



*California Environmental Protection Agency
Department of Toxic Substances Control*

DRAFT HAZARDOUS WASTE FACILITY PERMIT

Permit Number: **02-SAC-03**

Facility Name:
Chemical Waste Management, Incorporated,
Kettleman Hills Facility

Owner Name:
Waste Management, Incorporated

Operator Name:
Chemical Waste Management, Incorporated

Facility EPA ID Number:
CAT000646117

Effective Date: **June 16, 2003**
Expiration Date: **June 30, 2013**

Date Modified: **June 12, 2007 (draft)**
Modification Number:
MOD3 NC1-2007-013

Pursuant to Section 66270.42, title 22, division 4.5, California Code of Regulations, the Hazardous Waste Facility Permit, issued and effective June 16, 2003, is hereby modified to incorporate the permit modification described in section 2 of Part VII. Permit Modification History. This cover page and additions of pages 40-57 to the June 16, 2003 permit are affected by this modification. The revised permit consists of 57 pages including this cover page and additional sections, Part VII and VIII.

Chief, Northern California Permits and Corrective
Action Branch
Hazardous Waste Management Program
Department of Toxic Substances Control

Date:

CHEMICAL WASTE MANAGEMENT, INCORPORATED
KETTLEMAN HILLS FACILITY

Hazardous Waste Facility Permit, Attachment "A"

Effective 6/16/03, Revised 5/5/05 (Class 1), Revised 7/25/06 (Class 1*), **DRAFT- Revised 6/12/07 (Class 3)**

HAZARDOUS WASTE FACILITY PERMIT

CHEMICAL WASTE MANAGEMENT, INCORPORATED
KETTLEMAN HILLS FACILITY
35251 OLD SKYLINE ROAD
POST OFFICE BOX 471
KETTLEMAN CITY, CA 93239

ATTACHMENT "A"
TABLE OF CONTENTS

PART I. <u>DEFINITIONS</u>	Page 3 of 57
PART II. <u>DESCRIPTION OF THE FACILITY AND OWNERSHIP</u>	Page 4 of 57
1. <u>OWNER</u>	Page 4 of 57
2. <u>OPERATOR</u>	Page 4 of 57
3. <u>LOCATION</u>	Page 4 of 57
4. <u>DESCRIPTION</u>	Page 4 of 57
5. <u>FACILITY SIZE AND TYPE FOR FEES</u>	Page 5 of 57
PART III. <u>GENERAL CONDITIONS</u>	Page 6 of 57
1. <u>PERMIT APPLICATION DOCUMENTS</u>	Page 6 of 57
2. <u>EFFECT OF PERMIT</u>	Page 6 of 57
3. <u>COMPLIANCE WITH CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)</u>	Page 7 of 57
4. <u>ENVIRONMENTAL MONITORING</u>	Page 7 of 57
5. <u>WASTE MINIMIZATION CERTIFICATION</u>	Page 10 of 57
6. <u>WASTE MINIMIZATION CONDITIONS</u>	Page 10 of 57
7. <u>WASTES PROHIBITED</u>	Page 10 of 57
PART IV. <u>PERMITTED UNITS AND ACTIVITIES</u>	Page 12 of 57
PART V. <u>SPECIAL CONDITIONS THAT APPLY TO ALL OF THE FACILITY'S STORAGE AND TREATMENT UNITS</u>	Page 34 of 57
PART VI. <u>CORRECTIVE ACTION</u>	Page 38 of 57
PART VII. <u>PERMIT MODIFICATION HISTORY</u>	Page 38 of 57
PART VIII. <u>MODIFIED PART B APPLICATION (aka OPERATION PLAN), CHAPTER 15.0 (pages 1 to 14) and TABLE 40-1 (pages 1 to 2)</u>	Page 41 of 57

CHEMICAL WASTE MANAGEMENT, INCORPORATED
KETTLEMAN HILLS FACILITY

Hazardous Waste Facility Permit, Attachment "A"

Effective 6/16/03, Revised 5/5/05 (Class 1), Revised 7/25/06 (Class 1*), **DRAFT- Revised 6/12/07 (Class 3)**

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EPA ID NO.: CAT000646117***

PART I. DEFINITIONS

All terms used in this Permit shall have the same meaning as those terms have in the California Health and Safety Code, Division 20, Chapter 6.5 and Title 22, California Code of Regulations Division 4.5, unless expressly provided otherwise by this Permit.

1. **"DTSC"** as used in this Permit means the California Department of Toxic Substances Control.
2. **"Permittee"** as used in this Permit means the Owner and Operator.
3. **"HSC"** as used in this Permit means the Health and Safety Code.
4. **"Cal. Code of Regs."** as used in this Permit means the California Code of Regulations.
5. Unless explicitly stated otherwise, all references to items in this Permit shall refer only to items occurring within the same part.

CHEMICAL WASTE MANAGEMENT, INCORPORATED
KETTLEMAN HILLS FACILITY

Hazardous Waste Facility Permit, Attachment "A"

Effective 6/16/03, Revised 5/5/05 (Class 1), Revised 7/25/06 (Class 1*), **DRAFT- Revised 6/12/07 (Class 3)**

PART II. DESCRIPTION OF THE FACILITY AND OWNERSHIP

1. OWNER

The facility owner is WASTE MANAGEMENT, INCORPORATED (hereafter "owner").

2. OPERATOR

The facility operator is CHEMICAL WASTE MANAGEMENT, INCORPORATED (hereafter "Operator").

3. LOCATION

The Chemical Waste Management, Incorporated, Kettleman Hills Facility (Facility) is located in western Kings County, California, in the Kettleman Hills which borders the west side of the San Joaquin Valley, approximately 2.6 miles west of the Interstate 5 and State Route 41 intersection. The Facility is located at North Latitude 35° 58' 00" and West Longitude 120° 00' 45". The property includes all of Section 3, T23S, R18E, M.D.B. & M. (Assessor parcel nos. 03833001, 03833019 and 03833020), all of Section 34, T22S, R18E, M.D.B. & M. (Assessor parcel nos. 03832015, 03832020, and 03832021), and the eastern half of Section 33, T22S, R18E, M.D.B. & M. (Assessor parcel no. 03831005).

4. DESCRIPTION

The Chemical Waste Management, Inc., Kettleman Hills Facility is a commercial hazardous waste treatment, storage and disposal facility. The Facility contains 1,600 contiguous acres, 499 of which have been approved for hazardous waste activity. The Facility accepts solid, semi-solid, and liquid hazardous and extremely hazardous wastes. It may not accept Class 1, Division 1.1 or 1.2, or forbidden explosives (Code of Federal Regulations, title 49, subchapter C, part 173, section 50); compressed gas cylinders (excluding aerosol cans); radioactive waste that is not exempt from regulation and licensing or is not expressly authorized for disposal under the Radiation Control Law, chapter 8 (commencing with section 114960) of part 9 of division 104 of the Health and Safety Code, or any successor statute that may replace the Radiation Control Law, or is prohibited from disposal under article 1 (commencing with section 114705) of chapter 5 of part 9 of division 104 of the Health and Safety Code or any successor statute that may replace article 1, or is prohibited from disposal by any government agency; biological agents or infectious wastes. The Facility also has a permit, issued by the California Integrated Waste Management Board, to receive municipal /solid wastes into the converted landfill Unit B-19. The Facility conducts the following activities: solar evaporation in three surface impoundments; disposal into two

CHEMICAL WASTE MANAGEMENT, INCORPORATED
KETTLEMAN HILLS FACILITY

Hazardous Waste Facility Permit, Attachment "A"

Effective 6/16/03, Revised 5/5/05 (Class 1), Revised 7/25/06 (Class 1*), **DRAFT- Revised 6/12/07 (Class 3)**

hazardous waste landfills; PCB draining and flushing; PCB disposal and storage; and stabilization, solidification and storage of bulk and drummed wastes. The Facility is also permitted to operate a drum decant unit and to construct and operate a neutralization/filtration unit and eight one-million gallon above ground evaporation tanks.

5. FACILITY SIZE AND TYPE FOR FEES

The Facility is categorized as a large treatment, storage and disposal Facility for purposes of HSC Section 25205.19.

CHEMICAL WASTE MANAGEMENT, INCORPORATED

KETTLEMAN HILLS FACILITY

Hazardous Waste Facility Permit, Attachment "A"

Effective 6/16/03, Revised 5/5/05 (Class 1), Revised 7/25/06 (Class 1*), **DRAFT- Revised 6/12/07 (Class 3)**

PART III. GENERAL CONDITIONS

1. PERMIT APPLICATION DOCUMENTS

- (A) The Part "A" Application dated July 1, 1997 and the Part "B" Application (Operation Plan) July 1, 1997 are hereby made a part of this Permit by reference.

2. EFFECT OF PERMIT

- (A) The Permittee shall comply with the provisions of the California Health and Safety Code, and Cal. Code of Regs., title 22, division 4.5. The issuance of this Permit by DTSC does not release the Permittee from any liability or duty imposed by federal or state statutes or regulations or local ordinances, except the obligation to obtain this Permit. The Permittee shall obtain the permits required by other governmental agencies, including but not limited to, the applicable land use planning, zoning, hazardous waste, air quality, water quality, and solid waste management laws for the construction and/or operation of the Facility.
- (B) The Permittee is permitted to treat, store and dispose of hazardous wastes in accordance with the conditions of this Permit. Any treatment, storage or disposal of hazardous wastes not specifically authorized in this Permit is strictly prohibited.
- (C) Compliance with the terms of this Permit does not constitute a defense to any action brought under any other law governing protection of public health or the environment, including, but not limited to, one brought for any imminent and substantial endangerment to human health or the environment.
- (D) DTSC's issuance of this Permit does not prevent DTSC from adopting or amending regulations that impose additional or more stringent requirements than those in existence at the time this Permit is issued and does not prevent the enforcement of these requirements against the Permittee.
- (E) Failure to comply with any term or condition set forth in the Permit in the time or manner specified herein will subject the Permittee to possible enforcement action including but not limited to penalties.

CHEMICAL WASTE MANAGEMENT, INCORPORATED
KETTLEMAN HILLS FACILITY

Hazardous Waste Facility Permit, Attachment "A"

Effective 6/16/03, Revised 5/5/05 (Class 1), Revised 7/25/06 (Class 1*), **DRAFT- Revised 6/12/07 (Class 3)**

- (F) In addition, failure to submit any information required in connection with the Permit, or falsification and/or misrepresentation of any submitted information, is grounds for revocation of this Permit (Cal. Code of Regs., title 22, section 66270.43).
- (G) In case of conflicts between the Operation Plan and the Permit, the Permit conditions take precedence.
- (H) This Permit includes and incorporates by reference any conditions of waste discharge requirements issued by the State Water Resources Control Board or any of the California Regional Water Quality Control Boards and any conditions imposed pursuant to section 13227 of the Water Code. (Attachment B)

3. COMPLIANCE WITH CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

A Final Environmental Impact Report (FEIR), dated October 1985, a Supplemental Environmental Impact Report (SEIR), dated February 1988, and a Final Subsequent Environmental Impact Report (FSEIR), dated November 1997 were prepared in accordance with the requirements of Public Resources Code section 21000 et seq. and the CEQA Guidelines, section 15070 et seq. of title 14, of the California Code of Regulations.

The DTSC reviewed the SEIR certified by DTSC (formerly the Department of Health Services), the FEIR and the FSEIR certified by the Kings County Planning Agency, and using its independent judgment, finds that they are adequate for assessing potential impacts of this Permit. Approval of this Permit will not result in additional significant impacts on the environment. Mitigation measures identified in the documents are incorporated by reference, and as appropriate, to reduce impacts to less-than-significant levels. No additional mitigation measures are identified for the approval of this Permit.

4. ENVIRONMENTAL MONITORING

- (A) The Permittee shall comply with the requirements of the Environmental Monitoring and Response Programs for Air and Soil-Pore Gas provided in the California Code of Regulations, title 22, section 66264.700, et seq. Specifically, the Permittee shall comply with the following conditions for Environmental Monitoring:
 - (1)(a) The Permittee shall submit, for DTSC approval, a work plan describing the ambient air monitoring program no later than 180 days from the effective date of this Permit, or as agreed upon, in writing, between DTSC

CHEMICAL WASTE MANAGEMENT, INCORPORATED
KETTLEMAN HILLS FACILITY

Hazardous Waste Facility Permit, Attachment "A"

Effective 6/16/03, Revised 5/5/05 (Class 1), Revised 7/25/06 (Class 1*), **DRAFT- Revised 6/12/07 (Class 3)**

and the Permittee. The ambient air monitoring program shall be designed to protect human health and the environment, using ambient air monitoring techniques, to assess releases of volatile organic compounds, semi-volatile compounds, metals and particulates.

The ambient air monitoring program shall be designed in accordance with the United States Environmental Protection Agency, 1993 (or most current version) "Air /Superfund National Technical Guidance Series, Volume IV-Guidance for Ambient Air Monitoring at Superfund Sites" (Revised), EPA-451/R-93-007, 1993, and the United States Environmental Protection Agency, March 1995, "Quality Assurance Handbook for Air Pollution Measurement Systems: Volume IV, Meteorological Measurements," EPA/600/R-94/038d, unless as otherwise specified by DTSC.

- (b) The work plan shall include a list of chemicals of concern (COCs) to be included in the ambient air monitoring program. The list of COCs must be representative of the incoming waste and the waste streams as stated in the Permittee's Part B Permit Application. The list of COCs shall be based on the potential to be emitted and the risk to human health and the environment. In addition, the location of the meteorological station; the proposed number, type and location of the ambient air monitoring equipment; sampling techniques; analytical methods with proposed detection limits; data evaluation method and the proposed approach and methodology for a human health risk assessment must be included in the work plan.
 - (c) Upon approval by DTSC, the ambient air monitoring workplan shall be implemented within 180 days. Ambient air samples shall be collected for a 24-hour period, on a 12-day cycle, unless as otherwise specified by DTSC. This sampling shall be maintained at least through the first year of monitoring. After which, certain technical specifications of the program, such as sampling frequency, monitoring locations, COCs or analytical methods, may be re-evaluated and modified based on the findings of the previous year's data. Either DTSC, or the Permittee with DTSC approval, can initiate the re-evaluation of the ambient air monitoring program.
- (2) The Permittee shall collect the meteorological data continuously. The meteorological data shall be averaged over one-hour periods and summarized on a quarterly basis.

