



Matthew Rodriguez
Secretary for
Environmental Protection



Department of Toxic Substances Control

Barbara A. Lee, Director
1001 "I" Street
P.O. Box 806
Sacramento, California 95812-0806



Edmund G. Brown Jr.
Governor

November 18, 2016

Mr. Bob Henry
Senior District Manager
Chemical Waste Management, Incorporated
Kettleman Hills Facility
Post Office Box 471
Kettleman City, California 93239

Certified Mail No.: 70031680000430243308

NOTICE OF DEFICIENCY FOR THE PERMIT RENEWAL APPLICATION FOR THE
CHEMICAL WASTE MANAGEMENT, INC., KETTLEMAN HILLS FACILITY
HAZARDOUS WASTE FACILITY, 35251 OLD SKYLINE ROAD, KETTLEMAN CITY,
KINGS COUNTY, CALIFORNIA, 93239, ENVIRONMENTAL PROTECTION AGENCY
IDENTIFICATION NUMBER: CAT000646117

Dear Mr. Henry:

The Department of Toxic Substances Control (DTSC) has completed its technical review of the revised Hazardous Waste Facility Permit Renewal Application (Revised Application) dated May 15, 2013 for the Chemical Waste Management, Inc., Kettleman Hills Facility (CWM) located at 35251 Old Skyline Road, Kettleman City, Kings County, California. The Revised Application has been reviewed for compliance with the applicable California Code of Regulations, title 22 and the Health and Safety Code, division 20 requirements. DTSC has determined that the Revised Application is deficient. The enclosed comments comprise the Notice of Deficiency (NOD) issued for the Revised Application.

This NOD consists of three parts: this letter; the attached NOD referencing the Revised Application deficiencies; and specific comments with memorandum reports submitted by DTSC's Geological Services Unit, Human and Ecological Risk Office, and Permitting Cost Estimate Special Projects Unit.

DTSC would like to schedule a meeting to discuss the deficiencies. I will be contacting you shortly to schedule this meeting.

The following must be submitted by: February 15, 2017:

Mr. Bob Henry
November 18, 2016
Page 2

- 1) **Written responses to each of the deficiencies identified.** In responding to each of the deficiencies, restate the deficiency and identify the page number in the revised application where the deficiency has been addressed.
- 2) **A redlined/strikeout version of the revised permit application showing the changes that have been made to the Revised Application.**
- 3) **Two hardcopies and one electronic copy (CD or flash drive) of the complete revised permit application.**

Please note that pursuant to Health and Safety Code section 25200.8 and California Code of Regulations, title 22, section 66271.2(e), DTSC may deny permit applications based on a failure of the applicant to respond to a notice of deficiency or the applicant responds with substantially incomplete or substantially unsatisfactory information.

If you have any questions, please contact me at Muzhda.Ferouz@dtsc.ca.gov or (916) 255-3883.

Sincerely,



Muzhda Ferouz
Supervising Hazardous Substances Engineer I
Permitting Division
Department of Toxic Substances Control

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
Fresno, California 93706-2025

Mr. Bob Henry
November 18, 2016
Page 3

Ms. Frances Wicher
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 Avenue
Fresno, California 93726

Mr. Wayne Lorentzen, P.E.
Branch Chief
Permitting Division
Department of Toxic Substances Control
8800 Cal Center Drive
Sacramento, California 95826

**FIRST NOTICE OF DEFICIENCY FOR
CHEMICAL WASTE MANAGEMENT, INC., KETTLEMAN HILLS HAZARDOUS WASTE
FACILITY
EPA ID NO. CAT000646117**

The results of DTSC's technical review for the Chemical Waste Management, Inc., Kettleman Hills (CWM) Hazardous Waste Facility are presented below. The technical review is formatted to correspond with the sections presented in CWM's permit application. For each deficiency, the following are provided: (1) the requirement (i.e. relevant statute and/or regulation, where applicable), which provides the basis for the deficiency; (2) the part/section/page in which the deficiency is found in the application; (3) DTSC's findings; and, (4) instructions for remedying the deficiency.

GENERAL COMMENTS:

1. Revise the permit application to include a section that clearly lists all major changes in the new revised permit application. As a rule, changes requiring a Class 2 or Class 3 permit modification application should be listed clearly.
2. The permit application includes numerous references to pertinent documents. Pertinent documents associated with operating units at the facility must be included with the revised application.
3. The permit application shall not include any verbiage that refers to future revisions of documents. For example, verbiage such as "or any revision thereof" shall not be included in the permit application.

SPECIFIC COMMENTS:

1. Topographic map, Figure 4-2: Pursuant to California Code of Regulations, title 22, section 66270.14(b)(18)(G) the topographic map shall clearly show the legal boundaries of the hazardous waste management facility site. The topographic map does not clearly show the legal boundaries of the hazardous waste management facility.

The permit application must be revised to clearly show the legal boundaries of the hazardous waste management facility in such way that meets the requirements of California Code of Regulations, title 22, section 66270.14(b)(18)(G).

2. Topographic map, Figure 4-2: Pursuant to California Code of Regulations, title 22, section 66270.14(c)(3) the topographic map shall show a delineation of the waste management area, the property boundary, the proposed "point of compliance" as defined under section 66264.95, the proposed groundwater monitoring points as required under sections 66264.95 and 66264.705, and, to the extent possible, the information required in subsection 66270.14(c)(3).

The topographic map does not clearly show the legal boundaries of the hazardous waste management facility.

The permit application must be revised to clearly show the legal boundaries of the hazardous waste management facility in such way that meets the requirements of California Code of Regulations, title 22, section 66270.14(c)(3).

3. Identification of the Uppermost Aquifer, Chapter 25: Pursuant to California Code of Regulations, title 22, section 66270.14(c)(2) the permit application shall include, for each regulated unit, identification of the uppermost aquifer and aquifers hydraulically interconnected beneath the facility property, including groundwater flow direction and rate, which at a minimum shall be determined at the times of expected highest and lowest annual elevations of the groundwater surface, and the basis for such identification (i.e., the information obtained from hydrogeologic investigations of the facility area).

Chapter 25 of the Operation Plan references previously submitted documents that provide a comprehensive description of the site hydrogeology.

The permit application must be revised to include (not by reference) the appropriate documents to meet the requirements of California Code of Regulations, title 22, section 66270.14(c)(2).

4. Plume Descriptions and Delineations, Chapter 9.1: Pursuant to California Code of Regulations, title 22, section 66270.14(c)(4)(A) the permit application shall include a topographic map that includes delineation of the extent of any plume that has migrated from a regulated unit.

Chapter 9.1 of the Operation Plan references a report that includes this map but is not included in the submitted Operation Plan.

The permit application must be revised to include (not by reference) the appropriate documents to meet the requirements of California Code of Regulations, title 22, section 66270.14(c)(4)(A).

5. Seismic and Floodplain Information, Chapter 5.2 Floodplain Report: Chapter 5.2 of the application incorrectly references Figure 4.1 to indicate the active waste management area is at least 0.5 miles from a mapped Federal Insurance Administration (FIA) 100-year floodplain. The permit application must be revised to refer to Figure 4.2 instead.

- 5.1 Seismic and Floodplain Information, Chapter 5.2 Floodplain Report: Pursuant to California Code of Regulations, title 22, section 66270.14(b)(11)(B) the permit application shall provide an identification of whether the facility is located within a 100 year floodplain. This identification shall indicate the source of data for such determination and include a copy of the relevant Federal Insurance Administration (FIA) flood map, if used, or the calculations and maps used where and FIA map is not available.

The permit application does not include a copy of the relevant FIA flood map or the calculations and maps used where the FIA map is not available.

The permit application must be revised to include a copy of the flood map used in your determination.

6. Seismic and Floodplain Information, Chapter 5.2 Floodplain Report: Figure 4.2 references the source for the determination of how far the facility is located from a flood plain (Flood Insurance Rate Map). This map shall be included in the permit application (see comment 5.1). This map must also be referenced in Chapter 5.2 of the permit application for better clarity.
7. Traffic, Chapter 10: Pursuant to California Code of Regulations, title 22, section 66270.14(b)(10) the permit application shall provide a description of access road surfacing and load bearing capacity as well as traffic control signs and signals.

The text specifies that Figure 10-1 depicts the paved access road extending from SR-41 to the entrance gate. However, SR-41 is not shown on the figure and a description of the items required in 66270.14(b)(10) is not provided on a figure or in the text.

The permit application must be revised to meet the requirements of California Code of Regulations, title 22, section 66270.14(b)(10).

8. Chemical and Physical Analyses, Chapter 11.5 Chemical and Physical Analysis Data: Pursuant to California Code of Regulations, title 22, section 66270.14(b)(2) the permit application shall provide chemical and physical analyses of the hazardous waste and hazardous debris to be handled at the facility.

Chapter 11.5 of the application indicates that chemical and physical characterizations of each waste accepted at the facility are maintained in onsite files.

