Department of Toxic Substances Control

Terry Tamminen
Agency Secretary
Cal/EPA

700 Heinz Avenue, Suite 200
Berkeley, California 94710-2721

Arnold Schwarzenegger
Governor

February 18, 2005

CERTIFIED MAIL

U.S. Department of Navy
Mr Jerry Dunaway
BRAC Program Management Office West
1230 Columbia Street, Suite 1100
San Diego, California 92101-8571

Dear Mr. Dunaway:

Re: Groundwater Monitoring for RCRA/Facility Landfill and Investigation Area H1 (IA H1) Mare Island Naval Shipyard, Vallejo, Solano County, dated October 2004

The Department of Toxic Substances Control has reviewed the subject document. The attached comments are forwarded to you for your consideration.

Should you have any questions regarding this letter, please call me at (510) 540-3773.

Sincerely,

Chip Gribble
Remedial Project Manager
Base Closure Unit
Office of Military Facilities

Attachment

Certified Mail No.: 7004 1160 0002 1892 0346

cc: See next page

cc: Mr. Dwight Gemar
Weston Solutions, Inc.
750 Dump Road
Mare Island
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Mr. Gary Riley
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Regional Water Quality Control Board
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bcc: Ms. Patti Barni
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Ms. Nancy Long
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Department of Toxic Substances Control

Alan C. Lloyd, Ph.D.
Agency Secretary
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Arnold Schwarzenegger
Governor

MEMORANDUM

TO: Chip Gribble
Engineering Geologist
Office of Military Facilities, Berkeley Regional Office, Site Mitigation

FROM: Buck King, R.G., C.H.G.
Engineering Geologist, Northern California Geological Services Unit (GSU)
Hazardous Waste Management Program, Berkeley Regional Office

CONCUR: Brian Lewis, C.H.G., C.E.G. BK for Brian Lewis
Senior Engineering Geologist, Northern California GSU
Hazardous Waste Management Program, Sacramento Regional Office

DATE: February 16, 2005

SUBJECT: GROUNDWATER MONITORING FOR RCRA/FACILITY LANDFILL AND INVESTIGATION AREA H1 (IA H1) MARE ISLAND NAVAL SHIPYARD, VALLEJO, SOLANO COUNTY, PROJECT NO. 25045/200063-33/43-HWMP

DOCUMENTS REVIEWED

Draft Final Water Quality Sampling and Analysis Plan, Investigation Area H1, RCRA Landfill and IWTP Surface Impoundments, Post-Closure Groundwater Monitoring, Mare Island, Vallejo, California. Prepared by Weston Solutions, Inc. Dated October 2004. (WQSAP)

INTRODUCTION

As you requested, the Northern California GSU of the Department of Toxic Substances Control (DTSC) has reviewed the above-referenced WQSAP for the Mare Island Naval Shipyard (MINS). The WQSAP pertains to three different monitoring programs.

First, the WQSAP addresses post-closure groundwater monitoring of the Resource Conservation and Recovery Act (RCRA) Landfill, RCRA Surface Impoundments, and Industrial Waste Treatment Plant (IWTP) Pipeline. These units are subject to the monitoring requirements of California Code of Regulations, title 22, section 66265.90 et seq.[1] while the units are under interim status and the requirements of California Code of Regulations, title 22, section 66264.90 et seq.[1] after the units are under a post-closure permit, or equivalent enforceable document.[2] Article 6 wells may be used to monitor the

[1]These monitoring requirements will be referred to as "Article 6" requirements.
[2] For simplicity, this memorandum will use "post-closure permit" to refer to both the "post-closure permit and equivalent enforceable document.

point of compliance (POC) as well as to monitor the nature and extent of the release from these units.

Second, the WQSAP applies to performance monitoring of the Shallow Water Bearing Zone (SWBZ) Slurry Wall and Extraction Trench interim remedial measure. Wells in this monitoring program are referred to as "remedy wells" and are not subject to the above-cited requirements, unless a given well is also used by the Article 6 monitoring program.

Third, pertains to ongoing groundwater and surface water monitoring for the Investigation Area H1 Remedial Investigation (IA H1 RI). The IA H1 RI is evaluating distribution of contamination in soil, surface water and groundwater resulting from the regulated units and adjacent waste disposal areas. Wells in this monitoring program are referred to as "nature and extent wells" and are not subject to the above-cited requirements, unless a given well is also included the Article 6 monitoring program.