CHEMICAL WASTE MANAGEMENT, INCORPORATED

KETTLEMAN HILLS FACILITY

Hazardous Waste Facility Permit, Attachment "A"

Effective 6/16/03, Revised 5/5/05 (Class 1), Revised 7/25/06 (Class 1*), **DRAFT- Revised 6/12/07 (Class 3)**

- (3) The Permittee shall submit a report of the data collected during the ambient air sampling to DTSC for review and approval on a quarterly basis. The report shall be submitted within 90 days after the end of the reporting quarter. The quarterly report shall contain a summary of the meteorological data and the analytical results. The analytical results presented in the quarterly report shall include all COCs and any detected or estimated non-COC. In addition to the ambient air data, a brief description of the waste received during the ambient air monitoring period shall be included in the report. DTSC will work with the Permittee to establish the appropriate reporting format for the report.
- (4) Based on a review of the quarterly report, DTSC may request additional information that will assist in the interpretation of the analytical data, because an investigation into an analyte's concentration may require an examination of possible sources, causes and the types of wastes received.
- (5) To ensure that air emissions do not result in unacceptable risks to human health, the Permittee shall prepare a Health Risk Assessment (HRA) in accordance with the DTSC-approved ambient air monitoring program work plan.

Estimated risks are to be based on data collected during a one-year monitoring cycle and quantified at the facility boundary. The initial HRA shall be submitted 180 days after the end of the first-year monitoring cycle. Thereafter, the Permittee shall provide an annual update to the HRA based on newly-collected data. Previous HRA work may be incorporated with DTSC's prior approval.

Risk estimates are to be evaluated against a cumulative cancer risk of one in a million and a non-cancer hazard index of 1.0 for short- and long-term exposures.

- (6) The Permittee shall obtain DTSC's prior approval for any proposed change to the approved ambient air monitoring program.
 - (7) The Permittee shall maintain all existing monitoring programs instituted under the California Code of Regulations, title 22, division 4.5, chapter 14, regarding soil-pore gas.
- (B) The Permittee shall comply with the groundwater monitoring requirements of Cal. Code of Regs., title 22, section 66294.90 et seq., and the Waste Discharge

CHEMICAL WASTE MANAGEMENT, INCORPORATED
KETTLEMAN HILLS FACILITY

Hazardous Waste Facility Permit, Attachment "A"

Effective 6/16/03, Revised 5/5/05 (Class 1), Revised 7/25/06 (Class 1*), **DRAFT- Revised 6/12/07 (Class 3)**

Requirements Order Number 98-058 (Exhibit 1), and any groundwater monitoring provision in subsequent Waste Discharge Requirements, issued to the Permittee by the Central Valley Regional Water Quality Control Board.

5. WASTE MINIMIZATION CERTIFICATION

Pursuant to HSC Section 25202.9, the Permittee shall certify annually, by March 1 for the previous year ending December 31, that:

- (A) The Facility has a program in place to reduce the volume and toxicity of all hazardous wastes (as listed in the Part A Application, Appendix A, dated July 31, 1997) generated by the Facility operations to the degree, determined by the Permittee, to be economically practicable, and
- (B) The method of storage or treatment is the only practicable method or combination of methods currently available to the Facility that minimizes the present and future threat to human health and the environment.

The Permittee shall make this certification, in accordance with Cal. Code of Regs., title 22, section 66270.11. The Permittee shall submit the certification to the Permitting Land Disposal Branch Chief and shall record and maintain onsite such certification in the Facility Operating Record.

6. WASTE MINIMIZATION CONDITIONS

The Permittee shall comply with the Hazardous Waste Source Reduction and Management Review Act (SB 14) requirements that are specified in the HSC, sections 25244.19, 25244.20 and 25244.21, and any subsequent applicable statutes or regulations promulgated thereunder. This would include submittal of SB 14 documents to DTSC upon request. DTSC may require the Permittee to submit a more detailed status report explaining any deviation from, or changes to, the approved waste minimization plan.

7. WASTES PROHIBITED

The Permittee is not authorized to receive, treat, store, dispose of, or otherwise manage the following:

CHEMICAL WASTE MANAGEMENT, INCORPORATED

KETTLEMAN HILLS FACILITY

Hazardous Waste Facility Permit, Attachment "A"

Effective 6/16/03, Revised 5/5/05 (Class 1), Revised 7/25/06 (Class 1*), **DRAFT- Revised 6/12/07 (Class 3)**

- (A) Radioactive material that is not exempt from regulation and licensing or is not expressly authorized for disposal under the Radiation Control Law, chapter 8 (commencing with section 114960) of part 9 of division 104 of the Health and Safety Code, or any successor statute that may replace the Radiation Control Law; or is prohibited from disposal under article 1 (commencing with section 114705) of chapter 5 of part 9 of division 104 of the Health and Safety Code or any successor statute that may replace article 1; or is prohibited from disposal by any governmental agency.
- (B) Compressed gases (not including aerosol containers).
- (C) Class 1, Division 1.1 or 1.2, or forbidden explosives (Code of Federal Regulations, title 49, subchapter C, part 173, section 50).
- (D) Biological agents or infectious wastes.

PART IV. PERMITTED UNITS AND ACTIVITIES

This Permit authorizes operation only of the units and activities listed below. The Permittee shall not treat or store hazardous waste in any unit other than those specified in this part. Any modifications to a unit or activity authorized by this Permit require the written approval of DTSC in accordance with the permit modification procedures set forth in Cal. Code of Regs., title 22, section 66270.42.

UNIT NAME

Drum Storage Unit

LOCATION

The Drum Storage Unit is located between the Combined Closure Area, the Landfill B-13, and the Landfill B-19, in the approximate center of the active portion of the Facility.

ACTIVITY TYPE

Storage in containers.

ACTIVITY DESCRIPTION

At the Drum Storage Unit, containers are unloaded, inspected, segregated and temporarily stored for subsequent processing at another onsite waste management unit or for shipment to an offsite Facility. After containers have been evaluated and inspected, they are placed within a storage bay with other compatible wastes. When enough containers of a given waste category have accumulated and/or the storage time limit is being approached, the containers are transferred to the appropriate onsite waste management unit or offsite Facility via flatbed trucks or other suitable vehicles.

PHYSICAL DESCRIPTION

The Drum Storage Unit includes a main building and an adjacent loading/unloading area. A rigid frame metal roof covers the drum storage building. The floor of the unit is constructed of cast-in-place reinforced concrete with a perimeter containment curb. A 60-mil thick high density polyethylene (HDPE) containment liner and pea gravel leak detection layer underlie the concrete floor. The HDPE liner is sloped to separately collect potential leakage beneath each storage bay.

There are nine individual container storage bays, each with self-contained drainage. Containers are placed in the storage bays with aisles between the rows for access. Containers may be

CHEMICAL WASTE MANAGEMENT, INCORPORATED

KETTLEMAN HILLS FACILITY

Hazardous Waste Facility Permit, Attachment "A"

Effective 6/16/03, Revised 5/5/05 (Class 1), Revised 7/25/06 (Class 1*), **DRAFT- Revised 6/12/07 (Class 3)**

stacked to 72 inches in total container height, not including any pallet between the stacked containers. Unstacked containers may exceed 72 inches in total container height.

Drainage is directed inward from the perimeter containment curb toward the storage bays. The cast-in-place concrete slab includes a raised walkway separating each storage bay. Each of the bays is sloped to divert leaks, spills, or wash down water into a trench that drains to a separate, nondischarging sump. This prevents liquid accumulation around the base of containers and segregates spilled materials within individual bays. Each storage bay has containment capacity to hold at least 10 percent of the total volume of containers stored within the bay.

The loading\unloading area also has a metal roof to protect operations from inclement weather. The area has a reinforced concrete slab that is sloped to provide four individual bays, each with self-contained drainage that flows to a nondischarging sump. Each loading\unloading bay can accommodate two trucks and has the capacity to hold at least 10 percent of the maximum volume of two truck loads of wastes (i.e. one hundred sixty 55-gallon drums).

The drum storage unit perimeter curb is raised in relation to the surrounding topography, therefore run-on does not occur. The entrance to the loading\unloading area is graded to prevent run-on from the adjacent ground surface.

MAXIMUM CAPACITY OF UNIT

9,000 drums (55 gal./drum), or an equivalent volume.

WASTE TYPES ALLOWED

As Listed in the Part A Application, Appendix A.

RCRA HAZARDOUS WASTE CODES ALLOWED

As listed in the Part A Application, Appendix A.

AIR EMISSION STANDARDS SUBPART CC

This unit is subject to 40 CFR, Part 264, Subpart CC, Air Emission Standards.

UNIT NAME

Drum Decant Unit (DDU)

LOCATION

The Drum Decant Unit is located to the immediate west of the Drum Storage Unit.

ACTIVITY TYPE

Transfer of aqueous organic wastes from drums to bulk liquid treatment (i.e., separation) and storage.

ACTIVITY DESCRIPTION

Reclaimable liquids that are recovered at the DDU (i.e., solvents or supplemental fuels) are transported offsite for sale or beneficial use. Other wastes may be shipped offsite for treatment/destruction. Liquid wastes not subject to land disposal restrictions may be solidified/stabilized and landfilled, or placed in onsite surface impoundments. Liquids are removed from containers on a processing line using hand-held extraction wands. Sludge residues not subject to land disposal restrictions are stabilized and landfilled onsite. Where land disposal restrictions require waste residues to be treated prior to disposal, treatment may occur at the Final Stabilization Unit prior to onsite landfilling. Where land disposal restrictions preclude onsite treatment and/or landfilling, sludge residues are shipped offsite for treatment.

Clay absorbent or other suitable moisture-deficient material is added to drums containing non-land disposal restricted sludges destined for onsite landfilling. The drum is then allowed to set, and is examined for the presence of free liquids, as defined in Cal. Code of Regs., title 22, section 66264.10. If no free liquids are present, the drums are transported to an onsite landfill for final disposal. Empty drums are crushed and landfilled.

PHYSICAL DESCRIPTION

The DDU includes eight liquid storage and treatment tanks, a processing line, and concrete slabs for staging, on loading and off loading drums. The processing line consists of a roller conveyor, two hand-held extraction wands for decantation, one hand-held wand for sludge filling, and two absorbent filling stations.

The processing line is contained by a concrete slab and containment curbs. The containment slab is constructed of reinforced concrete with an epoxy-coated surface. The slab has a perimeter containment curb and a sloped surface that directs spilled liquids towards a collection sump.

CHEMICAL WASTE MANAGEMENT, INCORPORATED
KETTLEMAN HILLS FACILITY

Hazardous Waste Facility Permit, Attachment "A"

Effective 6/16/03, Revised 5/5/05 (Class 1), Revised 7/25/06 (Class 1*), **DRAFT- Revised 6/12/07 (Class 3)**

Containers on the processing line are elevated above the containment slab surface by the roller conveyor. The containment slab is elevated compared to the surrounding grade, so run-on does not occur.

MAXIMUM CAPACITY OF UNIT

60,600 gallons (eight tanks varying from 700 gallons to 13,000 gallons)

WASTE TYPES ALLOWED

As listed in the Part A Application, Appendix A.

RCRA HAZARDOUS WASTE CODES ALLOWED

As listed in the Part A Application, Appendix A.

AIR EMISSION STANDARDS SUBPART CC

This unit is subject to 40 CFR, Part 264, Subpart CC, Air Emission Standards.

UNIT NAME

PCB Flushing/Storage Unit

LOCATION

The PCB Flushing/Storage Unit is located to the immediate north of the Drum Storage Unit, in the approximate center of the Facility.

ACTIVITY TYPE

Transfer/Storage of liquid PCB wastes from bulk containers to the 10,000 gallon storage tank, or to DOT-approved metal drums for eventual off-site treatment/disposal.

ACTIVITY DESCRIPTION

Most PCB wastes handled at the PCB Flushing/Storage Unit are drums, PCB article containers, PCB articles (e.g., capacitors, transformers, contaminated equipment) or bulk solids. Transformers and drums containing PCB liquids are drained and flushed with a solvent and subsequently stored temporarily for eventual offsite treatment/disposal. Capacitors received at the unit, except those defined as being small (40 CFR Part 761), are shipped offsite for disposal. PCB solids, drained/flushed PCB contaminated drums and articles, and small capacitors are placed in an onsite landfill in accordance with the requirements of 40 CFR Part 761 and Cal. Code of Regs., title 22, division 4.5, or may be shipped offsite for disposal.

The PCB Flushing/Storage Unit also includes a PCB article draining area outside of the building. The draining of PCB liquids occurs here while the PCB articles are within containment trays. The trays are managed as clean and are lined with plastic material. Absorbent material is generally placed in the containment tray to contain drips or spills that may occur during the processing. After the processing is completed, the absorbent and lining materials are taken out of the tray and properly disposed. If the trays or other movable equipment become contaminated, thorough decontamination is required.

Repackaging of PCB wastes may also occur at the unit.

PHYSICAL DESCRIPTION

The PCB Flushing/Storage Unit consists of an enclosed building with a roof and walls to prevent the entrance of precipitation or run-on. There is a continuous concrete curb one and one half feet high inside and adjacent to the walls of the building to contain spills that may occur within the building. The reinforced concrete floor has a vinyl epoxy resin surface and is sloped to drain spilled liquids away from stored articles and containers to a nondischarging sump. A vehicle access door is provided at the southeast corner of the building.

CHEMICAL WASTE MANAGEMENT, INCORPORATED

KETTLEMAN HILLS FACILITY

Hazardous Waste Facility Permit, Attachment "A"

Effective 6/16/03, Revised 5/5/05 (Class 1), Revised 7/25/06 (Class 1*), **DRAFT- Revised 6/12/07 (Class 3)**

One 10,000 gallon aboveground storage tank is located within the building for the storage of PCB liquid and flushing solution. One 1,000 gallon aboveground storage tank is located outside the building for the storage of flushing solution.

MAXIMUM CAPACITY OF UNIT

10,000 gallons (One waste tank) plus 300 55-gallon drums, or an equivalent volume.

WASTE TYPES ALLOWED

Transformers and drums containing PCB liquids, PCB articles (e.g. capacitors, transformers, contaminated equipment) or bulk solids.

RCRA HAZARDOUS WASTE CODES ALLOWED

As listed in the Part A Application, Appendix A.

AIR EMISSION STANDARDS SUBPART CC

This unit is not subject to 40 CFR, Part 264, Subpart CC, Air Emission Standards.

CHEMICAL WASTE MANAGEMENT, INCORPORATED

KETTLEMAN HILLS FACILITY

Hazardous Waste Facility Permit, Attachment "A"

Effective 6/16/03, Revised 5/5/05 (Class 1), Revised 7/25/06 (Class 1*), **DRAFT- Revised 6/12/07 (Class 3)**

UNIT NAME

Bulk Storage Units 1 and 2

LOCATION

Bulk Storage Units 1 and 2 are located adjacent to the Final Stabilization Unit directly to the east and north, respectively.

