DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

RCRA Corrective Action
Environmental Indicator (EI) RCRAInfo code (CA750)
Migration of Contaminated Groundwater Under Control

Facility Name: **Clean Earth of North Jersey, Inc. (formerly S&W Waste, Inc.)**
Facility Address: **115 Jacobus Avenue, Kearny, New Jersey 07032**
Facility EPA ID#: **NJD991291105**

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 "Migration of Contaminated Groundwater Under Control" EI

A positive "Migration of Contaminated Groundwater Under Control" EI determination ("YE" status code) indicates that the migration of "contaminated" groundwater has stabilized, and that monitoring will be conducted to confirm that contaminated groundwater remains within the original "area of contaminated groundwater" (for all groundwater "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 "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, contaminatedgroundwater to be suitable for its designated current and future uses.

Duration / Applicability of EI Determinations

EI Determination status codes should remain in the RCRAInfo national database ONLY as long as they remain true (i.e., RCRAInfo status codes must be changed when the regulatory authorities become aware of contrary information).

Facility Information

The Clean Earth of North Jersey, Inc. (CENJ) site, formerly known as S&W Waste (S&W), is located on approximately six acres of land in heavily industrialized Kearny, New Jersey. A site map, showing facility features and lot locations, is provided as Drawing 1 from the Groundwater Remedial Investigation

Work Plan (Ref. 2). The CENJ site is bordered to the north by property formerly owned by Public Service Electric and Gas Company (PSE&G) and now owned by Melon Leasing Corporation, Inc. (Melon). Conrail rail lines and rights-of-way pass by the facility to the north and east. CENJ is bounded to the south by the former Syncon Resins facility (now a Superfund site with known soil and groundwater contamination), and to the west by the Passaic River. Other properties in the area that are subject to environmental investigation include Koppers Coke, Monsanto Chemical Company, and AT&T Technologies/Western Electric.

The CENJ site has been used for a variety of purposes throughout its operational history, including storage of construction equipment and material and marine salvage operations. Beginning in October 1984, and continuing to date under an active solid and hazardous waste permit from the New Jersey Department of Environmental Protection (NJDEP), the site has been used for hazardous waste treatment, storage, and transfer operations. CENJ receives a variety of waste streams from off-site generators for treatment via waste blending, solvent reclamation, solidification and stabilization, container repackaging, and/or waste homogenization. Other wastes are staged on site without processing prior to transfer to off-site hazardous waste treatment, storage, or disposal facilities. Except for temporary staging of incoming waste transport vehicles, waste management operations at the CENJ site are conducted within paved and bermed areas to minimize the potential for environmental impacts.

Environmental investigation efforts were initiated at the CENJ site in the early 1980s and have continued sporadically through 2009. Nine groundwater quality monitoring wells were installed at the site and sampled over time to assess groundwater quality. Preliminary Assessment (PA) activities were completed at six solid waste management units (SWMUs) in 1986, and a grid-based site-wide surface soil sampling program was conducted in 1989 and 1990. To further guide environmental investigation and any necessary corrective actions, NJDEP issued an Administrative Order on Consent to CENJ (then S&W Waste) in 1991. Remedial Investigation (RI) field activities were conducted at 11 areas of environmental concern (AECs) in 1992. Data from these investigations indicated a variety of organic and inorganic contaminants in soil and groundwater. However, based on all available investigation and groundwater monitoring efforts, CENJ and NJDEP determined that corrective actions were only required to address inorganic contamination in shallow groundwater.

To minimize migration of contamination to groundwater, CENJ removed and disposed of approximately 231 tons of lead-contaminated soil from two on-site locations. A low-permeability asphalt cap was also installed across the eastern portion of the site, and an improved stormwater run-on/run-off control system was implemented. A Declaration of Environmental Restrictions (DER) was filed with Hudson County on February 4, 1998, to limit future use of the property to industrial or commercial activities and prevent disturbance of the asphalt cap and underlying soil (Ref. 1). The DER was superseded by an updated deed notice on March 26, 2009, following implementation of capital improvements at the site (Ref. 4). CENJ conducted a Supplemental Groundwater Remedial Investigation in 2008 and 2009, ultimately concluding that inorganic lead and arsenic contamination in shallow groundwater was attributable to the presence of historic fill in the area (Ref. 3). Accordingly, no further action appears to be necessary to address environmental contamination at this site.

Reference:

1. Remedial Action Report for S&W Waste. Prepared by Sadat Associates, Inc. Dated December 1997.
2. Groundwater Remedial Investigation Work Plan. Prepared by Compliance Plus Services, Inc. Dated August 2008.