The permit application must be revised to include the chemical and physical characterizations of each waste accepted at the facility. The analyses must contain all information required to transfer, treat, store or dispose of the wastes properly in accordance with 66264.13(a)(1).

9. Specific Information for Tank Systems, Chapter 15.0: Pursuant to California Code of Regulations, title 22, section 66264.191(f) the permit application shall submit with the Part B application a written statement, signed by an independent, qualified professional engineer, registered in California, in accordance with section 66270.11(d), attesting that the tanks and containment system are suitably designed to achieve the requirements of this article.

Chapter 15.0 indicates the required certifications are provided in Exhibit 15-3 and in the "Certification Report (Engineering Services Inc., 1990)." The information provided is inadequate and the Certification Report was not included in the application.

The permit application must be revised to provide a written assessment of each existing tank system's integrity in accordance with California Code of Regulations, title 22, section 66264.191. The assessment must be current, prepared and certified by an independent, qualified professional engineer registered in California and must include all of the information listed in subsection 66264.191(i).

10. Waste Analysis Plan, Chapter 12: California Code of Regulations, title 22, section 66264.73(b) requires the recording of information that includes the description and the quantity of each hazardous waste received, and the method(s) and date(s) of its transfer, treatment, storage, or disposal at the facility as well as other information about the waste.

Please provide some examples of your (completed) operating records to show compliance with the items listed in 66264.73(b).

11. Part A Permit Application: Pursuant to California Code of Regulations, title 22, section 66270.13(n) the Part A permit application shall provide for hazardous debris, a description of the debris category(ies) and contaminant category(ies) to be treated, stored, or disposed of at the facility.

The permit application must be revised to include the required information listed in subsection 66270.13(n).

12. Waste Analysis Plan, Chapter 12: California Code of Regulations, title 22, section 66264.73(b)(3) requires recordkeeping procedures for waste analyses and waste determinations.

The Waste Analysis Plan must be revised to describe the recordkeeping procedures used to comply with 66264.73(b)(3) and 66268.7.

13. Waste Analysis Plan, Chapter 12: California Code of Regulations, title 22, section 66264.73 lists the requirements of the Operating Record. The permit application does not describe the procedures that will be used to maintain the Operating Record as required by 66264.73.

The application must be revised to include a description of the procedures that will be used to maintain the operating record in accordance with 66264.73.

14. Containers: California Code of Regulations, title 22, section 66268.50(a)(2)(A) requires each container to be clearly marked to identify its contents and the date each period of accumulation begins. The permit application does not describe the procedures that will be taken to ensure each container is clearly marked to identify its contents and the date each period of accumulation begins.

The permit application must be revised to include a description of the procedures that will be used to satisfy the requirements in 66268.50(a)(2)(A).

15. Tanks: California Code of Regulations, title 22, section 66268.50(a)(2)(B) requires each tank to be clearly marked with a description of its contents, the quantity of each hazardous waste received, and the date each period of accumulation begins, or such information for each tank be recorded and maintained in the operating record at the facility. The permit application does not describe the procedures that will be taken to ensure that a description of tank contents, quantity of hazardous waste received, and the date each period of accumulation begins for each tank used to store restricted wastes for the purpose of accumulation at the facility.

The permit application must be revised to include a description of the procedures that will be used to satisfy the requirements in 66268.50(a)(2)(B).

16. Polychlorinated Biphenyls (PCBs): California Code of Regulations, title 22, section 66268.50(f) requires liquid hazardous wastes containing PCBs at concentrations greater than or equal to 50 ppm be stored at a facility that meets the requirements of 40 CFR section 761.65(b) and that it is removed from storage within 1 year of the date when such waste was initially placed into storage. The permit does not describe the procedures that will be used to ensure that liquid hazardous wastes containing PCBs at concentrations greater than or equal to 50 ppm be stored at a facility that meets the requirements of 40 CFR section 761.65(b) and that it is removed from storage within 1 year of the date when such waste was initially placed into storage.

The permit application must be revised to include a description of procedures that will be used to ensure compliance with 66268.50(f).

17. Exemptions, Extensions, and Variances to Land Disposal Restrictions, Chapter 13: California Code of Regulations, title 22, section 66270.14(b)(20) requires copies of the notices of approval or the letter granting a variance to be submitted with the permit application. Chapter 13.0 indicates a variance was approved but does not include the approval letter(s).

The permit application must be revised to include the appropriate approval letter(s).

18. Variance from a Treatment Standard: California Code of Regulations, title 22, section 66268.44(i) requires generators, treatment facilities, and disposal facilities that manage waste covered under a site-specific variance from a treatment standard to comply with the waste analysis requirements for restricted wastes found in 66268.7.

The permit application must be revised to include a description of procedures that will be used to comply with 66264.13 and 66268.7 for waste managed under variances.

19. Specific Information for Containers, Chapter 14: California Code of Regulations, title 22, section 66264.175(b) specifies the design and operation requirements for containment systems. The design drawings are referenced but not included in the permit application.

The permit application must be revised to include as built drawings for the containment systems associated with the Drum Storage Unit (DSU), PCB Flushing/Storage Unit, Bulk Storage Unit (BSU) 1, BSU 2 and the Final Stabilization Unit (FSU). The drawings should contain enough information to show that the containment systems comply with 66264.175(b)(1)-(5) and 66270.15.

20. Specific Information for Containers, Chapter 14: California Code of Regulations, title 22, section 66264.175(c) requires the submittal of a written statement signed by an independent, qualified professional engineer, registered in California, which indicates that the containment systems in place at the container storage units identified in Chapter 14.0 are suitably designed to meet the requirements. These certifications are referenced but not included in the permit application.

The permit application must be revised to include signed statements for each of the container storage units to comply with 66264.175(c).

21. Specific Information for Tank Systems, Chapter 15: Chapter 15 includes discussion of future tank units but indicates specific details of the tanks will be provided prior to installation. DTSC cannot evaluate the application for approval of these units without the information required by California Code of Regulations, title 22, Sections 66264.192, 66264.193 and 66270.16.

The permit application must be revised to include this information prior to approval.

22. Specific Information for Tank Systems, Chapter 15: California Code of Regulations, title 22, section 66270.16(g) requires detailed plans and descriptions of how the secondary containment system for each tank is or will be designed, constructed, and operated to meet the requirements of sections 66264.193(a), (b), (c), (d), (e), (f) and (j). Such plans and descriptions are not included in the permit application.

The permit application must be revised to include drawings, plans, and details of the secondary containment system design and operation for each existing tank to meet the requirements of 66270.16(g) and 66264.193.

23. Specific Information for Tank Systems, Chapter 15: California Code of Regulations, title 22, section 66270.16(i) requires the permit application to include the description of controls and practices to prevent spills and overflows, as required under section 66264.194(b). Chapter 15 includes insufficient detail to describe controls and practices to prevent spills and overflows.

The permit application must be revised to provide sufficient descriptions and detail to meet the requirements of 66270.16(i), 66264.194 and 66264.195.

24. Specific Information for Surface Impoundments, Chapter 17: California Code of Regulations, title 22, section 66270.17(b) requires detailed plans and engineering reports be submitted with the application. Chapter 17 references Table 17-1 to identify plans, specifications, and engineering documents previously submitted to DTSC related to the active surface impoundments at the facility.

The permit application must be revised to include copies of plans and engineering reports that address the items listed in 66270.17(b)(1)-(7).

25. Specific Information for Surface Impoundments, Chapter 17: Chapter 17 includes insufficient detail on the description of the design and/or operating procedures that will protect against impoundment overtopping/overflow.

The permit application must be revised to include additional detail to meet the requirements of 66264.221(g)-(j).

26. Specific Information for Surface Impoundments, Chapter 17: California Code of Regulations, title 22, section 66270.17(d) requires a description of how each surface impoundment will be inspected to meet the requirements of 66264.226(a), (b) and (d). Chapter 17.2(a)(2) of the permit application indicates that some of these descriptions are contained in documents previously submitted to DTSC. These documents are considered part of the permit application and must be submitted with the application. Include copies of these documents with the revised application.

27. Specific Information for Surface Impoundments, Chapter 17: California Code of Regulations, title 22, section 66264.226(c) requires certification from a qualified engineer registered in California, that surface impoundment dikes have an adequate level of structural integrity.

The permit application must be revised to include the certification from a qualified engineer registered in California, that surface impoundment dikes have an adequate level of structural integrity.

28. Specific Information for Surface Impoundments, Chapter 17: Chapter 17 indicates the wastes listed in Appendix A of the application may be treated in active surface impoundments. However, Chapter 17.2(a)(5) states RCRA wastes F020, F021, F022, F023, F026 and F027 are not currently accepted in the surface impoundments but are included in Appendix A indicating they may be treated in surface impoundments.

In the revised permit application correct the discrepancies in these conflicting statements. California Code of Regulations, title 22, section 66270.17(j) requires a separate waste management plan for surface impoundments accepting RCRA wastes F020, F021, F022, F023, F026 and F027. Revise the list of wastes proposed to be accepted at the surface impoundments or provide the required waste management plan in accordance with 66264.231.

