DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

RCRA Corrective Action
Environmental Indicator (EI) RCRIS Code (CA725)
Current Human Exposures Under Control

Facility Name: Merck Sharp & Dohme Quimica
Facility Address: Barceloneta, Puerto Rico
Facility EPA ID#: PRD090028101

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EIs) are measures being used by the Resource Conservation and Recovery Act (RCRA) Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved) to track changes in the quality of the environment. The two EIs developed to date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Current Human Exposures Under Control" EI

A positive "Current Human Exposures Under Control" EI determination ("YE" status code) indicates that there are no unacceptable human exposures to "contamination" (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all contamination subject to RCRA corrective action at or from the identified facility [i.e., site-wide]).

Relationship of EI to Final Remedies

While final remedies remain the long-term objectives of the RCRA Corrective Action program, the EIs are near-term objectives, which are currently being used as program measures for the Government Performance and Results Act of 1993 (GPRA). The "Current Human Exposures Under Control" EI is for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and does not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program's overall mission to protect human health and the environment requires that final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

Duration / Applicability of EI Determinations

EI determination status codes should remain in the Resource Conservation and Recovery Information System (RCRIS) national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

Facility Information

The Merck Sharp and Dohme Quimica (MSDQ) facility is located in Barceloneta, Puerto Rico. The facility is located approximately three miles south of the Atlantic Ocean and 38 miles due west of San Juan, Puerto Rico. The site is bordered by industries to the north and west, and mogotes (undeveloped

large, round hills with steep sides formed by erosion of natural limestone) surround the remainder of the property.

MSDQ is a wholly-owned subsidiary of Merck and Company, Inc. and has existed at this location since 1971 as an operating pharmaceutical manufacturing plant. The facility currently manufactures human and animal health products such as anti-hypertensives, beta-blockers, diuretics, and anti-parasitic drugs. As a result of these manufacturing processes, the facility generates hazardous wastes, including chlorinated and non-chlorinated solvents, and solid and sludge wastes, as well as residues from incineration operations.

MSDQ has had a RCRA Operating Permit since 1988, and the permit was recently renewed in 2006. The permit currently authorizes MSDQ to manage two hazardous waste container storage areas, seven aboveground hazardous waste storage tanks, and two hazardous waste incinerators; the emissions of the incinerators are currently regulated under both the RCRA and Clean Air Act (CAA) permits.

1. Has **all** available relevant/significant information on known and reasonably suspected releases to soil, groundwater, surface water/sediments, and air, subject to RCRA Corrective Action (e.g., from solid waste management units (SWMUs), regulated units (RUs), and areas of concern (AOCs)), been **considered** in this EI determination?

X If yes - check here and continue with #2 below.

___ If no - re-evaluate existing data, or

___ If data are not available skip to #6 and enter IN (more information needed) status code

Summary of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs):
A RCRA Facility Assessment (RFA) was performed at the facility in 1986 and identified 37 solid waste management units (SWMUs) (Ref. 1). Based on visual inspection, no further action was deemed necessary at 23 SWMUs, and soil and air sampling was recommended at 14 SWMUs. Results of RFA investigations indicated that low-level soil contamination was detected in five SWMUs, and the RFA Report recommended further investigation in these five areas; no further action was required at the other nine SWMUs investigated. A RCRA Facility Investigation (RFI) was performed at these five areas in 1989, focusing on soil gas and soil contamination (Ref. 2). No groundwater studies were required. This EI Determination focuses only on the five SWMUs investigated during the RFI, as the remaining 32 SWMUs were determined to require no further action or investigation. See Figure 1-1 in the RFI Report for a figure depicting the five SWMU locations (Ref. 2).

SWMU 1, Old Landfill: This unit was in service from 1971 to 1981 and is located immediately north of the Secure Landfill. This area measures approximately 250 by 500 feet and has been covered with fill and regraded. This unit consisted of two active waste disposal pits excavated to a depth of approximately 20 feet; when full, the disposal trenches were covered with soil. Exact records of placement and earth cover volumes were not maintained while this unit was active. According to the RFA, wastes in the Old Landfill consisted of iron-cake contaminated with toluene, sludges from the Waste Water Treatment System (WWTS) and process filter cartridges containing cyanide (Ref. 1).