3. Revised Supplemental Groundwater Remedial Investigation Report. Prepared by Compliance Plus Services, Inc. Dated July 2009.
4. Letter from Donna Gaffigan, NJDEP, to Robert Fixter, CENJ, re: Remedial Action Report. Dated May 27, 2011.

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.

Summary of Areas of Concern (AOCs) and Groundwater Impacts:

RCRA-Regulated Units

Hazardous wastes are stored in a variety of RCRA-regulated units at the CENJ site (Ref. 6). Regulated units presently in active use or proposed for the site include the Loading/Unloading Dock, Concrete Pad, and Box Trailer; Container Storage Areas A through L; a processing/storage building; a tanker storage area; a containment building; hazardous waste storage tanks; and solidification/stabilization areas. There are no releases of hazardous constituents from these units that warrant corrective action.

On-Site SWMUs and AECs

As stated previously, environmental investigation efforts at the CENJ site initially focused on the six SWMUs and 11 AECs listed in Table 1 below. All of the SWMUs and AECs are located on CENJ property, except for SWMU 5 which is located on the adjacent Melon property. A portion of AEC F also extends onto the Melon property (Refs. 2 and 3). The locations of all AECs and several SWMU are shown on Drawing 1 of Attachment A to the August 2008 Groundwater Remedial Investigation Work Plan (Ref. 8).

Table 1. Former SWMUs and AECs at the CENJ Site

SWMUs Identified During the PA (Ref. 1)	AECs Evaluated During the RI (Ref. 3)
SWMU 1, Wastewater Tank	Area A, Staging Areas for Incoming Hazardous Waste
SWMU 2, Fuel Blending Tank	Area B, Empty Rolloff Storage Area
SWMU 3, Drum Storage Area	Area C, Former Staging Area for Outgoing Bulk Waste Tankers
SWMU 4, Bulk Storage Area	Area D, Former Bulk Waste Storage Area
SWMU 5, Quality Control (QC) Area	Area E, Known Spill Area
SWMU 6, Solidification Pads	Area F, Stormwater Overflow Areas Near Entrance Gate
	Area G, Former Location of Underground Storage Tanks
	Area H, Stabilization Pad Area
	Area I, High Truck Traffic Area
	Area J, Former Bulk Waste Storage Area
	Area K, Stormwater Overflow Areas Between Maintenance Facility and Lab Pack Processing Area

Although these SWMU and AEC designations were used to guide initial investigation efforts, on-site corrective actions and "no further action" decisions are being organized by media.

Off-Site Areas of Concern (AOCs)

In 2000, two site-related AOCs were identified on the Melon property adjacent to and north of the CENJ site during that facility's PA effort (Ref. 5). The PA was conducted by Melon, in accordance with a Remediation Agreement with NJDEP pursuant to the Industrial Site Recovery Act, N.J.S.A. 13:1K-6 et.seq., prior to purchase of the property. Melon maintains a right-of-way for overhead electrical power lines. In addition, underground liquid petroleum pipelines and underground fiber optic lines are buried on this property.

An area of approximately 40' x 100' on the Melon property was leased by S&W between 1984 and 1989 for use as a Quality Assurance and Quality Control (QA/QC) dock and employee parking area. The area has been designated as PSE&G AOC A and CENJ SWMU 5. This area was "closed" pursuant to a closure plan between 1989 and 1991. All wastes were removed from the area, contaminated structures were decontaminated or removed, and the area was lined with a plastic liner and covered with asphalt (Ref. 2). Surface soil samples collected around the dock as part of the closure activities and spill response actions contained hexachlorobenzene and chlorinated dioxins/furans significantly above applicable NJDEP nonresidential direct contact soil cleanup criteria (NRDCSCC) (Ref. 7). However, a review of CENJ inspection reports for the former QA/QC dock and parking area indicated a history of only minor spills that were immediately addressed and did not require follow-up investigation or corrective action (Ref. 5). These records do not indicate that poor housekeeping or spills are the source of contamination reported in area soil. Accordingly, NJDEP has indicated that they do not believe that the soil and groundwater contamination in the vicinity of the "Old QC Dock" is the result of activities conducted by S&W Waste, Inc., the predecessor of CENJ (Ref. 10). In June 2011, NJDEP issued a Notice of Deficiency to Melon requiring them to delineate soil and groundwater contamination in this area (Ref. 9). As a result, this area will not be considered further in the EI determination for CENJ.