DTSC has provided extensive comments on the MINS Article 6 groundwater monitoring program in the Comprehensive Groundwater Monitoring Evaluation (CME) Report (DTSC, 2004a). Where GSU's comments on the WQSAP are redundant with DTSC (2004a), GSU refers to the applicable sections of the CME Report. Nothing in this memorandum is intended to modify or reduce the required actions identified in the CME Report.

If you have questions, please contact me at (510) 540-3955 or Brian Lewis at (916) 255-6532.

REQUIRED ACTION

MINS must revise the WQSAP to address the enclosed comments as well as the comments and required actions identified in the CME Report (DTSC, 2004a). A revised draft WQSAP must be submitted for DTSC comment and be reviewed by GSU.

NOTE: WHILE UNDER INTERIM STATUS THE MONITORING REQUIREMENTS ARE SELF-IMPLEMENTING. HENCE, DTSC WILL NOT APPROVE THE PORTIONS OF THIS WQSAP THAT PERTAIN TO THE INTERIM STATUS MONITORING PROGRAM AT THIS TIME. THE DTSC CAN ONLY PROVIDE COMMENTS ON THE POST CLOSURE MONITORING PROGRAM. HOWEVER, DTSC CAN COMMENT AND APPROVE OF THE MONITORING PROGRAM THAT APPLIES TO EVALUATION OF SLURRY WALL PERFORMANCE AND THE ON-GOING REMEDIAL INVESTIGATION.

GSU understands that a modified <u>but equivalent</u> form of groundwater monitoring under the DTSC Office of Military Facilities (OMF) site cleanup program may accomplish some of the requirements discussed in the memorandum. If a given requirement is not covered by the revised WQSAP, MINS must specify the existing document in which the requirement is addressed.

GENERAL COMMENTS AND RECOMMENDATIONS

1) DTSC (2004a) required MINS to submit a status report on the evaluation of the ITWP Pipeline System in the WQSAP and demonstrate a reason for excluding it from appropriate Article 6 monitoring requirements. The WQSAP provided information for the IWTP Pipeline only within IA H1 and did not address the pipeline outside of IA H1. The WQSAP clearly indicates that the IWTP Pipeline in IA H1 failed integrity tests in 2004. The report indicates that IWTP Pipeline had a poorly documented history of pipeline failures and repairs. This information indicates that that IWTP Pipeline in IA H1 is currently leaking, has historically failed, and likely released chemicals to the environment. IWTP Pipeline System releases to groundwater are subject to Article 6 post-closure monitoring requirements. MINS must revise the WQSAP to include a nature and extent monitoring network for the IWTP Pipeline System segment that lies within IA H1.

2) The WQSAP must propose a well and piezometer network that assesses the hydrologic control of the slurry wall, impacts of the slurry wall on groundwater flow in the Shallow Water Bearing Zone (SWBZ), Intermediate Water Bearing Zone (IWBZ) and Deep Water Bearing Zone (DWBZ), groundwater flow conditions in the general vicinity of IA H1, and groundwater flow conditions within the extent of impacted groundwater originating from the RCRA Landfill and Surface Impoundments. An adequate hydraulic monitoring well network must be established for each water-bearing zone (WBZ) in the uppermost aquifer such that groundwater flow rate and direction can be accurately identified. GSU review of proposed water level monitoring locations described on Figures 5-1, 5-2, and 5-3 of the WQSAP identified the following portions of the water-level measurement network that are considered inadequate. MINS must revise the WQSAP to conform to the following comments.

   a. The proposed SWBZ water level monitoring network is deficient in regard to monitoring the area of historic maximum groundwater elevation within the RCRA Landfill. The water level monitoring network should include a monitoring point in the vicinity of SWBZ historic groundwater high such as existing well 01W04. This monitoring point will also allow for evaluation of effectiveness of remedial activities on groundwater mounding in the RCRA Landfill.

   b. The proposed SWBZ water level monitoring network is deficient in regard to monitoring vertical gradients between the SWBZ and underlying IWBZ and DWBZ in the central portion of the landfill area within the slurry wall containment area. The water level monitoring network should include historic monitoring points 01W36A and 01W37A along with the adjacent IWBZ wells (01W36B and 01W37B) and DWBZ wells (01W36C and 01W37C). These water level monitoring points will allow for calculation of vertical gradients between aquifers in the vicinity of the RCRA Landfill.

