	17.5	8.4	8.18	30	0.26	0.0085	17.6	7.3	7.95	30	0.21	0.0041	17.8	7.4	8.17	30	0.70	0.0228	17.2	9.7	8.09	31	0.42	0.0109
26	17.5	8.5	8.10	30	0.23	0.0063	17.9	7.2	8.00	30	0.18	0.0040	17.7	7.5	8.07	30	0.62	0.0160	17.6	9.3	8.13	31	0.41	0.0120
27	17.3	8.2	8.03	30	0.16	0.0037	17.4	7.3	7.89	30	< 0.10	---	17.5	7.6	8.06	31	0.24	0.0060	17.2	9.6	8.06	31	0.34	0.0083
28	18.2	8.1	7.94	30	0.22	0.0044	18.3	7.6	7.81	30	0.17	0.0026	17.6	7.5	7.98	30	0.35	0.0073	17.3	9.5	8.12	31	0.21	0.0059
29	16.7	9.2	7.96	31	0.16	0.0030	16.5	7.1	8.07	32	0.13	0.0031	15.5	7.6	8.05	32	0.46	0.0096	17.8	8.9	8.17	31	0.87	0.0283
30	18.0	8.5	8.09	30	0.34	0.0094	17.7	7.3	7.82	30	0.20	0.0029	18.3	7.6	8.08	30	0.70	0.0193	17.8	9.2	8.02	31	0.58	0.0135
31	17.7	8.2	8.02	29	0.22	0.0051	18.0	7.5	8.02	30	0.28	0.0066	17.3	7.6	8.08	30	0.54	0.0139	18.0	9.2	8.08	31	0.57	0.0154
32	17.9	8.6	8.16	29	0.25	0.0080	18.3	7.5	7.97	30	0.24	0.0052	18.0	7.6	8.13	30	0.84	0.0254	16.7	9.3	8.25	31	0.34	0.0122
33	18.0	7.6	7.94	30	0.13	0.0026	18.2	7.7	7.91	30	0.14	0.0026	17.8	7.4	8.13	30	0.61	0.0182	17.4	9.6	8.17	32	0.21	0.0066
41	16.5	7.9	7.93	31	0.23	0.0040	16.8	7.1	7.82	30	0.26	0.0036	17.2	7.3	7.85	30	0.43	0.0065	17.0	7.3	7.85	30	0.55	0.0082
42	16.0	7.6	8.04	32	1.37	0.0291	16.9	8.7	8.27	32	2.07	0.0788	17.2	8.5	8.05	32	3.54	0.0842	16.2	6.9	7.86	32	2.81	0.0403
43	17.9	8.5	8.01	32	0.47	0.0107	16.4	7.4	7.90	32	0.67	0.0107	16.9	9.4	8.12	32	1.01	0.0275	16.7	8.4	8.04	32	1.20	0.0269
44	16.5	7.5	8.04	32	1.08	0.0238	15.9	8.7	8.11	32	1.69	0.0417	17.2	8.7	8.08	32	3.40	0.0865	16.0	6.9	7.72	32	2.86	0.0294
45	16.0	7.6	8.00	32	0.77	0.0149	16.2	9.3	8.13	31	1.20	0.0317	16.8	8.7	8.08	32	2.11	0.0521	17.0	6.6	7.97	32	1.64	0.0321
46	16.3	7.5	8.00	32	0.78	0.0155	16.2	9.1	7.93	31	1.43	0.0241	17.6	8.5	8.10	32	2.36	0.0646	16.0	6.8	8.02	32	2.20	0.0446
47	16.0	7.5	8.03	32	0.53	0.0110	16.4	8.6	8.16	31	0.71	0.0204	17.4	8.4	8.10	32	1.31	0.0354	16.5	6.6	7.98	32	0.90	0.0173
48	16.7	7.8	8.01	31	1.74	0.0365	16.7	7.4	8.15	30	1.73	0.0497	17.4	7.3	7.94	30	3.26	0.0615	18.6	7.0	7.98	30	4.34	0.0979
49	16.7	7.9	8.01	31	0.49	0.0103	17.0	7.2	7.85	30	0.71	0.0106	17.2	7.3	7.76	30	0.84	0.0104	18.4	7.1	7.75	30	1.39	0.0184
50	16.2	7.5	8.03	32	0.79	0.0167	16.5	8.7	8.15	32	0.93	0.0263	16.2	8.3	8.03	32	1.71	0.0360	16.8	6.7	8.05	32	1.12	0.0259
51	16.2	7.5	8.00	32	1.01	0.0199	16.0	8.8	8.14	31	0.89	0.0237	17.2	8.2	7.98	32	2.06	0.0419	17.1	6.8	8.03	32	1.56	0.0352