ACTIVITY TYPE

Temporary storage of stabilized/unstabilized waste prior to land disposal, treatment, or shipment offsite.

ACTIVITY DESCRIPTION

Bulk Storage Unit 1 is primarily used for temporary storage of stabilized waste. After confirmation that the stabilized waste meets the appropriate treatment standard(s), the stabilized waste is then disposed in an onsite landfill. Bulk Storage Unit 1 contains a bermed asphalt pad that may be used to temporarily stage land disposal restricted wastes (i.e. unstabilized wastes). The asphalt pad is also used for sealing bulk containers for macro-encapsulation of land disposal restricted debris waste.

Bulk Storage Unit 2 is used for temporary storage of both stabilized and unstabilized waste.

PHYSICAL DESCRIPTION

Bulk Storage Unit 1 is lined with a 60-mil thick HDPE geomembrane, and is overlain by a geocomposite drainage layer and an 18-inch aggregate liner protection layer. There is also an area of approximately 6,000 square feet with asphalt overlying the aggregate liner protection layer.

Bulk Storage Unit 2 is overlain with two 60-mil thick HDPE geomembranes overlain and separated by geocomposite drainage layers. These liners are then overlain with an aggregate liner protection layer.

Both bulk storage units have a perimeter containment berm that prevents runoff or run-on. Inside the perimeter containment berms, the underlying liners are sloped toward sumps, which allows for removal of any standing water.

CHEMICAL WASTE MANAGEMENT, INCORPORATED
KETTLEMAN HILLS FACILITY

Hazardous Waste Facility Permit, Attachment "A"

Effective 6/16/03, Revised 5/5/05 (Class 1), Revised 7/25/06 (Class 1*), **DRAFT- Revised 6/12/07 (Class 3)**

MAXIMUM CAPACITY OF UNIT

70 bulk containers in each unit, for a total of 140 bulk containers.

WASTE TYPES ALLOWED

As listed in the Part A Application, Appendix A.

RCRA HAZARDOUS WASTE CODES ALLOWED

As listed in the Part A Application, Appendix A.

AIR EMISSION STANDARDS SUBPART CC

This unit is subject to 40 CFR, Title 264, Subpart CC, Air Emission Standards.

CHEMICAL WASTE MANAGEMENT, INCORPORATED

KETTLEMAN HILLS FACILITY

Hazardous Waste Facility Permit, Attachment "A"

Effective 6/16/03, Revised 5/5/05 (Class 1), Revised 7/25/06 (Class 1*), **DRAFT- Revised 6/12/07 (Class 3)**

UNIT NAME

Final Stabilization Unit (FSU)

LOCATION

The Final Stabilization Unit (FSU) is located south of closed Surface Impoundments P-10/11, between P-10/11 and Landfill B-18. The FSU is adjacent to Bulk Storage Units 1 and 2.

ACTIVITY TYPE

Processing of various solid, semi-solid, and selected liquid wastes not suitable for direct landfilling, solar evaporation, or other management method employed at the Facility, by mixing with stabilization reagents.

ACTIVITY DESCRIPTION

Waste processing occurs in four mixing bins. Bulk containers are emptied directly into the bins, and stabilization reagents are added from the storage silos via an automated feed system of conveyors, surge bins, and ducting, or are added from other dry reagents in bags or containers. Smaller containers are held over the bins and their contents poured out, or the containers are pierced with a spike while over the bins. Mixing is accomplished by the use of an excavator moving its bucket back and forth through the waste mixture.

Macro encapsulation is performed within the FSU on certain Land Disposal Restricted wastes (i.e. debris). When loads of debris are received at the FSU, the loads are either directly loaded into roll-off bins fitted with a high density polyethylene vault, or transferred from the waste processing bins to the Macro encapsulation vault. The Macro encapsulation vault is then capped and sealed prior to transport to a landfill.

PHYSICAL DESCRIPTION

The FSU building is a 120' x 80' steel framed structure with a reinforced concrete slab, indoor tanks for waste processing, recessed in the floor, and outdoor reagent storage tanks and appurtenant systems. The reinforced concrete floor is sloped inward to prevent runoff from occurring during waste loading/unloading and processing. The building enclosure prevents precipitation onto the FSU floor and in the waste processing tanks. Perimeter curbing and grading adjacent to the building prevents run-on to the building except from the inward sloping wash down aprons.

MAXIMUM CAPACITY OF UNIT

CHEMICAL WASTE MANAGEMENT, INCORPORATED

KETTLEMAN HILLS FACILITY

Hazardous Waste Facility Permit, Attachment "A"

Effective 6/16/03, Revised 5/5/05 (Class 1), Revised 7/25/06 (Class 1*), **DRAFT- Revised 6/12/07 (Class 3)**

Each of the four existing waste processing tanks can hold 20,000 gallons, for an aggregate total of 80,000 gallons; however, the batch processes in each tank typically incorporate 5,000 gallons or less of incoming waste. The FSU Facility has the capacity to be expanded by two additional waste processing tanks, an exterior tank farm consisting of six tanks each with a capacity of 20,000 gallons, and two above ground storage tanks of 20,000 gallon capacity each.

WASTE TYPES ALLOWED

As listed in the Part A Application, Appendix A.

RCRA HAZARDOUS WASTE CODES ALLOWED

As listed in the Part A Application, Appendix A.

AIR EMISSION STANDARDS SUBPART CC

This unit is subject to 40 CFR, Title 264, Subpart CC, Air Emission Standards.

CHEMICAL WASTE MANAGEMENT, INCORPORATED
KETTLEMAN HILLS FACILITY

Hazardous Waste Facility Permit, Attachment "A"

Effective 6/16/03, Revised 5/5/05 (Class 1), Revised 7/25/06 (Class 1*), **DRAFT- Revised 6/12/07 (Class 3)**

UNIT NAME

Surface Impoundments P-9, P-14, P-15, and P-16

LOCATION

There are three active, and one inactive surface impoundments on the KHF. The active impoundments are P-9, P -14, and P -16; the inactive impoundment is P-15. Unit P-9 is located immediately to the north of the Final Stabilization Unit, adjacent to the Landfill Unit B-19, Phase 3. Units P-14, P-15, and P-16 are located at the extreme north end of the active portion of the Facility adjacent to the Combined Closure as described under the landfill units.

ACTIVITY TYPE

Treatment by solar evaporation.

ACTIVITY DESCRIPTION

The surface impoundments are used to treat low solid, low organic content aqueous wastes by solar evaporation. Wastes treated at the impoundments may be generated offsite, or from onsite operations (e.g. leachate).

Wastes may be transferred to the impoundments from bulk liquid transport vehicles or from containers (e.g. drums).

PHYSICAL DESCRIPTION

Each of the active impoundments is designed with a reinforced concrete pad for unloading wastes. The unloading pads are sloped and curbed to direct spillage into the respective impoundment. Each of the active impoundments is constructed with a double-composite liner and a Leachate Collection and Recovery System (LCS) between the top and bottom composite liners. The LCS is also a Leak Detection System (LDS).

Liner components at each of the active impoundments include: bottom liner consisting of a 3-foot thick layer of clay (hydraulic conductivity $\leq 1 \times 10^{-7}$ cm/sec), and a 60-mil thick high density polyethylene (HDPE) geomembrane liner; LCS/LDS layer consists of: a geosynthetic drainage net; and a geotextile fabric, to prevent clogging; The top liner consists of a 1½ foot thick clay layer (hydraulic conductivity $\leq 1 \times 10^{-7}$ cm/sec), and a 60-mil thick HDPE geomembrane liner.

The inactive surface impoundment P-15 is constructed of the following elements: a 40-mil thick HDPE geomembrane, a geocomposite (geonet/geotextile) LCS/LDS layer, and a 60-mil thick HDPE geomembrane.

CHEMICAL WASTE MANAGEMENT, INCORPORATED

KETTLEMAN HILLS FACILITY

Hazardous Waste Facility Permit, Attachment "A"

Effective 6/16/03, Revised 5/5/05 (Class 1), Revised 7/25/06 (Class 1*), **DRAFT- Revised 6/12/07 (Class 3)**

MAXIMUM TREATMENT CAPACITY

Unit	Area (acres)	Unit Capacity Volume (gallons)
P-9	1.5	4,400,000
P-14	0.9	2,100,000
P-15	1.5	0*
P-16	1.6	3,900,000

*Unit is inactive, and therefore cannot receive any wastes.

WASTE TYPES ALLOWED

As listed in the Part A Application, Appendix A, with the following exceptions:

- Reactive wastes, including wastes with cyanide concentrations greater than 250 ppm or sulfide concentrations greater than 500 ppm.
- Wastes with total organic carbon concentration greater than 10,000 ppm.
- Wastes with an oil and grease concentration greater than 20,000 ppm.
- RCRA waste codes K044, K045, K046, K047, P056, P063, P076, P078, P081, P095, P096, and U135 as defined in Title 40 Code of Federal Regulations Part 261.
- Wastes with a total halogenated organic concentration of greater than 1,000 ppm.
- PCB wastes regulated under the federal Toxic Substances Control Act.
- Wastes prohibited from treatment in surface impoundments by Cal. Code of Regs., title 22, division 4.5, chapter 18, unless treated to meet land disposal restriction regulatory requirements.
- Radioactive waste that is not exempt from regulation and licensing or is not expressly authorized for disposal under the Radiation Control Law, chapter 8 (commencing with section 114960) of part 9 of division 104 of the Health and Safety Code, or any successor statute that may replace the Radiation Control Law; or is prohibited from disposal under

CHEMICAL WASTE MANAGEMENT, INCORPORATED
KETTLEMAN HILLS FACILITY

Hazardous Waste Facility Permit, Attachment "A"

Effective 6/16/03, Revised 5/5/05 (Class 1), Revised 7/25/06 (Class 1*), **DRAFT- Revised 6/12/07 (Class 3)**

article 1 (commencing with section 114705) of chapter 5 of part 9 of division 104 of the Health and Safety Code or any successor statute that may replace article 1; or is prohibited from disposal by any government agency.

RCRA HAZARDOUS WASTE CODES ALLOWED

As listed in the Part A Application, Appendix A.

UNIT SPECIFIC SPECIAL CONDITIONS

1. The Permittee shall test all components of surface impoundment liners for waste/leachate compatibility using EPA Method 9090 or other more appropriate methods approved by DTSC. The liner components include seamed portions of 60-mil high density polyethylene, high density polyethylene geomembrane material, high density polyethylene geonet, geotextile fabric, graded gravel used as drainage material, and the high density polyethylene piping used in the leachate collection systems.

The Permittee may propose the use of alternative test methods, existing test data from similar studies, and manufacturer supplied specifications as an alternative to the requirement above. The alternative methods and information must be submitted by the Permittee as a comprehensive plan designed to meet the goals of EPA Method 9090.

2. The Permittee shall not use drilling muds as a soil conditioner in the clay component of liners or cap/covers in any surface impoundment at the Facility.
3. The Permittee shall submit a detailed schedule of the major project milestones to DTSC, and the Regional Water Quality Control Board prior to any surface impoundment construction or closure project. The Permittee shall keep DTSC and the Regional Water Quality Control Board apprised of any changes to the planned dates and events associated with the construction or closure project.
4. The Permittee shall reject all high density polyethylene geomembrane liner materials that are damaged during installation under windy conditions. The definition of "wind damage," and the required remediation necessary for both preventing and repairing wind damaged geomembrane liner materials, are to be addressed by the Permittee and submitted for DTSC's review and approval within the text of the Construction Quality

CHEMICAL WASTE MANAGEMENT, INCORPORATED
KETTLEMAN HILLS FACILITY

Hazardous Waste Facility Permit, Attachment "A"

Effective 6/16/03, Revised 5/5/05 (Class 1), Revised 7/25/06 (Class 1*), **DRAFT- Revised 6/12/07 (Class 3)**

Assurance Plan (or plan addenda) required for each new surface impoundment construction or closure construction project. These plans (or addenda) require a permit modification in accordance with Cal. Code of Regs., title 22, sections 66270.41 and 66271.4 for approval.

AIR EMISSION STANDARDS SUBPART CC

This unit is subject to 40 CFR, Part 264, Subpart CC, Air Emission Standards.

CHEMICAL WASTE MANAGEMENT, INCORPORATED

KETTLEMAN HILLS FACILITY

Hazardous Waste Facility Permit, Attachment "A"

Effective 6/16/03, Revised 5/5/05 (Class 1), Revised 7/25/06 (Class 1*), **DRAFT- Revised 6/12/07 (Class 3)**

UNIT NAME

Landfill units B-16, B-18, and B-19

LOCATION

There is one active hazardous waste landfill on the Facility, Unit B-18, which is located at the southern-most point of the active portion of the Facility, immediately south of the Final Stabilization Unit. There are two inactive units, Unit B-16 and B-19, which are awaiting closure. The Unit B-16 is located immediately to the northwest of the Administration Building, and the Unit B-19 is located immediately north of the closed landfill Unit B-15, and southeast of the Drum Storage Unit.

ACTIVITY TYPE

Land disposal.

ACTIVITY DESCRIPTION

Landfills are operated as the final depositories of solid wastes. Materials that may be landfilled include noncontainerized bulk wastes, containerized wastes, and debris. Some wastes require stabilization/solidification prior to disposal in the landfill. Off loading and burial activities are overseen by trained employees. Containers of solid and lab-pack wastes are placed upright in the disposal area. Noncontainerized bulk wastes are placed in layers and compacted. Except for closed containers and waste materials not prone to wind erosion, daily cover material is placed on the wastes. The approximate midpoint of each shipment of wastes is recorded and documented and kept on file at the Facility in case the wastes must be exhumed.

As noted above, there is one active landfill, Unit B-18, permitted to accept hazardous wastes. The landfill B-16 is a unit regulated under the federal Toxic Substances Control Act and is currently awaiting final closure cap design approval by the United States Environmental Protection Agency, Region IX. The Unit B-16 is currently approved, by DTSC, to accept an additional 60,000 cubic yards of waste to complete the final grades prior to placing the final cover. The Unit B-16 is considered inactive and has an interim high density polyethylene cover currently in-place to minimize erosion and infiltration of precipitation, until the final cover is placed. The Unit B-19 has been converted to accept municipal solid wastes/designated wastes only in accordance with Cal. Code of Regs., title 22, section 66264.113(d).

CHEMICAL WASTE MANAGEMENT, INCORPORATED
KETTLEMAN HILLS FACILITY

Hazardous Waste Facility Permit, Attachment "A"

Effective 6/16/03, Revised 5/5/05 (Class 1), Revised 7/25/06 (Class 1*), **DRAFT- Revised 6/12/07 (Class 3)**

PHYSICAL DESCRIPTION

Construction of a landfill unit, such as B-18 or B-19, consists of a secondary liner system; primary liner system; leachate collection and recovery system; leachate detection system; and a vadose zone detection collection and recovery system. These systems are constructed of the following components:

Secondary Liner System: 3-foot minimum clay layer ($k \leq 1 \times 10^{-7}$ cm/sec), and a 60-mil textured high density polyethylene geomembrane.