3) The WQSAP describes the POC as defined in California Code of Regulations, title 22, section 66265.95(a). MINS must revise the WQSAP to conform to the following comments.

a. The SWBZ POC depicted on Figure 5.1 of the WQSAP does not comply with Article 6 monitoring locations previously requested by DTSC (2004b). The proposed monitoring network is deficient in regard to POC monitoring in the vicinity of the IWTP area and a lack of a monitoring point in the vicinity of 24W04. The revised WQSAP should include a figure that depicts the SWBZ POC and must include the slurry wall/extraction trench alignment, the most representative potentiometric surface map for the SWBZ, and the correct boundaries of RCRA units that are subject to Article 6 requirements.

b. The IWBZ POC depicted on Figure 5.2 of the WQSAP does not comply with Article 6 monitoring locations previously requested by DTSC (2004b). The proposed IWBZ monitoring network is deficient in regard to monitoring at the POC as defined by the RCRA unit boundary in the vicinity of well 01W19 (along the northeast RCRA unit boundary). As described in Comment 3a, the most representative potentiometric surface map for the IWBZ must be used as the base map when depicting the POC position for the IWBZ. The base map should also depict the correct boundaries for RCRA units subject to Article 6 requirements.

c. The DWBZ POC depicted on Figure 5.3 of the WQSAP does not comply with Article 6 monitoring locations previously requested by DTSC (2004b). The proposed DWBZ monitoring network is deficient in regard to monitoring at the POC as defined by the RCRA unit boundary in the vicinity of northwest corner of the RCRA Landfill area. As previously described in Comment 3a, the most representative potentiometric surface map for the DWBZ must be used as the base map when depicting POC position for the DWBZ. The base map should also depict the correct boundaries for RCRA units subject to Article 6 requirements.

4) The monitoring well network proposed by the WQSAP must address the following five main objectives for assessment of water quality: (1) assess groundwater passing the POC in each water-bearing unit; (2) fully evaluate the nature and extent of groundwater contamination associated with the RCRA Landfill, Surface Impoundments, and IWTP Pipeline System within Area H1 (see General Comment 1); (3) evaluate the performance of the slurry wall/extraction trench barrier, whether contaminants are migrating beyond the wall, and downward vertical migration induced by the barrier; (4) evaluate the nature and extent of contamination in surface water and groundwater for the Remedial Investigation; and (5) establish background water quality for each WBZ in the uppermost aquifer for use by both the Article 6 monitoring program and the Remedial Investigation.

   The WQSAP must describe a monitoring program that includes Article 6 monitoring requirements and fully supports assessment of the remedy and evaluation of nature and extent of groundwater contamination. Issues associated with determination of background inorganic chemical concentrations in groundwater and determination of nature and extent of groundwater contamination have not been resolved at the time of preparation of this memorandum. This prevents GSU from developing final recommendations on groundwater nature and extent monitoring. To assist MINS

with revision of this WQSAP and to provide a basis for discussion, GSU has the following comments and recommendations regarding the remedy well network, nature and extent well network, and background well network. *GSU emphasizes that the following monitoring network discussion is based on current knowledge. Additional modifications of the monitoring network may be necessary based on information provided by remedial investigation monitoring results.*

a. Remedy Monitoring Wells

The slurry wall and groundwater collection system constitute the presumptive remedy for the SWBZ for the RCRA landfill and adjacent waste disposal areas enclosed within the slurry wall. The monitoring well (remedy well) network for evaluating the slurry wall/trench performance consists of the following existing and proposed wells listed in the clockwise order that they occur on Plate 5-1: MW81, MW82, MW83, 01W35A, 01W34AN, 01W33A-R, MW-84, 01W39A-R, 01W38A-R, and MW80. Except as discussed in the following paragraphs, well placement to evaluate the slurry wall and trench performance is acceptable. MINS should install the proposed SWBZ wells without delay. Prior to well installation, MINS must submit a work plan for well installation for review and approval. This work plan should be submitted without delay.

MINS must use a consistent well spacing to monitor the length of the barrier. Therefore, two additional monitoring wells are needed to fill gaps in the well network around the slurry wall: (1) between proposed wells MW-80 and MW-81; (2) between the replacement wells for wells 01W38A-R and 01W39A-R. MINS should include the 15 collection trench sumps along with two to three piezometers to monitor SWBZ water levels within the containment area.

b. Nature and Extent Wells (Article 6 & Remedial Investigation)

MINS must characterize the nature and extent of contamination originating from the regulated units (Article 6) and from IA H1 (Remedial Investigation). A release to groundwater has already been identified from the regulated units and in IA H1. An interim action consisting of the installation of a SWBZ slurry wall and interior groundwater collection system (Containment Structure) has been conducted in an attempt to address SWBZ groundwater contamination. Hence, the emphasis of the monitoring program is to determine the nature and extent of contamination in SWBZ outside of the Containment Structure. Groundwater contamination outside of the Containment Structure may be related to either the RCRA units or to the adjacent waste disposal areas. Article 6 monitoring requirements will apply to nature and extent wells monitoring groundwater contamination that is related to the RCRA units. Nature and extent wells which monitor groundwater contamination that appears to be related to the adjacent waste disposal areas will not be subject to Article 6 monitoring requirements.