The PSE&G Report also identifies an area impacted by discharge of oily stormwater runoff flowing through the main gate of the former S&W Waste property in September 1985, and pooling on the Melon property (Ref. 5). This area has been designated as PSE&G AOC D and appears to overlap with CENJ AEC F. Flow onto the Melon site was due to unusually high amounts of precipitation associated with Hurricane Gloria, which resulted in overflow of the S&W Waste stormwater basin. This stormwater consisted of runoff from traffic areas only (non-processing areas) and was nonhazardous (Ref. 5). Immediately after this overflow incident, drainage conditions at the S&W Waste property were modified to include grading, lining, and capping. The grading specifically included elevating, pitching, and paving the main gate driveway, such that all stormwater would drain back toward the S&W Waste property. The potentially affected area on Melon property has also been graded and paved. In addition to affecting the off-site area, the September 1985 overflow incident would have also impacted the on-site area identified as CENJ AEC F. Soil contamination reported across the CENJ site (including at AEC F) is below applicable NJDEP NRDCSCC and impact to groundwater soil cleanup criteria (IGWSCC), or has been attributed to historic fill (Refs. 4 and 7). Thus, any site-related soil contamination at the former PSE&G AOC D would likely be similarly below applicable NJDEP cleanup standards. Furthermore, based on the extremely limited duration of the overflow event onto the Melon property, it is unlikely that groundwater would have been significantly impacted by this event. For these reasons, any potential site-related impacts at PSE&G AOC D will not be addressed further in this EI determination.

Summary

All identified areas of soil contamination at the CENJ site have been paved with concrete or asphalt. In fact, Drawing E-019 from the Groundwater Remedial Investigation Work Plan (Ref. 8) shows that all but the easternmost and westernmost sections of the active southern portion of the site are covered by asphalt

or concrete surfaces with low permeability. The two AOCs on the Melon property previously associated with CENJ have also been paved with asphalt.

References:

1. Preliminary Assessment for S&W Waste. Prepared by EPA. Dated June 19, 1986.
2. Letter from Thomas Sherman, NJDEP, to Robert Fixter, S&W Waste, re: Closure Certification for Old Quality Control Dock. Dated September 9, 1991.
3. Final Remedial Investigation Report for S&W Waste. Prepared by Sadat Associates, Inc. Revised April 27, 1995.
4. Remedial Action Report for S&W Waste. Prepared by Sadat Associates, Inc. Dated December 1997.
5. Preliminary Assessment Report for PSE&G. Prepared by Sadat Associates, Inc. Dated May 22, 2000.
6. Hazardous Waste Facility Permit. Issued by NJDEP on June 30, 1998 and most recently modified on April 3, 2006.
7. Letter from Donna Gaffigan, NJDEP, to William Moscatello, Melon Leasing Corporation, re: PA Report for PSE&G Electric Transmission Line Right-of-Way. Dated May 22, 2006.
8. Groundwater Remedial Investigation Work Plan. Prepared by Compliance Plus Services, Inc. Dated August 2008.
9. Letter from Donna Gaffigan, NJDEP, to William Moscatello, Melon Leasing Corporation, re: Remedial Investigation Work Plan Addendum. Dated June 15, 2011.
10. Letter from Donna Gaffigan, NJDEP, to Robert Fixter, CENJ, re: Revised Supplemental Groundwater Remedial Investigation Report. Dated September 26, 2012.

2. Is **groundwater** known or reasonably suspected to be "**contaminated**"[1] above appropriately protective "levels" (i.e., 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?

___ If yes - continue after identifying key contaminants, citing appropriate "levels," and referencing supporting documentation.

_X_ 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:

Hydrogeological Background

Based on information obtained at the CENJ site and nearby Monsanto and Syncon Resins sites, this region can be described as historically marshland converted into land with fill material. The native geology is characterized by four distinct strata associated with the Pleistocene and Recent Epochs (Ref. 1). In order of increasing depth, these strata include:

- A silt and sand layer approximately 2.5 to 8 feet thick, intermingled with fill material, including cinders, glass, ceramic, brick, coal, gravel, wood, concrete, asphalt (Ref. 5);
- A highly plastic clay layer approximately 10 feet thick;
- A medium sand layer approximately 10 feet thick; and
- A deep silty clay and very fine sand layer.

The deep clay layer beneath the site is believed to be underlain by Brunswick shale at a depth of approximately 60 feet below ground surface (bgs). The upper portion of this shale bedrock has been extensively weathered, resulting in a network of fractures in the bedrock.