Primary Liner System: 1.5 foot thick clay layer ($k \leq 1 \times 10^{-7}$ cm/sec), and a 60-mil textured high density polyethylene geomembrane.

Leachate Collection and Recovery System: On the side slopes, a geotextile, and a single-sided geocomposite drainage layer; on the base, a geotextile, single-sided geocomposite drainage layer, 1-foot gravel layer ($k \geq 1 \times 10^{-2}$ cm/sec), a geotextile, stainless steel/carbon steel side slope riser pipe, and a steel/high density polyethylene pipe vertical riser.

Leachate Detection System: On the side slopes, geotextile, and a single-sided geocomposite drainage layer; on the base, geotextile, single-sided geocomposite drainage layer, 1 foot gravel layer ($k \geq 1 \times 10^{-2}$ cm/sec), geotextile, stainless steel/carbon steel side slope riser pipe, and a high density polyethylene side slope riser pipe.

Vadose Zone Detection, Collection, and Recovery System: 80-mil smooth high density polyethylene geomembrane, geotextile, 1 foot-thick gravel layer, geotextile, and a stainless steel/carbon steel side slope riser pipe.

Older landfills at the Facility, such as B-16, have been constructed to lesser standards (prior to the current requirements of the federal Resource Conservation and Recovery Act (RCRA)). However, these units, except for B-16, have been closed with covers equivalent to current RCRA standards. The Permittee has conducted an extensive field study on the effects of an arid climate on various cover sections of a clay test fill. This study revealed that significant drying and cracking of cover soils, especially clays, will occur in as little as three years when exposed to the arid conditions experienced at the Kettleman Hills Facility. In response to this study, the Permittee submitted an alternative cover system as the standard for landfills at this Facility. The following is a breakdown of the components included in this alternative cover system:

- 2.5 feet of vegetative soil cover;
- Geotextile drainage layer (transmissivity ≥ 0.03 gal/min/ft);

CHEMICAL WASTE MANAGEMENT, INCORPORATED
 KETTLEMAN HILLS FACILITY

Hazardous Waste Facility Permit, Attachment "A"

Effective 6/16/03, Revised 5/5/05 (Class 1), Revised 7/25/06 (Class 1*), **DRAFT- Revised 6/12/07 (Class 3)**

- 40-mil thick textured high density polyethylene geomembrane;
- 1 foot (minimum) of compacted foundation layer (hydraulic conductivity $\leq 1 \times 10^{-5}$ cm/sec);
- 1 foot (minimum) of intermediate soil cover over the last lift of waste.

MAXIMUM CAPACITY

Unit	Operational Status	Wastes Managed	Unit Area (acres)	Total Capacity (cubic yards)	Net Disposal Volume Remaining (cubic yards) ¹
B-16	Inactive	TSCA-regulated PCB wastes, except those restricted by Title 22, California Code of Regulations, Division 4.5, Chapter 18.	5	258,000	60,000
B-18	Active	All types of solid hazardous wastes as described in the Part A application Appendix A, including TSCA-regulated wastes, except those that are restricted as listed in this permit.	53	10,700,000	7,300,000
B-19	Converted to Subtitle D unit	n/a	40	2,600,000	0
Total			98	13,558,000	7,360,000

¹Approximate values are current as of April 4, 2000.

WASTE TYPES ALLOWED

As listed in the Part A Application, Appendix A, with the exception of the following:

- Reactive wastes, unless rendered nonreactive (except for lab-packed cyanides or sulfides as allowed under Cal. Code of Regs., title 22, section 66264.316(e)).
- Ignitable wastes, unless rendered nonignitable or lab-packed as allowed under Cal. Code of Regs., title 22, section 66264.316.

CHEMICAL WASTE MANAGEMENT, INCORPORATED
KETTLEMAN HILLS FACILITY

Hazardous Waste Facility Permit, Attachment "A"

Effective 6/16/03, Revised 5/5/05 (Class 1), Revised 7/25/06 (Class 1*), **DRAFT- Revised 6/12/07 (Class 3)**

- Liquid waste or containers with free liquids, unless stabilized/solidified or lab-packed, except as allowed under Cal. Code of Regs., title 22, section 66264.314.
- Waste prohibited from disposal in landfill by Cal. Code of Regs., title 22, division 4.5, chapter 18, unless treated to meet land disposal regulatory requirements.
- Radioactive waste that is not exempt from regulation and licensing or is not expressly authorized for disposal under the Radiation Control Law (chapter 8 (commencing with section 114960) of part 9 of division 104 of the Health and Safety Code, or any successor statute that may replace the Radiation Control Law; or is prohibited from disposal under article 1 (commencing with section 114705) of chapter 5 of part 9 of division 104 of the Health and Safety Code or any successor statute that may replace article 1; or is prohibited from disposal by any government agency.

RCRA HAZARDOUS WASTE CODES ALLOWED

As listed in the Part A Application, Appendix A.

UNIT SPECIFIC CONDITIONS

1. During construction of any new proposed waste management units, the Permittee shall test all components of landfill liners for waste/leachate compatibility using EPA Method 9090 or other more appropriate methods approved by DTSC. The liner components include seamed portions of 60-mil high density polyethylene, high density polyethylene geomembrane material, high density polyethylene geonet, geotextile fabric, graded gravel used as drainage material, and the high density polyethylene piping used in the leachate collection systems.

The Permittee may propose the use of alternative test methods, existing test data from similar studies, and manufacturer supplied specifications as an alternative to the requirement above. The alternative methods and information must be submitted by the Permittee as a comprehensive plan designed to meet the goals of EPA Method 9090.

2. The Permittee shall not use drilling muds as a soil conditioner in the clay component of liners or cap/covers in any landfill at the Facility.
3. The Permittee shall submit a detailed schedule of the major project milestones to DTSC, and the Regional Water Quality Control Board prior to any landfill construction or closure project. The Permittee shall keep DTSC and the Regional Water Quality Control Board apprised of any changes to the planned dates and events associated with the construction or closure project.

CHEMICAL WASTE MANAGEMENT, INCORPORATED
KETTLEMAN HILLS FACILITY

Hazardous Waste Facility Permit, Attachment "A"

Effective 6/16/03, Revised 5/5/05 (Class 1), Revised 7/25/06 (Class 1*), **DRAFT- Revised 6/12/07 (Class 3)**

4. The Permittee shall reject all high density polyethylene geomembrane liner materials that are damaged during installation under windy conditions. The definition of "wind damage," and the required remediation necessary for both preventing and repairing wind damaged geomembrane liner materials, are to be addressed by the Permittee and submitted for DTSC's review and approval within the text of the Construction Quality Assurance Plan (or plan addenda) required for each new landfill construction or closure construction project. These plans (or addenda) require a permit modification in accordance with Cal. Code of Regs., title 22, sections 66270.41 and 66271.4 for approval.
5. The Permittee shall apply a daily cover soil over exposed wastes to control wind dispersal of particulate matter within the landfill operations area, as required by Cal. Code of Regs., title 22, section 66264.301(i). The Permittee may use other appropriate materials (such as polymeric soil sealers or foaming agents) that have been specifically approved through a permit modification in accordance with Cal. Code of Regs., title 22, sections 66270.41 and 66271.4.
6. The Permittee shall ensure that all containers are either at least 90 percent full when placed in a landfill or are crushed, shredded, or similarly reduced in volume to the maximum practical extent prior to burial in a landfill, as required by Cal. Code of Regs., title 22, section 66264.315. This condition does not apply to containers that are very small, such as ampules or to containers designed to hold free liquids for use other than storage, such as a battery or capacitor.
7. The Permittee shall maintain all units that are closed as partial closures, prior to the ultimate Facility closure, in accordance with the Post-Closure Plan submitted by the Permittee, which has been approved. The 30-year minimum post-closure care period specified in Cal. Code of Regs., title 22, section 66264.117(b) will not begin until the ultimate Facility closure.

AIR EMISSION STANDARDS SUBPART CC

These units are not subject to the requirements of 40 CFR, Part 264, Subpart CC.

CHEMICAL WASTE MANAGEMENT, INCORPORATED

KETTLEMAN HILLS FACILITY

Hazardous Waste Facility Permit, Attachment "A"

Effective 6/16/03, Revised 5/5/05 (Class 1), Revised 7/25/06 (Class 1*), **DRAFT- Revised 6/12/07 (Class 3)**

LIST OF CLOSED, INACTIVE, AND NON-CONSTRUCTED UNITS

NAME OF UNIT	STATUS	PERIOD OF OPERATION
Drum Decant Unit	Inactive. A request for extension for closure has been submitted to DTSC. Closure is required to occur within 3.5 years of the effective date of this permit.	1983 to present
Future PCB Flushing/Storage Unit	Not yet constructed.	N/A
Neutralization Filtration Unit	Not yet constructed.	N/A
Evaporative Tank System	Not yet constructed.	N/A
Temporary Container Storage Area	Closed June 1997, Combined Closure Area.	1984-1989
Interim Stabilization Unit	Closed June 1997, Combined Closure Area.	1985-1990
Old Truck Wash	Closed June 1997, Combined Closure Area.	1977-1992
Cyanide Treatment Unit	Partially closed, final closure will occur when the Drum Decant Unit is closed. These units share the secondary containment system.	1983-1993
Former Drum Staging Area (Central Processing Area)	Closed June 1996, Landfill B-13 Closure.	1983-1989
Landfill B-1	Closed June 1997, Combined Closure Area.	1978
Landfill B-2	Closed August 1988.	1978
Landfill B-3	Closed August 1988.	1978
Landfill B-4	Closed June 1997, Combined Closure Area.	1978-1980
Landfill B-5	Closed June 1997, Combined Closure Area.	1978-1979
Landfill B-6	Closed June 1997, Combined Closure Area.	1979-1983
Landfill B-7	Closed June 1997, Combined Closure Area.	1978-1979
Landfill B-8	Closed June 1997, Combined Closure Area.	1979
Landfill B-9	Closed June 1997, Combined Closure Area.	1978-1982

CHEMICAL WASTE MANAGEMENT, INCORPORATED

KETTLEMAN HILLS FACILITY

Hazardous Waste Facility Permit, Attachment "A"

Effective 6/16/03, Revised 5/5/05 (Class 1), Revised 7/25/06 (Class 1*), **DRAFT- Revised 6/12/07 (Class 3)**

NAME OF UNIT	STATUS	PERIOD OF OPERATION
Landfill B-9 Extension	Closed June 1997, Combined Closure Area.	1982-1983
Landfill B-9 Expansion	Closed June 1997, Combined Closure Area.	1983-1987
Landfill B-10	Closed June 1997, Combined Closure Area.	1978-1980
Landfill B-11	Closed June 1997, Combined Closure Area.	1978-1980
Landfill B-12	Closed June 1996, Landfill B-13 Closure.	1977-1980
Landfill B-13	Closed June 1996, Landfill B-13 Closure.	1979-1983
Landfill B-13 Expansion	Closed June 1996, Landfill B-13 Closure.	1979-1987
Landfill B-14	Closed.	1982-1984
Landfill B-15	Closed December 1997.	1981-1985
Landfill B-16	Inactive. This unit is permitted and has the capacity to receive approximately 60,000 additional yards.	1983-present
Landfill B-19	Partially closed, converted to a Municipal/Solid Waste Landfill. Final closure will occur upon completion of the Municipal/Solid Waste Landfill in accordance with Cal. Code of Regs., title 22, section 66264.113.	1987-present
Surface Impoundment P-1	Closed June 1997, Combined Closure Area.	1978-1983
Surface Impoundment P-2	Closed June 1997, Combined Closure Area.	1978-1983
Surface Impoundment P-3	Closed June 1997, Combined Closure Area.	1978-1983
Surface Impoundment P-4	Closed June 1997, Combined Closure Area.	1978-1981
Surface Impoundment P-5	Closed June 1997, Combined Closure Area.	1978-1980
Surface Impoundment P-6	Closed June 1993, P-6/7/8 Closure.	1978-1983
Surface Impoundment P-7	Closed June 1993, P-6/7/8 Closure.	1978-1983
Surface Impoundment P-8	Closed June 1993, P-6/7/8 Closure.	1978-1983
Surface Impoundment P-10	Closed June 1993, P-10/11 Closure.	1979-1986
Surface Impoundment P-11	Closed June 1993, P-10/11 Closure.	1978-1986

CHEMICAL WASTE MANAGEMENT, INCORPORATED

KETTLEMAN HILLS FACILITY

Hazardous Waste Facility Permit, Attachment "A"

Effective 6/16/03, Revised 5/5/05 (Class 1), Revised 7/25/06 (Class 1*), **DRAFT- Revised 6/12/07 (Class 3)**

NAME OF UNIT	STATUS	PERIOD OF OPERATION
Surface Impoundment P-12/12A	Closed June 1997, Combined Closure Area.	1981-1985
Surface Impoundment P-13	Closed June 1997, Combined Closure Area.	1981-1985
Surface Impoundment P-17	Closed June 1997, Combined Closure Area.	1982-1984
Surface Impoundment P-18	Closed June 1989, during Landfill B-19, Phase II/III construction.	1977-1985
Surface Impoundment P-19	Closed June 1989, during Landfill B-19, Phase II/III construction.	1983-1985
Surface Impoundment P-20	Closed June 1989, during Landfill B-19, Phase II/III construction.	1985-1988
Spreading Area 1	Closed June 1997, Combined Closure Area.	1975-1983
Spreading Area 2	Closed June 1997, Combined Closure Area.	1977-1980
Spreading Area 3	Closed June 1997, Combined Closure Area.	1977-1985
Spreading Area 4	Underlies the P-14,15, & 16 site. Certification of closure is required with the closure of these impoundments.	1977-1982
Spreading Area 5	Closed June 1989, during Landfill B-19, Phase II/III construction.	1979-1985
Spreading Area 6	Closed June 1989, during Landfill B-19, Phase II/III construction.	1979-1983
Mud Pond 1	Inactive. Currently under RCRA Facility Investigation.	1982-1984

CHEMICAL WASTE MANAGEMENT, INCORPORATED
KETTLEMAN HILLS FACILITY

Hazardous Waste Facility Permit, Attachment "A"

Effective 6/16/03, Revised 5/5/05 (Class 1), Revised 7/25/06 (Class 1*), **DRAFT- Revised 6/12/07 (Class 3)**

PART V. SPECIAL CONDITIONS THAT APPLY TO ALL OF THE FACILITY'S STORAGE AND TREATMENT UNITS

1. Waste Analysis

- (A) The Permittee shall require a generator to provide on the "Generator's Waste Material/Profile Sheet" described in the Waste Analysis Plan, or on an equivalent form, a description of the contents of an over-packed drum a.k.a. lab pack and certify that the over-packed drum meets the requirements of Cal. Code of Regs., title 22, section 66264.316. For the purposes of this permit, over-packed drum, or lab pack means a drum which contains small individual containers of hazardous waste which are over packed and surrounded by absorbent material.