Amphipod Bioassay Surface Water Quality Parameters

	Day 0						Day 1						Day 2						Day 3					
Station ID	Temperature (° C)	Dissolved Oxygen (mg/L)	pH	Salinity (g/kg)	Total Ammonia (mg/L)	NH_3[a] (mg/L)	Temperature (° C)	Dissolved Oxygen (mg/L)	pH	Salinity (g/kg)	Total Ammonia (mg/L)	NH_3[a] (mg/L)	Temperature (° C)	Dissolved Oxygen (mg/L)	pH	Salinity (g/kg)	Total Ammonia (mg/L)	NH_3[a] (mg/L)	Temperature (° C)	Dissolved Oxygen (mg/L)	pH	Salinity (g/kg)	Total Ammonia (mg/L)	NH_3[a] (mg/L)
52	16.5	7.4	8.00	32	0.51	0.0103	16.3	8.7	7.99	32	0.63	0.0122	15.9	8.4	7.87	32	1.25	0.0179	16.5	6.7	8.02	32	0.76	0.0160
40101.1	17.6	8.4	8.02	32	0.13	0.0030	15.9	7.4	7.97	32	0.20	0.0036	17.9	8.6	8.12	32	0.34	0.0099	16.6	8.6	8.00	34	0.38	0.0077
40101.2	18.0	8.2	8.03	32	0.30	0.0072	16.4	7.4	7.94	32	0.31	0.0054	17.3	9.3	8.11	32	0.61	0.0167	16.7	8.3	8.04	32	0.76	0.0170
40101.3	17.7	8.2	8.00	31	0.15	0.0033	15.8	7.6	8.02	32	0.18	0.0036	17.0	9.4	8.13	32	0.30	0.0084	17.7	8.1	8.00	33	0.39	0.0086
40102.1	18.0	8.5	8.01	32	0.17	0.0039	16.5	7.4	7.81	32	0.25	0.0033	18.0	8.8	7.97	32	0.22	0.0046	16.6	8.4	7.99	32	0.51	0.0101
40102.2	17.2	8.2	8.01	32	0.24	0.0052	15.9	7.6	7.92	32	0.37	0.0059	18.2	8.9	8.16	32	0.55	0.0180	17.2	8.4	7.96	32	0.73	0.0142
40102.3	17.6	8.5	8.03	32	0.17	0.0040	16.7	7.3	7.95	32	0.22	0.0040	16.8	9.4	8.15	32	0.45	0.0130	16.4	8.6	8.00	32	0.55	0.0110
40103.1	17.9	8.4	7.98	32	0.11	0.0024	15.8	7.6	7.95	32	0.14	0.0024	16.6	8.9	8.12	32	0.24	0.0064	16.2	8.5	7.96	32	0.25	0.0045
40103.2	17.6	8.4	8.00	32	0.16	0.0035	15.9	7.5	8.02	32	0.22	0.0044	18.6	7.8	8.00	32	0.38	0.0089	17.0	8.4	8.03	33	0.46	0.0103
40103.3	17.9	8.5	8.07	32	0.22	0.0058	16.4	7.4	7.92	32	0.23	0.0038	15.9	9.3	8.16	33	0.41	0.0113	16.2	8.2	8.01	32	0.50	0.0101
40181	16.0	7.5	7.99	32	0.14	0.0027	16.5	9.0	8.02	31	0.17	0.0036	16.7	8.3	8.02	32	0.24	0.0051	16.7	6.8	7.89	32	0.31	0.0050
40182	16.7	7.3	8.06	32	0.12	0.0028	17.2	8.6	8.16	32	0.19	0.0058	16.5	8.4	8.01	32	0.30	0.0062	16.5	6.8	7.93	32	0.30	0.0052
40183.1	16.4	9.3	7.96	31	0.19	0.0035	16.3	7.3	8.06	32	0.21	0.0048	15.2	7.5	8.02	32	0.29	0.0055	16.3	9.1	8.14	31	0.19	0.0052
40183.2	18.3	9.4	7.96	31	0.17	0.0036	16.1	7.2	8.08	32	0.18	0.0042	15.2	7.6	8.01	32	0.23	0.0043	17.2	8.8	8.13	32	0.44	0.0125
40183.3	18.0	8.6	8.02	32	0.14	0.0033	16.2	7.4	7.97	32	0.21	0.0039	16.2	9.1	8.11	32	0.24	0.0061	16.8	8.6	8.01	32	0.25	0.0053
40321	16.2	7.5	8.00	32	0.32	0.0063	15.9	8.8	8.19	32	0.46	0.0136	16.3	8.5	8.08	32	0.79	0.0188	15.9	6.9	7.97	32	0.62	0.0111

Notes:

[a] Calculated concentration.

[b] Concentration equals or exceeds the NOEC of 0.34 mg/L NH_3 for *Rhepoxynius abronius* (CDFG 1997).