Three aquifers have been identified in the regional geologic sequence for the CENJ site area: a shallow water table aquifer encountered in the upper sand unit at approximately 3 to 4 feet bgs; a second aquifer in the medium sand layer; and a deep aquifer in the weathered portion of the Brunswick shale. The clay layer immediately underlying the upper sand unit and shallow aquifer is highly impermeable, with measured hydraulic conductivities ranging between 1.85×10^{-6} and 5.21×10^{-7} centimeters per second (cm/s) (Ref. 1). Furthermore, logs from on-site soil borings and wells suggest that this clay layer is continuous across the entire CENJ site. Consequently, shallow groundwater is not believed to be hydraulically connected to deeper groundwater beneath the CENJ site. Based on the lack of a significant migration pathway, and dissimilar contamination between the shallow and deeper aquifers at nearby sites, NJDEP has determined that no further action is needed for the deeper aquifers beneath the CENJ site (Ref. 3). Consequently, only the shallow aquifer will be considered further in this EI determination.

[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 appropriate "levels" (appropriate for the protection of the groundwater resource and its beneficial uses).

Historic groundwater flow in the shallow aquifer was predominantly from the northeast corner of the site to the west-southwest toward the Passaic River and the Syncon Resins site (Ref. 1). A second component of groundwater flowed south toward the confluence of the Passaic and Hackensack Rivers. Flow velocity is slow at a rate of $3x10^{-5}$ cm/s, with a near-horizontal gradient adjacent to the river (Ref. 1). After an asphalt cap was placed over the eastern portion of the site and a stormwater collection system was installed in 1997, a groundwater mound formed in the shallow aquifer in the vicinity of wells SW-2R and SW-7. Shallow groundwater flowed from this high to the northwest along the Passaic River and northeast toward Jacobus Avenue (Ref. 5).

Additional groundwater elevation data were collected at the site in May and June 2009 to assess potential impacts of Superfund remedial activities (i.e., a slurry wall and groundwater extraction system) in operation at the Syncon site, which borders the CENJ site to the south. These and other water level data indicate a mounding of groundwater in the center of both sites, which creates divergent flow in shallow groundwater. As shown on the June 2009 Groundwater Flow Map in the Revised Supplemental Groundwater Remedial Investigation Report (Ref. 7), shallow groundwater beneath the western half of each site flows west toward the Passaic River, while shallow groundwater beneath the eastern portion of the property flows to the northeast.

Early Groundwater Investigation

In 1984, under a temporary operating authorization and prior to beginning hazardous waste operations, S&W Waste installed four groundwater monitoring wells around the site (i.e., at the eastern, northern, and southern property boundaries, and west of the active waste management area). The wells, designated as SW-1 through SW-4, are approximately 11 feet deep and screened across the shallow aquifer. To monitor groundwater quality, samples were collected from these wells in 1984 and then again between 1992 and 1994 as part of the more comprehensive RI effort involving nine on-site monitoring wells and an upgradient observation well (OW-1) north of the northeastern corner of the CENJ site. Each sample was analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and inorganic constituents.

During the RI effort, six VOCs and five SVOCs were reported above their respective New Jersey Ground Water Quality Criteria (NJ GWQC) for Class II-A groundwater in the on-site shallow aquifer. Most of these constituents (four VOCs and all five SVOCs) were also detected in the upgradient observation well. Although acetone and trichloroethene concentrations were detected above NJ GWQC, these exceedances were reported only on-site and appear to be unrelated to former site operations. Neither constituent was reported at a significant concentration in site soil during the RI. Moreover, acetone may have been attributable to laboratory contamination (Ref. 1). Based on their locations with respect to the CENJ site and their specific groundwater contamination profiles, numerous other sites in the area (listed in the facility information section above) have been identified as possible off-site sources for organic contamination in groundwater. With approval of the Final RI Report on July 22, 1996, NJDEP agreed with CENJ's conclusion that organic contamination in CENJ monitoring wells is attributable to regional groundwater quality in the South Kearny area (Refs. 1 and 3). Thus, no further evaluation of this organic groundwater contamination is provided in this EI determination.

Metals contamination in shallow groundwater is the primary environmental concern at the CENJ site. During the RI, a variety of metals were reported in the upgradient observation well; however, higher concentrations of those same metals were reported in on-site monitoring wells. Table 2 presents a comparison of metals concentrations detected on-site and off-site during the RI; only those hazardous constituents that exceeded their respective NJ GWQC are included in the table.