MSDQ submitted a Corrective Measures Study (CMS) in November 1990 that selected soil venting as the best corrective measure alternative for this site (Ref. 3). In October 2004, a Corrective Measures Implementation (CMI) Report was submitted that deselected soil venting as the selected alternative and proposed Biodegradation/Natural Attenuation as the selected alternative for this site. EPA did not provide comments on the 1990 CMS and is currently in the process of reviewing the 2004 CMI. EPA has concerns over the biodegradation alternative as proposed in the CMI Report and is currently evaluating MSDQ's comments relative to these concerns (Refs. 8, 9).

Two groundwater wells (N-1 and MW-1) are present in the vicinity of this unit. These wells were sampled for informational purposes in November 2001 as part of quarterly monitoring in the Secure Landfill (SWMU 2). These wells were sampled for the general quality and contamination indicator parameters, including: chloride, total and dissolved iron, total and dissolved manganese, total recoverable phenolics, total and dissolved sodium, sulfate, pH, specific conductance, total organic carbon, and total organic halogens (Refs. 5, 6). Sample results showed that groundwater quality in these samples had not been adversely impacted; however, toluene and cyanide were not included in the analyte list.

SWMU 2, Secure Landfill: This unit is located on the eastern edge of the facility and was operational from 1981 to 1992. The unit consisted of two identical waste cells; hazardous materials were disposed of in the western cell (No. 1), while the eastern cell (No. 2) contained no waste materials. The cells were designed with impermeable liners (20-mil PVC flexible membrane), liner foundations (24-inch compacted clay), and leachate collection/detection systems that were designed to conform to 40 CFR Part 264 (Refs. 1, 2). Closure activities began in 1992 and were completed in 1994; EPA approved the closure in 1996. Closure activities included removal and off-site disposal of wastes and a portion of the clay liner from Cell No. 1; post-excavation samples confirmed that all contaminated material, including soils, had been removed (Refs. 5, 6). A post-closure groundwater monitoring system was installed and consisted of two upgradient background wells (MW-6 and MW-7) and four downgradient compliance wells (P-1, N-3, ET-1A, and MW-4). Groundwater sampling was initiated in 2001 with four quarterly sampling events. Sampling results have shown that groundwater quality has not been impacted by activities at this unit (Refs. 4, 5, 6, 7).

SWMU 16, WWTS Degritter/Solvent Skimmer and SWMU 17, WWTS Tank 5311, Waste Solvent Storage Tank: These two SWMUs were evaluated as separate units in the RFA; however, they were investigated as one unit during the RFI due to their close proximity. These units were constructed in 1971, but were taken out of service prior to the RFI. Prior to 1986, the Degritter/Skimmer was used to skim toluene from the wastewater flow and to remove settled solids prior to discharge into the Equalization Basin. The floating solvent fraction was deposited in Tank 5311 prior to transfer to MSDQ's hazardous waste incinerator. Prior to 1985, these two SWMUs received hazardous waste discharges (Refs. 1, 2).

SWMU 18, WWTS Aerated Equalization Basin (Big Basin): This unit consists of a 1.6 million gallon Equalization Basin that was built in 1971. This unit presently receives wastewater and some stormwater runoff from the plant. Prior to December 1987, solvent fractions (primarily toluene) of chemical waste were skimmed in the Degritter/Skimmer unit (described above) and discharged into Tank 5311. Bottom flow from the Degritter/Skimmer was then deposited into the Equalization Basin before being discharged to the Barceloneta Regional WWTP. Prior to 1985, the Equalization Basin also received chemical sewer discharges after they were processed through the Degritter/Skimmer (Refs. 1, 2).

References:

1. RCRA Facility Assessment Report. Prepared by A.T. Kearney, Inc. Dated August 8, 1986.
2. RCRA Facility Investigation Report. Prepared by Alliance Technologies Corporation. March 1990.
3. Old Landfill Preliminary Correction Measures Study. Prepared by Alliance Technologies Corporation. November 1990.
4. Presentation on Former Secure Landfill Post-Closure Monitoring Plan, MSDQ Barceloneta Plant. Prepared by MSDQ. Dated December 11, 2000.
5. Secure Landfill Post-Closure Monitoring Final Report and Results of the November 2001 Groundwater Sampling. Prepared by GeoTrans, Inc. Dated March 2002.
6. Secure Landfill Post-Closure Documentation Summary. Prepared by MSDQ. Dated September 2003.
7. Annual Groundwater Quality Report, Secure Landfill. Prepared by MSDQ. Dated February 28, 2005.
8. Letter from Diana Cabrera, MSDQ, to Carl-Axel P. Soderberg, USEPA, re: Response to EPA Comments on the Old Landfill's Final CMI Report. Dated November 17, 2006.