29. Specific Information for Landfills, Chapter 19: California Code of Regulations, title 22, section 66270.21(b) requires Part B applications include detailed plans and engineering reports describing how the landfills are designed, constructed, operated and maintained to meet the requirements of sections 66264.19, 66264.301, 66264.302 and 66264.303 . The application includes references to design and construction documents that demonstrate compliance with 66264.301 through 66264.304. These documents are considered part of the permit application and must be submitted with the application.

The permit application must be revised to include copies of these documents. The documents should address all of the information required under 66270.21(b) to meet the requirements of 66264.19, 66264.301, 66264.302 and 66264.303.

30. Specific Information for Landfills, Chapter 19: Chapter 19.2(a)(4) references the Storm Water Management Plan. This document is considered part of the permit application and must be submitted with the application. Include copies of this document with the revised application.
31. Specific Information for Landfills, Chapter 19: California Code of Regulations, title 22, section 66264.314(d) requires sorbents used to treat free liquids to be disposed of in landfills shall be nonbiodegradable.

In the revised permit application provide details on the type of sorbents used at the facility to ensure they comply with 66264.314(d).

32. Specific Information for Surface Impoundments, Chapter 17: Chapter 17.2(a)(5) indicates that "RCRA Waste Nos. 17.2(a)(5) RCRA Waste Nos. F020, F021, F022, F023, F026 and F027 are not currently accepted at the KHF surface impoundments. Should these wastes be accepted for treatment in surface impoundments in the future, a management plan for these wastes would be submitted to DTSC as required by 22 CCR 66270.17(j)."

The revised permit application must indicate that DTSC approval of the Special Waste Management Plan is required prior to placing these wastes.

33. Specific Information for Containers, Chapter 14: California Code of Regulations, title 22, section 66270.14(a) requires "Certain technical data, such as design drawings and specifications, and engineering studies shall be certified by an independent, qualified professional engineer registered in California. Geologic plans, specifications, reports or documents shall be prepared

by or under the direction of, and shall be certified by, a geologist registered in California.” Chapter 14.1 of the application includes references to design drawings only.

These documents are considered part of the permit application and must be submitted with the application. Include copies of these documents with the revised application. The documents must address all of the information required under 66270.14 and 66264.1100-1102 to meet the requirements of 66264.19, 66264.301, 66264.302 and 66264.303.

34. Procedures to Prevent Hazards: California Code of Regulations, title 22, section 66264.15(d) requires the owner or operator to record inspections in an inspection log or summary. At a minimum, these records shall include the date and time of the inspection, the name of the inspector, a notation of the observations made, and the date and nature of any repairs or other remedial actions.

In the revised application provide an example log or summary to illustrate that the minimum requirements are met.

35. Specific Information for Waste Piles: Chapter 16.0 of the Operation Plan indicates there are no waste piles at the facility. However, in Table 31-3 (Active and Inactive Unit Inspection), it indicates that treated waste piles will be inspected daily.

In the revised permit application please clear this discrepancy.

36. Inspection Program, Chapter 31: California Code of Regulations, title 22, section 66270.17(c) requires detailed plans and an engineering report explaining the location of the saturated zone in relation to the surface impoundment, and the design of a double liner system that incorporates a leak detection system between the liners. This has not been provided in the permit application.

The permit application must be revised to provide the associated documents and describe how the double liner system and leak detection system will be inspected. Information provided shall also meet the requirements of 66264.226(d).

37. Containment Buildings: The permit application must be revised to provide a detailed description of the prevention, inspection, and recording practices for containment buildings to meet the requirements of California Code of Regulations, title 22, sections 66264.1101(c)(3) and 66264.1101(c)(4).

38. Contingency Plan, Chapter 35: California Code of Regulations, title 22, section 66264.227 describes conditions under which a surface impoundment shall be removed from service.

In the contingency plan of the revised permit application, indicate the procedures to remove a surface impoundment from service to meet the requirements of 66264.227(a) – (e).

39. Contingency Plan, Chapter 35: Pursuant to California Code of Regulations, title 22, section 66264.1101(c)(3) throughout the active life of the containment building, if the owner or operator detects a condition that could lead to or has caused a release of hazardous waste, the owner or operator shall repair the condition promptly, in accordance with the procedures listed

in 66264.1101(c)(3)(A) – (C). The permit application does not indicate the process that will be enacted were such a condition detected.

The permit application must be revised to detail the process that would take place if a condition was detected that could lead to or has caused a release of hazardous waste to meet the requirements of 66264.1101(c)(3)(A) – (C).

Attachment A
Geological Services Branch Memorandum Report



Matthew Rodriguez
Secretary for
Environmental Protection



Department of Toxic Substances Control

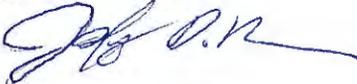
Barbara A. Lee, Director
8800 Cal Center Drive
Sacramento, California 95826-3200

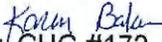


Edmund G. Brown Jr.
Governor

MEMORANDUM

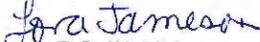
TO: Muzhda Ferouz
Hazardous Substances Engineer
Sacramento Office of Permitting
Hazardous Waste Management Program

FROM: Jeff Brown, PG #7757 
Engineering Geologist
Sacramento Geologic Services Unit (GSU)
Geological Services Branch
Brownfields and Environmental Restoration Program

REVIEWERS: Karen Baker, CHG #172 
Branch Chief
Geological Services Branch

Dan Gallagher, CHG #506 
Senior Engineering Geologist
Sacramento GSU

Paul Carpenter, CHG #752 
Senior Engineering Geologist
Sacramento Cleanup Program

Lora Jameson, PG #8134 
Engineering Geologist
Sacramento GSU

DATE: August 14, 2015

SUBJECT: Review of the Part B Permit Application
Chemical Waste Management (CWM) – Kettleman Hills Facility
Kings County, California
Project No. 25005/100032-33/20028684

DOCUMENT REVIEWED

1. Hazardous Waste Facility Permit Renewal Application, Operation Plan, Chemical Waste Management Facility, Revision 1, prepared by Chemical Waste Management, dated May 15, 2013 (permit application).

The Sacramento Geologic Services Unit (GSU) of the Department of Toxic Substances Control (DTSC) reviewed the above-referenced document and prepared the following comments. If you have any questions regarding this memorandum, please contact me at (916) 255-3704 or jeff.brown@dtsc.ca.gov.

SCOPE OF REVIEW

GSU was asked to conduct a technical review of Sections 4 through 6, 8, 9, 24 through 29, and 33 of the permit application. The purpose of this review was to determine if the information in these sections is sufficient to comply with the following portions of Title 22 of the California Code of Regulations (CCR):

- The Part B permit application content requirements in §66270.14 et seq;
- The water quality and unsaturated zone monitoring and response program requirements in §66264.90 et seq (Article 6); and
- The applicable air and soil-pore gas monitoring and response program requirements in §66264.700 et seq (Article 17);

SUMMARY OF FINDINGS

The comments provided herein address those areas of the permit application which do not satisfy the requirements of the Title 22 sections listed above. GSU identified the following six primary deficiencies with the permit application:

- 1) References other documents outside of the permit application, rather than providing new text or applicable sections of other documents;
- 2) Language which appears to give CWM, DTSC, and/or the Central Valley Regional Water Quality Control Board (CVRWQB) the ability to change the content of the permit without following the permit modification processes pursuant to Title 22;
- 3) Absence of a corrective action monitoring and response program (CAP) for the unsaturated zone releases at landfill B-15 to achieve compliance with Article 17;
- 4) Absence of detection monitoring program well(s) in the unsaturated zone to achieve compliance with Article 6 and 17 monitoring requirements;
- 5) Undefined remediation time frames and performance metrics for corrective action measures for groundwater and the unsaturated zone to achieve compliance with Articles 6 and 17 requirements; and
- 6) Inadequate corrective action measures for groundwater at the K-4 and K-40 areas. New measures are necessary, pursuant to Article 6 requirements, because CWM has recently concluded the existing pump and treat remedy is ineffective at both areas.

The *General Comments* and *Specific Comments* sections of this memorandum provide details on these six deficiencies as well as other deficiencies identified during this review.

GENERAL COMMENTS

1. Reference to Documents Which Are Not Included in the Permit Application.

Sections 8, 9, and 24 through 29 of the permit application do not comply with Part B permit content requirements specified in §66270.14 et seq, notably §66270.14(c)(5), in large part, because these sections refer the reader to documents located outside of the permit application to find the required Title 22 information.

Moreover, several of those documents outside of the permit application either, 1) do not actually contain the technical information needed to satisfy Title 22 requirements or 2) conflict with the permit application text. The following two examples illustrate this point:

- a) Instead of providing a current depiction of plume extents for the facility as required in §66270.14(c)(4)(A), Section 9.1 refers the reader to a 1997 document (Einerson et al, 1997) which depicts plume extents that are over 18 years old (see specific comment (SC) #2 for additional detail).
- b) The 2001 Site Specific Groundwater Monitoring Plan (SSGWMP) (GeoSyntec, 2001) and the 2002 Site Specific Unsaturated Zone Monitoring Plan (SSUZMP) (Geomatrix, 2002), both of which are cited in Sections 8, 9, and 24 through 29, were recently revised in 2014 (Amec, 2014a, 2014b) after the permit application was submitted.