Table 2. Maximum Metals Concentrations in On-Site and Off-Site Monitoring Wells During the RI (1992 through 1994)

Constituent	NJ GWQC (µg/L)	On-Site Max. (µg/L)	Off-Site Max. (µg/L)
Antimony	6	84.9	38.6 B
Arsenic	3	368	11.2
Cadmium	4	37.1	ND
Chromium	70	87.1	ND
Lead	5	4,980	55
Mercury	2	7.3	ND
Nickel	100	197	ND

µg/L: micrograms per liter
B: Analyte also found in associated blank sample.
ND: Constituent not detected
Source: Reference 1.

Groundwater Monitoring after Corrective Action via Capping

The detected metals contamination in shallow groundwater is believed to be associated primarily with leaching from historic fill in the area (Ref. 3). For this reason, CENJ and NJDEP implemented a corrective action strategy to minimize continued migration of contaminants from on-site soil to underlying groundwater. Between November 1996 and January 1997, a total of 231 tons of contaminated soil was excavated from two areas with the highest reported lead concentrations in surface and subsurface soil: east of Storage Pad C near the center of the site in the vicinity of soil boring SB-4, and at the northern edge of the site in the vicinity of soil boring SB-5 (Ref. 2). Although post-excavation soil samples indicated residual lead exceedances, the intent of the removal was not to eliminate direct contact risks, but rather to reduce the quantity of lead available for leaching to groundwater. With off-site disposal of the lead-contaminated hot spot soil, one corrective action objective was achieved.

After soil excavation was complete, CENJ placed a low-permeability asphalt cap over the eastern, active portion of the site (Ref. 3). The cap consisted of six inches of dense graded aggregate, 2.5 inches of pavement base, and 1.5 inches of surface course. Cap construction was completed on October 24, 1997. An improved surface water drainage system was also installed over the area at this time. This corrective action strategy was intended primarily to minimize infiltration of rain water and surface water run-on, and thereby reduce leaching of contaminants from on-site soil to underlying groundwater. However, the asphalt cap also minimizes direct contact risks associated with lead-contaminated historic fill remaining in place.

To monitor the effect of this corrective action program on shallow groundwater quality, CENJ implemented a two-year groundwater monitoring program including nine on-site wells (SW-1, SW-2R, SW-3, SW-4, SW-5, SW-6, SW-7, SW-8, and SW-9) and one historically upgradient, off-site well (OW-1). These wells are shown on Drawing E-012 in Attachment 1 to the Revised Supplemental Groundwater Remedial Investigation Report (Ref. 7). The program required quarterly sampling at each well for lead, and annual sampling of each well for 11 metals, including aluminum, antimony, arsenic, cadmium, chromium, iron, lead, manganese, mercury, nickel, and sodium (Ref. 3). This monitoring program was initiated in September 1997 and ended in September 1999, after three rounds of annual sampling and ten rounds of quarterly sampling. The highest contaminant concentrations reported during this program are shown in Table 3. Again, only those hazardous constituents that exceeded their NJ GWQC are included.

Table 3. Maximum Post-Capping Groundwater Contaminant Concentrations (µg/L)

Constituent	NJ GWQC	September 1997		September 1998		September 1999	
		On-Site	Off-Site	On-Site	Off-Site	On-Site	Off-Site
Antimony	6	ND	NE	78	ND	35	210
Arsenic	3	574	4	306	7	230	86
Lead	5	28	ND	21	ND	NE	43

µg/L: micrograms per liter
ND: Constituent not detected
NE: Constituent detected at a concentration below the applicable NJ GWQC
Source: Reference 4.

As noted in the table, only three hazardous inorganic constituents were reported above their respective Class II-A NJ GWQC in shallow groundwater. In September 1999, concentrations of both antimony and lead were reported at higher levels off-site than on site, suggesting that the on-site detections of inorganic constituents may also be attributable to regional groundwater quality. Following this investigation, only arsenic and lead were retained as site-related constituents of concern for groundwater (Ref. 7).