9. Teleconference between Kristin McKenney, Booz Allen Hamilton, and Angel Salgado-Torrellas, USEPA Region 2, Caribbean Section, re: Status of the MSDQ Facility Relative to the CA725 EI Determination. February 15, 2007.

2. Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be "**contaminated**"[1] above appropriately protective risk-based levels (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?

Media	Yes	No	?	Rationale/Key Contaminants
Groundwater		X		
Air (indoors)[2]		X		
Surface Soil (e.g., <2 ft)	X			Toluene
Surface Water		X		
Sediment		X		
Subsurface Soil (e.g., >2 ft)	X			Toluene
Air (Outdoor)		X		

___ If no (for all media) - skip to #6, and enter YE, status code after providing or citing appropriate levels, and referencing sufficient supporting documentation demonstrating that these levels are not exceeded.

_X_ If yes (for any media) - continue after identifying key contaminants in each contaminated medium, citing appropriate levels (or provide an explanation for the determination that the medium could pose an unacceptable risk), and referencing supporting documentation.

___ If unknown (for any media) - skip to #6 and enter IN status code.

Rationale:

Groundwater

The water table at the MSDQ site varies from approximately 230 to 320 feet below ground surface (bgs) (approximately 10 feet above mean sea level [msl]), resulting in a thick unsaturated zone in limestone and overlying consolidated materials. Groundwater beneath the MSDQ site flows through interconnected, intergranular pore space; through interconnected fractures in the limestone; and through open voids formed by solution weathering. These cavities and fractures determine groundwater directions and velocities at the site (Refs. 1, 3).

[1] "Contamination" and "contaminated" describe media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriately protective risk-based "levels" (for the media, that identify risks within the acceptable risk range).

[2] Recent evidence (from the Colorado Department of Public Health and Environment, and others) suggest that unacceptable indoor air concentrations are more common in structures above groundwater with volatile contaminants than previously believed. This is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration necessary to be reasonably certain that indoor air (in structures located above (and adjacent to) groundwater with volatile contaminants) does not present unacceptable risks.

Groundwater investigations at the MSDQ facility have focused primarily in the area of the Secure Landfill (SWMU 2). Under normal fair weather conditions, groundwater flow direction in the vicinity of this unit is generally from south to north. However, under high precipitation conditions, the direction of groundwater flow beneath the Secure Landfill reverses, changing the direction of groundwater flow from north to south (Ref. 3).

The post-closure groundwater monitoring system at the secure landfill consists of two upgradient background wells (MW-6 and MW-7) and four downgradient compliance wells (P-1, N-3, ET-1A, and MW-4). See Figure 1-2 in the RFI Report for a depiction of monitoring well locations (Ref. 1). As of February 2005, Merck had submitted eight rounds of monitoring data that confirmed a lack of impact to groundwater in the area of the Secure Landfill when compared to background levels obtained from MW-6 and MW-7 (Ref. 3). Sampling was conducted for groundwater quality parameters (e.g., chloride, iron, manganese), groundwater indicator parameters (e.g., pH, total organic carbon), as well as waste-specific parameters (i.e., toluene and cyanide). Concentrations of all constituents were also reported to be below applicable drinking water standards (Ref. 3). Given the absence of contamination, Merck requested the discontinuation of monitoring at the Secure Landfill (Refs. 4, 5). EPA granted Merck's request for monitoring discontinuation subject to public comment during the RCRA permit renewal process.

During the November 2001 sampling event at the Secure Landfill, Old Landfill wells N-1 and MW-1 were sampled for informational purposes. See Figure 1-2 in the RFI Report for a depiction of monitoring well locations (Ref. 2). These wells were sampled for the general quality and contamination indicator parameters, including: chloride, total and dissolved iron, total and dissolved manganese, total recoverable phenolics, total and dissolved sodium, sulfate, pH, specific conductance, total organic carbon, and total organic halogens. However, toluene and cyanide were not included in the analyte list. Sample results confirmed a lack of impact to groundwater quality when compared to background levels obtained from MW-6 and MW-7 (Ref. 2). It should be noted that in its comments on the Merck CMI Report, EPA requested that additional wells be installed in the area of the Old Landfill to confirm the lack of contamination in this area.

