

**DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION**

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

**Facility Name:** Northeast Environmental Services, Inc.(NES)  
**Facility Address:** 4123 Canal Road, Canastota, NY, 13032  
**Facility EPA ID#:** NYD057770109

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 unites (RU), and Areas of Concern (AOC), been considered in this EI determination?

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 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 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).

2. Are groundwater, soil, surface water, sediments, or air media 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 (from SWMUs, RUs or AOCs)?

	<u>Yes</u>	<u>No</u>	<u>?</u>	<u>Rationale / Key Contaminants</u>
Groundwater	<u>X</u>	___	___	<u>Groundwater monitoring: Volatile Organic Contaminants (VOCs).</u>
Air (indoors) <sup>2</sup>	<u>X</u>	___	___	<u>Soil sampling under building &amp; Groundwater Data.</u>
Surface Soil (e.g., <2 ft)	___	<u>X</u>	___	<u>Soil sampling: VOCs.</u>
Surface Water	___	<u>X</u>	___	<u>No impact from facility releases.</u>
Sediment	___	<u>X</u>	___	<u>No impact from facility releases.</u>
Subsurf. Soil (e.g., >2 ft)	<u>X</u>	___	___	<u>Soil sampling: VOCs.</u>
Air (outdoors)	___	<u>X</u>	___	<u>No impact from facility releases.</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):**

#### **Facility and Release Sources**

Northeast Environmental Services, Inc.(NES) was a commercial treatment and storage facility on Canal Road in the Town of Lenox, Madison County, New York, from September 5, 1986 until the facility was closed by order of the State Supreme Court on July 24, 2001, due to non-compliance with local fire and building codes. The NYSDEC revoked NES’ operating permit in January, 2002. The facility is located outside of the Village of Canastota in the Town of Lenox, but has a Canastota mailing address (Figure 1). The facility is located in a

<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 appropriately protective risk-based “levels” (for the media, that identify risks within the acceptable risk range).

<sup>2</sup> 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.

rural area, surrounded by active farmland. The nearest residential dwelling is approximately 2,000 feet from the facility to the east, west and north. Dwellings to the south are a greater distance away, across the Erie Canal. There are no industrial or commercial buildings within the immediate vicinity of the facility.

NES, Inc. was a treatment and storage facility for hazardous and non-hazardous wastes. No wastes were disposed of on-site, and treatment and storage operations were completely contained within the building. Materials that are explosive, radioactive, or contained PCBs from a source that contained greater than or equal to 50 ppm PCBs were not accepted by NES, Inc. The facility's operation involved the processing, blending and preparation of hazardous and non-hazardous wastes for final disposal. Some examples of the hazardous wastes that were handled are industrial solvents, ink and paint residues, acids, caustics, lab chemicals and bleach. Examples of non-hazardous wastes are oil contaminated debris, latex paint, waxes and resins.

Prior to its purchase in September 1986, the facility was owned by the Haz-O-Waste Corporation. The Haz-O-Waste Corporation operated the site as a TSD facility for hazardous and industrial wastes. Hazardous waste management operations began at the facility on August 31, 1976.

NES, Inc. investigated two Solid Waste Management Units (SWMU) at the facility. The SWMUs were the truck unloading area and the outside storage area. Based upon the investigations, it determined that hazardous waste constituents have been released to the soil and groundwater beneath the facility. Samples of soil and groundwater have demonstrated contamination at levels exceeding state standards. The most significant contamination has been by volatile organic contaminants (VOCs), which are residual in the site soils (including those under the site structures) and have migrated to the north across the length of the facility via groundwater.

## **Geology**

Based on the data from the many borings drilled at the site, the geologic materials in the upper 30 -35 feet across the site is generally composed of a reddish-brown to reddish-gray fine sand and silt. This unit becomes somewhat coarser and less silty with depth. Lenses of fine to medium sand, and occasionally gravel have been identified within the fine sand unit. These lenses appear to be interconnected to some degree, but are structurally complex, and have not been fully characterized.

