



DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99

RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA725)

Current Human Exposures Under Control

RCRA RECORDS CENTER Landfill
FACILITY Windsor Bloomfield San
I.D. NO. CTD991289133
FILE LOC. R-13
OTHER

Facility Name: Windsor-Bloomfield Sanitary Landfill
Facility Address: Huckleberry Road, Windsor, CT
Facility EPA ID #: CTD991289133

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 (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), 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.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI 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 objective of the RCRA Corrective Action program the EI 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 are for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do 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 Determinations status codes should remain in 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).

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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)?

	<u>Yes</u>	<u>No</u>	<u>?</u>	<u>Rationale / Key Contaminants</u>
Groundwater	<u>X</u>	___	___	See Attachment 1
Air (indoors) ²	___	<u>X</u>	___	
Surface Soil	___	___	___	
(e.g., <2 ft)	<u>X</u>	___	___	
Surface Water	___	<u>X</u>	___	
Sediment	___	<u>X</u>	___	
Subsurf. Soil	___	___	___	
(e.g., >2 ft)	<u>X</u>	___	___	
Air (outdoors)	___	<u>X</u>	___	

___ 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 and Reference(s):_

Footnotes:

¹ “Contamination” and “contaminated” describes 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 Dept. 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.

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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	Trespassers	Recreation	Food ³
Groundwater	_N_	_N_	_N_	_N_			_N_
Air (indoors)							
Soil (surface, e.g., <2 ft)	_N_	_Y_	_N_	_Y_	_Y_	_N_	_N_
Surface Water							
Sediment							
Soil (subsurface e.g., >2 ft)				_N_			_N_
Air (outdoors)							

Instructions 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 (“___”). 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).
- ___Y_ 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 and Reference(s): See Attachment 2

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

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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)?

 N If no (exposures can not 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 and Reference(s): _____

Exposure of surface soil to *site workers and construction workers* is insignificant because workers are usually in trucks or compaction machinery so are not in direct contact with the soil. Additionally, site workers are trained in accordance with the solid waste permit for the site to maintain the worker’s health and safety. Finally, the non-hazardous nature of the municipal solid waste likely precludes significant exposure to hazardous constituents. *Trespassers* are not likely to be present since this is an active landfill that is partially fenced with access control on one side with a river on the other side. If exposure should occur, the non-hazardous nature of the waste likely precludes significant exposure to hazardous constituents.

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.

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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 and Reference(s): _____

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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):

 YE 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 **Windsor – Bloomfield Sanitary Landfill** facility, EPA ID #**CTD991289133**, located at **Huckleberry Road, Windsor** 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 (signature) David Ringquist Date 9-29-03
(print) **David Ringquist**
(title) **Sanitary Engineer 3**

Supervisor (signature) Diane Duva Date 9-29-03
(print) **Diane Duva**
(title) **Supervising Environmental Analyst**
(EPA Region or State) **Connecticut**

Locations where References may be found:

 Connecticut Department of Environmental Protection, 79 Elm St. Hartford, CT.

Contact telephone and e-mail numbers

(name) **David Ringquist** _____
(phone #) **860-424-3573** _____
(e-mail) **david.ringquist@po.state.ct.us** _____

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.

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

Completed by (signature) _____
(print) **David Ringquist** _____
(title) **Sanitary Engineer 3** _____

Date _____

Reviewed by
David Lim

David Lim
9/29/03

Supervisor (signature) _____
(print) **Diane Duva** _____
(title) **Supervising Environmental Analyst** _____
(EPA Region or State) **Connecticut** _____

Date _____

Approved by

Matthew R. Hoagland
Matthew R. Hoagland

9/29/03

Locations where References may be found:

___ Connecticut Department of Environmental Protection, 79 Elm St. Hartford, CT.

Contact telephone and e-mail numbers

(name) **David Ringquist** _____
(phone #) **860-424-3573** _____
(e-mail) **david.ringquist@po.state.ct.us** _____

Chief, RCRA
Corrective Action
Section
Reg. I.

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Attachment 1 –

Windsor Bloomfield Sanitary Landfill – EI Determination - CA725

Question 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)?*

Groundwater: Contaminants typical of municipal solid waste landfills are present in the groundwater monitoring wells downgradient of the landfill, including total dissolved solids, specific conductance, alkalinity, ammonia, hardness, sodium, barium, iron, manganese and arsenic. In addition, trichloroethylene and vinyl chloride slightly exceed the groundwater protection criteria in one monitoring well located within the landfill and adjacent to the RCRA closed metal hydroxide cell.