Merck Barceloneta relies on two private wells for its sole water supply. Well #3 is 550 ft. deep with a production of 25 GPM, and Well #5 is 1200 ft. deep with a production of 390 GPM. Since well water is the facility's main source for industrial operations as well as human consumption, it is assumed that water quality is closely monitored and is in compliance with Safe Drinking Water Act requirements.

Based on current available information, no adverse groundwater impacts have been identified in the area of the Old Landfill related to industrial activities (Refs. 4, 5). Further groundwater investigations have not been required at any other area at the MSDQ site. Should additional investigations identify contamination in this area in the future, this EI Determination will have to be revised accordingly.

Air (Indoors)

A soil gas study was performed as part of the RFI. Forty-one points were sampled during this study at the five SWMUs requiring further investigation. Only two hot spots were identified adjacent to the Equalization Basin. Soil borings were advanced at these locations to determine the source of the elevated soil gas readings, and no volatiles of significant concentrations were found (Ref. 1). Given the lack of groundwater contamination, and the apparent lack of soil contamination in the vicinity of buildings, migration of volatile contaminants from the subsurface into indoor area is not a concern at the MSDQ site.

Surface/Subsurface Soil

Soil sampling was performed at all five SWMUs during the RFI (Ref. 1). Additional soil sampling was also performed at the Secure Landfill (SWMU 2) as part of closure activities (Ref. 2). Soil sampling activities are discussed below.

SWMU 1, Old Landfill: Numerous samples were collected at this unit during the RFI; these samples are broken down into the following categories:

Toluene: A total of 359 samples were analyzed for toluene, and 126 (approximately 35 percent) contained toluene concentrations above method quantitation limits. Toluene concentrations ranged from 0.001 to 29,000 milligrams per kilogram (mg/kg). Four samples, obtained at depths ranging from 4 to 10 feet bgs, contained toluene concentrations above the health-based criterion used for toluene in soil during the RFI (i.e., 20,000 mg/kg). Three of the samples were found at continuous depth in one boring (0L-18), and the other was obtained from boring 0L-30 at a depth of 6 to 8 feet bgs. These results indicated localized concentrations of toluene-contaminated wastes within the subsurface; no large, continuous area of elevated toluene concentrations was found as part of the RFI (Ref. 1).

Total Cyanide: A total of 359 samples were analyzed for total cyanide, and 131 (approximately 37 percent) contained total cyanide concentrations above quantitation limits. Concentrations ranged from 0.5 to 943 mg/kg; however, all concentrations were well below the health-based criterion used for cyanide in soil during the RFI (i.e., 2,000 mg/kg). Results indicted that total cyanide concentrations were distributed similar to toluene, and no large, continuous area of elevated total cyanide was found (Ref. 1).

Select Organic Priority Pollutants: A total of 35 samples were collected and analyzed, and all but one (OL-28-16) reported concentrations at or below the quantitation limits. Sample OL-28-16 was taken at a depth of 16 feet in waste material (Ref. 1). Thus, none of these constituents were reported above health-based criteria and were not identified as a concern (Ref. 1).

TCLP Analysis: Two subsurface samples were collected and indicated that toluene may be leaching in the subsurface in the Old Landfill (Ref. 1).

Given the fact that these samples were collected in 1989 as part of the RFI, they have not been compared to more recent risk-based criteria. Thus, for purposes of this EI, a review of the soil results presented in the RFI were compared to the Region 9 Preliminary Remediation Goals (PRGs) for Industrial Soil. Based on this comparison, numerous locations contained toluene at levels above the Region 9 PRG for Industrial Soil of 520 mg/kg. A summary of the RFI results compared to the current Region 9 PRG for toluene is presented below.

Table 1. Toluene Concentrations Reported Above the EPA Region 9 PRGs During the RFI (October 1989)

Sample Location	Depth Range (ft bgs)	Concentration Range (mg/kg)	PRG (mg/kg)
OL-7	10 – 14	14,000 J – 18,000 J	520
OL-8	0 – 12*	12,000 J – 18,000 J	
OL-17	6 – 8	910 J	
OL-18	2 – 14	690 – 29,000 J	
OL-19	10 – 14	880 J – 13,000 J	

OL-20	2 – 6	1,100 J – 4,800 J	
OL-22	8 – 12	740 J – 12,000 J	
OL-30	6 – 8	28,000 J	

* The surface soil (0-2 foot bgs) concentration was reported at 12,000 J mg/kg.
J – Estimated concentration.