Amphipod Bioassay Surface Water Quality Parameters

	Day 4						Day 5						Day 6						Day 7					
Station ID	Temperature (° C)	Dissolved Oxygen (mg/L)	pH	Salinity (g/kg)	Total Ammonia (mg/L)	NH_3[a] (mg/L)	Temperature (° C)	Dissolved Oxygen (mg/L)	pH	Salinity (g/kg)	Total Ammonia (mg/L)	NH_3[a] (mg/L)	Temperature (° C)	Dissolved Oxygen (mg/L)	pH	Salinity (g/kg)	Total Ammonia (mg/L)	NH_3[a] (mg/L)	Temperature (° C)	Dissolved Oxygen (mg/L)	pH	Salinity (g/kg)	Total Ammonia (mg/L)	NH_3[a] (mg/L)
1	16.5	8.7	7.98	31	0.48	0.0093	16.5	7.2	8.04	32	0.45	0.0099	15.0	6.6	7.91	32	0.38	0.0056	15.6	8.1	7.86	33	< 0.10	---
2	16.2	8.7	7.98	31	0.27	0.0051	16.4	7.2	8.05	31	0.23	0.0052	15.4	6.7	7.93	32	0.10	0.0016	14.5	8.0	7.75	32	< 0.10	---
3	16.5	8.7	7.97	32	0.20	0.0038	15.9	7.4	7.98	32	0.12	0.0022	15.3	6.6	7.90	32	< 0.10	---	15.2	7.9	7.78	32	< 0.10	---
4	16.2	7.9	7.98	31	< 0.10	---	17.2	7.2	8.07	32	0.12	0.0030	17.6	7.5	8.04	32	< 0.10	---	17.5	8.4	7.95	32	< 0.10	---
5	16.0	8.7	7.99	31	0.83	0.0158	15.7	7.3	7.97	32	0.78	0.0138	15.5	6.6	7.99	31	0.52	0.0095	14.9	8.0	7.73	32	< 0.10	---
6	16.6	8.7	8.01	33	0.42	0.0087	15.9	7.3	7.81	33	0.43	0.0054	15.2	6.6	7.98	31	0.33	0.0058	14.9	7.9	7.92	33	0.20	0.0030
7	16.4	7.7	8.06	31	0.21	0.0048	17.6	7.2	7.93	32	0.13	0.0024	17.6	6.5	7.93	31	0.16	0.0030	17.6	8.3	8.05	33	< 0.10	---
8	16.2	8.8	8.02	31	0.57	0.0118	15.5	7.2	8.09	32	0.56	0.0128	15.5	6.6	8.00	32	0.36	0.0067	14.4	7.8	7.75	32	0.50	0.0049
9	16.5	7.9	7.88	31	< 0.10	---	17.5	7.2	8.06	33	< 0.10	---	17.5	7.3	8.03	31	< 0.10	---	17.6	8.4	7.91	32	< 0.10	---
10	17.6	7.7	8.04	30	< 0.10	---	17.0	7.3	8.02	32	0.15	0.0033	17.6	6.4	7.96	31	0.21	0.0042	17.9	8.5	7.96	32	0.10	0.0021
11	16.4	7.6	8.04	31	0.11	0.0024	17.2	7.2	7.99	33	0.10	0.0021	17.4	7.3	8.02	31	< 0.10	---	17.6	8.6	8.01	32	< 0.10	---
12	17.3	7.8	8.19	31	0.31	0.0102	17.1	7.2	8.09	32	0.38	0.0098	17.5	7.5	8.11	32	0.20	0.0056	17.6	8.4	8.04	32	< 0.10	---
13	16.7	7.8	8.02	31	0.13	0.0028	17.2	7.2	8.01	32	0.14	0.0030	17.4	7.3	7.96	31	0.11	0.0022	17.5	8.4	7.94	32	< 0.10	---
14	15.1	8.00	8.02	32	0.31	0.0059	15.1	7.3	8.02	32	0.31	0.0059	15.0	6.7	7.95	32	0.19	0.0030	15.5	8.1	7.96	32	< 0.10	---
15	16.2	7.6	8.03	31	0.17	0.0036	16.9	7.4	8.02	32	0.17	0.0037	17.4	7.5	8.04	32	0.11	0.0026	17.6	8.3	8.05	33	< 0.10	---
16	16.8	7.6	8.08	32	0.17	0.0042	17.3	7.2	8.05	32	0.98	0.0235	17.6	7.5	8.04	32	< 0.10	---	17.5	8.3	8.02	32	< 0.10	---
17	17.5	7.8	7.85	31	0.40	0.0062	16.2	7.7	8.07	31	0.16	0.0037	17.0	7.3	8.02	32	0.24	0.0053	17.5	7.4	8.00	31	0.19	0.0041
18	16.3	7.7	8.01	31	0.23	0.0047	17.1	7.2	7.91	32	0.28	0.0048	17.3	7.5	7.94	31	0.16	0.0030	17.6	8.5	8.00	32	< 0.10	---
19	16.6	7.6	8.02	31	0.21	0.0045	17.1	7.3	8.09	32	0.33	0.0085	18.1	7.2	7.98	32	< 0.10	---	17.4	8.4	8.07	32	< 0.10	---
20	17.0	8.0	8.01	31	0.23	0.0049	17.0	7.4	8.01	31	0.23	0.0049	17.0	7.2	7.98	32	5.33	0.1068	17.4	7.5	8.15	32	< 0.10	---
