

DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

**RCRA Corrective Action**

**Environmental Indicator (EI) RCRIS code (CA750)**

**Migration of Contaminated Groundwater Under Control**

**Facility Name:** Lyncott Corporation Landfill  
**Facility Address:** Road 1, Route 1554 New Milford, Pennsylvania 18834  
**Facility EPA ID #:** PAD 060506805

1. Has **all** available relevant/significant information on known and reasonably suspected releases to the groundwater media, 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 #8 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 Controls" 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 "Migration of Contaminated Groundwater Under Control" EI pertains ONLY to the physical migration (i.e., further spread) of contaminated groundwater and contaminants within groundwater (e.g., non aqueous phase liquids or NAPLs). Achieving this EI does not substitute for achieving other stabilization or final remedy requirements and expectations associated with sources of contamination and the need to restore, wherever practicable, contaminated groundwater to be suitable for its designated current and future uses.

**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. Is **groundwater** known or reasonably suspected to be "contaminated"<sup>1</sup> 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 anywhere at, or from, the facility?

  X   If yes – continue after identifying key contaminants, citing appropriate "levels," and referencing supporting documentation.  
       If no – skip to #8 and enter "YE" status code, after citing appropriate "levels," and referencing supporting documentation to demonstrate that groundwater is not "contaminated."  
       If unknown – skip to #8 and enter "IN" status code.

Rationale and Reference(s): *Reference: Final Environmental Indicator Inspection Report Lyncott Corporation (URS, September 2009).*

On-site groundwater in the eastern portion of the Lyncott site has been extensively investigated for both organic and inorganic constituents via installation and sampling of over 60 monitoring wells since 1979. Review of groundwater chemistry data collected since 1992 for the shallow bedrock wells shows that samples were analyzed for both dissolved and total inorganic constituents.

The remaining bedrock wells continue to monitor the Sanitary Landfill (SWMU #3) where dissolved arsenic (W18, WR07), iron (W16, W17, W18, and W19), and manganese (W16, W17, W18, W19, and W20) are present above the current Maximum Concentration Limit (MCL) National Drinking Water Standard and the Pennsylvania Groundwater Medium-Specific Concentration (MSC) for Used Aquifer. Additionally, total lead (P05, WT21, and WR07) remains present above the MCL National Drinking Water Standard and the PA Groundwater MSC for Used Aquifer.

A linear regression analysis for all contaminants of concern in W21, which monitored the IBM Pad (SWMU #6), were acceptable for approved termination by PADEP therefore this well has not been sampled since 2004.

Recommendations in the Interim RCRA Facility Assessment (RFA) Report included the installation of monitoring wells near the Drum Storage Barns (SWMU #8) to determine groundwater flow and to ensure that the existing monitoring well system is adequate. Spring #4, located downgradient from the former storage barns, was sampled until June 1989. Analytical results indicate the one-time presence of arsenic (0.014 mg/l – 10/22/81) and mercury (0.075 mg/l – 4/14/81). Both analytes' concentrations were above the current MCL National Drinking Water Standard and the Pennsylvania Groundwater MSC for a Used Aquifer. However, the subsequent 4 and 8 sampling rounds were non-detect for mercury and arsenic, respectively. Following drum and soil removal, soil samples were obtained from each of the barn floors. No sample results exceed the current PA Soil-to-Groundwater MSC for Used Aquifers. Therefore, there is no reason to believe that the groundwater in this part of the Site has been impacted.

The closest municipal water source is the New Milford Municipal Authority (NMMA), which is over one-half mile northeast of the Site. A detailed Site-specific geologic/hydrogeologic study titled the Groundwater Site Assessment Evaluation (GSAE) was performed to assess the groundwater monitoring program. Results indicate that the dominant bedrock groundwater movement is by fracture flow toward the south-southeast on the south side of the bedrock ridge. A local perched water table exists in the eastern part of the site represented by seasonal springs. Permeability in the bedrock is low with eventual discharge into Meylert Creek via an unnamed surface stream located along the southern site

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<sup>1</sup>"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 appropriate "levels" (appropriate for the protection of the groundwater resource and its beneficial uses).

boundary. Therefore, there is no reason to believe that the municipal water source has been impacted.

Residents adjacent to the Site appear to be serviced by springs and private groundwater wells. Two rounds of residential groundwater and spring sampling occurred in 1982 and 1984. No concentrations above the drinking water standards were present in these samples.

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3. Has the **migration** of contaminated groundwater **stabilized** (such that contaminated groundwater is expected to remain within "existing area of contaminated groundwater"<sup>1</sup> as defined by the monitoring locations designated at the time of this determination)?

