



**Matthew Rodriguez**  
Secretary for  
Environmental Protection



## Department of Toxic Substances Control

**Barbara A. Lee, Director**  
8800 Cal Center Drive  
Sacramento, California 95826-3200



**Edmund G. Brown Jr.**  
Governor

March 19, 2015

**Mr. Paul Turek**  
Environmental Manager  
Chemical Waste Management, Incorporated  
Kettleman Hills Facility  
Post Office Box 471  
Kettleman City, California 93239

Certified Mail #: 70102780000096658115

**REVIEW OF CONSTRUCTION QUALITY ASSURANCE FOR LANDFILL B-18 PHASE IIIA EXPANSION, CHEMICAL WASTE MANAGEMENT, INC., KETTLEMAN HILLS FACILITY, 35251 OLD SKYLINE ROAD, KETTLEMAN CITY, KINGS COUNTY, CALIFORNIA 93239, ENVIRONMENTAL PROTECTION AGENCY IDENTIFICATION NUMBER CAT000646117**

Dear Mr. Turek:

On December 12, 2008 Chemical Waste Management (CWM) submitted a Class 3 permit modification request to modify the design of Landfill B-18 to increase the facility's disposal capacity. The Department of Toxic Substances Control (DTSC) reviewed the associated application and granted a Class 3 permit modification of the Hazardous Waste Facility Permit effective June 23, 2014.

DTSC visited the CWM Kettleman Hills Facility to observe Landfill B-18 construction activities on the following dates: November 24, 2014, December 16, 2014, January 6, 2015, January 13, 2015, January 26, 2015, and February 12, 2015. In accordance with the California Code of Regulations (CCR), Section 66270.30, DTSC has inspected the construction activities and finds it in compliance with the conditions of the permit.

In accordance with CCR, Section 66264.19, CWM must meet the Construction Quality Assurance (CQA) Program requirements to ensure the constructed unit meets or exceeds all design criteria and specifications of the permit.

DTSC received the Landfill B-18 Volume 1 CQA Report (Phase IIIA Subgrade and Clay) on February 1, 2015 and the Volume 2 CQA Report (Phase IIIA Geosynthetics and Ops Layer) on February 17, 2015. Mr. Peter Gathungu of the DTSC Engineering and Special Projects Office reviewed the reports and DTSC provided comments to CWM. After

Mr. Paul Turek  
March 19, 2015  
Page 2

numerous reviews and revisions, Mr. Gathungu has issued final comments on the Volume 1 and Volume 2 CQA reports. As is noted on page 6, comment #15 of Mr. Gathungu's memorandum (enclosed) please revise the text and slope stability plots with the appropriate material properties to remove the discrepancy between the tabulated values and the values in the plot in the CQA Report and the values in the referenced 2011 Golder Report.

In accordance with CCR, Section 66264.19(d), DTSC has received the certification signed by the CQA officer, Mr. Ryan Hillman of Golder Associates, Inc.

DTSC has no objection to CWM placing waste in the newly constructed Landfill B-18 Phase IIIA unit, contingent upon CWM revising the text and slope stability plots with the appropriate material properties and submitting the revision to DTSC by March 27, 2015.

If you have any questions regarding this letter, please contact me at (916) 255-6413 or [muzhda.ferouz@dtsc.ca.gov](mailto:muzhda.ferouz@dtsc.ca.gov).

Sincerely,

  
// Original signed by//

Muzhda Ferouz  
Hazardous Substances Engineer  
Department of Toxic Substances Control  
8800 Cal Center Drive

Enclosure

cc: Mr. Dan Carlson  
Regional Water Quality Control Board  
Central Valley Region  
1685 "E" Street  
Fresno, California 93706-2025

Ms. Kristen Gomes  
Regional Water Quality Control Board  
Central Valley Region  
1685 "E" Street  
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**Mr. Paul Turek**  
**March 19, 2015**  
**Page 3**

**cc: Mr. John Moody**  
**Waste Management Division (WST-4)**  
**US Environmental Protection Agency, Region 9**  
**75 Hawthorne Street**  
**San Francisco, California 94105-3901**

**Mr. Lynn Baker**  
**California Air Resources Board**  
**1001 I Street**  
**Sacramento, California 95812**

**Mr. Arnaud Marjollet**  
**San Joaquin Valley Unified Air Pollution Control District**  
**1990 East Gettysburg Avenue**  
**Fresno, California 93726**