21	16.8	7.9	7.89	32	0.34	0.0055	16.2	7.5	8.11	31	0.21	0.0053	17.1	7.4	8.09	32	0.49	0.0127	17.4	7.4	8.11	32	< 0.10	---
22	16.8	7.9	7.95	32	0.14	0.0026	16.7	7.6	7.99	31	< 0.10	---	17.0	7.3	7.91	32	0.20	0.0034	17.4	7.3	8.00	31	< 0.10	---
23	17.1	7.5	8.09	31	0.25	0.0065	17.5	7.3	8.10	32	0.29	0.0079	17.2	7.4	8.09	31	0.15	0.0039	17.6	8.2	7.93	32	0.16	0.0030
24	16.5	8.4	8.08	32	0.70	0.0169	15.9	7.4	7.89	32	0.68	0.0102	15.0	6.7	8.03	32	0.61	0.0117	15.0	8.0	8.03	33	0.38	0.0073
25	16.5	7.9	7.99	32	0.38	0.0075	16.5	7.8	8.14	31	0.32	0.0088	16.9	7.2	8.15	32	0.38	0.0111	17.4	7.4	8.06	31	0.35	0.0086
26	16.7	8.0	7.85	31	0.43	0.0063	16.4	7.6	8.14	31	0.19	0.0052	17.2	7.2	8.03	32	0.13	0.0030	17.4	7.3	7.95	31	0.15	0.0029
27	16.8	7.9	7.91	32	0.35	0.0059	16.2	7.7	8.10	31	0.14	0.0035	16.8	7.3	7.97	32	< 0.10	---	17.4	7.2	7.95	32	< 0.10	---
28	16.6	7.9	8.00	32	0.48	0.0098	17.2	7.5	8.08	31	0.11	0.0028	17.0	7.6	8.02	32	< 0.10	---	17.4	7.4	8.10	31	< 0.10	---
29	16.2	8.7	7.98	31	0.17	0.0032	15.8	7.3	7.75	32	5.88	0.0637	15.3	6.6	7.92	32	< 0.10	---	15.4	8.0	7.82	32	0.24	0.0030
30	16.4	7.9	8.03	32	0.62	0.0133	17.5	7.6	8.02	31	0.34	0.0077	17.0	7.3	7.96	32	0.37	0.0071	17.4	7.5	8.07	31	0.85	0.0215
31	17.0	7.7	8.03	31	0.85	0.0191	16.5	7.6	8.16	31	0.25	0.0072	17.2	7.3	8.00	31	0.57	0.0121	17.2	7.4	8.11	31	0.21	0.0057
32	16.8	7.9	8.01	31	0.79	0.0167	17.4	7.2	8.03	30	0.41	0.0095	17.1	7.5	8.04	31	0.51	0.0118	17.5	7.1	7.97	31	1.30	0.0264
33	16.7	8.0	8.04	32	< 0.10	---	16.7	7.5	8.14	31	0.15	0.0042	17.1	7.5	7.94	32	< 0.10	---	17.8	7.5	8.00	31	< 0.10	---
41	17.8	7.4	8.26	30	1.00	0.0398	17.3	7.3	8.07	30	0.73	0.0183	17.5	7.6	7.98	30	0.53	0.0110	17.2	6.7	7.94	30	0.13	0.0024
42	20.5	6.4	8.19	33	3.68	0.1517	15.5	7.8	8.26	33	2.97	0.0992	16.7	7.6	8.32	31	1.92	0.0804	15.2	8.0	8.49	32	4.77	0.2588
43	16.4	6.8	7.98	32	1.40	0.0268	15.8	6.6	8.18	32	1.31	0.0375	15.3	8.0	8.19	33	1.37	0.0385	16.9	7.5	8.36	30	0.75	0.0348
44	20.4	6.2	8.03	32	3.87	0.1111	15.3	7.9	8.12	33	2.51	0.0604	17.0	7.3	8.21	31	2.19	0.0735	16.5	8.3	8.58	32	4.21	0.3055
45	20.4	6.4	8.03	32	2.25	0.0646	15.5	7.8	8.23	33	1.65	0.0515	16.2	7.7	8.37	30	2.74	0.1235	15.9	8.3	8.43	33	2.28	0.1143
46	20.0	6.5	8.15	32	2.62	0.0954	15.2	8.0	8.17	35	1.55	0.0413	16.4	7.5	8.32	30	1.34	0.0549	16.7	8.3	8.54	32	1.39	0.0940
47	16.0	6.6	7.81	32	1.44	0.0182	14.9	7.9	8.03	32	0.53	0.0101	16.5	7.3	8.07	30	0.50	0.0118	15.5	8.1	8.17	31	0.69	0.0189
48	17.9	7.6	8.27	30	10.00	0.4098[b]	17.6	7.2	8.38	30	7.68	0.3921[b]	17.6	7.5	8.40	30	7.16	0.3819[b]	17.6	6.8	8.15	30	4.28	0.1314
49	18.2	7.5	8.27	30	1.96	0.0821	17.6	7.2	8.33	30	1.70	0.0778	17.6	8.0	8.49	30	1.91	0.1238	17.8	6.4	8.11	30	1.34	0.0382
50	20.9	6.4	8.11	33	1.43	0.0509	15.5	7.9	8.02	33	1.10	0.0214	16.5	7.3	8.21	29	0.78	0.0253	15.6	8.2	8.04	32	1.51	0.0311
51	17.9	6.4	8.17	32	1.73	0.0566	15.2	8.0	8.24	32	1.20	0.0375	16.2	7.5	8.38	31	0.83	0.0382	16.6	8.3	8.53	31	2.19	0.1439