- X   If yes - continue, after presenting or referencing the physical evidence (e.g., groundwater sampling/measurement/migration barrier data) and rationale why contaminated groundwater is expected to remain within the (horizontal or vertical) dimensions of the "existing area of groundwater contamination"<sup>2</sup> )
- \_\_\_\_\_ If no (contaminated groundwater is observed or expected to migrate beyond the designated locations defining the "existing area of groundwater contamination"<sup>2</sup>) - skip to #8 and enter "NO" status code, after providing an explanation.
- \_\_\_\_\_ If unknown - skip to #8 and enter "IN" status code.

**Rationale and Reference(s):**

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Annual groundwater monitoring results indicate that monitoring data generally indicates stable or decreasing concentration trends. PADEP responses to the quarterly data reflect this trend, therefore migration of the contaminated groundwater has been shown to have been stabilized.

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<sup>1</sup> "Existing area of contaminated groundwater" is an area (with horizontal and vertical dimensions) that has been verifiably demonstrated to contain all relevant groundwater contamination for this determination, and is defined by designated (monitoring) locations proximate to the outer perimeter of "contamination" that can and will be sampled/tested in the future to physically verify that all "contaminated" groundwater remains within this area, and that the further migration of "contaminated" groundwater is not occurring. Reasonable allowances in the proximity of the monitoring locations are permissible to incorporate formal remedy decisions (i.e., including public participation) allowing a limited area for natural attenuation.

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4. Does "contaminated" groundwater **discharge** into **surface water** bodies?

- X        If yes - continue after identifying potentially affected surface water bodies.
- If no - skip to #7 (and enter a "YE" status code in #8, if #7 = yes) after providing an explanation and/or referencing documentation supporting that groundwater "contamination" does not enter surface water bodies.
- If unknown - skip to #8 and enter "IN" status code.

**Rationale and Reference(s):**

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Stream data samples were collected since 2001 in three sample locations from the unnamed surface stream located along the southern site boundary. Results indicate that site-related contaminants are present.

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5. Is the **discharge** of "contaminated" groundwater into surface water likely to be "**insignificant**" (i.e., the maximum concentration<sup>2</sup> of each contaminant discharging into surface water is less than 10 times their appropriate groundwater "level," and there are no other conditions (e.g., the nature, and number, of discharging contaminants, or environmental setting), which significantly increase the potential for unacceptable impacts to surface water, sediments, or eco-systems at these concentrations)?

    X    

If yes - skip to #7 (and enter "YE" status code in #8 if #7 = yes), after documenting: 1) the maximum known or reasonably suspected concentration<sup>3</sup> of key contaminants discharged above their groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) provide a statement of professional judgment/explanation (or reference documentation) supporting that the discharge of groundwater contaminants into the surface water is not anticipated to have unacceptable impacts to the receiving surface water, sediments, or eco-system.

\_\_\_\_\_ If no - (the discharge of "contaminated" groundwater into surface water is potentially significant) - continue after documenting: 1) the maximum known or reasonably suspected concentration of each contaminant discharged above its groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) for any contaminants discharging into surface water in concentrations<sup>3</sup> greater than 100 times their appropriate "level(s)," and if estimated total amount (mass in kg/yr) of each of these contaminants that are being discharged (loaded) into the surface water body (at the time of the determination), and identify if there is evidence that the amount of discharging contaminants is increasing. .

\_\_\_\_\_ If unknown - enter "IN" status code in #8.

**Rationale and Reference(s):**

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Stream data samples were collected since 2001 in three sample locations. Results were compared to the SWQC, the Groundwater MSCs for Used Aquifer Residential and Non-Residential and the Human Health Criteria specified in Pennsylvania Code Title 25 Chapter 16.51, "Water Quality Criteria for Toxic Substances" (first adopted March 1989, last amended November 2000). Comparison of surface water data to MSC and SWQC criteria indicate exceedances of total iron in 2005, 2006, 2007, and 2008 sample data. Total and dissolved manganese was also detected above MSCs in the most downgradient sample point in 2005 but was below PA SWQC criteria.

In 2004, procedures provided in Act 2 guidelines were used to calculate and model the impact of the diffuse discharge of groundwater containing arsenic and manganese to the stream. According to projections of in-stream manganese concentrations presented in documents reviewed, the average of the Site-Specific standards for manganese (4.071 mg/l) will not unduly impact the surface water stream to the south of the Sanitary Landfill.