**Mr. Dave Warner**  
**Director of Permit Services**  
**San Joaquin Valley APCD**  
**1990 E. Gettysburg Ave.**  
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### MEMORANDUM

TO: Muzhda Ferouz  
Project Manager  
Office of Permitting, Sacramento

VIA: Juan Koponen, Unit Chief // Original signed by//  
Engineering and Special Projects Office

FROM: Peter Gathungu, P.E.; G.E. // Original signed by//  
Hazardous Substances Engineer. U 3/18/15  
Engineering and Special Projects Office



SUBJECT: RESPONSE TO COMMENTS FOR REVIEW OF CONSTRUCTION  
QUALITY ASSURANCE FOR LANDFILL B-18 PHASE IIIA EXPANSION,  
KETTLEMAN HILLS FACILITY, KINGS COUNTY, CALIFORNIA  
(SITE CODE: 100032)

DATE: March 18, 2015

#### DOCUMENTS REVIEWED

1. *Response to DTSC Review Comments on the Volume 2 CQA Report, Landfill B-18 Phase III Expansion, Kettleman Hills Facility—Kings County, California, dated March 11, 2015, prepared by Golder Associates, Inc., 230 Commerce, Suite 200, Irvine, California 92602 for Chemical Waste Management, Inc., 35251 Old Skyline Road, Kettleman City, California 93239.*
2. *Construction Quality Assurance (CQA) Report for landfill B-18 Phase III Expansion, Volume 1: Phase IIIA Subgrade and Secondary Clay Liner, Kettleman Hills Facility, Kings County, California, dated January 2015 (CQA Report Volume 1), prepared by Golder Associates, Inc., 230 Commerce, Suite 200, Irvine, California 92602 for Chemical Waste Management, Inc., 35251 Old Skyline Road, Kettleman City, California 93239.*

3. *Construction Quality Assurance (CQA) Report for landfill B-18 Phase III Expansion, Volume 2: Phase IIIA Geosynthetics and Operations Layer, Kettleman Hills Facility, Kings County, California*, dated February 2015 (CQA Report Volume 2), prepared by Golder Associates, Inc., 230 Commerce, Suite 200, Irvine, California 92602 for Chemical Waste Management, Inc., 35251 Old Skyline Road, Kettleman City, California 93239.

## INTRODUCTION

The Engineering and Special Projects Office (ESPO) of the Department of Toxic Substances Control (DTSC) has completed its review of responses to comments (RTCs) from our review memo dated March 9, 2015 for the above listed documents for the Kettleman Hills Facility (KHF), Landfill B-18 Phase IIIA Expansion in Kettleman City, Kings County, California. We reviewed CQA Report Volume 1 in February and provided our review comments to Chemical Waste Management (CWM) via an email dated February 18, 2015. We received responses from Golder Associates (Golder) to those comments in a letter dated February 24, 2015. Golder provided responses to our March 9, 2015 memo in a letter dated March 11, 2015. If you have any questions or comments regarding this memorandum, please contact me at (916) 255-6662 or via email at [Peter.Gathungu@dtsc.ca.gov](mailto:Peter.Gathungu@dtsc.ca.gov).

## PROJECT SUMMARY

The KHF is located on the north side of Highway 41 about 2.5 miles west of Interstate 5 and about 3.5 miles southwest of Kettleman City in Kings County, California. The KHF site is surrounded by cattle grazing and oil and gas production operations. The KHF was established in 1979 and encompasses about 1600 acres of which 499 acres are presently permitted for active hazardous and municipal solid waste management activities. However, the hazardous (Class I) and municipal solid waste (Class II/II) operations are handled separately. The facility consists of one hazardous waste landfill (Unit B-18), two municipal solid waste landfill units (Units B-17 and B-19), a polychlorinated biphenyl (PCB) flushing/storage unit, a final stabilization unit (FSU), two bulk storage units (BSU I and BSU II), and a drum storage unit.