Indoor Air: There are no buildings on the landfill and the closest building is the landfill scale house located approximately 300 feet to the east. As a precaution, this building will soon have a continuous monitoring device to warn the workers of the presence of gas.

Surface and Subsurface Soil: This is an active landfill that receives municipal solid waste and bulky waste, e.g. large furniture, daily, therefore **surface soil** in the vicinity of the working face of the landfill is likely to be contaminated. **Subsurface soil** is contaminated by the municipal solid waste and by metal hydroxide sludge that is disposed of in a cell adjacent to the solid waste landfill. The cell has been capped with a RCRA engineered cover system that includes an impermeable membrane. The town is required to monitor the groundwater and maintain the sludge landfill for 30 years after closure

Surface Water and Sediments: “Several leachate-impacted groundwater seeps are present west and northwest (down gradient) of the landfill. The leachate seeps occur where the groundwater elevation equals the topographic elevation” (from Zone of Influence Investigation Report, Windsor-Bloomfield Sanitary Landfill, Windsor, CT, dated May 1996). Some leachate seeps containing iron-oxide precipitate (orange-stained soil) discharge directly into the Farmington River. Arsenic has been measured in groundwater at a maximum of .035 mg/l as reported in a May 2001 landfill groundwater monitoring report, exceeding Connecticut’s Remediation Standard Regulations surface water protection criteria of .004 mg/l. However arsenic does not exceed this criteria by more than 10 times so it can be concluded that this is *not anticipated to have an unacceptable impact to the Farmington River, its sediments*, or eco-system. Also, “surface water samples from the Farmington River continue to show no significant impact from the landfill. Water quality at SW-1, upriver from the landfill, is similar to that at downstream location SW-3”, as reported in the 2000 Annual Summary Groundwater Monitoring Program...by Fuss & O’Neill, Inc., dated February 2001. Finally, the toxicity of the groundwater and stream water down gradient of the landfill was determined in 1992 by exposing live organisms to these water samples. This study concluded that the water is non-toxic. Nevertheless, the CTDEP is requiring the Town of Windsor, through an administrative order, to implement controls on the landfill leachate and the leachate seeps for aesthetic (odor and visual) reasons.

Air Outdoors: The landfill emits gas to the atmosphere, typical of a solid waste disposal area. The residents located to the east occasionally detect an odor that is generally a function of certain weather conditions, however the gas is diluted over the 1000-foot distance to the nearest home and therefore can be reasonably expected to be an aesthetic and not a health problem.

Attachment 2
Windsor Bloomfield Sanitary Landfill – EI Determination - CA725

Question 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?*

Groundwater: There are no drinking water wells located downgradient of the contaminated groundwater. All groundwater discharges to the Farmington River before reaching wells, therefore there is not a complete pathway.

Surface Soil: Workers at the landfill will likely come into contact with the contaminated soil, as well as construction workers and trespassers, therefore there is a complete pathway.

Subsurface Soil: It is very unlikely that the RCRA metal hydroxide cell or the solid waste landfill will be dug up, therefore the exposure pathway to construction workers is not complete. Current land use precludes growing crops therefore the food pathway is incomplete.

References
Windsor Bloomfield Sanitary Landfill – EI Determination - CA725

1. *Zone of Influence Investigation Report, Windsor-Bloomfield Sanitary Landfill, Windsor, Connecticut, Volume I: Technical Report*, prepared by Fuss & O’Neill Inc., May 1996.
2. *Second Quarter 2001 Monitoring Results, Groundwater Monitoring Program, Windsor-Bloomfield Sanitary Landfill and RCRA Metal Hydroxide Cell, Windsor, Connecticut*, prepared by Fuss & O’Neill Inc., May 2001.
3. *Verification Of Approved Controls In Place Windsor-Bloomfield Landfill*, September 13, 2001, Prepared by Marina Crawford, Connecticut Department of Environmental Protection.
4. *2000 Annual Summary, Groundwater Monitoring Program, Windsor Bloomfield Sanitary Landfill, Windsor, Connecticut*, prepared by Fuss & O’Neill, Inc., February 2001.