Background groundwater inorganic chemical concentrations necessary to determine nature and extent of inorganic groundwater contamination have not been developed. This data gap prevents determination of nature and extent of

contamination based on historic groundwater data. However, for the purposes of discussion, GSU has the following comments on the proposed nature and extent well network.

SWBZ

The GSU recommends that the location for proposed well MW85 be moved approximately 200 feet east to the vicinity of IR01PZ004 to allow for evaluation of the SWBZ historically down-gradient from the RCRA facility.

The GSU does not agree with using well 01W12A as a SWBZ nature and extent well because of its distant location from waste disposal areas and recommends that a nature and extent well be installed in the Undeveloped West Subarea uplands area. The well should be located in the vicinity hot spot excavation area WS-2. Monitoring data from this well will be used to evaluate SWBZ water quality associated with local fill material.

The GSU recommends that existing wells 01W47A, 01W48, 01W53, 01W13, and 01W28 be identified as nature and extent monitoring wells. These existing wells will be used to characterize SWBZ groundwater in the vicinity of the IWTP Pipeline segment within IA H1.

The GSU recommends installation of two to three monitoring wells in the vicinity of the remaining upland area of the combined Demolition Debris Subarea / Fire Fighting Training Subarea. These wells should be located in the vicinity of areas identified for hot spot removal action associated with potential threat to groundwater. These monitoring locations will allow for evaluation of shallow groundwater down-gradient from the RCRA Landfill. Monitoring data from these wells will be used to evaluate SWBZ water quality associated with local fill material.

IWBZ

GSU repeats the previous DTSC (2004b) recommendation that wells 01W35B, 01W36B, 01W37B, and a new well located outside of the slurry wall in the vicinity of 01W38B be identified as nature and extent wells for the IWBZ.

DWBZ

GSU recommends deferring additional DWBZ well installation to address this monitoring objective until data from the proposed POC wells is evaluated.

c. Background Wells (Article 6 & Remedial Investigation)

DTSC (2004a) requires MINS to submit a workplan that will be used to establish existing or new background monitoring wells. Further discussion on determination of background concentrations in groundwater is provided in General Comment 8. GSU reviewed the proposed background well locations described on Figures 5-1, 5-2, and 5-3 and has the following comments on the

proposed well locations. Final selection of background wells will require evaluation of historic groundwater monitoring data associated with proposed background wells.

SWBZ

GSU recommends that wells 01W47A and 01W48A not be used as background wells because of their proximity to the IWTP pipeline. GSU also recommends that well 01W55 not be used as a background well due to its close proximity to wetland D and local impacts that the surface water may have on the adjacent groundwater monitoring location.

IWBZ

GSU recommends that wells BG01, 01W43B, 01W44B not be used as background wells because of their relative cross-gradient locations from the RCRA Landfill. The GSU recommends that proposed well DPW76B be considered for use as a background well because of its anticipated upgradient location and hydrostratigraphic information provided by IR01CPT004.

GSU notes that proposed background wells DPW73 and DPW74 are approximately a mile from the RCRA Landfill and may be too distant to accurately reflect background conditions. GSU recognizes that these wells are being proposed because of their upgradient location and existing inorganic monitoring results. The GSU recommends that these distant monitoring points be considered for temporary use as representative of background conditions until data from existing or new wells located closer to the RCRA Landfill are developed.

DWBZ

GSU recommends that wells BG02 and 01W47C not be used as background wells because of their relative cross-gradient locations from the RCRA facility. The GSU recommends that proposed well DPW76C be considered for use as a background well because of its anticipated upgradient location and hydrostratigraphic information provided by IR01CPT004. GSU recommends that existing well 01W40C be considered for use as a background well because of its proximity to the RCRA Landfill.

GSU notes that proposed background wells DPW71 and DPW72 are approximately a mile from the RCRA Landfill and may be too distant to accurately reflect background conditions. GSU recognizes that these wells are being proposed because of their upgradient location and existing inorganic monitoring results. GSU recommends that these distant monitoring points be considered for temporary use as representative of background conditions until data from closer upgradient existing or new wells are developed.

d. Point of Compliance Wells (Article 6)

Please see General Comment 3 for comments on POC wells.