Unit B-18, an approximate 52.4-acre landfill, was constructed in two phases between 1991 and 1993: Phase I on the west portion and Phase II on the east portion. Unit B-18 is being expanded by about 13.8 acres (Phase III) in two phases (IIIA and IIIB). Phase IIIA covers about 3.5 acres along the entire northern and northern one-third portion of the western portion of Phase III, was completed last month, and is the subject of the current CQA review effort. Phase IIIB construction is ongoing and is expected to be completed in the summer. The expansion involves construction of a sideslope liner system along the west, north and south sides of the existing unit. The sideslope liner system consists of, from bottom to top, prepared subgrade, a minimum 3-foot thick secondary clay layer with a maximum saturated hydraulic conductivity (permeability) of  $1.0 \times 10^{-7}$  centimeters per second (cm/sec), a 60-mil double-sided textured (DST) high density polyethylene (HDPE) secondary geomembrane, a

secondary geocomposite leachate collection and removal system (LCRS) drainage layer, a 60-mil DST HDPE primary geomembrane, a primary geocomposite LCRS drainage layer, and a minimum 2-foot thick operations soil layer.

Our previous comments and recommendations, and our responses to the February 24<sup>th</sup> and March 11<sup>th</sup> responses from Golder, are presented below. All our previous comments, with the exception of Comment No. 15 on Volume 2 CQA, appear to have been addressed adequately.

## **COMMENTS AND RECOMMENDATIONS**

### **CQA Report Volume 1**

1. It would be helpful to include a list of abbreviations and acronyms in the front portion of the document. *No further comment.*
2. **Section 3.2 Mass Earthworks.** The last sentence in the second paragraph states that fill was "keyed into" the slope a minimum of six horizontal feet such that the "keys" formed a series of steps in the structural fill subgrade. However, what is described, *steps*, appear to be benches. This terminology is used elsewhere in the document, e.g Section 3.6.2 Mass Earthworks first sentence, second paragraph, as well as in the daily field reports. Please clarify whether keying or benching, or both were performed and revise the text accordingly. *No further comment.*
3. **Section 3.3 Exposing of Tie-In to Existing Phases I and II Liner Systems.** The first sentence of the second paragraph states; ".....was to be completely removed". This is not clear/is confusing. However, the CQA is supposed to report on what was actually done. Please revise the text to clearly indicate what was done. *No further comment.*
4. **Section 4.3 Clay Liner Placement and Compaction.** The first sentence in the second paragraph states that either a Caterpillar 815F or 825H padfoot compactor was used. However, the project specifications called for a Caterpillar 825. While a Caterpillar 815 is acceptable as long as the required compaction was met, an explanation should be included in the text for the deviation from the project specification. *No further comment*
5. **Section 4.3 Clay Liner Placement and Compaction.** The fourth sentence of the second paragraph refers to the "south" side of Phase IIIA and Design Clarification 02 in Appendix C.1. However, Design Clarification 02 refers to the "west" side. Please clarify and revise the text accordingly. *No further comment*

6. Appendix A Photographs. The photographs are not dated. Please revise the caption text to include a date when the photographs were taken. *No further comment.*
7. Appendix B Daily CQA Field Monitoring Reports. November 20, 2014 Daily Field Report, third bullet in Section 3 CQA Activity Summary states that sample SF-02 was collected on this date, however, the Daily Field Report for November 19<sup>th</sup> also states that sample SF-02 was collected on November 19<sup>th</sup>. Please clarify and revise the text accordingly. *No further comment.*
8. Appendix C.2 Record Drawings. The drawings are not dated. In addition, it is not clear whether the drawings show clay liner or subgrade grades. A tabulation of the survey points would be helpful to the reader for ease of reference. Please revise the drawings and include drawing preparation dates, indicate clearly what the grades shown represent (clay or subgrade). *No further comment.*
9. Appendix D Subgrade Geologic Mapping Technical Memorandum. The tech memo is signed and stamped, but a signing date is not included. Please include a signing date as required by the Business and Professions Code. *No further comment.*
10. Appendix E 2 Field Moisture-Density Test Results. Table E-1: Summary of Field Moisture-Density Test Results, Phase IIIA Structural Fill Subgrade, Kettleman Hills Facility – Landfill B-18 Phase III Expansion. The tabulated data indicates that the compaction curve test results for Samples SF-06 and SF-06 are dated 12/18/2014. However, field moisture-density tests referencing these compaction curves were performed on 11/21/2014. Please explain the discrepancy. *No further comment.*