LEGEND

- CHAINLINK FENCE
- GUARDRAIL
- TREELINE
- EDGE OF PAVED ROAD
- EDGE OF UNPAVED ROAD
- EDGE OF WATER
- WETLANDS
- GZ-101R EXISTING MONITORING WELL
- (146.14) GROUNDWATER ELEVATION - FT. NGVD 1929
- PROPERTY LINE
- GP-21 EXISTING GAS PORT
- PZ-92-2 EXISTING PIEZOMETER
- STANDING WATER / GROUNDWATER SEEPAGE
- LIMIT OF REFUSE
- CATCH BASIN
- 120 GROUNDWATER CONTOUR (DASHED WHERE INFERRED)
- GROUNDWATER FLOW DIRECTION
- GROUNDWATER DIVIDE

NOTE:
 NA = NOT MEASURED OR NOT UTILIZED IN GROUNDWATER CONTOURING
 OBS = WATER LEVEL WAS BELOW TOP OF BLADDER PUMP

AREAS OF CONCERN:
 FORMER DRY WELL FROM GARAGE
 FORMER HOUSEHOLD APPLIANCE STORAGE AREA
 COMMERCIAL RECYCLING AREA
 CITIZEN'S RECYCLING AREA

SOLID WASTE MANAGEMENT UNITS (SWMUs):
 CELL A: SEWAGE SLUDGE
 CELL B: MUNICIPAL SOLID WASTE
 CELL C: MUNICIPAL SOLID WASTE
 CELL D: MUNICIPAL SOLID WASTE

CLOSED METAL
 HYDROXIDE CELL: EPA #F006 SLUDGE
 SWARF CELL: INDUSTRIAL METAL CUTTINGS

NOTE:
 TOPOGRAPHIC FEATURES, SHOWN HEREON, WERE PREPARED IN ACCORDANCE WITH CLASS T-2 & T-3.
 ELEVATIONS ARE BASED ON NGVD 29 & HORIZONTAL DATUM BASED ON NAD 27.
 CONTOURS HAVE BEEN TAKEN FROM AN M.D.C. DIGITAL FILE & FIELD TOPO TAKEN BY THE TOWN OF WINDSOR 10/94, 11/94 & 1/95
 MONITOR WELL, PIEZOMETER, & GASPORT LOCATIONS WERE FIELD VERIFIED BY THE TOWN OF WINDSOR ENGINEERING DEPARTMENT.

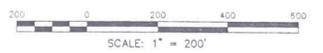
PROPERTY LINES HAVE BEEN ROTATED TO NAD27 DATUM BASED ON COORDINATE INFORMATION PROVIDED BY THE TOWN OF WINDSOR ENGINEERING DEPARTMENT.

TOPOGRAPHY FROM AERIAL SURVEY ON 4/19/91 BY TOPOGRAPHIC DATA CONSULTANTS, INC., BERLIN, N.J., VERTICAL AND HORIZONTAL CONTROL BASED ON M.D.C. DATUM.

BOUNDARY FROM MAP ENTITLED "BOUNDARY MAP, SOLID WASTE DISPOSAL SITE, PREPARED FOR TOWN OF WINDSOR, CONNECTICUT, SCALE 1"=100", DATED FEB. 4, 1972, REV. 7/8/72" PREPARED BY GRISWOLD & FUSS, INC., MANCHESTER, CT. COORDINATES FOR MW-N035, AND MW-N045 PROVIDED BY ABB INC.

I hereby declare that this map is substantially correct in accordance with the standards of a Class D map as defined in the "Recommended Standards for Surveys and Maps in the State of Connecticut" as prepared and adopted by the Connecticut Association of Land Surveyors, Inc. on September 13, 1984. This map is compiled from other maps, deed dimensions, and/or other sources of information and subject to change as a field survey may disclose.

LAWRENCE R. GRISSLER, JR. NO.12327



NOT RELEASED FOR CONSTRUCTION

PROJ. MANAGER:	CHIEF DESIGNER:	REVIEWED BY:	DATE:
SURVEY:			
SITE:			
STRUCTURAL:			
REVISION DATE:			
DATUM:	H NAQ27 V NGVD29		
SCALE:	1" = 200'		

FUSS & O'NEILL INC. Consulting Engineers
 146 HARTFORD ROAD, MANCHESTER, CONNECTICUT 06040
 (860) 648-2469

GROUNDWATER CONTOUR MAP
SECOND QUARTER MONITORING EVENT
APRIL 2001
WINDSOR/BLOOMFIELD SANITARY LANDFILL
HUCKLEBERRY ROAD WINDSOR, CONNECTICUT
 JOB NUMBER 88-37744 PHASE 1 DATE MAY 2001 FIGURE 1

C:\p1\187\187.dwg (187) 11:37:49 2001
 FILENAME: C:\P1\187\187.dwg (187) 11:37:49 2001
 M: APR 11 11:37:49 2001
 P: P187.DWG