The revised 2014 plans, which CWM intends to implement as part of this permit instead of the 2001 and 2002 plans, now contradict the permit application text. For example, Section 28.1 of the permit application states an evaluation monitoring program (EMP) exists, yet the 2014 SSGWMP does not establish an EMP (see SC #6 for additional detail).

Resolution:

Sections 8, 9, and 24 through 29 should be revised in one of the following two ways, or a combination thereof:

- The documents (or pertinent sections of the documents) which are currently outside of the permit, and believed by CWM to contain the required Title 22 content, may be included as attachments to the revised permit application; and/or
- Include new text, tables, and/or figures in the revised permit application which summarize the required permit content in sufficient detail to comply with Title 22.

CWM should be cautioned that simply attaching documents (such as the 2014 SSGWMP and 2014 SSUZMP), as is, to a revised permit application will not necessarily satisfy all Title 22 content requirements, such as Article 6.

This conclusion is based on a preliminary review of the revised 2014 SSGWMP and SSUZMP that GSU was recently asked to complete concurrent with this permit application review. Specific comments (SC) #5 and #7 in this memorandum provide examples of the Title 22 deficiencies in each of the 2014 plans.

GSU will conduct a full of the review of the 2014 SSGWMP and 2014 SSUZMP only after CWM elects to, 1) submit these plans, or updated versions of these plans, as contents of the revised permit application, or 2) implement the plans as part of a permit modification request.

2. **The Phrase “or the latest revision thereof.”** The phrase “or the latest revision thereof” is used frequently in Sections 8, 9, and 24 through 29 when referring to the SSGWMP and the SSUZMP and the revisions CWM anticipates for these plans in the future. The phrase is similarly used in other sections of the permit application for other subject matter, such as the surface water management plan (SWMP) and the storm water pollution prevention plan (SWPPP).

The phrase should be deleted from all sections of the permit application because it appears to grant CWM (and/or DTSC) the authority to make changes to the permit application contents and associated monitoring procedures, at any time in the future, by way of reference, and without following Title 22 permit modification procedures.

Neither CWM nor DTSC have the authority to change permit application contents in this manner. See SC #4b for related concerns.

SPECIFIC COMMENTS

1. **Points of Compliance (Section 8)**. Four issues have been identified specific to this section:
- a) **Map with Monitoring Wells**. Pursuant to §66270.14(c)(3), a map should be provided in the permit application depicting the locations of the proposed monitoring wells . This map should also contain, to the extent possible, information required under §66270.14(c)(2), such as the contacts/outcrops of the water bearing units which underlie the facility and each regulated unit.
 - b) **Description of the Points of Compliance**. Section 8 or Section 26 should be revised to include a table and/or text summarizing the following information specific to each well proposed to monitor the saturated and unsaturated zones at the facility:
 - o The monitoring function for each well (water level measurements, water quality sampling, soil-pore gas sampling, or soil-moisture measurements);
 - o The monitoring program for each well [detection monitoring program (DMP), evaluation monitoring program (EMP) or corrective action monitoring program (CAP)];

- The water bearing sandstone unit each well is screened within;
 - The name of the Class I waste cell each well is proposed to monitor.
 - The point of compliance well for each Class I waste cell.
- c) Need for Additional Wells. GSU has initiated a detailed analysis of the facility's hydrogeologic data to verify if the monitoring wells, and their monitoring function as proposed in the revised 2014 plans, will be sufficient to comply with Article 6 and 17.

The preliminary finding from this work suggests a need for additional wells to be installed at the facility, based largely on developments that have occurred and data collected since the issuance of the last permit in 2003. However, this analysis cannot be completed until the missing permit content, as noted in GC#1, and each of the specific comments provided in this memorandum, are addressed in a revised permit application.

2. **Plume Description (Section 9).** Section 9 of the permit application does not comply with permit application content requirements of §66270.14(c)(4)(A) and (B) because it does not include current plume extent maps or identify the concentration (or maximum concentration) of each constituent of concern (COC) throughout these plumes. Instead, the reader is referred to documents which are not included in the permit application for this information and, in some cases, are also outdated.

For example, the reference provided for plume information was published in 1997 (Einerson et al, 1997) and depicts plume extents that are over 18 years old.

To address this comment, Sections 9.1 and 9.2 should be revised to include the following information:

- a) A table and/or text describing the current maximum concentration of each constituent of concern (COC) detected in both the groundwater and soil vapor plumes.
- b) A new figure(s) depicting current plume extents for all areas at the facility where a release from a regulated unit has occurred and concentrations of contaminants still exceed the water quality protection standards (WQPS) or environmental protection standard (EPS) defined for the site.

If these plumes cannot be drawn due to uncertain extent, this condition would warrant the establishment of an EMP, under which, plume extents would ultimately be defined.

- 3. Flow Rate and Direction of Groundwater (Section 25).** Section 25 of the permit application does not satisfy the permit content requirements of §66270.14(c)(2) because the text does not describe the groundwater flow rate or direction of groundwater flow beneath the Class I landfill cells.

Instead, Section 25 generally describes the groundwater to have “low flow rates” and “small ambient gradients” and subsequently refers the reader to documents not included in the application (such as the 2001 SSGWMP) to find the required information.

To address this comment, Section 25 should be revised to include the following:

- a) A new table and/or text listing the specific flow rates (or specific flow rate ranges) and current flow directions within each of the water bearing sandstone units beneath the facility. The source(s) of this information should be provided; and
- b) A plan view map which includes the following:
 - o The location of the outcrop contacts of the water bearing sandstone units and the wells used for the environmental monitoring programs; and
 - o Flow direction arrows plotted atop each of the water bearing sandstone units.

Groundwater is known to flow both north and south along strike within a single sandstone unit but in different parts of the facility. Accordingly, the appropriate number of flow arrows between well pairs should be plotted on the figure to depict these flow conditions. The predominant flow direction, determined from inter-well gradient analyses (completed in past monitoring reports), should be used to develop the flow direction arrows.

“Site-wide” flow directions (as calculated in quarterly monitoring reports) should not be presented in response to this request because they are developed using non-adjacent well pairs and, therefore, are unreliable indicators of flow direction near the boundaries of the facility or adjacent to a specific landfill cell.

The flow direction information requested above is needed to determine the following:

- If existing DMP wells are located at appropriate downgradient locations (allowing for the earliest possible detection of a release pursuant to Article 6);
- If existing CAMP wells are appropriate to monitor the effectiveness of corrective action measures, or
- Where new point of compliance wells may be needed.

4. **Environmental Monitoring Programs (Section 26)**. The following three issues were identified specific to this section of the permit application.

- a) **Missing Content and Referral to Other Documents**. Section 26 does not satisfy the permit content requirements of §66270.14(c)(5) for the reasons outlined in GC #1.
- b) **Permit Modification Process and Approval**. The last two paragraphs in Section 26 should be revised because the text suggests changes can be made to the environmental monitoring programs by only obtaining approval from the CVRWQCB and DTSC without following the Title 22 permit modification processes.

Any changes sought for the monitoring program outside of the permit renewal period requires CWM and DTSC to follow Title 22 permit modification processes pursuant to §66270.42, beginning with a request to DTSC to modify the permit content and including public notice and review opportunities of the proposed modification. Approval by DTSC is only the final step in the permit modification process.

- c) **Description of the Monitoring Programs**. Pursuant to §66270.14(c)(5) this section should be revised to contain a detailed description of the environmental monitoring programs for groundwater and the unsaturated zone at the facility and a summary of the plans CWM proposes to follow to implement these programs. As noted in GC#1, the applicable engineering reports and plans referred to in this regulation may be attached to the permit application to augment this summary text.

5. **Detection Monitoring Program (Section 27)**. The following two issues were identified specific to this section of the permit.

- a) **Missing Content and Referral to Other Documents**. Section 27 does not satisfy the permit content requirements of §66270.14(c)(6) for the reasons provided in GC #1. However, as noted in that comment, attaching a document to the permit application (such as the 2014 SSGWMP or 2014 SSUZMP) will not satisfy all of the content requirements of §66270.14(c)(6) and Article 6 or Article 17 for the DMP. For example, based on GSU's preliminary review of the 2014 SSGWMP and the 2014 SSUZMP, the following deficiencies specific to the DMP would exist if the 2014 plans were attached, as is, to the permit application:

- The 2014 SSGWMP no longer proposes to use groundwater wells K-57 and K-58 for any class I monitoring function. This change would not satisfy Article 6 requirements because it would allow groundwater within sandstone unit #8, which underlies the Class I B-18 cell, to be unmonitored.
- The 2014 SSUZMP does not satisfy §66264.94(a) or §66264.704 because concentration limits have not been established for soil-pore gas or soil-

moisture measurements in the unsaturated zone and CWM's response to an exceedance of these limits is undefined.