5) The WQSAP lists groups of Constituents of Concern (COCs) in Section 5.2.1 and then lists groups of COCs organized by analytical test method in Tables 6 through 14. Section 5.2.1 includes explosive compounds on the list of COCs. The GSU was unable to locate a corresponding analytical test method or list of analytes representative of explosive compounds. The revised WQSAP must include a table describing test method for explosive compounds.

6) The WQSAP correctly describes a quarterly sampling frequency for all POC and Interim POC wells for monitoring parameters in Section 5.2.2. The WQSAP proposes that background monitoring wells be sampled for monitoring parameters on an annual basis. California Code of Regulations, title 22, §66265.97 (e) (6) requires that "owner or operator shall collect all data necessary for selection of appropriate statistical methods pursuant to subsections (e) (7), (e) (8) and (e)(9) of this section and for establishing the background values pursuant to subsection (e)(11)" and "at a minimum, this data shall include analytical data obtained during quarterly sampling of all background wells for a period of one year". The GSU recommends that background wells be sampled at the same quarterly frequency as the POC and Interim POC wells to allow for compilation of an appropriate background dataset that reflects the potential temporal variation of the groundwater data.

7) The WQSAP Section 5.2.2 proposes that remedy monitoring wells and nature and extent monitoring wells be sampled for monitoring parameters on a quarterly basis for a one year period and then annually thereafter. California Code of Regulations, title 22, §66265.99 (e) (3) requires that "For groundwater, samples from each monitoring point and each background monitoring point shall be collected at least quarterly during the compliance period...". MINS must sample Article 6 monitoring wells on a quarterly basis until such time the site moves from interim status into post closure permit status. Sampling frequency will then be reevaluated as part of post closure permit. GSU recommends that non-Article 6 wells also be analyzed on a quarterly basis until an adequate data set is developed (i.e., a minimum of eight consecutive quarters for all wells in the existing monitoring network). The GSU requests that MINS update Table 3 to explicitly identify all wells that are (1) Article 6 POC wells, (2) Article 6 nature and extent wells (3) remedy wells used to evaluate Containment Structure, and (4) nature and extent wells used for the on-going remedial investigation. Some wells may be part of all three programs. For example, well 01W38-AR is a nature and extent well for both the Article 6 monitoring program and the on-going remedial investigation. As another example, well 01W34AN is a POC well for the Article 6 monitoring program and a remedy well used to evaluate the slurry wall. For wells that are part of the Article 6 monitoring program as well as another monitoring program, the most prescriptive requirements should be used. Hence, these wells are subject to a quarterly sampling frequency and annual Appendix IX sampling.

8) The WQSAP includes a statistical evaluation plan (Appendix C) for determining background concentration limits and for assessing compliance with the evaluation monitoring program. The statistical evaluation plan proposes to use techniques for

developing ambient screening levels previously presented in the Final Compilation of Technical Memorandum on Ambient Analysis of Metals in Soils and Groundwater (TtEMI, 2002). DTSC (2004b) has previously indicated that the SWBZ ambient screening levels established in TtEMI (2002) do not fulfill the requirements of California Code of Regulations, title 22, section 66265.97 (e)(8). GSU has previously provided extensive comments (DTSC 2004c) on the incompatibility of background values developed using TtEMI (2002) methods for use as background concentration limits for Article 6 monitoring at Investigation Area H1, RCRA Landfill and IWTP Surface Impoundments. Readers should refer to DTSC (2004c) for description of inadequacies of TtEMI (2002) methods and for guidance in selecting an acceptable method for determining background concentration limits and for assessing compliance with an evaluation monitoring program that fulfills Article 6 monitoring requirements. Determination of background values is subject to the regulatory requirements summarized in Table 1 of this memorandum. [Note: Refer to California Code of Regulations for exact regulatory language.] Guidance on developing procedures for establishing background concentrations can be found in Appendix C of DTSC (2001). When presenting the statistical procedure in the WQSAP, MINS should consider the suggested content summarized in Section 13.2 of DTSC (2001) and in Table 1 (attached). MINS should prepare a revised Statistical Evaluation Plan that fulfils Article 6 requirements and submit it for DTSC review.

9) The WQSAP describes a rationale for not conducting surface water monitoring adjacent to the RCRA Landfill and Surface Impoundments. The basis of the rationale for not monitoring is that the anticipated final remedy presence of the vertical barrier, extraction trench, and RCRA cap will prevent releases to the surrounding wetlands. The rationale for not conducting surface water monitoring does not address outstanding issues associated with nature and extent of contamination in SWBZ groundwater and adjacent surface water areas. The GSU does not agree with the rationale for not conducting surface water monitoring and notes that the final remedy has not been selected. GSU recommends that surface water monitoring be performed in Wetland D, Wetland A, and Wetland B for the purpose of developing surface water nature and extent data to be used in conjunction with the evaluation of SWBZ groundwater outside of slurry wall containment area. MINS should include surface water monitoring in a revised WQSAP and submit it for DTSC review.