Cyanide results were also compared to the Region 9 PRG for industrial soil for free cyanide (i.e., 12,000 mg/kg). All sample results collected during the RFI in the Old Landfill were below the Region 9 PRG of 12,000 mg/kg. Thus, it does not appear that cyanide impacts in the Old Landfill area are of concern, which is consistent with conclusions made by both Merck and EPA for this area (Ref. 1).

SWMU 2, Secure Landfill: During the RFI, soil samples were collected in this area for toluene, total cyanide, and select priority organic pollutants. Minimal levels of toluene and cyanide were reported above method quantitation limits. However, this unit was closed between 1992 and 1994. During closure, waste materials and a portion of the clay liner in Cell No. 1 were excavated and disposed of off site. Confirmatory samples were collected and demonstrated that all contaminated materials, including soils, have been removed. Thus, there is no residual soil contamination remaining in this unit (Refs. 1, 2).

SWMU 16, WWTS Degritter/Solvent Skimmer and SWMU 17, WWTS Tank 5311, Waste Solvent Storage Tank: Of the 44 samples analyzed for toluene, all were below method qauntitation limits except DT-7-10 (0.011 mg/kg toluene). None of the eight samples analyzed for select organic priority pollutants reported concentrations above the method quantitation limit. Two samples were analyzed via TCLP for toluene, and one contained 0.051 mg/L of toluene (Ref. 1). Given the results, soil contamination in this area was not identified as a concern, and no further action was proposed.

A comparison of sample results from the RFI to the current EPA Region 9 PRG for Industrial Soil for toluene indicates that all sample results were well below the EPA Region 9 PRG of 520 mg/kg.

SWMU 18, WWTS Aerated Equalization Basin (Big Basin): Sixty-two samples were analyzed for toluene, and 12 samples were analyzed for select organic priority pollutants; no samples contained concentrations of contaminations above the method quantitation limits. Four samples were analyzed via Toxicity Characteristic Leaching Procedure (TCLP) analysis for toluene, and 0.014 milligrams per liter (mg/L) of toluene was reported in one sample (Ref. 1). Given the results, soil contamination in this area was not identified as a concern, and no further action was proposed.

Thus, based upon the results of soil investigations performed, the only area containing contamination in soil above risk-based levels is the Old Landfill. Toluene is present in the old landfill at levels above the Region 9 PRG (520 mg/kg) and the "health-based criteria" presented in the RFI (i.e., 20,000 mg/kg), which is also Merck's proposed cleanup level for this unit. Soil impacts in all other areas are below health-based levels and are not a concern with regards to this CA725 EI Determination.

Surface Water/Sediment

Impacts to surface water and sediment from activities at the MSDQ facility have not been identified as a concern. Given the apparent lack of groundwater contamination, and the localized areas of subsurface soil contamination at the site, migration of contaminants into surface water and sediment is not currently a concern.

Air (Outdoors)

Migration of contaminants in soil to outdoor air is also not a concern at the MSDQ site. All contamination in soil at the Old Landfill (SWMU 1) above health-based levels has been identified in the subsurface; thus, migration of these contaminants entrained on particulates is not expected to be a concern at the MSDQ site.

References:

1. RCRA Facility Investigation Report. Prepared by Alliance Technologies Corporation. March 1990.
2. Secure Landfill Post-Closure Monitoring Final Report and Results of the November 2001 Groundwater Sampling. Prepared by GeoTrans, Inc. Dated March 2002.
3. Annual Groundwater Quality Report, Secure Landfill. Prepared by MSDQ. Dated February 28, 2005.
4. Letter from Diana Cabrera, MSDQ, to Carl-Axel P. Soderberg, USEPA, re: Response to EPA Comments on the Old Landfill's Final CMI Report. Dated November 17, 2006.
5. Teleconference between Kristin McKenney, Booz Allen Hamilton, and Angel Salgado-Torrellas, USEPA Region 2, Caribbean Section, re: Status of the MSDQ Facility Relative to the CA725 EI Determination. February 15, 2007.