The "Generator's Waste Material/Profile Sheet" described in the Waste Analysis Plan, or an equivalent form, shall include specific listings for total halogenated organic compounds greater than one thousand (1000) mg/l [ppm] as identified in Cal. Code of Regs., title 22, division 4.5, chapter 18, Appendix III and III-A;

- (B) The Permittee shall repeat the pre-acceptance evaluation described in the Waste Analysis Plan for each waste stream that is a candidate for delivery to the Facility either:

(1) every 24 months, or

(2) when a generator notifies the Permittee that the process generating the waste has changed, or

If the Permittee has reason to suspect that the waste is not in conformance with pre-acceptance documentation, a profile reevaluation may occur.

- (C) The Permittee shall conduct the appropriate "Supplemental Analyses" described in the Waste Analysis Plan to ensure that waste received at a hazardous waste management unit meets the acceptance criteria for that unit, listed in Table 3-1 in the Waste Analysis Plan, and any other criteria specified in the Operation Plan for the unit. Waste that does not meet any acceptance criteria for a unit may be accepted at the unit on a case-by-case basis provided that: the Permittee conducts all of the "Supplemental Analyses" applicable to the unit; the results of the analyses indicate that the waste may be accepted at the unit without violating any other condition of the permit; and the results of the analyses and the decision to accept the waste at the unit are documented in the operating record on the "Special

CHEMICAL WASTE MANAGEMENT, INCORPORATED
KETTLEMAN HILLS FACILITY

Hazardous Waste Facility Permit, Attachment "A"

Effective 6/16/03, Revised 5/5/05 (Class 1), Revised 7/25/06 (Class 1*), **DRAFT- Revised 6/12/07 (Class 3)**

Waste Management Decision Form" described in the Waste Analysis Plan or an equivalent form.

- (D) The Permittee shall not change the acceptance criteria in Table 3-1 of the Waste Analysis Plan without prior approval by DTSC. This approval will require a permit modification in accordance with Cal. Code of Regs., title 22, sections 66270.41 and 66271.4.
2. Unless otherwise specified, all information required to be submitted to DTSC pursuant to this Permit, shall be submitted as follows:
- (A) The original document shall be submitted to: Permitting Division, Land Disposal Branch, Department of Toxic Substances Control, 8800 Cal Center Drive, Sacramento, California 95826. Oral notices and reports shall be made either to the Duty Officer at (916) 255-3618, or to the Permitting Branch project manager for the Facility, or to the Statewide Compliance Division at (559) 297-3901.
 - (B) One copy shall be submitted to: Statewide Compliance Division, Department of Toxic Substances Control, 1515 Tollhouse Road, Clovis, California 93612.
 - (C) One copy shall be submitted to: Executive Officer, Regional Water Quality Control Board, Central Valley Region, 1685 E Street, Fresno, California 93706-2025.
 - (D) One copy shall be submitted to: Director, Waste Management Division, U.S. Environmental Protection Agency, Region IX, Mail Code WST-1, 75 Hawthorne Street, San Francisco, California 94105.
 - (E) One copy shall be submitted to: Director, Division of Environmental Health Services, Kings County Department of Public Health, 330 Campus Drive, Hanford, California 93230.

DTSC will notify the Permittee of changes in this distribution list.

3. Site Construction Activities

- (A) The Permittee shall follow the unit-specific construction procedures and design specifications that have been approved by DTSC when performing any new unit construction or closure construction related activity at the Facility.

CHEMICAL WASTE MANAGEMENT, INCORPORATED

KETTLEMAN HILLS FACILITY

Hazardous Waste Facility Permit, Attachment "A"

Effective 6/16/03, Revised 5/5/05 (Class 1), Revised 7/25/06 (Class 1*), **DRAFT- Revised 6/12/07 (Class 3)**

- (B) DTSC will allow the Permittee to make minor modifications to design plans, specifications, and QA/QC procedures for any new unit construction or closure construction related activity, without prior approval by DTSC, provided that the minor modifications meet the following three conditions:
- (1) The modification will in no way affect the performance standard or the original intent of the plans and specifications approved by DTSC.
 - (2) The modifications will in no way reduce the effectiveness of the QA/QC effort used to ensure the quality and consistency of the materials and workmanship used to meet the performance standards in the plans and specifications approved by DTSC.
 - (3) All minor modifications to the plans, specifications, and QA/QC documents are clearly identified, described and justified in the construction certification report and as-built drawings submitted for DTSC's approval following completion of the construction activities.

When minor modifications are necessary, the Permittee shall notify DTSC of these minor modifications not later than seven (7) days after such minor modifications are determined by the Permittee to be necessary.

4. Requirements to Mitigate Disturbance to Endangered Species

- (A) The Permittee shall implement the Mitigation and Monitoring Plan for the Chemical Waste Management, Inc., Kettleman Hills Facility in Kings County, California (BioSystems Analysis, Inc. January 11, 1990, revised May 1, 1990, September 6, 1990, March 15, 1991, April 1, 1991, April 26, 1991, hereinafter called the "Mitigation Plan.") This Mitigation Plan describes methods the Permittee will use to mitigate disturbance of endangered species during construction, operation, and maintenance of the Facility. The following measure shall be incorporated into the Mitigation Plan:

The Permittee shall designate a contact representative to keep the U.S. Fish and Wildlife Service, Sacramento Endangered Species Office, and the California Department of Fish and Game, apprised of the status of ongoing efforts to protect listed species during construction, operation and maintenance of the Facility.

CHEMICAL WASTE MANAGEMENT, INCORPORATED

KETTLEMAN HILLS FACILITY

Hazardous Waste Facility Permit, Attachment "A"

Effective 6/16/03, Revised 5/5/05 (Class 1), Revised 7/25/06 (Class 1*), **DRAFT- Revised 6/12/07 (Class 3)**

- (B) If the established limit of incidental take of the San Joaquin kit fox or blunt-nosed leopard lizard is exceeded, the Permittee shall cease the causative action and within five days of the most recent mortality, the Permittee shall reinitiate consultation with the U.S. Fish and Wildlife Service. The limit of incidental take is established in the "Formal Endangered Species Consultation on the Chemical Waste Management, Inc., Kettleman Hills Hazardous Waste Facilities Operation, Kings County, California," U.S. Fish and Wildlife Service, May 2, 1991.
- (C) The Permittee shall notify the U. S. Fish and Wildlife Service, Sacramento Endangered Species Office, and the California Department of Fish and Game, in writing within three days of finding any dead or injured endangered species. This notification must include the date, time, and location of the incident or of the finding of a dead or injured animal, and any other pertinent information. Any endangered species found dead or injured must be turned over to the California Department of Fish and Game for care or analysis.

5. Schedule of Compliance

The Permittee shall submit the following documents to DTSC in accordance with the following schedule:

- (A) Closure Certification for the Landfill Unit B-16 by December 16, 2004.
- (B) Closure Certification for the Drum Decant Unit and the Cyanide Treatment Unit within three and a half (3.5) years from the effective date of this Permit.
- (C) Workplan describing the ambient air monitoring program within 180 days from the effective date of this Permit.

CHEMICAL WASTE MANAGEMENT, INCORPORATED

KETTLEMAN HILLS FACILITY

Hazardous Waste Facility Permit, Attachment "A"

Effective 6/16/03, Revised 5/5/05 (Class 1), Revised 7/25/06 (Class 1*), **DRAFT- Revised 6/12/07 (Class 3)**

PART VI. CORRECTIVE ACTION

The Permittee shall conduct corrective action at the Facility pursuant to Health and Safety Code section 25200.10. Corrective action will be carried out either under a Corrective Action Consent Agreement or an Enforcement Order for Corrective Action pursuant to Health and Safety Code section 25187.

1. In the event the Permittee identifies an immediate or potential threat to human health and/or the environment, discovers new releases of hazardous waste and/or hazardous constituents, or discovers new Solid Waste Management Units (SWMUs) not previously identified, the Permittee shall notify DTSC orally within 24 hours of discovery and notify DTSC in writing within 10 days of such discovery summarizing the findings including the immediacy and magnitude of any potential threat to human health and/or the environment.
2. DTSC may require the Permittee to investigate, mitigate and/or take other applicable action to address any immediate or potential threats to human health and/or the environment and any identified releases of hazardous waste and/or hazardous constituents. For any identified SWMUs, the Permittee is required to conduct corrective action.

CHEMICAL WASTE MANAGEMENT, INCORPORATED
KETTLEMAN HILLS FACILITY

Hazardous Waste Facility Permit, Attachment "A"

Effective 6/16/03, Revised 5/5/05 (Class 1), Revised 7/25/06 (Class 1*), **DRAFT- Revised 6/12/07 (Class 3)**

PART VII. PERMIT MODIFICATION HISTORY

1. This section incorporates a facility-initiated Class 1* permit modification. The modification request was submitted on June 12, 2006. The modification to the permit is a 6-month extension of the closure deadline for the Drum Decant Unit (DDU), and as part of the same containment system, the Cyanide Treatment Unit (CTU). The modification of the DDU/CTU date of closure will change from June 16, 2006 to January 16, 2007.

In the DDU/CTU closure process, the first step is the sampling of the soil adjacent to the unit and under the sumps. DTSC approved the DDU Sampling and Analysis Plan on April 10, 2006. KHF conducted the soil sampling over the first four days of May 2006. After evaluating the data, KHF requested some additional analysis for soluble concentrations of certain parameters for some of the soil samples. To allow time for completion of the analytical tests, KHF requested an additional six months to complete the closure of the DDU/CTU. Once DTSC confirms the soil is clean, KHF will proceed with the prior approved DDU/CTU closure plan.

- (A) The changes affect the following sections: Part IV, List of Closed, Inactive, and Non-Constructed Units and V.5.(B) (pages 31 and 37). There are no changes needed to the Part B Application (Operation Plan).

Page 31, modified to read:

NAME OF UNIT	STATUS	PERIOD OF OPERATION
Drum Decant Unit	Inactive. A request for extension for closure has been submitted to DTSC. Closure is required to occur within 3.5 years of the effective date of this permit.	1983 to present

Page 37, modified to read:

- (B) Closure Certification for the Drum Decant Unit and the Cyanide Treatment Unit within **three and a half (3.5)** years from the effective date of this Permit.

CHEMICAL WASTE MANAGEMENT, INCORPORATED
KETTLEMAN HILLS FACILITY

Hazardous Waste Facility Permit, Attachment "A"

Effective 6/16/03, Revised 5/5/05 (Class 1), Revised 7/25/06 (Class 1*), **DRAFT- Revised 6/12/07 (Class 3)**

2. This section incorporates a facility-initiated Class 3 permit modification to the Landfill Unit B-19 Closure Plan to incorporate the changes for the Class II/III waste operations as described in the following document:

Modification No. 2, Landfill Unit B-19 Closure Plan for Class I Portion, Kettleman Hills Facility, Kettleman City, California, by Golder Associates, October 2005, revised November 2006.

The Class 3 permit modification request, dated December 7, 2006 and received on December 11, 2006, covers the activity for a temporary authorization that allowed the facility to amend the final closure grades of Landfill Unit B-19 from 4:1H:V (4 units horizontal to 1 unit vertical) to 2.5:1 H:V (2.5 units horizontal to 1 unit vertical) between drainage benches (effective 3:1 H:V (3 units horizontal to 1 unit vertical) when benches are included). The temporary authorization was granted on June 15, 2006 pursuant to California Code of Regulations, title 22, sections 66270.42(e)(3)(C)1 and 66270.42(e)(3)(C)5 for a term of 180 days. The temporary authorization was reissued on January 10, 2007 pursuant to California Code of Regulations, title 22, section 66270.42(e)(4)(C)2 for an additional term of 180 days to allow for the authorized activities to continue while the modification procedures for the Class 3 permit modification were conducted.

The approval of this modification changes the following sections in the Part B Application (Operation Plan): Chapter 15.0, Sections 15.3(a) and (b); and Chapter 40.0, Table 40-1. Copies of the Operation Plan Chapter 15.0 and Table 40-1 with the text changes incorporated are in PART VIII. MODIFIED PART B APPLICATION (aka OPERATION PLAN), CHAPTER 15.0 (pages 1-14) and TABLE 40-1 (pages 1-2).

The operational and financial management of Landfill Unit B-19 will be as a partially closed hazardous waste unit and an active solid waste unit; however, DTSC retains its authority over the entire original landfill and must be contacted regarding any changes to the closure of the Class II/III portion of the landfill and DTSC approval may be required for changes that may impact the Class I portion of the landfill.

Furthermore, this permit corrects word-processing errors from the Class 1* permit modification described in Part VII.1. and reflects a facility-initiated Class 1 permit modification from May 5, 2005 which corrected typographical errors, updated the Regional Water Quality Control Board mailing address, included the DTSC approved Landfill Unit B-16 closure deadline, and updated Chapter 36.0 and Appendix A of the Operation Plan.

Header modified to show revision date.

CHEMICAL WASTE MANAGEMENT, INCORPORATED

KETTLEMAN HILLS FACILITY

Hazardous Waste Facility Permit, Attachment "A"

Effective 6/16/03, Revised 5/5/05 (Class 1), Revised 7/25/06 (Class 1*), **DRAFT- Revised 6/12/07 (Class 3)**

PART VIII. MODIFIED PART B APPLICATION (aka OPERATION PLAN),
CHAPTER 15.0 (pages 1 to 14) and TABLE 40-1 (pages 1 to 2)

15.0 CLOSURE AND POST-CLOSURE PLANS

22 CCR 66270.14(b)(13)

15.1 BACKGROUND AND SCOPE

This chapter addresses how and when closure of existing active and inactive units and final closure of the KHF will occur in accordance with 22 CCR 66264.111. Reference is made to Closure Plans previously approved by DTSC, where appropriate. Post-closure monitoring and maintenance is also addressed in conformance with 22 CCR 66264.118.

Support and ancillary facilities that are not hazardous waste management units, such as the vehicle wash station, laboratory and maintenance facilities, are not subject to closure and post-closure requirements of 22 CCR Division 4.5, Chapter 14. Therefore, they are not addressed in this document.