10) Table 2 (attached) provides GSU's recommendations for the wells proposed to be abandoned in Section 5 and Table 2 of the WQSAP. MINS should revise the WQSAP to address monitoring requirements identified in this memorandum (General Comments 3 and 4) prior to finalizing decisions as to wells that will be abandoned.

SPECIFIC COMMENTS AND RECOMMENDATIONS

1) Page 2-4. GSU recommends that a table describing the 15 extraction trench sump monitoring location names, measuring point elevations, sump total depth measurements, and sump bottom elevations be included as part of the description of the Extraction Trench. Future versions of the WQSAP should include an updated figure showing sump locations and other SWBZ monitoring locations.

2) Page 3-2. Last Paragraph Section 3-1. The WQSAP states that the Evaluation Monitoring Program will be changed to a Corrective Action Monitoring Program when the Final Remedy is implemented and that the WQSAP will be revised to reflect the requirements of the Corrective Action Monitoring Program. Regardless of issuance of a post-closure permit, the units must still be monitored under an evaluation monitoring program (Cal. Code Regs., tit. 22, §66264.99) until MINS determines the nature and extent of contamination (Cal. Code Regs., tit. 22, §66264.99(b)), submits an engineering feasibility study that evaluates corrective measures (Cal. Code Regs., tit. 22, §66264.99(b)), submits a groundwater corrective action program in the permit application (Cal. Code Regs., tit. 22, §66264.99(d)), and DTSC has approved the groundwater corrective action plan. Once MINS has fulfilled these requirements, and a post-closure permit has been issued, MINS may monitor the regulated units under a corrective action monitoring program (Cal. Code Regs., tit. 22, §66264.100). If a post-closure permit is issued while the units are under an evaluation monitoring program, a permit modification may be needed in order to move into a corrective action monitoring program (Cal. Code Regs., tit. 22, §66264.99(d)); in this eventuality, the DTSC Permitting Division will make the determination as to whether a permit modification is necessary.

3) Page 3-4. Second Full Paragraph. MINS should provide additional details regarding previous investigations of the IWTP Pipeline and the basis for the WQSAP statement that soil and groundwater adjacent to the pipeline is adequately characterized.

4) Page 3-5. Last Paragraph. MINS should provide details regarding the original reports describing IWTP Pipeline integrity testing activities performed in the spring of 2004.

5) Page 3-6. First Full Paragraph. GSU disagrees with the statement that chromium and TPH observed in the vicinity of the IWTP Pipeline are likely related to sources other than the IWTP Pipeline. GSU also disagrees with the statement that groundwater would have more likely leaked into the pipeline than wastewater would have leaked out because the IWTP Pipeline in the IA H1 is primarily below the seasonal low groundwater level. This statement is incorrect because the IWTP Pipeline in the IA H1 operated as a force main under pressure and any leak would have resulted in wastewater being pumped into backfill area surrounding the pipeline. MINS should remove these statements from the WQSAP.

6) Page 5-4. Section 2.2, Third Paragraph. The statement indicating that proposed remedy wells will be installed upon approval of the WQSAP should be revised to indicate that wells will be installed upon approval from DTSC. It appears that installation of necessary monitoring wells is being delayed by linking well installation to final approval of the WQSAP. GSU has previously commented (DTSC 2004b, comment 8) on proposed remedy wells located around the perimeter of the slurry wall containment system and indicated that proposed remedy wells identified as acceptable should be installed without delay. GSU has provided comments regarding proposed remedy wells described in WQSAP (General Comment 4) and repeats the statement that proposed wells identified by DTSC as acceptable should be installed without delay.

7) Page 5-6. Last Paragraph. The text indicates that Interim POC wells are proposed for the IWBZ at locations outside of the slurry wall containment system. MINS must locate IWBZ wells along the POC as defined by the boundaries of the regulated unit. The IWBZ POC wells cannot be relocated away from the POC because of issues such as facility grading and RCRA cap construction. See General Comment 3.

8) Page 5-9. First Paragraph. The text indicates that Interim POC wells are proposed for the DWBZ at locations outside of the slurry wall containment system. MINS must locate DWBZ wells along the POC as defined by the boundaries of the regulated unit. The DWBZ POC wells cannot be relocated away from the POC because of issues such as facility grading and RCRA cap construction. See General Comment 3.