Amphipod Bioassay Surface Water Quality Parameters

	Day 4						Day 5						Day 6						Day 7					
Station ID	Temperature (° C)	Dissolved Oxygen (mg/L)	pH	Salinity (g/kg)	Total Ammonia (mg/L)	NH_3[a] (mg/L)	Temperature (° C)	Dissolved Oxygen (mg/L)	pH	Salinity (g/kg)	Total Ammonia (mg/L)	NH_3[a] (mg/L)	Temperature (° C)	Dissolved Oxygen (mg/L)	pH	Salinity (g/kg)	Total Ammonia (mg/L)	NH_3[a] (mg/L)	Temperature (° C)	Dissolved Oxygen (mg/L)	pH	Salinity (g/kg)	Total Ammonia (mg/L)	NH_3[a] (mg/L)
52	15.2	6.6	7.77	32	1.33	0.0144	15.5	8.0	8.12	33	0.75	0.0183	16.5	7.3	8.35	31	0.80	0.0353	15.1	8.1	8.46	32	1.49	0.0752
40101.1	16.9	6.9	7.90	32	0.47	0.0078	15.4	6.6	7.91	32	4.29	0.0648	15.2	8.0	7.80	32	0.25	0.0029	17.4	7.4	7.96	31	0.18	0.0036
40101.2	16.2	6.9	7.89	32	0.74	0.0114	16.4	6.6	7.95	32	0.73	0.0130	15.4	8.1	7.86	36	0.42	0.0056	16.9	7.5	7.98	32	0.21	0.0042
40101.3	17.4	6.7	7.95	32	0.40	0.0077	15.3	6.7	7.98	32	0.29	0.0051	14.7	8.1	7.84	33	0.33	0.0040	16.3	7.4	7.93	32	0.20	0.0034
40102.1	16.4	6.9	7.94	32	0.59	0.0103	16.0	6.6	7.91	34	0.43	0.0068	16.6	8.2	7.81	33	0.50	0.0066	16.9	7.4	7.95	32	0.18	0.0033
40102.2	16.9	6.9	7.96	32	0.77	0.0146	15.7	6.7	7.94	32	0.70	0.0116	14.9	8.0	7.82	32	1.02	0.0121	17.4	7.3	7.93	32	0.40	0.0074
40102.3	16.4	6.8	7.93	32	0.59	0.0101	15.7	6.7	7.93	32	0.52	0.0084	15.9	8.0	7.79	33	0.45	0.0054	16.5	7.4	7.95	32	0.31	0.0056
40103.1	17.0	6.7	7.84	32	0.31	0.0045	15.1	6.7	7.87	32	0.26	0.0035	14.8	8.0	7.94	33	0.28	0.0043	17.0	7.5	8.09	31	1.10	0.0282
40103.2	16.3	6.8	7.98	32	0.61	0.0116	15.4	6.7	7.98	32	0.26	0.0046	14.9	8.0	7.84	33	0.44	0.0054	17.9	7.3	7.94	31	0.30	0.0059
40103.3	16.2	6.8	8.02	32	0.66	0.0136	15.5	6.7	7.92	32	0.47	0.0073	15.1	7.8	7.87	33	0.42	0.0056	16.2	7.4	8.00	32	0.30	0.0059
40181	21.1	6.4	7.91	32	0.29	0.0067	15.5	7.8	7.93	33	0.17	0.0027	16.6	7.4	7.97	30	1.63	0.0310	15.4	8.2	8.19	30	< 0.10	---
40182	20.3	6.3	7.97	32	0.24	0.0060	14.9	7.9	7.95	33	< 0.10	---	17.0	7.4	8.21	31	0.54	0.0181	16.1	8.1	8.12	32	< 0.10	---
40183.1	15.9	8.6	7.98	32	0.20	0.0037	15.9	7.3	7.98	32	0.18	0.0033	15.2	6.7	7.94	31	< 0.10	---	14.4	7.9	7.82	33	0.14	0.0016
40183.2	15.9	8.7	7.99	32	< 0.10	---	16.5	7.3	8.04	30	0.13	0.0029	15.2	6.7	7.95	31	< 0.10	---	14.5	8.0	7.79	33	< 0.10	---
40183.3	16.4	7.0	7.99	32	0.21	0.0041	15.7	6.6	7.97	32	< 0.10	---	15.8	8.1	7.85	33	0.13	0.0018	16.2	7.5	8.02	32	< 0.10	---
40321	20.8	6.4	8.11	33	0.65	0.0230	14.9	7.8	8.00	32	0.59	0.0105	16.9	7.6	8.12	31	0.65	0.0177	15.8	8.2	8.04	32	0.68	0.0142

Notes:

[a] Calculated concentration.

[b] Concentration equals or exceeds the NOEC of 0.34 mg/L NH_3 for *Rhepoxynius abronius* (CDFG 1997).