- o The 2014 SSUZMP does not satisfy §66264.97(d)(2)(B) or §66264.706 because unsaturated zone monitoring is not implemented for all regulated Class I units. The proposed soil moisture and soil pore-gas monitoring and reporting addresses only seven of the Class I units at the site. Unsaturated zone monitoring of B-18, for example, is not included in the 2014 SSUZMP (see comment #5b for related concerns).

- b) Unsaturated Zone Monitoring Well Network Layout. The rationale for the layout of existing soil vapor monitoring wells is not clearly explained in the documentary record or addressed in the permit application or the 2014 SSUZMP.

Because of this, it appears the CWM is not compliant with Article 6 or 17 unsaturated zone DMP requirements. Section 27.1 should be revised to include the following information to address this deficiency:

- A discussion justifying, pursuant to Title 22 regulations and provisions, why soil-pore gas monitoring beneath Class I cells P-6, P-7, P-8, P-10, P-11, B-14, B-16, B-18, and the class I portion of B-19 are not included in the unsaturated zone DMP; and
- A discussion justifying, pursuant to Title 22 regulations and provisions, why only two of the nineteen Class I cells (B-9 extension and B-11) within the Combined Closure Area are monitored in the unsaturated zone DMP.

CWMs response to this comment will also be needed to determine which of the Class I cells, as listed above, may need to be added to the DMP to satisfy Article 6 and/or 17 and, accordingly, require the installation of new unsaturated zone monitoring wells adjacent to these cells to allow monitoring to proceed.

6. Evaluation Monitoring (Section 28). The following three issues are identified specific to this section of the permit:

- a) Missing Content and Referral to Other Documents. Section 28 does not satisfy the permit content requirements of §66270.14(c)(7) for the reasons outlined in GC #1.
- b) 2014 SSGWMP and 2014 SSUZMP Conflict with Permit Application Text. The text and list of wells provided in this section is in conflict with the 2014 SSGWMP (which is "the latest revision thereof" to the SSGWMP referred to in the text). Specifically, Section 28 indicates an EMP is being established in the current permit to address releases to groundwater. Yet, the 2014 SSGWMP does not establish an EMP; instead each of the wells at the facility which were previously included in an EMP (as described in the 2001 SSGWMP), have been reassigned to a DMP or

a CAP in the 2014 SSGWMP. Neither the 2014 SSGWMP nor the permit application provides an explanation justifying these changes.

- c) Elimination of the EMP. Wells with detections above the defined WQPS must be included in an EMP or assigned to CAMP and justified in the permit application with supporting data pursuant to 66270.14(c)(7) and (8) and Article 6 and 17 requirements.

If CWM believes an EMP is no longer required for groundwater, or not required for the unsaturated zone, then the permit should be revised as follows:

- o Section 28 should state why EMP-specific Title 22 regulations under Article 6 and Article 17 are not applicable to the CWM facility at the time of the permit application; and
- o Sections 27 and Section 29 should provide justification to reassign wells, formerly in the EMP, to the DMP and CAP programs. This justification should describe the conclusions made in pertinent engineering feasibility study reports previously submitted to DTSC.

7. **Corrective Action (Section 29).** The following four issues are identified specific to this section of the permit:

- a) Missing Content and Referral to Other Documents. Section 29 does not satisfy the permit content requirements of §66270.14(c)(8) for the reasons outlined in GC #1. However, as noted in that comment, attaching a document to the permit (such as the 2014 SSGWMP and 2014 SSUZMP) will not necessarily satisfy all the content requirements of §66270.14(c)(8) and Article 6 or Article 17 for the corrective action programs. For example, based on GSU's preliminary review of the 2014 SSGWMP and SSUZMP, the following deficiencies specific to the corrective action program would exist if the 2014 plans were attached, as is, to the permit:
- o The 2014 SSGWMP does not define the specific measures will be taken to remediate the groundwater to meet the WQPS pursuant to §66264.100(b) and §66270.14(c)(8)(D).
 - o The 2014 SSGWMP does not include a proposed time period to complete the corrective action measures pursuant to §66264.100(e) nor provide technical support for this remediation timeframe. Alternatively, the regulation allows DTSC to specify this timeframe independent of a CWM proposal.
 - o The 2014 SSGWMP does not define how corrective action monitoring will demonstrate the adequacy of the corrective action measures [§66270.14(c)(8)(E) and §66264.100(b) and (d)]. In other words, the performance metrics that define the success and protectiveness of the remedy are not defined in the permit application or the 2014 SSGWMP.

- Performance metrics for monitored natural attenuation (MNA), the remedy selected for releases to groundwater in the B-7 and B-15 areas, are undefined in the permit application and 2014 plans.
- Performance metrics for pumping and treating (P&T), the remedy selected for releases to groundwater in the K-4 and K-40 areas, are undefined the permit application and the 2014 plans.
- The 2014 SSUZMP does not establish concentration limits for soil-pore gas as required pursuant to §66264.704 or define what the response program will be to releases which occur to the unsaturated zone.
- The 2014 SSUZMP does not establish corrective action remedial measures or a corrective action monitoring program for releases to the unsaturated zone pursuant to §66270.14(c)(8), §66264.706(a), and §66264.708.

The establishment of a corrective action program, that includes corrective action measures and corrective action monitoring, for the unsaturated zone beneath cell B-15 is now warranted based on data and analyses obtained since the last permit was issued in 2003. The following data demonstrate the soil vapor contamination beneath B-15 is not stable, is migrating downward and outside of the cell boundary, and is likely continue to impacting groundwater beneath the cell:

- In 2004, Freon 12 detections in groundwater well K-63 were determined to be caused by soil vapor migration from cell B-15 (Amec, 2004);
- In 2014, trichloroethene (TCE) was detected in groundwater well K-62. This well was installed in a different sandstone unit than well K-63 and is hydraulically upgradient, and outside of, the B-15 cell boundary. The cause of this contamination was also linked to soil vapor migration from cell B-15.
- Soil vapor data time-series plots, spanning the 2002 to 2014 time-period, are consistent with the downward migration trends and plume instability.

Specifically, twelve VOCs (including Freon 12 and TCE) were identified to have significantly increasing concentrations in the deepest vapor well GP-15B (Amec, 2015), and are at, or near, historic concentration highs. For example, March of 2015 sampling completed in GP-15B detected Freon 12 at 1,400,000 parts per billion by volume (ppbv), TCE at 150,000 ppbv and vinyl chloride at 34,000 ppbv.

- b) Corrective Action Monitoring Is Not a Corrective Action Measure. Text in the 2001 and 2014 SSGWMPs and the quarterly groundwater monitoring reports, all of which the reader is referred to in Section 29.1, incorrectly equates corrective action monitoring as a corrective action measure.

Pursuant to §66264.100(c) and (d), corrective action monitoring is implemented to demonstrate the effectiveness of corrective action measures. Future revisions made to the permit application and forthcoming monitoring reports should ensure this distinction is clear.

- c) Summary of Corrective Action Programs. Section 29 fails to provide basic summary-level information specific to the corrective action programs at the facility. As a result, readers unfamiliar with the site (such as the public) cannot reasonably determine when releases occurred at the facility, what corrective action measures (remedies) have been selected, or where these remedies are implemented.

Accordingly, Sections 29.1 and 29.2 should be revised to contain the following information to describe the corrective action programs at the facility:

- Nature and date of releases which led to the implementation of each corrective action program;
- The corrective action measures which have been selected to remediate each groundwater and soil vapor release;
- The engineering reports and/or feasibility studies which selected each corrective action measure pursuant to §66270.14(c)(7) and §66264.99(d);
- How long the measures have been in place, and active, and their current performance status;
- The corrective action measure linked to each corrective action area at the facility; and
- The corrective action wells assigned to monitor the effectiveness of each corrective action measure.

This summary information listed above could be supplied in a table(s) to efficiently convey the components of the corrective action programs at the Kettleman facility, thereby limiting the need to generate new text.

As needed to satisfy corrective action program-specific requirements of Title 22, CWM should augment the information requested above with additional text and/or pertinent attachments. The background section provided in Section 2.0 of the document titled *Assessment of Increasing Groundwater Levels and Trichloroethene Concentrations in the K40 Corrective Action Area* (Amec, 2012) appears to address some of the required narrative for the corrective action

program history and that can be incorporated into the permit application. Similar information should be provided for the other corrective action programs.

d) Cessation of Pumping at the K-4 and K-40 Areas in 2005. Neither the permit application text nor the 2014 SSGWMP discuss the following significant changes to the corrective action programs which have occurred since the last permit was issued:

1. The cessation of pumping in the K-4 and K-40 corrective action areas in 2005; and
2. Conclusions, drawn by CWM in 2012, that the pumping remedy in these areas are ineffective (Amec, 2012).

Moreover, neither the permit application nor the 2014 SSGWMP propose changes to the corrective action program that is now required because the remedy was found (by the owner operator) to be ineffective [§66264.100(i)].