A copy of these Closure and Post-closure Plans and subsequent approved amendments will be maintained onsite until the post-closure period begins. CWM will amend the plans as necessary when changes in facility design or operating plans affect the proposed closure or post-closure activities. Amendments will be made in accordance with 22 CCR 66264.112 and 66264.118.

15.2 GENERAL CLOSURE PROCEDURES, REQUIREMENTS AND SCHEDULE

15.2(a) Closure Policies and Practices

In accordance with 22 CCR 66264.111, closure of the KHF will incorporate necessary measures to:

- Minimize the need for further maintenance.
- Control, minimize or eliminate, to the extent necessary to protect human health and the environment, post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated rainfall or runoff, or waste decomposition products to ground water, surface water or the atmosphere.
- Comply with closure requirements of 22 CCR Division 4.5, Chapter 14.

Except for surface impoundments, the hazardous waste received at each unit will be treated, removed or disposed of within 90 days following receipt of final waste at the respective unit⁽¹⁾. A DTSC extension to this 90-day period for surface impoundments, and for the 180-day closure limit pursuant to 22 CCR 66264.113(b), is discussed in Section 15.2(c). CWM will notify DTSC in

⁽¹⁾ Since landfills are disposal units, hazardous waste received at landfill units is disposed of at the time of placement.

writing at least 60 days prior to the date that closure of a surface impoundment or landfill unit, or final closure of the facility, is expected to begin.

Closure of facility operations will be conducted in a manner that will provide for sufficient reserve landfill capacity to allow onsite disposal of final volumes of hazardous waste received at each unit and contaminated materials generated by partial and final closure activities. Six months of landfill capacity will be reserved for this purpose. Waste generated by closure activities will be handled and disposed of in accordance with applicable regulation, including, but not limited to, pertinent requirements of 22 CCR, Division 4.5, Chapter 12 (Standards Applicable to Generators of Hazardous Waste) and Chapter 18 (Land Disposal Restrictions). Where Land Disposal Restrictions preclude onsite treatment and/or landfiling, hazardous wastes generated by closure will be shipped offsite for disposal in accordance with applicable regulations.

Where hazardous waste, waste residues or contaminated materials remain in place upon unit closure (e.g., at landfills and closed-in-place surface impoundments), specific closure measures such as construction of a final cover will be taken to control, minimize or eliminate migration of hazardous constituents, as further discussed in Sections 15.3 and 15.4. Areas of final cover will be graded and revegetated to control ponding, runoff and erosion, so that maintenance requirements are minimized. The KHF has successfully completed partial closure of several units which have exhibited the performance characteristics desirable for long-term closure. The site has worked with local experts to determine the types of vegetation which are best suited for the climatic conditions in the area of the Kettleman Hills. Drought-tolerant species of plants will be used to revegetate cover areas without irrigation. Plants with shallow root zones will be used so as not to impair the cover integrity.

A heavy equipment fleet (e.g., scrapers, dozers, graders, compactors and trucks) will be used to close the site. Steam and/or pressure washing, with the appropriate chemical additives, will be used for the decontamination of heavy equipment either at a future vehicle wash station, or a temporary decontamination unit. Rinse waters will be collected and treated or disposed of in accordance with applicable regulations.

Chapter 7.0 of this renewal application provides an Inspection Program Plan for the KHF to conform with the requirements of 22 CCR 66264.15. The inspection program will continue during the closure period. Detailed descriptions of site environmental monitoring operations (leachate collection/detection, vadose zone detection, and ground water monitoring) are included in the facility's approved environmental monitoring plans. The monitoring program will continue as described in those plans throughout the duration of the closure period.

15.2(b) Estimate of Maximum Unclosed Operations and Waste Inventory

Closure of some active or inactive waste management units may occur independent of (i.e., prior to) final closure of the facility. However, for the purposes of tracking progress with the closure schedule, estimating maximum potential facility waste inventory and identifying the maximum extent of operations that may be unclosed at any given time, the closure plans described herein are based on each of the existing active and inactive units remaining unclosed until final closure is initiated. This closure scenario results in the most expensive estimated closure costs as required by 22 CCR 66264.142(a)(1). The estimated maximum waste inventory that may occur and

other key parameters pertinent to closure are summarized in Tables 15-1, 15-2 and 15-3 for existing unclosed landfills, surface impoundments and other storage/treatment units, respectively.

TABLE 15-1
LANDFILL DATA
KETTLEMAN HILLS FACILITY

Unit	Unit Area (acre)	Total Airspace (cy)	Net Disposal Volume Remaining (cy) ⁽¹⁾
B-16	5	258,000	60,000
B-18	53	10,700,000	8,453,000
B-19	40	7,000,000	4,400,000
Total	98	17,958,000	12,913,000

(1) Approximate disposal volume remaining as of June 1997 including waste and intermediate soil cover.

TABLE 15-2
SURFACE IMPOUNDMENT DATA
KETTLEMAN HILLS FACILITY

Unit	Unit Area (acres)	Liquid Surface Area ⁽¹⁾ (acres)	Depth of Liquid ⁽¹⁾ (feet)	Capacity ⁽¹⁾ (gal)
P-9	1.5	1.3	14	4,400,000
P-14	0.9	0.8	12	2,100,000
P-15	1.5	1.1	9	(2)
P-16	1.6	1.4	11	3,900,000
Total	5.5	4.6	--	10,400,000

(1) Based on a freeboard of 2 feet.

(2) Pond P-15 is inactive. Potential waste inventory for Pond P-15 would be incorporated for closure financial assurance if and when this pond is reconstructed.

TABLE 15-3
WASTE INVENTORY FOR OTHER STORAGE/TREATMENT UNITS
KETTLEMAN HILLS FACILITY

Waste Type	Waste Inventory ⁽¹⁾					
	DDU (gal)	PCB Flushing/ Storage Unit (gal)	DSU (gal)	FSU (gal)	BSU 1 (cy)	BSU 2 (cy)
Tanks	60,600	10,000	--	20,000	--	--
Containers	33,000	16,500	495,000	--	2,300	2,300
Total	93,600	27,500	495,000	20,000	2,300	2,300

(1) Capacity of potential future facilities addressed in Chapters 2.0, 34.0 and 35.0 would be in addition to that shown. Potential waste inventory of future facilities would be incorporated for closure financial assurance if and when constructed.

15.2(c) Schedule

The KHF is estimated to have adequate remaining disposal capacity for at least 40 years. For the purpose of this closure plan, final closure is estimated to occur in the year 2037. This estimate does not include the potential extension of facility life due to future advances in waste treatment technology, regulatory changes or other factors.

The estimated schedule of final closure is shown in Figure 15-1. This schedule includes the closure of landfills, surface impoundments and other waste storage/treatment units. The time for closure shown on the schedule accommodates time needed to process the maximum potential waste inventory. While the schedule is based on individual unit closure occurring sequentially as part of final closure, individual units may be closed earlier (i.e., during the site operational life). At least one landfill unit will remain open until disposal of waste residue and contaminated material resulting from final closure of units is complete (except surface impoundments that are closed during final closure).

As shown in Figure 15-1, closure of surface impoundments will require about 29 months from receipt of the last volume of waste, including time for processing (evaporation) of liquids. Closure of the final landfill is expected to take about 14 months from receipt of the last volume of waste at the facility, including the time that the final landfill will remain open to accept hazardous waste, waste residue and contaminated material resulting from closure of other units. CWM requests that, in conjunction with this permit renewal, DTSC approve an extension to reflect these anticipated schedules pursuant to 22 CCR 66264.113(b)(1)(A).

The DDU and Surface Impoundment P-15 are currently inactive. The DDU may receive additional waste and be reactivated under the renewed permit. Impoundment P-15 is no longer in use but is not practical to close at this time due to its proximity to active impoundments P-14 and P-16. Impoundment P-15 would not be reactivated under the renewed permit unless reconstructed, as

further addressed in Section 36.3. CWM has submitted to DTSC requests for extensions for the closure of the DDU and Impoundment P-15 (CWM, 1997a and 1997b).

Landfill B-16 is currently inactive pending disposal of additional waste. The KHF has submitted to DTSC a request to allow delay of closure for this landfill (CWM, 1996) to utilize its remaining capacity and fill the unit to meet the subgrade elevations of the approved Closure Plan.

Landfill B-19 is in an interim closed configuration with Phase 1A to be reconstructed when appropriate. The DTSC has approved the landfill to remain in the interim closure configuration for a period lasting up to about the year 2004 (DTSC, 1994).

The CTU has been removed and a closure certification report has been submitted to DTSC (RUST, 1996). Because this unit shared a containment slab with the DDU, DTSC staff has indicated that they will consider the CTU interim closed until the DDU containment slab is also closed.

15.2(d) Closure Certification

Within 60 days of completion of partial closure (i.e., closure of a unit) or final closure, CWM will submit to DTSC, by registered mail, a certification that the closure has been completed in accordance with the specifications in the approved closure plan. The certification will be signed by an appropriate representative of CWM and an independent qualified professional engineer registered in California.

15.2(e) Survey Plat

At or prior to the time certification of closure is submitted, CWM will provide a survey plat to the DTSC and Kings County Planning Agency (or other appropriate local land authority). The plat, indicating the location and dimensions of the waste burial areas, will be prepared and certified by a professional land surveyor. It will contain notification that hazardous wastes have been disposed of at the site, and that the owner of the facility is obliged to restrict disturbance of the site as specified in 22 CCR 66264.117.

In addition, CWM will submit a record of survey to the DTSC and Kings County Zoning Authority that describes the type, location and quantity of hazardous wastes disposed of within each burial area of the facility. Information on waste disposal which took place at the facility prior to promulgation of 40 CFR Part 264 will be estimated based on available records. Changes in the type, location or quantity of hazardous wastes disposed of after the survey plat is filed will be reported by CWM to DTSC and the Kings County Zoning Authority.

15.3 LANDFILLS

15.3(a) General

The unclosed landfill units at the KHF are B-16, B-18 and B-19. Engineering construction plans and specifications for these landfill units have been approved by the DTSC (formerly DHS) and

other appropriate regulatory agencies as discussed in other sections of this renewal application. The following Closure Plans have been approved for Landfills B-16, B-18 and B-19 and are incorporated by reference:

1. Closure Plan for Landfill B-16, Kettleman Hills Facility, Kettleman City, California, Golder Associates, Inc., August 23, 1990.
2. Closure Plan for Landfill B-16, Revision 1, Kettleman Hills Facility, Kettleman City, California, Golder Associates, Inc., March 11, 1993.
3. Engineering and Design Report Landfill Unit B-18, Phases I and II and Final Closure, Kettleman Hills Facility, Kings County, California, Environmental Solutions, Inc., August 1990.
4. Landfill B-19, Phase IA Redesign and Closure Plan, Kettleman Hills Facility, Kettleman City, California, Golder Associates, April 15, 1991.
5. Modification No. 2, Landfill Unit B-19 Closure Plan for Class I Portion, Kettleman Hills Facility, Kettleman City, California, Golder Associates, October 2005, revised November 2006.

The configurations and procedures in these approved closure plans will be utilized for Landfills B-16, B-18 and B-19 with one exception; a modified cover layer configuration to match the cover configuration approved by DTSC (DTSC, June 28, 1996 and October 24, 1996) for the Combined Closure Plan. This proposed modification is discussed further in Section 15.3(b).

15.3(b) Final Cover

On June 28, 1996, a Notice of Final Decision was issued by DTSC approving a revised cover section for use in the Combined Closure Area and Landfill B-15. This revised section is proposed for approval in this renewal application for the closure of landfills B-16, B-18 and B-19 (and impoundments P-9, P-14, P-15 and P-16 as discussed in Section 15.4). This cover section is indicated in Figure 15-2. From top to bottom, the final cover will consist of:

- 2.5 feet of vegetative soil cover;
- Geotextile drainage layer (transmissivity ≥ 0.03 gal/min/ft);
- 40-mil-thick textured high density polyethylene (HDPE) geomembrane;
- 1 foot (minimum) of compacted foundation layer (Hydraulic Conductivity $\leq 1 \times 10^{-5}$ cm/sec);
- 1 foot (minimum) of intermediate soil cover.

For Landfill B-19, the final cover for the Class II/III waste (municipal solid waste) portion will follow the aforementioned plan.

The synthetic components of the final cover will be constructed using guidelines and specifications contained in the Quality Assurance Manual for the Installation of Geosynthetic Lining Systems (CWM, June 15, 1990, or latest revision thereof). Drawings and specifications for cover construction will be provided to DTSC with notification of closure pursuant to 22 CCR 66264.112(d).

Soils for partial closure and final closure of waste management units will either be excavated onsite or imported. The KHF contains sufficient onsite soils to complete the closures, although these soils may require processing to meet permeability requirements.

15.3(c) Erosion Control and Cover Maintenance

After the soil cover has been placed to final grades and compacted, the surfaces will be graded and conditioned to create a uniform slope. Disturbed soil areas will be reseeded to establish vegetative growth (at least 65 percent cover) for erosion control.

The final cover has been designed to avoid ponding, control runoff, minimize erosion or abrasion, and therefore function with minimal maintenance. Cover designs include benches when necessary for erosion control. Calculations using the Universal Soil Loss Equation show that the slope and cover designs will restrict erosion of the soil cover to less than 2 tons per acre per year. Drainage of water from the closed units will be promoted by the slope of the final cover and perimeter run-on/runoff control ditches.

Post-closure inspections will be performed, and post-closure maintenance will occur, as discussed in Section 15.6.

15.4 SURFACE IMPOUNDMENTS

15.4(a) General

The unclosed surface impoundment units are P-9, P-14, P-15 and P-16. Detailed engineering plans and specifications for these surface impoundments have been submitted to the DTSC (formerly DHS), as discussed in other sections of this renewal application. Impoundment P-15 is currently inactive and waste has been removed. It will be closed in conjunction with P-14 and P-16 because of its proximity to these ponds.

In accordance with 22 CCR 66264.112(a)(1) and 66264.228(a) surface impoundments will be closed by one of two methods:

- Closure in Place
- Closure by Removal

Closure procedures for surface impoundments under each of these scenarios are summarized in Table 15-4.

The closure schedule presented in Section 15.2 and closure and post-closure cost estimates in Chapters 17.0 and 18.0 are based on closure in place, because that procedure is expected to be the more expensive and time consuming. The closure method to be used will be defined by CWM at the time of notification of closure pursuant to 22 CCR 66264.112(d). At that time, CWM will provide DTSC with final grading plans and construction specifications for ponds to be closed in place, and sampling and analysis procedures to confirm removal of hazardous constituents at ponds to be closed by removal.

The closure of impoundments P-14, P-15 and P-16 will complete the closure of the area where Spreading Area S-4 was located, as discussed in Chapter 31.0.