Amphipod Bioassay Surface Water Quality Parameters

	Day 8						Day 9						Day 10					
Station ID	Temperature (° C)	Dissolved Oxygen (mg/L)	pH	Salinity (g/kg)	Total Ammonia (mg/L)	NH_3[a] (mg/L)	Temperature (° C)	Dissolved Oxygen (mg/L)	pH	Salinity (g/kg)	Total Ammonia (mg/L)	NH_3[a] (mg/L)	Temperature (° C)	Dissolved Oxygen (mg/L)	pH	Salinity (g/kg)	Total Ammonia (mg/L)	NH_3[a] (mg/L)
1	15.7	7.6	7.95	32	0.13	0.0022	15.8	7.9	7.99	32	< 0.10	---	15.5	7.9	8.04	32	< 0.10	---
2	16.2	7.6	8.09	32	< 0.10	---	15.1	8.1	8.00	33	0.16	0.0029	15.8	8.1	8.00	31	< 0.10	---
3	16.9	7.2	7.92	32	0.12	0.0021	15.5	8.0	7.97	32	< 0.10	---	15.9	8.0	7.87	32	< 0.10	---
4	17.1	7.9	7.98	32	< 0.10	---	17.3	8.0	7.92	32	0.11	0.0020	17.0	7.2	8.04	33	< 0.10	---
5	15.2	7.4	8.17	32	< 0.10	---	15.2	8.1	8.17	32	< 0.10	---	15.9	7.7	8.20	32	< 0.10	---
6	16.1	7.5	8.02	32	0.15	0.0031	15.9	8.1	7.95	33	0.15	0.0026	16.2	8.1	8.11	34	< 0.10	---
7	17.0	7.8	7.90	32	< 0.10	---	17.2	8.0	7.95	33	0.14	0.0027	17.2	7.5	8.01	36	< 0.10	---
8	15.9	7.5	8.01	32	0.30	0.0059	16.0	8.2	8.17	33	< 0.10	---	15.6	8.0	8.05	32	< 0.10	---
9	17.1	7.9	7.93	33	< 0.10	---	17.5	8.0	7.91	33	0.11	0.0019	16.9	7.4	8.03	36	< 0.10	---
10	16.9	7.9	8.03	33	< 0.10	---	17.5	7.8	8.04	35	0.13	0.0031	17.0	7.4	7.99	33	< 0.10	---
11	16.9	7.8	7.91	33	< 0.10	---	17.3	8.1	7.98	33	0.13	0.0027	16.8	7.3	8.03	36	4.16	0.0917
12	16.9	7.8	8.10	33	< 0.10	---	17.7	7.5	8.07	35	0.27	0.0069	16.8	7.2	8.05	33	< 0.10	---
13	16.9	7.8	8.11	33	< 0.10	---	17.5	8.1	7.96	34	0.14	0.0028	17.0	7.4	8.02	22	< 0.10	---
14	16.7	7.6	8.26	32	< 0.10	---	15.7	8.0	7.96	33	< 0.10	---	15.7	8.1	8.04	31	< 0.10	---
15	17.1	7.9	7.98	33	< 0.10	---	17.2	8.1	8.00	33	0.12	0.0025	17.2	7.3	7.92	33	< 0.10	---
16	17.0	7.8	7.93	33	< 0.10	---	17.3	7.9	7.93	34	0.22	0.0040	16.8	7.5	8.03	35	< 0.10	---
17	17.5	8.3	7.98	31	< 0.10	---	17.0	8.0	7.99	31	< 0.10	---	17.1	8.1	8.06	33	0.13	0.0031
18	16.9	7.8	7.98	33	< 0.10	---	17.2	8.0	7.98	32	0.12	0.0024	16.9	7.4	7.93	33	< 0.10	---
19	17.0	7.8	8.05	33	< 0.10	---	17.5	7.6	7.88	33	0.15	0.0025	16.9	7.4	8.01	33	< 0.10	---
20	17.5	8.3	8.06	31	< 0.10	---	17.0	8.0	8.02	33	< 0.10	---	17.2	8.0	8.01	32	0.14	0.0030
21	17.5	8.4	7.94	32	< 0.10	---	16.9	7.9	8.02	32	< 0.10	---	17.2	8.0	8.08	33	0.14	0.0036
22	17.4	8.2	7.84	32	< 0.10	---	17.0	7.9	8.00	33	< 0.10	---	17.2	8.0	7.94	32	0.13	0.0024
23	16.8	7.8	7.94	32	< 0.10	---	17.4	7.9	7.98	34	0.21	0.0043	16.9	7.2	8.02	32	< 0.10	---
24	16.2	7.5	8.15	32	< 0.10	---	15.5	8.0	8.26	32	< 0.10	---	16.5	8.0	8.50	32	< 0.10	---
25	17.5	8.3	7.96	31	0.23	0.0046	16.9	7.9	8.05	32	< 0.10	---	17.1	7.9	8.03	32	0.27	0.0061
26	17.5	8.5	8.18	31	0.10	0.0033	16.9	7.9	8.07	32	< 0.10	---	17.1	8.1	8.06	32	< 0.10	---
27	17.7	6.5	7.82	31	0.42	0.0062	16.9	7.9	7.91	32	< 0.10	---	17.2	8.1	8.09	32	0.13	0.0034
28	17.6	8.3	7.88	31	< 0.10	---	16.8	7.9	7.90	33	< 0.10	---	17.5	8.0	7.85	32	< 0.10	---
29	16.2	7.6	8.12	32	< 0.10	---	14.9	8.2	7.98	32	< 0.10	---	16.2	7.9	7.98	32	< 0.10	---
30	17.6	8.2	7.92	31	0.43	0.0079	16.1	7.9	8.01	32	0.26	0.0052	17.2	7.8	8.08	32	0.24	0.0061
31	15.9	8.1	8.01	32	0.22	0.0043	16.9	7.9	8.02	32	0.20	0.0044	17.4	7.9	7.96	32	0.16	0.0032
32	17.5	8.4	8.08	32	< 0.10	---	16.9	7.8	7.97	32	0.38	0.0074	17.5	7.8	7.96	32	0.42	0.0083
33	17.4	8.4	8.01	32	< 0.10	---	16.9	7.9	8.06	33	< 0.10	---	17.1	7.8	8.03	32	< 0.10	---
41	17.4	7.3	8.14	30	< 0.10	---	17.7	7.0	8.14	30	1.02	0.0309	17.3	8.0	8.38	30	< 0.10	---
42	15.9	8.1	8.55	30	1.46	0.0952	16.5	7.4	8.68	31	2.06	0.1848	17.0	8.3	8.62	31	0.21	0.0172
43	15.4	8.2	8.43	32	0.81	0.0391	15.9	7.9	8.53	32	0.46	0.0287	17.2	7.5	8.62	31	0.94	0.0781
44	16.4	7.7	8.41	30	1.73	0.0864	16.6	7.2	8.74	30	2.56	0.2622	17.3	8.4	8.57	32	1.04	0.0782
45	17.4	7.8	8.51	33	0.44	0.0293	17.0	7.1	8.79	30	0.45	0.0525	17.1	8.4	8.50	32	2.28	0.1456
46	15.9	7.5	8.50	31	0.91	0.0532	15.9	7.2	8.67	31	1.32	0.1111	18.6	8.5	8.41	33	0.94	0.0548
47	15.5	7.3	8.00	31	0.37	0.0069	17.0	7.3	8.36	31	0.70	0.0327	17.2	8.5	8.47	32	0.11	0.0066
48	18.2	7.1	8.22	31	7.69	0.2878	18.2	6.9	8.28	30	7.15	0.3060	17.4	7.9	8.83	31	4.25	0.5518[b]
49	18.2	7.2	8.42	30	1.24	0.0721	17.9	7.3	8.18	31	1.51	0.0506	17.4	7.9	8.95	31	0.26	0.0427
50	15.9	7.8	8.11	30	0.42	0.0104	17.1	7.8	8.49	31	0.45	0.0281	17.0	8.3	8.21	33	0.25	0.0084
51	17.4	7.9	8.46	31	0.68	0.0407	17.2	7.4	8.55	31	0.66	0.0473	17.4	8.4	8.47	32	0.29	0.0177