To address this comment the following changes to the permit application are needed:

- The permit application text should be revised to describe the following background information:
 - The decision to transition the P&T remedy at the K-4 and K-40 areas into a long term pilot study in 2005, the technical reasons for this decision, and the approval by the RWQCB and DTSC to make this transition; and
 - The conclusion reached by CWM [in 2004 and recently reaffirmed in 2012 (Amec, 2012)] that the P&T remedies are not effective;
- Pursuant to §66270.14(c)(7) and (8), and §66264.100 et seq, the revised permit application should include:
 - An updated, or new, feasibility study (FS) report which evaluates alternative remedies for the K-4 and K-40 groundwater remediation and proposes a new remedy based on this evaluation; and
 - A description of how the monitoring program will demonstrate the adequacy (or performance) of the newly proposed remedy in the FS.

For example, if the FS proposes MNA as the new corrective action measure, the performance metrics (such as plume stability and production of degradation related daughter products) need to be specified pursuant to §66270.14(8)(D). In addition, the remediation timeframe (or estimated time to cleanup) should be specified pursuant to §66264.100(e).

REFERENCES

1. Amec, 2012. Assessment of Increasing Groundwater Levels and Trichloroethene Concentrations in the K40 Corrective Action Area, Kettleman Hills Facility, Kings County, California. July.
2. Amec Environment and Structure, 2015, Annual Graph Report, Kettleman Hills Facility, Kings County, California. February.
3. Amec Environment and Structure, 2014a, Revised Site-Specific Groundwater Monitoring Plan Class I Waste Management Units, Kettleman Hills Facility, Kings County, California. April.
4. Amec Environment and Structure, 2014b, Revised Site-Specific Unsaturated Zone Monitoring Plan Class I Waste Management Units, Kettleman Hills Facility, Kings County, California. April.
5. Amec Environment and Structure, 2014c, Engineering Feasibility Study Report for Well K-62, Kettleman Hills Facility, Kings County, California. July.
6. Amec Foster Wheeler Environment & Structure, Inc., 2015, Annual Evaluation of Soil-Gas Data Through 2014, Kettleman Hills Facility, Kings County, California. February.
7. Amec Foster Wheeler Environment & Infrastructure, Inc., 2015, First Quarter 2015 Groundwater and Unsaturated Zone Monitoring Data Report. June.
8. Amec Geomatrix, Inc., 2011, Evaluation Monitoring Program and Engineering Feasibility Study Report for Well K-30R, Kettleman Hills Facility, Kings County, California. July.
9. Einerson, Fowler, & Watson, 1997, Evaluation of Corrective Action Programs, Well K-4 Area and Well K-40 Area, Kettleman Hills Facility, Kings County, California. January.
10. Geomatrix Consultants, Inc. 2002, Engineering Feasibility Study for VOC Detections in Well K-63, Chemical Waste Management, Inc., Kettleman Hills Facility, Kettleman City, California. March.
11. Geomatrix Consultants, 2002, Site-Specific Groundwater Monitoring Plan, Kettleman Hills Facility, Chemical Waste Management, Inc., Kings County, California. October.
12. Geomatrix Consultants, Inc. 2004, K-40 and K-04 Corrective Action Programs – Changes in Groundwater Extraction for Hydraulic Containment Pilot Study Letter, Kettleman Hills, Facility Kings County California. December.

13. GeoSyntec Consultants, Inc., 2001, Site-Specific Groundwater Monitoring Plan, Kettleman Hills Facility, Chemical Waste Management, Inc., Kings County, California. May.

Attachment B
Human and Ecological Risk Office Memorandum Report



Matthew Rodriguez
Secretary for
Environmental Protection



Department of Toxic Substances Control

Barbara A. Lee, Director
700 Heinz Avenue
Berkeley, California 94710



Edmund G Brown Jr
Governor

MEMORANDUM

TO: Muzhda Ferouz
Project Manager
Office of Hazardous Waste Permitting Teams – Sacramento
Cal Center Office

FROM: Brian Endlich, Ph.D. *Brian P Endlich*
Senior Toxicologist – Chief, Central California HERO Unit
Human and Ecological Risk Office (HERO)
Brownfields Evaluation and Restoration Cleanup Program
Berkeley Office

DATE: January 14, 2016

SUBJECT: Chemical Waste Management, Inc., Kettleman Hills Facility (KHF), Kings
County, California, CAT000646117

Permit Completeness Checklist
Hazardous Waste Facility Permit Renewal Application

PCA: 24040 Site: 100032-50 8-HWMP

In preparation for completion of the Permit Completeness Checklist the Human and Ecological Risk Office (HERO) has reviewed the following documents:

Hazardous Waste Facility Permit Renewal Application for the Waste Management, Inc., Kettleman Hills Facility, Kings County, California with a cover date of February 18, 2013; Revision 1: May 15, 2013.

Background

The Kettleman Hills Facility (KHF) is a commercial Class I hazardous waste Treatment, Storage, and Disposal Facility (TSDF), and Class II designated waste and Class III Municipal Solid Waste (MSW) disposal facility owned and operated by Chemical Waste Management, Inc. KHF is located approximately 3.5 miles southwest of Kettleman City at 35251 Old Skyline Road. The facility covers approximately 1600 acres in an area of small rolling hills with surface elevations which range from approximately 700 feet above mean sea level to 1100 feet above mean sea level. Operations at the facility include landfilling bulk and containerized Class I & II waste in the B-18 Landfill, landfilling Class II & III

industrial and municipal waste in the B-17 Landfill, injection of non-hazardous waste liquids in the B-19 landfill bioreactor, use of evaporation ponds for treatment of permitted liquid waste, a stabilization facility for treatment of bulk waste prior to landfilling, use of a polychlorinated biphenyl (PCB) storage/flush unit, drum storage unit, and bulk storage units. The chemicals of potential concern include metals, organochlorine pesticides, volatile organic compounds, and semi-volatile organic compounds.

HERO reviewed the sections of the Permit Renewal Application which pertain to Human Health Risk Assessment and are required for the Permit Completeness Checklist.

Scope of Review

HERO has reviewed this document with emphasis on those aspects that affect the risk to human health. HERO's review addressed issues concerning sampling and analysis, reporting, and calculation of screening level risk (potential cancer risk and hazard indices). The purpose of the Hazardous Waste Facility Permit Renewal Application is to provide risk managers with sufficient information to support decision-making. Minor grammatical or typographical errors that do not affect the evaluation have not been noted.

General Comments

1. It is the opinion of HERO that the historical documents which support the permit application should be included in the permit package such that the permit contains a complete set of all the documents that support the risk assessment issues for the Facility. See the list of documents that HERO recommends be submitted with the permit application.

Specific Comments:

HERO recommends that Chemical Waste Management submit the following documents to support the Permit Renewal Application and include more specific titles of the documents:

1. **Ambient Air Concentration studies by CARB, EPA, and independent firms in 1980, 1983, two in 1984, and 1985.**
These documents concluded that impacts at the nearest offsite location (SR-41 and I-5) are ppb levels, but that predominant wind direction is not towards Kettleman City.
2. **Air Quality Solid Waste Assessment Test Report, 1988, independent firm, NUS Corporation.**
This document concluded that "KHF does not have an adverse effect on air quality surrounding the site."

3. Gaseous Tracer Study at the Chemical Waste Management Kettleman Hills Facility 1988, CARB.

This document showed that winds from the southwest towards Kettleman City are rare, and the converging distance and topography disperses the trace gases.

4. KHF VOC Air Monitoring Program, KC, over nine years from April 1986 through July 1995.

This study should be included and greater detail should be provided concerning who conducted the study.

5. 1994 Topographical, Meteorological and Airborne Contaminant Characterization at Kettleman Hills Facility, independent firm.

This study should be included and greater detail should be provided concerning who conducted the study.

6. California Air Toxics "Hot Spots", 1996, SJVUAPCD.

In this study the SJVUAPCD indicated that KHF was a low priority facility.

7. Ambient Air Monitoring Program, October 2006 to the present, DTSC, with CARB.

In this important study the Ambient Air Monitoring Program (AAMP) collected data which was used to assess potential human health risks.

8. AAMP Annual Screening Level Health Risk Assessments:

Submitted November 2011.

Submitted in July 2012.

Include Annual Screening Level Health Risk Assessments submitted to present date.

9. Dioxin-Like PCB Congeners Study, 2009, EPA-IX.

This study investigated dioxin-like PCB congeners in soil, air, and vegetation within the KHF property boundary in order to evaluate the potential human health and ecological risks that may be posed by the management, storage, and disposal of PCB wastes at the facility.

10. CEQA SEIR for B18/B20, (CH2M HILL, 2009).

This document analyzed the public Health risk during the preparation of the SEIR for B18/B20.

11. Storm Water Management Plan (Centra Consulting, 2009).

12. Rainy Season Preparedness Plan (Centra Consulting, 2009).

13. Storm Water Pollution Prevention Plan (Waste Management, Inc., 2011).

These documents address control measures to prevent release to surface water and other environmental media. Please include the latest versions of these documents.