9) Page 5-11. Section 5.2.1, Bullet List. The WQSAP lists COC chemical groups or individual chemicals. The list of COCs should include references to WQSAP tables that identify specific chemical names, practical quantitation limits, and analytical test methods.

10) Page 5-12. Second Paragraph. See General Comment 6. Monitoring parameters should be analyzed on a quarterly basis for remedy wells, nature and extent wells, and background wells until the site obtains a post closure permit.

11) Page 5-12. Section 5.2.3. The text indicates that compounds listed in Appendix IX of CCR Title 22, Chapter 14, Division 4.5 as well as radiochemical parameters will be analyzed from all POC and Interim POC wells on an annual basis. Section 5.2.3 refers to a bullet list of Appendix IX compound groups that have been identified and does not specifically reference a list of Appendix IX chemical or analytical test methods. <u>The WQSAP must include specific references to tables that describe specific Appendix IX compound analytical test methods, chemical names, and practical quantitation limits. MINS must conduct annual Appendix IX sampling from all Article 6 monitoring wells (POC, Interim POC, and nature and extent) in the impacted media (Cal. Code Regs., tit. 22, §66265.99(e6) until a corrective action monitoring program is established.</u>

12) Page 7-1. Section 7, Statistical Evaluation Plan. This section contains a single paragraph which introduces Appendix C – Statistical Evaluation Plan. The WQSAP must specify specific procedures for evaluating groundwater data sets and provide a detailed description of the selected method(s). The WQSAP must be revised to address the statistical requirements discussed in General Comment 8.

13) Table 5. MINS should revise this table to address previous comments regarding determination of background concentrations and procedures for evaluating groundwater data sets. References listed under Step 6 to updating probability plots for determination of ambient concentrations should be removed.

14) Table 15. The well screened interval data should be provided for all existing wells identified for sampling. Screened interval information should include middle of screen location based on surveyed top of casing datum to facilitate pump intake placement.

15) Appendix A. To facilitate location and review of the well logs, the appendix should have a table of contents, or at a minimum, a sequential list of the well logs contained within it.

16) Appendix B, Page 2, First Paragraph. The paragraph references "EM 385-1" requirements for drilling equipment. The appendix should identify the full reference of "EM 385-1" and summarize the relevant requirements.

17) Appendix B, Page 4. Second Paragraph. The paragraph indicates a minimum of 24 hours between annular seal (cement grout) placement and well development. The paragraph should be changed to indicate a 48 hour minimum between annular seal placement and well development. Water Well Standards, State of California, Bulletin 74-81 indicates that cement grout curing time should be 48 to 72 hours.

18) Appendix B, Page 6. Section 1.2 - Well Abandonment. The section should indicate that the neat cement used to seal the borehole of the destroyed well will be placed using a tremie pipe. The section should also include details for sequentially sealing off of DWBZ, IWBZ, and SWBZ in order to prevent vertical migration of contaminated SWBZ groundwater to underlying IWBZ and DWBZ areas during destruction of IWBZ and DWBZ wells.

19) Appendix C, Table C1. The table of chemical data from SWBZ wells proposed for use of characterizing background appears to contain errors associated with references to analyses conducted and results reported as "ND" (non-detect) when in fact they were not analyzed. The table must include the detection limit during instances of non-detect. The table must explain the difference between qualifiers "ND" and "U". The table should be reorganized into multiple tables consisting of inorganic results and organic results. The revised tables should also be submitted electronically in a readable computer format such as an Excel™ worksheet to allow for data review and evaluation of chemical statistics.

REFERENCES

DTSC. 2001. *Guidance Document, Monitoring Requirements for Permitted Hazardous Waste Facilities.* July 2001.
(www.dtsc.ca.gov/PublicationsForms/HWMP_Guidance_Monitoring-Requirements.pdf)

DTSC. 2004a. *Comprehensive Groundwater Monitoring Evaluation Report, Mare Island Naval Shipyard, RCRA Landfill, Surface Impoundments, and IWTP Pipeline.* April 2004.

DTSC. 2004b. *Memorandum, Review of Draft Water Quality Sampling and Analysis Plan, RCRA/Facility Landfill Post-Closure Groundwater Monitoring, Mare Island, Vallejo, California.* July 19, 2004.

DTSC. 2004c. *Memorandum, Groundwater Background Determination for Groundwater Remedial Investigation and Article 6 Monitoring Area H1 Landfill and Surface Impoundments, Mare Island, Vallejo, Solano County.* November 5, 2004.