Immediately underlying the upper fine sand and silt unit is a several foot thick layer of compact till. This till unit is composed of an unstratified and variable mixture of particle sizes, ranging from silt and clay to rounded - subangular gravels, and has been described as a basal till. The till layer represents a lower boundary to the upper sand aquifer, which is the primary aquifer of concern and appears to be continuous across the site. Due to concerns about penetrating this layer and possibly providing a conduit to lower aquifers, the thickness of the till layer has only been determined at two locations (one upgradient and one downgradient, but off-plume). Thickness at WP-12 was 2 feet min and has been estimated to be approximately 5 feet. Recoveries during drilling did not allow more precise measurement. Thickness at WP-13 was approximately 5 feet thick. Only one boring, located to the north of the site, did not encounter the till layer at an expected depth. It is not known if the till is absent or just deeper at this location.

Underlying the basal till layer is a second sand unit. Only a small number of borings have penetrated into this unit, so it has not been well characterized and its thickness is not known.

Borings have not been drilled to bedrock in the study area, so its depth is not known. However interpretations from other published information suggests that the depth to bedrock beneath the site is at least 40 - 60 feet.

### **Hydrogeology**

Investigations performed at the site have identified two unconsolidated aquifers beneath the NES site. The upper 30-35 foot thick fine sand and silt unit is an unconfined water table aquifer. It is this unit that has been impacted by site contaminants and is presently the primary aquifer of concern. The depth to groundwater is between two (2) and four (4) feet below grade across the site, with groundwater flow (under non-pumping conditions) generally to the north-northwest. Groundwater flow rates have been calculated at around 100 feet per year for this unit, in general. Lenses of medium to coarse sands and occasionally gravels are present within this unit, generally increase in frequency and grain size with depth, and appear to be some somewhat interconnected. Consequently, these lenses are thought to be having an effect on groundwater flow and contaminant migration. Groundwater flow rates within interconnected coarser layers are not known, but can be expected to exceed the values calculated for the upper sand unit in bulk.

The second unconsolidated aquifer is a lower confined or semi-confined sand unit, which is physically and hydraulically separated from the upper sand unit by the intervening layer of basal till. The numerous borings drilled have shown the till unit to be at least several feet in thickness and to be continuous across the site. One boring north of the site did not encounter till at the expected depth, but it is not known whether this unit it is missing or just deeper at that location. Two piezometer sets have been installed that include piezometers screened in both the upper and lower sand units. Data from these piezometer sets have indicated an upward hydraulic gradient exists across the till unit. Due to the measured upward gradient and the density and continuity of the till layer, migration of site contaminants into the lower aquifer unit is not likely to occur beneath the site.

### **Topography**

According to the USGS Topographic Map of Oneida, New York, the site is approximately 429 feet amsl. The topography of the site is generally flat with a slight slope to the north and a slight rise to the south of the site. Surface water runoff is generally from south to north across the site, via a series of buried drainage pipes that reportedly drain to a common shallow ditch that traverses the northern portion of the site. The shallow ditch drains in a general northerly direction and intersects a similar shallow ditch positioned in an east-to-west orientation along the northern edge of the subject property. The intercepting trench appears to drain in a westerly direction away from the site, in the general direction of Dutch Settlement Creek.

### **Groundwater**

In order to contain and treat the contaminated groundwater, a groundwater extraction and treatment system was installed at the site in April 1993. The groundwater treatment system is designed to operate at a rate of up twenty (20) gallons per minute, initially pumping from one centrally located withdrawal well (WP-R1). The

system was modified in April 1998, by the addition of a second withdrawal well (WP-5D), after data showed significantly increasing levels of vinyl chloride in a monitoring well near the physical limits of hydraulic containment from the initial withdrawal well. The vinyl chloride levels reached a high of several parts-per-million (ppm) in 1997, at which time this well was converted to a second pumping well. This well continues to be operated in concert with original recovery well. Piezometric monitoring data now show adequate plume capture on-site (Figure 2). The source of the vinyl chloride spike in monitoring well MW-5D has never been positively determined.