14. RWQCB Resolution 88-051, (March 25, 1988).

This document made a determination that ground waters beneath the site and within one-half mile of the Facility surface impoundments are not a potential source of drinking water.

15. Contingency Plan (year not specified).

This document describes the Facility's in-place response procedures and capabilities to provide a rapid and effective control mechanism for limiting exposures from offsite transportation spills particularly with 1.0 mile of the Facility's access road.

Conclusions and Recommendations

HERO concludes that the Hazardous Waste Facility Permit Renewal Application is deficient because it does not include the documents referred to in Section 48.0 Exposure Information. When these documents are added to the application HERO would support a recommendation that the health risk assessment documentation is complete. These comments are meant to be constructive and we hope they are useful. The recommendations provided in this memo are meant to be site specific and are not to be construed as DTSC policy. If you have additional questions please feel free to contact Dr. Brian Endlich at (510) 540-3804 or bendlich@dtsc.ca.gov.

Reviewed by:

Claudio Sorrentino, Ph.D.
Senior Toxicologist
Chief, Northern California Unit
Human and Ecological Risk Office
Sacramento (Cal Center) Office



Attachment C
Closure and Post Closure Plan Cost Estimate Review Memorandum Report



Department of Toxic Substances Control



Matthew Rodriguez
Secretary for
Environmental Protection

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

Edmund G. Brown Jr.
Governor

FINAL CLOSURE AND POST-CLOSURE PLAN COST ESTIMATE REVIEW DEFICIENCIES M E M O R A N D U M

TO: Muzhda Ferouz
Project Manager
Permitting Division
Hazardous Waste Management Program

From: Tamara Zielinski, P.E.
Senior Hazardous Substances Engineer
Special Projects Unit
Permitting Division
Hazardous Waste Management Program

SUBJECT: REVIEW OF THE CLOSURE AND POST COST ESTIMATE FOR
KETTLEMAN HILLS FACILITY, 35251 OLD SKYLINE ROAD
KETTLEMAN CITY, CA 93239 (EPA ID CAT 000646117)

DATE: October 26, 2016



Documents Reviewed

The result of this review is limited to the following documents, or sections thereof:

1. Draft Closure and Post-Closure Plans and Cost Estimate for Landfill B-18, Kettleman Hills Facility, Kings County, California, dated June 2015.

The Department of Toxic Substances Control (DTSC), Permitting Division, Cost Engineering Staff have reviewed the Draft Closure and Post-closure Plans and associated cost estimates for Landfill B-18 at the Kettleman Hills Facility (Facility). This review was conducted in accordance with DTSC's Work Plan for Closure and Post-Closure Plans and Cost Estimate Reviews, dated May 2015. The purpose of this review is to:

- 1) Determine if the Closure and Post-Closure Plans adequately address the activities required for Closure and Post-Closure Care of the Facility as required by California Code of Regulations Title 22 (22 CCR) section 66264.112(b)-Contents of Closure Plans and section 66264.1118(b)-Contents of Post-closure Plans, and
- 2) Determine if the estimated costs are sufficient to provide financial assurance for the completion of the Closure and Post-Closure Care activities throughout the 30 year post-closure care period, pursuant to section 66264.142 for Closure Cost Estimates and section 66264.144 for Post-closure Care Cost Estimates.

Closure Plan and Cost Estimate

Pursuant to 66264.112(b)(1) the Closure Plan is required to contain a description of how and when each hazardous waste management unit is closed in accordance with the closure performance standards in 66264.111. This section references the performance standards for landfills in 66264.310. The Closure Plan is a draft closure plan that only addresses Landfill B-18, but all waste management units will need to be addressed in the next revision of the Closure Plan. The Closure Plan for Landfill B-18 did not adequately address the closure performance standards for landfills in 66264.310 including the requirements for slope stability and drainage design.

In general the Closure Plan provides statements in the text that were not supported by data in the Appendixes. For example, the Closure Plan states on page 12 that site specific laboratory testing data was used to prove the stability of the final cover system exceeds the factor of safety of 1.5 and the permanent deformation is less than the industry standard of 6 inches. However, the stability analysis calculations in Appendix A.5 uses a residual friction angle of 25 degrees, not the 12.1 degree residual friction angle provided in the site specific laboratory testing in Appendix A.5. Recalculating the stability analysis using the 12.1 degree friction angle results in a factor of safety for the Landfill B-18 slopes much less than 1.5 under static conditions and will increase the permanent deformation of the liner system over 12 inches, under dynamic conditions.

Furthermore, the text states, on page 17 that the capacity of the drainage system for the landfill final cover is sufficient for the appropriate estimate peak flow. However, the drainage design calculations in Appendix A.7 show the flow velocity for the drainage ditches exceeds the 25 cubic feet per second performance criteria and that the drainage ditches will overflow. In addition the capacity of the north detention basin capacity is

exceeded by two acre-feet. This would result in significant erosion of the drainage and final cover systems. These are serious flaws in the final cover and drainage system designs that will need to be addressed to meet the Landfill Closure Performance Standards in 66264.310 and 66264.228 (e) – (r) incorporated by reference in 66264.310(a)(7). The current Closure Cost Estimate for Landfill B-18 did not include costs for all the final cover elements required in 66264.310 and 66264.228 (e)-(r), such as a clay layer.

Since the final cover and drainage designs significantly impact the Closure Cost Estimates, the Closure Cost Estimate will need to be revised to reflect the revised final cover and drainage designs. The following comments are provided to assist with the revision of the Landfill B-18 Closure Cost Estimate. The attached spreadsheets contain a line by line comparison of the Closure Cost proposed by CWM and revisions required by DTSC to meet the regulatory requirements in 66264.142. In addition the Closure Cost Estimate needs be update to reflect current 2015 costs.

The following table provides a summary of the Closure Costs proposed in the Closure Plan and the Cost Estimate revisions require by DTSC for Landfill B-18.

TABLE 2.2
SUMMARY OF CLOSURE COST ESTIMATE FOR
LANDFILL B-18
CWMI KETTLEMAN HILLS FACILITY

<u>DESCRIPTION</u>	<u>CWM</u> <u>SUBTOTAL</u>	<u>DTSC</u> <u>SUBTOTAL</u>
I. MANAGEMENT OF LEACHATE DURING CLOSURE	\$38,775	\$1,794,420
II. FINAL COVER FOR LANDFILL CLOSURE	\$4,332,852	\$6,893,238
III. DRAINAGE CONTROL FACILITIES	\$587,607	\$598,852
IV. REVEGETATION	\$433,074	\$448,778
V. EQUIPMENT DECONTAMINATION	\$30,537	\$19,757
VI. SURVEYING AND FILING OF SURVEY PLAT	\$18,932	\$18,932
VII. CERTIFICATION OF FINAL CLOSURE	\$409,440	\$423,663
TOTAL FOR CLOSURE OF LANDFILL B-18 (Based on 2012 Year Dollars)	\$5,851,217	\$10,197,640

Further details regarding the deficiencies in the Closure Plan and Closure Cost Estimates are in the Detailed Comments Section.

Post-Closure Plan and Cost Estimate

The proposed final cover design does not meet the Closure Performance Standards in 66264.111, because it does not minimize the need for future maintenance. The proposed final cover design would require significantly more Post-Closure Care and cost to repair washouts and final cover liner failures. Therefore, the Post-closure Cost Estimate will need to be revised once the final cover and drainage designs are revised to meet the closure performance standards. In addition the Post-closure Cost Estimate needs be update to reflect current 2015 costs. The following comments are provided to assist with the revision of the Landfill B-18 Post-closure Cost Estimate. The attached spreadsheets contain a line by line comparison of the Post-closure Cost proposed by CWM and revisions required by DTSC to meet the regulatory requirements in 66264.144.

The following table provides a summary of the Post-closure Costs proposed in the Post-closure Plan and the Post-closure cost estimate revisions require by DTSC for Landfill B-18. DTSC revised cost include additional maintenance for the final cover and drainage systems.

**TABLE 3.1
 SUMMARY OF POST-CLOSURE COST ESTIMATE
 CWMI KETTLEMAN HILLS FACILITY**

<u>DESCRIPTION</u>	<u>CWM SUBTOTAL</u>	<u>DTSC SUBTOTAL</u>
I. NOTATION ON PROPERTY DEED - FINAL CLOSURE	\$28,900	\$28,900
II. MAINTENANCE OF WASTE MANAGEMENT AREA BOUNDARIES	\$2,820	\$2,820
III. FACILITY INSPECTION	\$478,400	\$2,444,000
IV. ROUTINE MAINTENANCE AND REPAIRS	\$2,589,796	\$2,589,796
V. SEVERE EROSION DAMAGE REPAIR	\$117,247	\$828,292
VI. LEACHATE MANAGEMENT	\$2,791,140	\$3,147,162
VII. GROUNDWATER MONITORING	\$4,236,134	\$15,312,974
VIII. UNSATURATED ZONE MONITORING	\$327,060	\$654,120
IX. CERTIFICATION OF POST-CLOSURE	\$213,600	\$213,600
COST FOR POST-CLOSURE CARE	\$10,785,097	\$25,221,664
CONTINGENCY (10%)	\$1,078,510	\$2,522,167
TOTAL COST FOR POST-CLOSURE CARE (Based on 2012 Dollars)	\$11,863,607	\$27,743,831

Further details regarding the deficiencies in the Closure and Post-Closure Plans and associated cost estimates are provided in the following detailed comments section.