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Attachments:
Table 1 – Summary of California Code of Regulations, Title 22 Background Concentration Limits
Table 2 – GSU's Recommendation for Well Decommissioning

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Table 1
Summary of California Code of Regulations, Title 22
Requirements for Establishing Background Concentration Limits

Section No.	Description (refer to complete regulatory citation for exact requirement)
66265.97(e)(6)	Establish a data set to be used to calculate background values.
66265.97(e)(7)	-Select one of the statistical methods specified in subsection (e)(8). Provide detailed description of criteria to be used for determining statistically significant evidence of a release and determining compliance with the water quality protection standard. -Demonstrate that use of the selected statistical method is protective of human health and the environment. -Demonstrate that method complies with performance standards of subsection (e)(9).
66265.97(e)(8)	Specify one of the listed statistical methods in the WQSAP.
66265.97(e)(9)	-Comply with the listed performance standards. -Statistical method must include procedures to control or correct for seasonal and spatial variability as well as temporal correlation in the data.
66265.97(e)(10)	-Select and justify use of the procedure for determining background value for each COC and monitoring parameter. -If parameter does not show natural variation, establish a procedure for determining the background value. -If parameter shows natural variation, statistical method to determine background should include a procedure updating the background value.
66265.97(e)(11)	-If parameter does not show natural variation, establish background value. -If parameter shows natural variation, provide detailed description of procedure to be used to establish and update background value.
66265.97(e)(12)	-For each COC and monitoring parameter, specify the procedure for establishing background values. -For each COC and monitoring parameter, specify the sampling methods that will be used to support establishment of the background value, determination of statistically significant release, and assessment of compliance with GWPS.

Table 2
GSU's Recommendation for Well Decommissioning

Well Number	Location Relative to Slurry Wall	Aquifer Zone Status	Weston Proposal	GSU's Recommendation
01W01	Inside	SWBZ	Abandon/Destroy	1
01W04	Inside	SWBZ	Abandon/Destroy	3
01W14	Outside	SWBZ	Abandon/Destroy	3
01W18	Inside	SWBZ	Abandon/Destroy	1
01W19	Inside	SWBZ	Abandon/Destroy	1
01W20X	Inside	SWBZ	Abandon/Destroy	1
01W21	Inside	SWBZ	Abandon/Destroy	1
01W22	Inside	SWBZ	Abandon/Destroy	1
01W28	Outside	SWBZ	Abandon/Destroy	2
01W32	Inside	SWBZ	Abandon/Destroy	1
01W36A	Inside	SWBZ	Abandon/Destroy	3
01W36B	Inside	IWBZ	Abandon/Destroy	3
01W36C	Inside	DWBZ	Abandon/Destroy	3
01W37A	Inside	SWBZ	Abandon/Destroy	3
01W37B	Inside	IWBZ	Abandon/Destroy	3
01W37C	Inside	DWBZ	Abandon/Destroy	3
01W38A	Inside	SWBZ	Abandon/Destroy	3
01W38B	Inside	IWBZ	Abandon/Destroy	3
01W38C	Inside	DWBZ	Abandon/Destroy	3
01W41C	Outside	DWBZ	Abandon/Destroy	3
01W60C	Outside	DWBZ	Abandon/Destroy	3
01W62B(C)	Outside	DWBZ	Abandon/Destroy	3
06W01	Inside	SWBZ	Abandon/Destroy	1
06W02	Inside	SWBZ	Abandon/Destroy	1
06W03	Inside	SWBZ	Abandon/Destroy	1
06W04	Inside	SWBZ	Abandon/Destroy	1
06W05	Inside	SWBZ	Abandon/Destroy	1
06W06	Inside	SWBZ	Abandon/Destroy	1
06W07	Inside	SWBZ	Abandon/Destroy	1
24W02	Outside	SWBZ	Abandon/Destroy	3
24W03	Outside	SWBZ	Abandon/Destroy	3
24W04	Outside	SWBZ	Abandon/Destroy	2
24W05X	Outside	SWBZ	Abandon/Destroy	3
IR01PZ013/14/15	Outside	SWBZ	Abandon/Destroy	3
IR01PZ016/14/15	Outside	SWBZ	Abandon/Destroy	3
IR01PZ019/14/15	Outside	SWBZ	Abandon/Destroy	3
IR01PZ022/14/15	Outside	SWBZ	Abandon/Destroy	3

1 Abandon / Destroy.
2 Retain well for groundwater sampling and piezometric monitoring.
3 Retain well for piezometric monitoring.