Amphipod Bioassay Surface Water Quality Parameters

	Day 8						Day 9						Day 10					
Station ID	Temperature (° C)	Dissolved Oxygen (mg/L)	pH	Salinity (g/kg)	Total Ammonia (mg/L)	NH_3[a] (mg/L)	Temperature (° C)	Dissolved Oxygen (mg/L)	pH	Salinity (g/kg)	Total Ammonia (mg/L)	NH_3[a] (mg/L)	Temperature (° C)	Dissolved Oxygen (mg/L)	pH	Salinity (g/kg)	Total Ammonia (mg/L)	NH_3[a] (mg/L)
52	16.2	7.5	8.57	29	0.28	0.0195	17.0	7.4	8.76	31	0.71	0.0779	17.3	8.5	8.53	32	0.32	0.0221
40101.1	15.4	8.2	8.05	33	< 0.10	---	15.4	7.8	7.89	33	< 0.10	---	16.3	7.6	8.18	32	0.10	0.0030
40101.2	16.5	8.0	8.11	31	0.37	0.0096	15.1	7.6	7.90	32	< 0.10	---	17.2	7.7	8.15	32	0.29	0.0086
40101.3	17.2	8.2	7.99	31	< 0.10	---	17.2	7.8	7.99	31	< 0.10	---	16.3	7.6	8.15	32	< 0.10	---
40102.1	15.6	8.1	8.18	32	0.13	0.0037	15.9	7.8	8.07	32	0.14	0.0032	16.7	7.6	8.22	31	0.25	0.0084
40102.2	16.4	8.3	8.03	32	0.56	0.0120	15.5	8.0	7.93	32	0.18	0.0029	16.5	7.5	8.20	31	0.32	0.0101
40102.3	14.9	8.2	8.07	32	0.51	0.0106	15.9	7.7	8.14	32	0.10	0.0026	17.7	7.6	8.29	32	0.26	0.0109
40103.1	15.7	8.2	7.95	32	0.15	0.0025	15.9	8.0	8.10	32	< 0.10	---	16.5	7.8	8.24	31	0.10	0.0035
40103.2	16.7	8.2	8.16	32	0.21	0.0062	16.4	8.0	8.02	31	0.15	0.0031	16.7	7.7	8.17	30	< 0.10	---
40103.3	15.0	8.2	8.11	31	0.31	0.0071	15.8	7.6	8.09	29	< 0.10	---	16.8	7.5	8.20	31	0.25	0.0081
40181	16.9	8.1	8.03	30	0.18	0.0040	16.8	7.7	8.39	29	0.12	0.0059	17.1	8.5	8.32	32	0.11	0.0047
40182	15.7	7.5	7.75	30	< 0.10	---	17.2	7.4	8.16	30	0.21	0.0064	18.2	8.5	8.12	31	0.17	0.0051
40183.1	16.5	7.5	8.00	32	< 0.10	---	14.9	7.8	7.99	33	< 0.10	---	15.6	7.9	8.05	32	< 0.10	---
40183.2	16.4	7.5	7.99	32	< 0.10	---	15.5	8.2	8.13	32	< 0.10	---	15.7	8.1	8.03	32	< 0.10	---
40183.3	15.5	8.1	8.14	32	< 0.10	---	15.3	7.8	8.16	30	< 0.10	---	17.3	7.6	8.26	31	0.33	0.0126
40321	15.7	8.0	8.14	30	0.20	0.0052	16.8	7.7	8.33	31	0.16	0.0069	17.4	8.2	8.13	31	0.30	0.0087