Detailed Comments

Regulatory Requirement	Deficiency	Location
<p>66264.112(b)(1) How and When Each HWMU will be Closed Pursuant to Closure Performance Standards</p>	<p><u>Closure Plan</u> The Closure Plan does not address the closure performance standards for Landfills in 66264.310. Specifically, the final cover design does not meet the standards to prevent slope failure under static and dynamic conditions and erosion and flooding during major storm events.</p> <p><u>Slope Stability Deficiencies (Appendix A.5)</u> 66264.310 (a)(5) and (7) require the design and construction of the final cover to accommodate lateral and vertical shear forces generated by the maximum credible earthquake, so that the integrity of the cover is maintained. The slopes in the final cover for landfill B-18 are not designed to minimize the potential for failure nor to accommodate the lateral and vertical shear forces generated by the maximum credible earthquake. The 2008 HIA stability analysis for the final cover system proved in Appendix A.5 of the Closure Plan uses a residual friction angle of 25 degrees based on site-specific laboratory interface direct shear tests performed on the geomembrane and geotextile materials and attached to the report. However, a 2009 addendum to the stability analysis includes the direct shear test data indicating the residual friction angle is 12.1 not 25 degrees. Recalculating the final cover stability analysis using the appropriate friction angle in the stability analysis of 12.1 degrees produces results that do not meet the performance criteria established in the stability analysis. The factor of safety for static loading is less than the 1.5 required factor of safety, therefore the final cover design is not safe under static conditions. Furthermore the seismic displacement due to dynamic loading will exceed 12 inches for the 40 mill liner which is twice as much displacement than recommended for a 60 mil liner in the 2009 stability analysis. The final cover design needs to be revised to meet the design standards in 66264.310(a)(5) and (7). Please note that the 66264.310(7) incorporates the final cover requirements in 66264.228 (e)-(r). The revised final cover design will also need to meet the requirements in 66264.228 (e)-(r) include but are not limited to the following requirements.</p> <p>Section 66264.228(e)(8) requires that, if hazardous waste is underlain by a liner containing a synthetic membrane, then a synthetic membrane shall be provided in the final cover above the compacted</p>	<p>Appendixes A.5 and A.7</p>

Regulatory Requirement	Deficiency	Location
	<p>barrier layer. The membrane shall be made of material chemically resistant to the waste at the facility, whether or not contact between the membrane and the waste is anticipated, and shall have thickness and strength sufficient to withstand the stresses to which it shall be subject to including: shear forces, puncture from rocks, or penetration from roots.</p> <p>Section 66264.228(h) requires all slopes shall be designed and constructed to minimize the potential for failure.</p> <p><u>Drainage Design Deficiencies (Appendix A.7)</u> 66264.228(e)(15) requires that at and after closure, permanent disposal areas shall have drainage systems capable of transporting water from the water drainage layer away from the closed facility and capable of diverting surface runoff away from or around disposal areas, containment structures, leachate collection systems and monitoring facilities. Drainage systems shall be capable of preventing erosion of containment structures. Drainage system components themselves shall be lined or otherwise protected against erosion. The conclusion provided in the Surface Water Drainage Analysis provided in Appendix A.7 of the Closure Plan states: "The perimeter road channel will exceed the flow capacity of the roadside asphalt-lined channel." Since the roadside asphalt-lined channel is located against the bottom of the final cover slope and according to Table 5.2 in Appendix A.7 the maximum velocity will exceed the maximum allowable velocities for asphalt lined channels of 25 cubic feet per second, the drainage channel and the bottom of the final cover slope will be eroded. Since the final cover did not have an adequate factor of safety under dry and static conditions as stated above, it would likely fail under saturated and eroding conditions. Furthermore the Surface Water Drainage Analysis also states, "During the 24-hour PMP, it is predicted that the run-off to the existing retention basin (Reservoir 2) located on the north side of the proposed landfill will exceed capacity by approximately 2 AC-FT. In the event of a PMP storm event the excess stormwater will have to be pumped to the proposed retention basin (Reservoir 1)." This does not meet the criteria for 66264.228(e)(15) and the performance criteria of limiting the need for future maintenance." Staff and auxiliary power would be necessary during major storm events to prevent failure of the drainage system. The drainage design needs to be revised to meet the criteria of 66264.228(e)(15) and since dikes for the landfill and drainage basins will remain onsite after closure the operator will have to provide the information require in 66264.228(e)(18) to prove the</p>	

Regulatory Requirement	Deficiency	Location
	dikes have sufficient structural integrity to withstand forces to which they can be exposed during and after closure. These forces would include overtopping of the drainage basin.	
§ 66264.112(b)(2) How and When the Facility will be Closed Pursuant to Closure Performance Standards	Closure of All Waste Management Units The Closure Plan does not address how and when final closure of the facility will be conducted in accordance with the Closure Performance Standards in section 66262.111, because several units have been excluded. The Closure Plan states on page 1, "As such, proposed future hazardous waste facilities such as Landfill B-20 and the Neutralization /Filtration Unit are not considered herein". The Closure Plan needs to be revised to fully address the requirement to identify the maximum extent of the operations that will be unclosed during the active life of the facility.	Not included
§ 66264.112(b)(3) Removal of Hazardous Waste Inventory	The Closure Plan does not describe how or when the facility will be partially closed, it just states in section 2.2.3 that DTSC will be notified 60 days after the completion of practical closure. The closure plan needs to be revised to describe the partial closure activities and provide adequate notification to DTSC staff prior to implementing partial closure activities.	Section 2.2.3
§ 66264.112(b)(4) Clean Closure	The Closure Plan does not address the requirements of 66264.114- Disposal or Decontamination of Equipment, Structures, and Soils, because it excludes existing units and support/ancillary facilities that are not hazardous waste management units. The closure plan states on page 1, "Existing Waste Management Units and support ancillary facility's that are not hazardous waste management units (e.g., Landfill B-17, the vehicle wash station, laboratory and maintenance facilities, etc.) are not subject to the closure and post-closure requirements of 22 CCR, division 4.5, Chapter 14. Therefore, these facilities/units are not addressed in this document. The Closure Plan needs to be revised to address the Closure of all Equipment, Structures, and Soils pursuant to 66264.114.	Not Included
66270.14(a) Owner and Engineer's Certification:	The report was not stamped and signed by the Professional Engineer. It is recommended that all inconsistencies are corrected before the Professional Engineer stamps the document.	Cover Page
§ 66264.142(a)(1) Maximum Cost of Final Closure as indicated in the Closure Plan.	Since the final cover and drainage design for Landfill B-18 do not meet the Closure Performance Standards and will require revision, the Closure Cost Estimate will need to be revised to reflect the design changes. The following comments are provided for the development of the revised Closure Cost estimate: The revised cost estimate shall be based on current cost data from a	Closure Cost Estimate

Regulatory Requirement	Deficiency	Location
	<p>reputable source such as RSMenas 2015. The current estimate contains data from RSMenas 2012.</p> <p>The revised cost estimate needs to consider the additional cover volume due to the 3.5:1 side slopes. The current estimate assumes the site is flat.</p> <p>The revised estimate needs to include the cost for a clay layer. This cost was not included in the current estimate.</p> <p>Since substantial settlement of the landfill and native material is expected the asphalt lined ditches should include costs for an additional liner under the asphalt.</p>	
<p>§ 66264.142(a)(2) Cost Estimate Based on hiring a Third Party to Close the Facility</p>	<p>The Closure Plan proposes to use surface impoundments for the treatment of leachate generated onsite. For the purposes of closure of the facility by a third party the Closure Cost Estimate needs to reflect offsite disposal of the leachate. The closure cost estimate shall be revised reflect the offsite disposal of leachate.</p>	<p>Closure Cost Estimate</p>
<p>66264.118(b) (1) Post-Closure Monitoring Activities and Frequency</p>	<p>The Post-Closure Plan did not adequately address the Water Quality Monitoring and Response Programs in Article 6. Only one the following sentence was provided. "Maintaining groundwater and unsaturated zone monitoring well be necessary for compliance with the Site-Specific Groundwater Monitoring Plan (Geosyntech, 2001 or latest revision thereof." The Post-Closure Plan needs to be revised to fully describe the quarterly groundwater monitoring program approved by DTSC.</p>	<p>Not Included</p>
<p>66270.14(a) Owner and Engineer's Certification:</p>	<p>The report was not stamped and signed by the Professional Engineer. It is recommended that all inconsistencies are corrected before the Professional Engineer stamps the document.</p>	<p>Cover Page</p>