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<sup>2</sup> As measured in groundwater prior to entry to the groundwater-surface water/sediment interaction (e.g., hyporheic) zone.

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6. Can the **discharge** of "contaminated" groundwater into surface water be shown to be "**currently acceptable**" (i.e., not cause impacts to surface water, sediments or eco-systems that should not be allowed to continue until a final remedy decision can be made and implemented<sup>3</sup>)?

\_\_\_\_\_ If yes - continue after either: 1) identifying the Final Remedy decision incorporating these conditions, or other site-specific criteria (developed for the protection of the site's surface water, sediments, and eco-systems), and referencing supporting documentation demonstrating that these criteria are not exceeded by the discharging groundwater; OR 2) providing or referencing an interim-assessment<sup>4</sup> appropriate to the potential for impact, that shows the discharge of groundwater contaminants into the surface water is (in the opinion of a trained specialists, including ecologist) adequately protective of receiving surface water, sediments, and eco-systems, until such time when a full assessment and final remedy decision can be made. Factors which should be considered in the interim-assessment (where appropriate to help identify the impact associated with discharging groundwater) include: surface water body size, flow, use/classification/habitats and contaminant loading limits, other sources of surface water/sediment contamination, surface water and sediment sample results and comparisons to available and appropriate surface water and sediment "levels," as well as any other factors, such as effects on ecological receptors (e.g., via bio-assays/benthic surveys or site-specific ecological Risk Assessments), that the overseeing regulatory agency would deem appropriate for making the EI determination.

\_\_\_\_\_ If no - (the discharge of "contaminated" groundwater can not be shown to be "**currently acceptable**") – skip to #8 and enter a "NO" status, after documenting the currently unacceptable impacts to the surface water body, sediments, and/or eco-systems.

\_\_\_\_\_ If unknown – skip to 8 and enter "IN" status code.

**Rationale and Reference(s):**

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<sup>3</sup> Note, because areas of inflowing groundwater can be critical habitats (e.g., nurseries or thermal refugia) for many species, appropriate specialist (e.g., ecologist) should be included in management decisions that could eliminate these areas by significantly altering or reversing groundwater flow pathways near surface water bodies.

<sup>4</sup> The understanding of the impacts of contaminated groundwater discharges into surface water bodies is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration to be reasonably certain that discharges are not causing currently unacceptable impacts to the surface waters, sediments or eco-systems.

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7. Will groundwater **monitoring** / measurement data (and surface water/sediment/ecological data, as necessary) be collected in the future to verify that contaminated groundwater has remained within the horizontal (or vertical, as necessary) dimensions of the "existing area of contaminated groundwater?"

- X        If yes - continue after providing or citing documentation for planned activities or future sampling/measurement events. Specifically identify the well/measurement locations which will be tested in the future to verify the expectation (identified in #3) that groundwater contamination will not be migrating horizontally (or vertically, as necessary) beyond the "existing area of groundwater contamination."
- If no - enter "NO" status code in #8.
- If unknown - enter "IN" status code in #8.

**Rationale and Reference(s):**

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The Sanitary Landfill has impacted the groundwater, is currently being monitored, and will continue to be monitored as per the most recent post-closure plan in accordance with the requirements of an October 22, 1984 Order of the Commonwealth Court of Pennsylvania and a Stipulation of Parties dated September 28, 1984. The current requirements for monitoring/measurement are as follows:

Groundwater samples from monitoring wells P05, W16, W17, W18 W19, W20, WR07 and leachate should be collected annually in April of each year until termination criteria is initiated by WMI. Until termination is initiated samples will be analyzed for select organics, metals and indicator parameters including:

**Organics:**

1,1-dichloroethane  
benzene  
ethylbenzene  
toluene  
trans-1,2-dichloroethene  
trichloroethene  
vinyl chloride  
total xylenes  
1,2-dichloroethane  
cis-1,2-dichloroethene  
tetrachloroethene  
1,4-dichlorobenzene  
methylene chloride

**Metals (total & dissolved):**

arsenic  
barium  
cadmium  
chromium  
iron  
lead  
zinc  
copper – from P05 only

**Indicator Parameters:**

alkalinity  
chloride  
specific conductivity  
pH  
ammonia  
nitrate  
sulfate





Facility Name: Lyncott Corp Landfill  
 EPA ID #: PAD060506805  
 Location: Road 1, Route 1554 New Milford, Pennsylvania 18834

### MIGRATION OF CONTAMINATED GROUNDWATER UNDER CONTROL (CA 750)