3. Are there **complete pathways** between "contamination" and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions?

Summary Exposure Pathway Evaluation Table
*Potential **Human Receptors** (Under Current Conditions)*

"Contaminated" Media	Residents	Workers	Day-Care	Construction	Trespasser	Recreation	Food[3]
~~Groundwater~~					–	–	
~~Air (indoor)~~				–	–	–	–
Surface Soil (e.g. < 2 ft)	No	No	No	Yes	No	No	No
~~Surface Water~~			–	–			
~~Sediment~~			–	–			
Subsurface Soil (e.g., > 2 ft)	–	–	–	Yes	–	–	No
~~Air (outdoors)~~						–	–

Instruction for Summary Exposure Pathway Evaluation Table:

1. Strike-out specific Media including Human Receptors' spaces for Media which are not "contaminated" as identified in #2 above.

2. Enter "yes" or "no" for potential "completeness" under each "Contaminated" Media — Human Receptor combination (Pathway).

Note: In order to focus the evaluation to the most probable combinations some potential "Contaminated" Media - Human Receptor combinations (Pathways) do not have check spaces. These spaces instead have dashes ("--"). While these combinations may not be probable in most situations they may be possible in some settings and should be added as necessary.

___ If no (pathways are not complete for any contaminated media-receptor combination) - skip to #6, and enter "YE" status code, after explaining and/or referencing condition(s) in-place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional Pathway Evaluation Work Sheet to analyze major pathways).

_X_ If yes (pathways are complete for any "Contaminated" Media - Human Receptor combination) - continue after providing supporting explanation.

___ If unknown (for any "Contaminated" Media - Human Receptor combination) - skip to #6 and enter "IN" status code

Rationale:

[3] Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish)

Surface/Subsurface Soil

As discussed in Question 3, only toluene is present in the Old Landfill at levels above the Region 9 PRG (520 mg/kg) and the RFI "health-based criteria" and proposed cleanup level (i.e., 20,000 mg/kg). All samples with concentrations above the EPA Region 9 PRG, with the exception of one location (OL-8), are within the subsurface (Ref. 1). The only receptors that may enter this area are those people involved with environmental activities (e.g., sampling, remediation) or maintenance of the site (Ref. 2). The landfill area was covered and regraded when it was closed, and no disruption of soil has occurred or is planned at this unit. Thus, on-site maintenance personnel are not expected to come into contact with contaminated soil at the Old Landfill. However, there is a potential that on-site remedial workers (considered construction workers for the purpose of this EI Determination) may come into contact with impacted soil while conducting remedial activities at this unit (Ref. 2).

It should also be noted that the MSDQ facility is totally secured from off-site receptors. It is closely guarded by private security and is completely surrounded by perimeter fencing. The only access point to the facility is through the main gate, which is guarded by private security agents. On-site trespassing is not expected to occur at the MSDQ facility. Thus, there is no concern for any off-site receptors to gain access to the area of the Old Landfill and potentially disrupt impacted soil in this area (Ref. 2).

References:

1. RCRA Facility Assessment Report. Prepared by A.T. Kearney, Inc. Dated August 8, 1986.
2. Teleconference between Kristin McKenney, Booz Allen Hamilton, and Angel Salgado-Torrellas, USEPA Region 2, Caribbean Section, re: Status of the MSDQ Facility Relative to the CA725 EI Determination. February 15, 2007.

4. Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be **significant**[4] (i.e., potentially "unacceptable") because exposures can be reasonably expected to be: 1) greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the acceptable "levels" (used to identify the "contamination"); or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable "levels") could result in greater than acceptable risks?

   _X_ If no (exposures cannot be reasonably expected to be significant (i.e., potentially "unacceptable") for any complete exposure pathway) - skip to #6 and enter "YE" status code after explaining and/or referencing documentation justifying why the exposures (from each of the complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

   ___ If yes (exposures could be reasonably expected to be "significant" (i.e., potentially "unacceptable") for any complete exposure pathway) - continue after providing a description (of each potentially "unacceptable" exposure pathway) and explaining and/or referencing documentation justifying why the exposures (from each of the remaining complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

   ___ If unknown (for any complete pathway) - skip to #6 and enter "IN" status code.

Rationale:

Surface/Subsurface Soil

As mentioned in response to Question No. 3, there is a potential that on-site remedial workers (considered construction workers for the purpose of this EI Determination) may come into contact with impacted soil in the Old Landfill while conducting remedial activities. However, exposures are not anticipated to be significant because remedial workers would be expected to follow Occupational Safety and Health Administration (OSHA) health and safety procedures specified in the facility's Health & Safety Plan, and wear the appropriate personal protective equipment (PPE), while performing remedial activities. Thus, any exposure by on-site remedial workers is not expected to be significant.