TABLE 15-4
SURFACE IMPOUNDMENT CLOSURE PROCEDURES
KETTLEMAN HILLS FACILITY

Closure Alternative	Closure Procedures
Closure in place	<ul style="list-style-type: none"> • The truck unloading aprons will be decontaminated. • Piping, pipe stands and other ancillary equipment will be removed and disposed of in onsite landfills. • Liquids will be evaporated to reduce volume. Waste residue will be stabilized in place or removed and disposed of in accordance with applicable regulations. Waste residue stabilized in place will be tested for free liquids using the Paint Filter Liquids Test (EPA Test Method 9095) or other approved method. • The impoundment will be filled with compacted soil backfill, placed such that there is sufficient bearing capacity to support the final cover and to provide drainage off of the cover area. • The final cover will be placed and the area revegetated.
Closure by removal	<ul style="list-style-type: none"> • Liquids will be evaporated to reduce volume. • Waste residue, liner systems, piping, pipe stands, truck unloading aprons and other ancillary equipment will be removed and disposed of in accordance with applicable regulations. • Subgrade soils will be tested and decontaminated or removed and disposed of in onsite landfills. • The pond area will be regraded to promote drainage and revegetated.

Based on the average yearly effective liquid waste evaporation rate and the full impoundment capacity being evaporated to a 1.5-foot depth, the time required for evaporation of surface impoundment liquids at closure is estimated to be 26 months. Approximately three additional months will be required for residue stabilization or removal, backfill and the placement of the final cover. Therefore, it will take an estimated 29 months to close the impoundments.

15.4(b) Final Cover, Erosion Control and Cover Maintenance

The cover cross-section proposed for landfills in Section 15.3 will also be utilized for surface impoundments that are closed in place. Cover configurations will conform with applicable specifications in 22 CCR 66264.228. The final cover will be constructed and compacted to avoid ponding and control runoff. The vegetative soil layer will be seeded to attain at least 65 percent grass cover. Site drainage controls will be maintained to control run-on/runoff in impoundments areas.

Post-closure inspections will be performed, and post-closure maintenance will occur, as discussed in Section 15.6.

15.5 OTHER WASTE STORAGE/TREATMENT UNITS

15.5(a) General

Closure plans and procedures for existing unclosed waste storage units and treatment units other than surface impoundments are addressed in this section. These existing units include:

- Drum Decant Unit
- Bulk Storage Units
- Final Stabilization Unit
- PCB Flushing/Storage Unit
- Drum Storage Unit

Closure plans for future units (i.e., Neutralization/Filtration Unit, Evaporative Tank Unit and future PCB Flushing/Storage Unit) are not included herein. They will not become part of the “working” Closure/Post-closure Plans until they have been constructed and begun accepting wastes. Closure cost estimates for future units are not included in the current total facility closure cost calculations that form the basis for the financial assurance demonstration for the KHF. These costs will be included in updated closure cost estimates and financial assurance document packages as the units become operational.

15.5(b) Closure Procedures

The waste storage and treatment units addressed in this section will be closed and decontaminated in accordance with requirements for closure of container and tank units pursuant to 22 CCR 66264.114, 66264.178 and 66264.197. Table 15-5 addresses measures to be taken at each unit to conform with these requirements.

TABLE 15-5

**CLOSURE PROCEDURES FOR OTHER
WASTE STORAGE AND TREATMENT UNITS
KETTLEMAN HILLS FACILITY**

CLOSURE TASK	UNIT				
	DDU	BSU	FSU	PCB Flushing/ Storage Unit	DSU
• Process remaining hazardous wastes and remove from the unit.	X	X	X	X	X
• Remove hazardous waste residues (e.g., solids, sludges) and contaminated containers for treatment and/or disposal. ⁽¹⁾	X	X	X	X	X
• Decontaminate storage/processing tanks; or remove and dispose. ⁽¹⁾	X		X	X	
• Decontaminate appurtenant piping and hardware (e.g., pumps, conveyors); or remove and dispose. ⁽¹⁾	X		X	X	X
• Assess potential for structures and ancillary equipment to be contaminated (e.g., buildings, electronics). Decontaminate as needed, or remove and dispose. ⁽¹⁾	X		X	X	X
• Decontaminate concrete containment slabs, curbing and sumps, including those at loading/unloading aprons.	X		X	X	X
• Remove and dispose of aggregate and geosynthetic liners. ⁽¹⁾		X			
• Regrade excavated containment areas to blend with surrounding contours and control drainage.		X			
• Sample and analyze soils adjacent to units to confirm compliance with 22 CCR 66264.114.	X	X	X	X	X

(1) Hazardous waste residues and contaminated materials destined for disposal will be handled in accordance with applicable regulations including, but not limited to, 22 CCR Division 4.5, Chapter 12.0 and Chapter 18.0.

Hazardous waste, hazardous waste residue and contaminated containers will be removed from each unit and disposed of in accordance with applicable regulations including, but not limited to, 22 CCR, Division 4.5, Chapter 12.0 (Standards Applicable to Generators of Hazardous Waste) and Chapter 18 (Land Disposal Restrictions). Waste storage/processing tanks, piping, pumps, conveyors and other appurtenant equipment contaminated by hazardous waste will be either decontaminated or removed and disposed of as hazardous waste. Remaining equipment and structures will be assessed for potential contamination, and decontaminated as necessary, or also removed and disposed of. Onsite landfiling with macro-encapsulation bins may be used for disposal of debris and other wastes if necessary for compliance with Land Disposal Restrictions.

Decontamination will occur using pressure and/or steam sprays, with cleaning reagents where appropriate. Containment floors and curbing will also be scrubbed to achieve adequate cleaning. The brooms will be disposed of as hazardous wastes in an onsite landfill. Cleaning solutions will be selected considering compatibility and effectiveness for cleaning wastes handled at each unit, and specific vendor recommendations. They typically will consist of:

- Mild caustic solution for acid waste handling areas;
- Water for alkaline waste handling areas;
- Nonalkali detergents for other storage/treatment and handling areas; and
- Solvent for the PCB Flushing/Storage Unit.

The effectiveness of the decontamination program will be determined either by obtaining and analyzing samples from decontaminated surfaces, or by analyzing the final decontamination rinsate for appropriate waste constituents. Additional rinses will be performed as necessary. Rinsate will be evaporated in onsite surface impoundments, except for PCB-contaminated rinsate, which will be removed from the site.

The aggregate and geosynthetic liners at the BSUs will be excavated and disposed of in an onsite landfill. Following excavation of the liner and soil sampling to confirm that no contaminated soil remains, the BSU areas will be regraded to blend with surrounding areas and to control drainage. Compaction and grading will occur to preclude ponding in the BSU areas, and the disturbed areas will be seeded.

Soil samples from areas adjacent to each unit will be taken and analyzed. Contaminated areas will be excavated to a depth where contamination no longer is detected at hazardous levels, as determined by additional soil sampling and analysis. The contaminated soil will be removed and disposed of in accordance with applicable regulations. Detailed procedures for sampling and analysis to confirm effective decontamination will be provided to DTSC at least 60 days prior to initiation of partial (unit) closure or final closure.

At the time of final facility closure, certifications by both CWM and an independent qualified professional engineer registered in California will be submitted to DTSC to document that waste processing units have been closed in accordance with approved closure procedures.

15.6 POST-CLOSURE PLAN

15.6(a) Introduction

This section describes the manner in which CWM will provide for post-closure inspections and maintenance of the KHF in accordance with the requirements of 22 CCR 66264.117. A copy of this Post-closure Plan will be available at the facility until final closure is complete. Thereafter, a copy will be maintained at the following address:

Post-closure Period Facility Contact: Chemical Waste Management, Inc.
1001 Fannin Street, Suite 4000
Houston, TX 77002
(713) 512-6200

If changes in the operation or design of the KHF occur prior to closure that affect the post-closure or the anticipated year of final closure, CWM will amend this Post-closure Plan as required by 22 CCR 66264.118(d).

15.6(b) Inspection and Maintenance Activities and Schedule

Surface impoundments closed in place, landfills, and other units closed with waste or waste constituents in place will be inspected and maintained in accordance with this Post-closure Plan following certification of the respective partial (unit) closure and final closure. Inspections and maintenance will continue for the period of time required by 22 CCR 66264.117. For the purpose of this plan and post-closure cost estimates, the post-closure period is assumed to be 30 years.

Inspections will be conducted as described in Table 15-6 by persons familiar with the Closure and Post-closure Plans. Inspections conducted pursuant to 22 CCR 66264.228(k), at a minimum, will be conducted by an independent qualified professional engineer registered in California. Copies of inspection records and associated remedial work forms will be maintained by the Post-closure Period Facility Contact specified in Section 15.6(a) for a period of at least three years following the paperwork date.

Maintenance may include, but would not be limited to, the following:

- Reseeding, with fertilization if necessary, of soil areas where vegetation is inadequate to prevent erosion.
- Repairing of erosion or other disruption to unit covers that threatens the integrity of the cover system.
- Cleaning and repair of drainage controls to mitigate erosion, silting or debris accumulation that hinder drainage system performance.
- Maintaining adequate grades in cover areas to promote controlled runoff and avoid ponding (e.g., placing additional soils if low spots occur due to settlement).

TABLE 15-6

**DESCRIPTION OF POSTCLOSURE INSPECTION ACTIVITIES
KETTLEMAN HILLS FACILITY**

ITEM(S)	INSPECTION/MONITORING ELEMENTS	FREQUENCY
Surface Impoundment Closed-In-Place, Landfills, and Other Units Closed with Waste or Waste Constituents In Place	<ul style="list-style-type: none"> • Final cover; <ul style="list-style-type: none"> • Check condition of vegetation (estimate percent vegetative cover; stress indications, if any; areas requiring reseeding, if any). • Check for signs of erosion, cracking, heaving, excessive disturbance by animals or other visible disturbance. • Water or leachate flow from disposal areas (including rainfall runoff), if present: <ul style="list-style-type: none"> • Check for surface flow presence or absence. • Estimated flow rate and appearance, if applicable. • Erosion and run-on/runoff control systems: <ul style="list-style-type: none"> • Check for evidence of damage or degradation; • Check condition of erosion controls; • Check for excessive debris or vegetation;⁽¹⁾ • Check for high or low spots that inhibit free drainage. • Slope areas: <ul style="list-style-type: none"> • Check for evidence of potential slope instability that could affect containment (e.g., bulging, cracking). • Monitor location and elevation (by survey) of the cover and other containment features, monitoring facilities and drainage features; and benchmarks required by 22 CCR 66264.116, 66264.228(c)(16), and 66264.309(a). 	Annually
	<ul style="list-style-type: none"> • LCRS systems: <ul style="list-style-type: none"> • Monitor/record volume of liquids removed. 	Monthly ⁽²⁾
Ground Water Monitoring System	<ul style="list-style-type: none"> • Monitor performance and integrity of wells in conjunction with sampling. • Sample and analyze ground water. 	Sampling and analysis performed pursuant to Site-Specific Ground Water Monitoring Plan (GeoSyntec Consultants, 2001 or latest revision thereof).
Security Fencing, Gates and Firebreak	<ul style="list-style-type: none"> • Check for potential damaged or degraded fencing. • Check for breaches in access control via erosion at fenceline. • Check to see that gates are securely locked. • Check integrity of gate hardware (e.g., hinges, kingposts). • Check condition of firebreak. 	Annually

(1) Debris or vegetation will be considered excessive if it is likely to result in or lead to inadequate performance of drainage or erosion controls.

(2) Intact LCRS systems would initially be monitored monthly. When liquid stays below the pump operating level, inspection frequency and scope will be in accordance with 22 CCR 66264.226(d)(2) and 66264.303(c)(2).

- Maintaining ground water monitoring wells necessary for compliance with the Site-Specific Ground Water Monitoring Plan.
- Repairing areas if movement causes slopes or other conditions that do not conform with applicable 22 CCR, Division 4.5, Chapter 14 requirements.
- Clearing vegetation at benchmarks required by 22 CCR 66264.116, 66264.228(c)(16) and 66264.309(a), and other activities necessary to maintain these benchmarks.
- Maintaining fencing and gates such that their effectiveness as a deterrent to access is not impaired.
- Clearing of the firebreak as required to maintain its effectiveness.

CWM will submit annual reports to DTSC and the RWQCB describing post-closure inspection results and maintenance activities conducted at the site during the previous year.

15.6(c) Notice in Deed to Property

Waste will be permanently disposed of at some KHF waste management units. CWM will record, in accordance with state law, the following notice appended to the legal description of the parcel or the plat(s) filed with the local land authority.

"Notice is hereby given that the property described on the Exhibit attached hereto has been used to dispose of hazardous waste and its use is restricted pursuant to 22 CCR 66264.117. A survey plat and record of the type, location and quantity of hazardous wastes disposed of has been filed with the local land authority and the California Department of Toxic Substances Control."

The plat will contain a note, prominently displayed, stating the property owner's obligation to restrict disturbance of the site.

15.6(d) Certification of Completion of Post-closure

No later than 60 days after the completion of the established post-closure maintenance, CWM will submit to the appropriate regulatory agencies, by registered mail, a certification that post-closure maintenance was performed in accordance with the approved post-closure plan. The certification will be signed by the owner or operator and an independent qualified professional engineer registered in California.