Two separate studies, including the most recent investigation, have shown concentrations of VOCs at a few hundred parts-per-billion (ppb) at the northern property line. After beginning pumping from MW-5D in 1998, VOC concentrations dropped off quickly in monitoring well MW-16D, which is located between MW-5D and the northern property line, indicating that a portion of the plume to the north of well MW-5D had been captured. Since that time, additional wells have been installed and sampled at the site, and the most recent data show that VOC concentrations in the few hundred ppb range still exist at the northern property line. Considering all of the available data and the current hydrogeologic characterization, it is most reasonable to conclude that the high concentration vinyl chloride plume, impacting MW-5D, was quite narrow and possibly followed a preferential flow path(s) between the monitoring points in place at the time. The resultant shift in groundwater flow directions, from pumping of the original recovery well, may have caused the vinyl chloride plume to then move through MW-5D.

In this scenario, and based on all available groundwater quality data, there is a strong possibility that elevated levels of VOCs may have escaped from the site prior to attainment of the current level of hydraulic control. Such a plume would have had to be narrow, but most likely would have contained concentrations of vinyl chloride higher than those seen in well MW-5D, prior to its start of pumping. The significance of plume migration off-site has not been fully evaluated. A few groundwater samples were collected north of the site, which were found to be free of VOCs, however these sample locations may not have been of sufficient density to intercept the plume and the samples might not have been collected at all appropriate depths.

In summary, and after consideration of all available site data, it is reasonable to conclude that VOCs levels in excess of groundwater standards have migrated off-site in a generally northerly direction, within the upper fine sand aquifer. The extent the off-site migration and VOC concentrations are not known. Considering the site's long term release history and likely groundwater flow rates, contaminants could have migrated a considerable distance. Additional investigation are planned to better evaluate the conditions off-site.

The New York State Department of Health (NYSDOH) has periodically sampled private wells located in the downgradient direction from the site. The latest samples were taken in 1999 and no impacts from the site were detected. In the interim, and until additional off-site plume characterization can be completed, NYSDEC has recommended to the NYSDOH that the periodic monitoring of nearby private wells be done every three years unless additional data indicate a higher risk level. The distance to downgradient groundwater users, and expected natural dilution and attenuation of any fugitive plume, all act to reduce the likelihood of significant impact to existing private wells near the site. The nearest residential dwellings are approximately 2,000 feet sidegradient and 3,000 feet downgradient of the facility.

**Key Contaminants:** 1,1,1-trichloroethane, toluene, xylene, 4-methyl-2-pentanone (MIBK),

1,2-dichloroethene, chloroethane, vinyl chloride.

**References:**

*Subsurface Soil and Groundwater Remedial Investigation Report for the Former Northeast Environmental Services, Inc. Site*, Strategic Environmental Management, Inc., December 23, 2002.  
*1999 Annual/2000 First Quarter Groundwater Monitoring System Report Northeast Environmental Services, Inc.*, MEI Environmental Group, Inc., July 2000.  
*RCRA Facility Investigation: Soil Northeast Environmental Services, Inc.*, INTEX, November 4, 1992.

**Air (indoor)**

Investigations have shown that hazardous waste constituents have been released to the soil and groundwater beneath the facility. Thus, there is a possibility that there may be some contaminants impacting the indoor air quality in the building located at the facility. The facility ceased operations in July 2001. There are no active process and/or administrative areas at the facility. The building at the facility is currently vacant. Even though there is a possibility that air quality inside the buildings is impacted by underlying contamination, absence of any potential receptors eliminates any concern regarding human exposure and its impact on human health.

It is reasonable to conclude that there is no off-site indoor air impacts from soil gas vapor intrusion. The nearest residential dwellings are approximately 2,000 feet sidegradient and 3,000 feet downgradient of the facility. The New York State Department of Health (NYSDOH) has periodically sampled private wells located in the downgradient direction from the site and this testing shows that groundwater impact has not occurred, so there is no potential for adverse indoor air exposure (see groundwater above).

**Surface Soil (e.g. < 2 ft.) and Subsurface Soil (e.g. > 2 feet)**

Comparison of all available soils data to Recommended Soil Cleanup Objective values presented in TAGM 4046 *Determination of Soil Cleanup Objectives and Cleanup Levels* showed several parameters which exceeded the TAGM.