[4] If there is any question on whether the identified exposures are "significant" (i.e., potentially "unacceptable"), consult a Human Health Risk Assessment specialist with appropriate education, training, and experience.

5. Can the "significant" **exposures** (identified in #4) be shown to be within acceptable limits?

____ If yes (all "significant" exposures have been shown to be within acceptable limits) - continue and enter "YE" after summarizing and referencing documentation justifying why all "significant" exposures to "contamination" are within acceptable limits (e.g., a site-specific Human Health Risk Assessment).

____ If no (there are current exposures that can be reasonably expected to be "unacceptable") - continue and enter "NO" status code after providing a description of each potentially "unacceptable" exposure.

____ If unknown (for any potentially "unacceptable" exposure) - continue and enter "IN" status code.

Rationale:

This question is not applicable. See response to Question No. 4.

6. Check the appropriate RCRIS status codes for the Current Human Exposures Under Control EI event code (CA725), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (and attach appropriate supporting documentation as well as a map of the facility):

_X_ YE - Yes, "Current Human Exposures Under Control" has been verified. Based on a review of the information contained in this EI Determination, "Current Human Exposures" are expected to be "Under Control" at the Merck Sharp & Dohme Quimica site, EPA ID# PRD090028101, located in Barceloneta, Puerto Rico, under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.

___ NO - "Current Human Exposures" are NOT "Under Control."

___ IN - More information is needed to make a determination.

Completed by: _____ Date: _____

Kristin McKenney
Environmental Consultant
Booz Allen Hamilton

Reviewed by: _____ Date: _____

Amy Brezin
Environmental Consultant
Booz Allen Hamilton

Also reviewed by: _____ Date: 8-13-07

Angel Salgado-Torrellas, Project Manager
RCRA Programs Branch
EPA Region 2

_____ Date: 9-13-2007

Ariel Iglesias-Portalatin, Branch Chief
Response & Remediation Branch/CEPD
EPA Region 2

Approved by: _____ Date: 9-13-2007

Carl Axel-P Soderberg, Division Director
Caribbean Environmental Protection Division
EPA Region 2

Locations where references may be found:

References reviewed to prepare this EI determination are identified after each response. Reference materials are available at U.S. EPA, Region 2.

Contact telephone and e-mail numbers: Angel Salgado-Torrellas
787-977-5854
salgado.angel@epa.gov

FINAL NOTE: THE HUMAN EXPOSURES EI IS A QUALITATIVE SCREENING OF EXPOSURES AND THE DETERMINATIONS WITHIN THIS DOCUMENT SHOULD NOT BE USED AS THE SOLE BASIS FOR RESTRICTING THE SCOPE OF MORE DETAILED (E.G., SITE-SPECIFIC) ASSESSMENTS OF RISK.

Attachments

The following attachments have been provided to support this EI determination:

- Attachment 1 - Summary of Media Impacts Table

Attachment 1: Summary of Media Impacts Table

SWMU	GW	AIR (Indoors)	SURF SOIL	SURF WATER	SED	SUB SURF SOIL	AIR (Outdoors)	CORRECTIVE ACTION MEASURE	KEY CONTAMINANTS
SWMU 1 – Old Landfill	No	No	Yes	No	No	Yes	No	• Currently evaluating corrective measure alternatives, which include Biodegradation/Natural Attenuation and Soil Venting.	Toluene
SWMU 2 – Secure Landfill	No	No	No	No	No	No	No	• Unit closure included removal and off-site disposal of wastes and a portion of the clay liner from Cell. No. 1. Post-excavation samples confirmed all contaminated material was removed. EPA approved closure in 1996. • Groundwater sampling initiated in 2001 and completed in 2004; results have not shown adverse impacts since initiation. Post-closure groundwater monitoring discontinuation was granted by EPA in 2006 upon RCRA permit renewal.	None identified.
SWMU 16 – WWTS Degritter/Solvent Skimmer	No	No	No	No	No	No	No	None.	
SWMU 17 – WWTS Tank 5311, Waste Solvent Storage Tank	No	No	No	No	No	No	No	None.	
SWMU 18 - WWTS Aerated Equalization Basin (Big Basin)	No	No	No	No	No	No	No	None.	