Notes:

[a] Calculated concentration.

[b] Concentration equals or exceeds the NOEC of 0.34 mg/L NH_3 for *Rhepoxynius abronius* (CDFG 1997).

SITE 7 (WEST BASIN) STATION CATEGORIES BASED ON CHEMISTRY, BIOASSAY, AND BENTHIC COMMUNITY DATA FOR PURPOSES OF THE REMEDIAL INVESTIGATION / FEASIBILITY STUDY

Category 1: Basin stations with cumulative chemistry quotients[1] greater than the breakpoint value[2] **and** with observed biological response[3], as well as all pier stations. Basin stations include 10, 11, 17, 18, and 41; pier stations include 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, and 52.

Category 2: Basin stations with **either** cumulative chemistry quotients greater than the breakpoint value **or** with observed biological response. These stations include 1, 2, 4, 5, 6, 7, 8, 13, 14, 16, 19, 21, 22, 23, and 33. In addition, this category includes basin Station 27, which has a cumulative chemistry quotient less than the breakpoint value with no biological response, but has high PCB concentrations (exceeding 350 ppb).

Category 3: Basin stations with cumulative chemistry quotients less than the breakpoint value **and** with no observed biological response. These stations include 3, 9, 12, 15, 20, 24, 25, 26, 28, 29, 30, 31, and 32.

[1] The cumulative chemistry quotient is the sum of individual analyte quotients calculated for each basin station (individual analyte concentration divided by the maximum reference station concentration [n = 7]).

[2] The breakpoint value was obtained visually from the plot of cumulative chemistry quotients versus West Basin sampling stations, ranked from lowest to highest cumulative chemistry quotients.

[3] Reduced performance as compared to reference station values of laboratory echinoderms (as measured by development and survival), laboratory amphipods (as measured by reburial and survival), laboratory polychaetes (as measured by survival), or the West Basin benthic community (as measured by species count, total and major phyla abundance, and dominance).

Bechtel
Southern California
12440 East Imperial Highway
Norwalk, CA 90650-3134

CLEAN II Program
Bechtel Job No. 22214
Contract No. N68711-92-D-4670
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IN REPLY REFERENCE: CTO-0026/0466

21 May 1997

Commanding Officer
Naval Facilities Engineering Command
Southwest Division
Mr. Richard Selby, Code 57CS.RS
Building 127, Room 112
1220 Pacific Highway
San Diego, CA 92132-5187

Subject: Transmittal of 01 April 1997 and 28 April 1997 Workshop Minutes, Results of Un-ionized Ammonia and Hydrogen Sulfide Calculations, and Definitions and Listing of West Basin Station Categories
Installation Restoration Site 7 (West Basin), Naval Station Long Beach
Long Beach, California

Dear Mr. Selby:

Enclosed please find five (5) copies of workshop minutes, results of additional analyses and descriptions of West Basin station categories, as referenced above, prepared in support of the Remedial Investigation (RI) being conducted at the Installation Restoration Site 7 (West Basin), Naval Station Long Beach, Long Beach, California. These documents are being transmitted to the individual Agencies and Trustees (DTSC, USEPA, USFWS, NOAA and CDFG) for their use.

If you have any questions and/or comments, please feel free to contact Omer Kadaster at (562) 807-2178.

Very truly yours,

K.K. Kapur
Project Manager

Enclosures

BECHTEL NATIONAL INC.

CLEAN II TRANSMITTAL/DELIVERABLE RECEIPT

Contract No. N-68711-92-D-4670 **Document Control No.** CTO-0026/0466

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TO: Commanding Officer
Naval Facilities Engineering Command
Southwest Division
Mr. Richard Selby, Code 57CS.RS
Building 127, Room 112
1220 Pacific Highway
San Diego, CA. 92132-5187

DATE: 21 May 1997
CTO #: 0026
LOCATION: LBNC, Long Beach, CA

FROM: Toni Tamw
Program / Project Manager

Operations Manager

DESCRIPTION: Transmittal of : 01 April 1997 and 28 April 1997 Workshop Minutes, Results of Un-ionized Ammonia and Hydrogen Sulfide Calculations, and Definitions and Listing of West Basin Station Categories; Installation Restoration Site 7 (West Basin) , Naval Station Long Beach, Long Beach, California

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