**TABLE 40-1
DETAILS OF ACTIVE LANDFILL UNITS
KETTLEMAN HILLS FACILITY**

LANDFILL UNIT	APPLICABLE DESIGN AND CONSTRUCTION DOCUMENTS			RESPONSE ACTION PLAN REFERENCES	DESCRIPTION OF KEY DESIGN COMPONENTS			
	Design	Construction ⁽¹⁾	Construction Quality Assurance		Lining System ⁽²⁾	LCRS ⁽²⁾	LDS ⁽²⁾	VZDCRS ⁽²⁾⁽³⁾
B-16	<ul style="list-style-type: none"> Engineering Plans, Specifications and Certification Reports for Existing Landfills, EMCON Associates, September 7, 1985. Engineering Report for Landfills, KHF, Kings County, California, EMCON Associates, September 7, 1985, revised November 3, 1992. Closure Plan for Landfill B-16, KHF, Kettleman City, California, Golder Associates, Inc., August 23, 1990, revised March 11, 1993. 	<ul style="list-style-type: none"> Construction Certification Report, PCB Burial Area B-16, Kettleman Hills Facility, California, EMCON Associates, April 27, 1987. 	<ul style="list-style-type: none"> No specific quality assurance document used for existing construction. Future construction to be completed in accordance with: <ul style="list-style-type: none"> Quality Assurance Manual for the Installation of the Soil Components of Lining and Final Cover Systems, Chemical Waste Management, Inc., June 1986. Quality Assurance Manual for the Installation of Geosynthetic Lining Systems, Chemical Waste Management, Inc., June 15, 1990. 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> 3-foot clay layer ($k \leq 10^{-7}$ cm/sec). Sealed with emulsified asphalt. 	<ul style="list-style-type: none"> Gravel blanket drain in cell base with single riser. 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A
B-18	<ul style="list-style-type: none"> Construction specifications and Quality Assurance Plan, Landfill B-18, Phases I and II and Final Closure, KHF, King County, California, Environmental Solutions Inc., July 31, 1990a. Construction Drawings, Landfill Unit B-18, Phases I and II and Final Closure KHF, Kings County, California, Environmental Solutions Inc., July 1990b. Engineering and Design Report Landfill Unit B-18 Phases I and II and Final Closure, Environmental Solutions, Inc., August 1990. Revised Interim Waste Fill Plan, Landfill Unit B-18 Phase I, Kettleman Hills Facility, Kings County, California, Environmental Solutions, Inc., August 1993. Potential Chemical Similarities Between the B-19 and B-18 Clay, Kettleman Hills Facility, (Environmental Solutions, Inc., January 9, 1992). 	<p>Phase I</p> <ul style="list-style-type: none"> Subgrade Geologic Mapping and Chemical Analysis for Landfill B-18, Phase I, Kettleman Hills Facility, Kettleman City, California (Golder Associates Inc., November 27, 1991, revised March 30, 1992). Clay Source Landfill B-18, Phases IA and IB, Kettleman Hills Facility, Kettleman City, California (Environmental Construction Services, Inc., November 25, 1991, revised January 9, 1992). Secondary Clay Liner, Landfill B-18, Phases IA and IB, Kettleman Hills Facility, Kettleman City, California (Environmental Construction Services, Inc., January 6, 1992, revised March 30, 1992). Secondary HDPE Liner and Leachate Collection System, Landfill B-18, and Phases IA and IB, Kettleman Hills Facility, Kettleman City, California (Environmental Construction Services, Inc., January 13, 1992, revised March 30, 1992). Primary Clay Liner, Landfill B-18 Phases IA and IB, Kettleman Hills Facility, Kettleman City, California (Environmental Construction Services, Inc., January 13, 1992, revised March 30, 1992). Primary HDPE Liner and Leachate Collection System, Landfill B-18, Phases IA and IB, Kettleman Hills Facility, Kettleman City, California (Environmental Construction Services, Inc., January 20, 1992, revised March 30, 1992). Summary Construction Report, Landfill B-18, Phases IA and IB, Kettleman Hills Facility, Kettleman City, California (Environmental Construction Services, Inc., February 18, 1992, revised March 30, 1992). Design Changes and Design Clarifications, Landfill B-18, Phases IA and IB, Kettleman Hills Facility, Kettleman City, California (Environmental Construction Services, Inc., February 18, 1992). Test Fill and Infiltration Test Results, Landfill Unit B-18, Phases I and II and Final Closure (Environmental Solutions, Inc., January 23, 1992). <p>Phase II</p> <ul style="list-style-type: none"> Landfill B-18, Phases IIA and IIB Construction Reports, Volume 1 - Clay Liner Source Report, prepared by Golder Construction Services, Inc. and ACZ Engineering Inc., May 1993. Landfill B-18, Phases IIA and IIB Construction Reports, Volume 2 - Subgrade Geologic Mapping and Chemical Analysis Report, prepared by Golder Construction Services, Inc. and ACZ Engineering, Inc., May 1993. Landfill B-18, Phases IIA and IIB Construction Reports, Volume 3 - Excavation and Structural Fill Placement Construction Report, prepared by Golder Construction Services, Inc. and ACZ Engineering Inc., August 1993. Landfill B-18, Phases IIA and IIB Construction Reports, Volume 4 - Secondary Clay Liner Construction Report, prepared by Golder Construction Services, Inc. and ACZ Engineering Inc., September 1993. Landfill B-18, Phases IIA and IIB Construction Reports, Volume 5 - Secondary and Vadose HDPE Liner and Leachate Collection System Report, prepared by Golder Construction Services, Inc. and ACZ Engineering Inc., October 1993. Landfill B-18, Phases IIA and IIB Construction Reports, Volume 6 - Primary Clay Liner Construction Report, prepared by Golder Construction Services, Inc. and ACZ Engineering Inc., October 1993. Landfill B-18, Phases IIA and IIB Construction Reports, Volume 7 - Primary HDPE Liner and Leachate Collection System Construction Report, prepared by Golder Construction Services, Inc. and ACZ Engineering Inc., November 1993. Landfill B-18, Phases IIA and IIB Construction Reports, Volume 8 - Summary Construction Report, prepared by Golder Construction Services, Inc. and ACZ Engineering Inc., November 1993. 	<ul style="list-style-type: none"> Quality Assurance Manual for the Installation of the Soil Components of Lining and Final Cover Systems, Chemical Waste Management Inc., June 1986. Quality Assurance Manual for the Installation of Geosynthetic Lining Systems, Chemical Waste Management Inc., June 15, 1990. 	<ul style="list-style-type: none"> Response Action Plan, Landfill B-18, KHF, SEC Donohue, Inc., June 1992. 	<p>Bottom Liner</p> <ul style="list-style-type: none"> 3-foot-thick (min.) clay layer ($k \leq 10^{-7}$ cm/sec). 60-mil textured HDPE geomembrane. 			<ul style="list-style-type: none"> 80-mil smooth HDPE geomembrane. Geotextile. 1-foot-thick gravel layer. Geotextile. Stainless steel/carbon steel sideslope riser pipe.
							<p>Sideslopes</p> <ul style="list-style-type: none"> Geotextile. Single-sided geocomposite drainage layer. <p>Base</p> <ul style="list-style-type: none"> Geotextile. Single-sided geocomposite drainage layer. 1-foot gravel layer ($k \leq 10^{-2}$ cm/sec). Geotextile. Stainless steel/carbon steel sideslope riser pipe. HDPE sideslope riser pipe. 	
					<p>Top Liner</p> <ul style="list-style-type: none"> 1.5-foot-thick clay layer ($k \leq 10^{-7}$ cm/sec).⁽⁶⁾ 60-mil textured HDPE geomembrane. 		<p>Sideslopes</p> <ul style="list-style-type: none"> Geotextile. Single-sided geocomposite drainage layer. <p>Base</p> <ul style="list-style-type: none"> Geotextile. Single-sided geocomposite drainage layer. 1-foot gravel layer ($k \leq 10^{-2}$ cm/sec) Geotextile. Stainless steel/carbon steel sideslope riser pipe. Steel/HDPE pipe vertical riser. 	

TABLE 40-1
DETAILS OF ACTIVE LANDFILL UNITS
KETTLEMAN HILLS FACILITY
(Continued)

LANDFILL UNIT	APPLICABLE DESIGN AND CONSTRUCTION DOCUMENTS			RESPONSE ACTION PLAN REFERENCES	DESCRIPTION OF KEY DESIGN COMPONENTS			
	Design	Construction ⁽¹⁾	Construction Quality Assurance		Lining System ⁽²⁾	LCRS ⁽²⁾	LDS ⁽²⁾	VZDCRS ⁽²⁾⁽³⁾
B-19	<ul style="list-style-type: none"> Construction Drawings, Landfill Unit B-19, Kettleman Hills Facility, Kings County, California, (13 Drawings) EMCON Associates, June 18, 1986a. Construction Specifications for Double-Lined Landfill Unit B-19, Kettleman Hills Facility, Kings County, California, EMCON Associates, June 18, 1986b. Engineering Report, Chemical Waste Management Inc., Kettleman Hills Facility, Landfill B-19, Phases II and III, King County, California, Revision 2, Donohue and Associates, January 1989a. Supplemental Geotechnical Investigation, Kettleman Hills Facility, Landfill Unit B-19, Phases II and III, Kings County, California, Donohue and Associates, January 31, 1989b. As-Built Sections, Landfill B-19, Phases II and III, Kettleman Hills Facility, Donohue and Associates, April 13, 1989. Landfill B-19, Phase IA Redesign and Closure Plan, KHF, Kettleman City, California, Golder Associates, Inc., April 15, 1991. Landfill B-19 Interim Closure Plan, Kettleman Hills Facility, Golder Associates Inc., June 18, 1993. Modification No. 2, Landfill Unit B-19 Closure Plan for Class I Portion, Kettleman Hills Facility, Kettleman City, California, Golder Associates, October 2005, revised November 2006. 	<p><u>Phase IA</u></p> <ul style="list-style-type: none"> To be reconstructed in accordance with Golder Associates Inc., April 15, 1991. <p><u>Phase IB</u></p> <ul style="list-style-type: none"> Geologic Conditions of the Subgrade, Landfill B-19, Phase IB, Kettleman Hills Facility, Kettleman City, California, Golder Associates Inc., September 16, 1987. Clay Liner Source Report, Landfill B-19, Phase IB, Kettleman Hills Facility, Kettleman City, California, Golder Associates Inc., September 25, 1987. Secondary Clay Liner Construction Report, Landfill B-19, Phase IB, Kettleman Hills Facility, Kettleman City, California, Golder Associates Inc., October 16, 1987. Secondary HDPE Liner and Leachate Collection System Report, Landfill B-19, Phase IB, Kettleman Hills Facility, Kettleman City, California, 2 Volumes, Golder Associates Inc., October 27, 1987. Primary Clay Liner Construction Report, Landfill B-19, Phase IB, Kettleman Hills Facility, Kettleman City, California, Golder Associates Inc., November 6, 1987. Primary HDPE Liner and Leachate Collection System Report, Landfill B-19, Phase IB, Kettleman Hills Facility, Kettleman City, California, Golder Associates Inc., November 13, 1987. <p><u>Phases II and III</u></p> <ul style="list-style-type: none"> Geologic Conditions of the Subgrade, Landfill B-19, Phases II and III with Summary of Geology and Engineering Properties of Landfill B-19, Kettleman Hills Facility, Kettleman City, California, Golder Associates Inc., February 1989. Chemical Analyses Results of Subgrade Soil, Landfill B-19, Phases II and III, Kettleman Hills Facility, Kettleman City, California, Golder Associates Inc., March 1989a. Clay Liner Source Report, Landfill B-19, Phases II and III, Kettleman Hills Facility, Kettleman City, California, Golder Associates Inc., March 1989b. Secondary Clay Liner Construction Report Landfill B-19, Phases II and III, Kettleman Hills Facility, Kettleman City, California, Golder Associates Inc., April 1989. Secondary HDPE Liner and Leachate Collection System Report, Landfill B-19, Phases II and III, Kettleman Hills Facility, Kettleman City, California, Golder Associates Inc., April 1989. Primary Clay Liner Construction Report, Landfill B-19, Phases II and III, Kettleman Hills Facility, Kettleman City, California, Golder Associates Inc., May 1989. Landfill B-19 Interim Closure, Chemical Waste Management, Inc., Kettleman City, California, Golder Construction Services, Inc., May 1994. 	<p><u>Phases IB, II and III</u></p> <ul style="list-style-type: none"> Quality Assurance Manual for the Installation of the Soil Components of Lining and Final Cover Systems, Chemical Waste Management Inc., June 1986. Specification Guidelines for the Procurement and Installation of Geosynthetic Lining Systems, Chemical Waste Management Inc., June 1986. Quality Assurance Manual for the Installation of Geosynthetic Lining Systems, Chemical Waste Management Inc., June 15, 1990. <p><u>Phase IA Reconstruction</u></p> <ul style="list-style-type: none"> Quality Assurance Manual for the Installation of the Soil components of Lining and Final Cover Systems, Chemical Waste Management Inc., June 1986. Quality Assurance Manual for the Installation of Geosynthetic Lining Systems, Chemical Waste Management Inc., June 15, 1990. 	<ul style="list-style-type: none"> Provided in Exhibit 36-1. 	<p><u>Lining System⁽²⁾</u></p> <p><u>Bottom Liner</u></p> <ul style="list-style-type: none"> 3-foot-thick (min.) clay layer ($k \leq 1 \times 10^{-7}$ cm/sec). 60-mil smooth HDPE geomembrane.⁽⁴⁾ 60-mil textured HDPE geomembrane.⁽⁵⁾ <p><u>Top Liner</u></p> <ul style="list-style-type: none"> 1.5-foot-thick clay layer ($k \leq 1 \times 10^{-7}$ cm/sec).⁽⁸⁾ 60-mil smooth HDPE geomembrane.⁽⁴⁾ 60-mil textured HDPE geomembrane.⁽⁵⁾ 	<p><u>Sideslopes</u></p> <ul style="list-style-type: none"> Geonet.⁽⁴⁾ Geotextile.⁽⁴⁾ Double-sided Geocomposite.⁽⁵⁾ <p><u>Base</u></p> <ul style="list-style-type: none"> Geonet.⁽⁴⁾ Geotextile.⁽⁴⁾ Double-sided Geocomposite.⁽⁵⁾ 1-foot gravel ($k \geq 1 \times 10^{-2}$ cm/sec). Geotextile. HDPE sideslope riser pipe.⁽⁶⁾ Stainless steel/carbon steel sideslope riser pipe.⁽⁷⁾ 	<p><u>Sideslopes</u></p> <ul style="list-style-type: none"> Geonet.⁽⁴⁾ Geotextile.⁽⁴⁾ Double-sided Geocomposite.⁽⁵⁾ <p><u>Base</u></p> <ul style="list-style-type: none"> Geonet.⁽⁴⁾ Geotextile.⁽⁴⁾ Double-sided Geocomposite.⁽⁵⁾ 1-foot gravel ($k \geq 1 \times 10^{-2}$ cm/sec). Geotextile. HDPE sideslope riser pipe.⁽⁶⁾ Stainless steel/carbon steel sideslope riser pipe.⁽⁷⁾ 	<ul style="list-style-type: none"> 80-mil smooth HDPE. Geotextile. 1-foot-thick gravel layer. Geotextile. HDPE sideslope riser pipe.⁽⁶⁾ Stainless steel/carbon steel sideslope riser pipe.⁽⁷⁾

(1) Design changes and clarifications are included in construction documentation.

(2) Described from bottom to top.

(3) Materials are installed in a trench extending from the sump along the centerline of the base of each phase below the 3-foot (min.) clay layer.

(4) Phases IB, II and III.

(5) Phase IA reconstruction only.

(6) Phase IB only.

(7) Phases IA reconstruction, II and III.

(8) Base only.

LCRS = Leachate collection and removal system.

LDS = Leak detection system.

VZDCRS = Vadose zone leak detection, collection and recovery system.

N/A = Not applicable.