## **CQA Report Volume 2**

11. Section 3.2.2.1 Deployment. The fourth sentence states that approximately 149,000 square feet each of primary and secondary geomembrane were deployed in Phase IIIA. However, the deployment logs in Appendices D.6 and D.7 show that 151,345 square feet of primary and 150,748 square feet of secondary geomembranes were installed. We note that the text in the fourth paragraph in Section 3.3.2 states that approximately 150,000 square feet each of primary and secondary geocomposite was installed in phase IIIA (we anticipate that the geocomposites are underlain by geomembranes). Please revise the text to clarify and indicate the correct footage of installed/deployed geomembrane. *No further comment.*
12. Section 5.2 CQA Activities. The text in the second sentence in the second (last) paragraph states that all construction equipment operated on at least three feet of operations layer soil over geosynthetics. However, the design documents, as well as the text in the second and fourth paragraphs in Section 5.1 Construction Methods and Quantities, indicate that the operations layer was designed as a two-foot thick

section. Please clarify the correct operations layer thickness and revise the text accordingly. *No further comment.*

13. Appendix A Construction Photographs. The photographs are not dated. Please revise the caption text to include a date when the photographs were taken. *No further comment.*

14. Appendix B Daily CQA Field Monitoring Reports. The first bullet in Section 3 CQA Activity Summary of the January 23, 2015 Daily CQA Field Monitoring Report #057 states that Golder observed geomembrane subgrade preparation in Phase IIIA. However, the text in the last paragraph in Section 4.3 Clay Liner Placement and Compaction of the CQA Report Volume 1 states that placement of the secondary clay liner was completed on January 22, 2015. In addition, the subgrade acceptance letter is dated January 23, 2015. Please clarify when the subgrade was completed and revise the text accordingly. *No further comment.*

15. Appendix G.2 Confirmatory Slope Stability Analyses. Appendix B Slope Stability Analysis Plots. The material properties shown in the plots do not appear to agree with the information in the text. For example, the plots show a bedrock unit weight of 130, but the value in Table 1, Selected Material Properties for Static and Seismic Stability Analyses, is shown as 150. Also, it is not clear which liner is being referred to in the plots; clay or HDPE. In addition, the unit weight used for the waste, liner and compacted soil are the same (115 pounds per cubic foot). Please include an explanation/justification for assuming the waste has similar properties to compacted soil, and revise the text/plots to remove the discrepancy between the tabulated values and the values in the plots.

*Golder response: The bedrock unit weight of 150 pcf shown in Table 1 is a typo as it should be 130 pcf, which is the value that was used in the analyses as shown on the plots. Table 1 on page 2 in Appendix G.2 has been revised to show the correct bedrock unit weight of 130 pcf. The bedrock unit weight has no effect on the results of the slope stability analyses as all of the potential failure surfaces are located above the bedrock. All of the other values in Table 1 are in agreement with those shown on the plots.*

*The liner being referred to in the slope stability plots represents the geosynthetic interface with the lowest shear strength (e.g., the 60-mil HDPE geomembrane/secondary clay liner interface for the Phase III liner system). For each phase of B-18, the geosynthetic liner system for that phase is modeled in the slope stability program as a thin layer with a shear strength equal to that of the weakest geosynthetic interface in that liner system.*

*With the exception of the Phase III liner system, all of the unit weight and shear strength properties for the materials/interfaces modeled in the confirmatory slope*

*stability analyses were the same as those used in the original slope stability analyses performed to support the B-18 Phase III design, as described in the Engineering and Design Report for B-18 (Golder, 2011). A sentence has been added to the end of the paragraph immediately before Table 1 on page 2 in Appendix G.2 to state this. As such, explanation/justification for the use of a unit weight of 115 pcf for the hazardous waste and compacted clay liner are given in Golder (2011).*

*The unit weights of the geosynthetic liner systems were assigned an arbitrary value of 115 pcf in the analyses, as shown on the plots. The unit weight of the geosynthetic liner system has no effect on the results of the slope stability analyses due to the geosynthetic liner system being very thin.*

*Instructions for replacement pages: Remove pages 1 and 2 in Appendix G.2 and replace with the new pages 1 and 2.*

***Follow-up comment:*** Our review of the referenced 2011 Golder study indicates that a bedrock unit weight of 150 pounds per cubic foot (pcf) was used. Please revise the text and plots for consistency. In addition, it is stated that the geosynthetic liner was assigned an arbitrary unit weight of 115 pcf, and that the unit weight of the liner has no effect because the liner is very thin. It is our opinion that because the liner is a material with a known unit weight, using the known unit weight would provide better clarity and completeness.

16. Appendix G.2 Confirmatory Slope Stability Analyses. The report is signed and stamped, but the signing date is not include. Please include a signing date to comply with the requirements of the Business and Professions Code. *No further comment.*