Many soil samples have been taken at the site to characterize the nature and extent of contamination. Figure 3 shows soil sample locations near the building from the Subsurface Soil and Groundwater Remedial Investigation Report, December, 2002. These samples were analyzed for volatile and semi-volatile organic, pesticides, polychlorinated biphenyls (PCBs) and metals. Based on the results from the investigations, the following table represents contaminants found in soils at the site. The soil contamination was found near (i.e. within 50 feet) or under the building at the site. The Complete list of contaminants and their concentrations can be found in *Subsurface Soil and Groundwater Remedial Investigation Report for the Former Northeast Environmental Services, Inc. Site*, December 23, 2002 and *RCRA Facility Investigation: Soil Northeast Environmental Services, Inc.*, November 4, 1992.

Chemicals of Concern in Soils:

Contaminant of Concern	Maximum Concentration (ppb)	TAGM value (ppb)
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acetone	730,000	110
ethylbenzene	160,000	5500
toluene	950,000	1500
xylene	510,000	1,200
4-methyl-2-pentanone (MIBK)	8,000	1000

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

<b><u>“Contaminated” Media</u></b>	Residents	Workers	Day-Care	Construction	Trespassers
Recreation Food <sup>3</sup>		<b><u>NO</u></b>	<b><u>NO</u></b>	<b><u>NO</u></b>	<b><u>NO</u></b>
Groundwater		<b><u>NO</u></b>			
Air (indoors)	<b><u>NO</u></b>	<b><u>NO</u></b>	<b><u>NO</u></b>		
Soil (surface, e.g., <2 ft)	<b><u>NO</u></b>	<b><u>NO</u></b>	<b><u>NO</u></b>	<b><u>YES</u></b>	<b><u>NO</u></b>
					<b><u>NO</u></b>
					<b><u>NO</u></b>
<del>Surface Water</del>					
<del>Sediment</del>					
Soil (subsurface e.g., >2 ft)			<b><u>YES</u></b>		<b><u>NO</u></b>
<del>Air (outdoors)</del>					

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).

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 and Reference(s):**

#### **Groundwater:**

See answer to question 2 above regarding groundwater.

#### **Indoor Air:**

See answer to question 2 above regarding indoor air.

### **Surface Soils and Subsurface Soils:**

#### **Rationale:**

The NYSDEC is currently managing the site and will require a Health and Safety plan from any contractor hired to perform work at the site. The health and safety plans will address exposure to soils for maintenance and construction workers and for site excavation work. In addition, the portion of the facility that has soil contamination is completely fenced or under the building, and posted to help prevent trespassers from entering the site. The site is not used for recreation or food production.

#### **References:**

*Subsurface Soil and Groundwater Remedial Investigation Report for the Former Northeast Environmental Services, Inc. Site*, Strategic Environmental Management, Inc., December 23, 2002.  
*RCRA Facility Investigation: Soil Northeast Environmental Services, Inc.*, INTEX, November 4, 1992.

4. Can the exposure from any of the complete pathways identified in #3 be reasonably expected to be “significant”<sup>2</sup> (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)?

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<sup>2</sup>

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.

X   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):**

See responses to questions 2 and 3.

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):**

Not applicable, see responses to questions 2, 3 and 4.

6. Check the appropriate RCRIS status codes for the Current Human Exposures Under Control EI event code (CA 725), 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** - 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 Northeast Environmental Services, Inc. facility, EPA ID# NYD057770109, located at 4123 Canal Road, Canastota, NY 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.

Approved by: Original signed by: \_\_\_\_\_

Date: 9/30/2003

Stephen G. Malsan  
Environmental Engineer I  
New York State Department of Environmental Conservation (NYSDEC)

And

\_\_\_\_\_

Date:

Robert J. Phaneuf  
Chief, Hazardous Waste Engineering Western Section  
NYSDEC

Supervisor: \_\_\_\_\_

Date:

Edwin Dassatti  
Director, Bureau of Hazardous Waste and Radiation Management  
NYSDEC

Locations where References may be found:

NYSDEC  
Division of Solid and Hazardous Materials  
625 Broadway  
Albany, NY 12233-7258

Contact telephone and e-mail numbers

Stephen Malsan, (518) 402-8594, E-Mail: [sgmalsan@gw.dec.state.ny.us](mailto:sgmalsan@gw.dec.state.ny.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.**