In 2006 and 2007, CENJ implemented several capital improvement projects at the site that required temporary disturbance of the engineered asphalt cap (Ref. 5). Specifically, portions of the asphalt cap were removed to facilitate construction of a new locker/lunch room and installation of a new water line on the property. The concrete floor and foundation system of the new locker/lunch room serves as the new engineered control in that area at the southeast corner of the site. Along the water line installation, the asphalt was replaced and the cap was reconstructed. Portions of the asphalt cap along the southern boundary of the site were also removed to allow for construction of two new railroad spurs into the property from Jacobus Avenue. These spurs, necessary for ongoing hazardous waste operations, are supported by asphalt foundations that were installed in such a way as to restore the integrity and protectiveness of the original cap. (CENJ is also leasing a very small portion of Melon property immediately adjacent to Jacobus Avenue to accommodate these spurs.) On August 28, 2008, CENJ submitted a Remedial Action Report (Ref. 5) documenting remedial actions taken in response to disturbance of the previously approved engineering controls (i.e., the asphalt cap), including a revised deed notice recorded with Hudson County on March 26, 2009. NJDEP approved this Remedial Action Report on May 27, 2011 (Ref. 8). The effectiveness of the cap does not appear to have been permanently comprised by implementation of capital improvements at the CENJ site.

Supplemental Groundwater Remedial Investigation

Between December 2008 and June 2009, a supplemental groundwater investigation was conducted at the CENJ site to delineate the vertical and horizontal extent of arsenic and lead contamination in groundwater (Ref. 6). Three rounds of groundwater monitoring were conducted at wells SW-1, SW-2RR, SW-3, SW-4, SW-5, SW-6, SW-7, SW-8R, SW-09, and OW-4 (elevation measurement only). Again, these wells are shown on Drawing E-012 in Attachment 1 to the Revised Supplemental Groundwater Remedial Investigation Report (Ref. 7). To assess the vertical extent of contamination, an attempt was made to sample both the upper 5 feet and lower 5 feet within the roughly 10-foot screened interval at each well.

Samples collected during the December 2008 monitoring event were analyzed for total arsenic and total lead. Samples collected in January and June 2009 were analyzed for both total (unfiltered) and dissolved (filtered) metals. Prior to the June 2009 sampling event, all active wells were redeveloped and allowed to remain undisturbed for a two-week period to permit the wells to achieve equilibrium prior to sampling. This effort was intended to evaluate the possibility that elevated concentrations of arsenic and lead resulted from particulates suspended in the samples, rather than reflecting actual groundwater contaminant levels (Ref. 7).

Maximum arsenic and lead concentrations reported above their respective NJ GWQC during the supplemental groundwater investigation are indicated in Table 4 below. To facilitate comparison against the NJ GWQC, total metals concentrations are provided in the table.

Table 4. Maximum Contaminant Concentrations Detected during the Supplemental Groundwater Investigation (µg/L)

Constituent	NJ GWQC	December 2008		January 2009		June 2009	
		Upper Interval	Lower Interval	Upper Interval	Lower Interval	Upper Interval	Lower Interval
Total Arsenic	3	49	52	NS	NS	59.0	70.4
Total Lead	5	47	97	130	160	28.1	3,290

µg/L: micrograms per liter
NS: Well not sampled for this constituent
Source: Reference 7.

The majority of results obtained during the supplemental investigation indicated total arsenic and total lead levels that were within historic concentration ranges. However, some wells (particularly SW-6 and SW-8R) exhibited total metals concentrations above their respective reference ranges. Available documentation indicates no record of any spills or releases at the site or on the adjacent Melon property that would account for these increases. A review of field notes associated with these wells indicated that the samples exhibited high turbidity, were discolored, and smelled strongly of mud. Well SW-6 is situated close to some of the most intrusive construction completed as part of the rail spur improvements, and the top of the well casing was damaged during construction. Although repairs were made, it is possible that the integrity of this well has been compromised. Similarly, well SW-8R has been damaged by vehicles following new on-site traffic patterns. Although repairs were attempted, it now appears that this well may be subject to significant silt intrusion. It is recommended that both wells be replaced prior to any further sampling that may be conducted at the CENJ site.

Dissolved (filtered) metals concentrations were also compared to their corresponding total (unfiltered) concentrations. Of the nine wells sampled in January and June 2009, only one (SW-6) exhibited a dissolved lead concentration above the NJ GWQC of 5 µg/L (with a detected concentration of 5.5 µg/L). These findings suggest that the elevated lead levels in groundwater at the site are directly related to sediment in the wells. In all but three samples (from wells SW-2RR and SW-5), dissolved arsenic concentrations were also lower than corresponding total arsenic concentrations. According to available documentation, the three anomalous results are not representative of a normal filtered sample result. Nevertheless, 12 of the 14 dissolved arsenic concentrations still exceeded the NJ GWQC of 3.0 µg/L (with a maximum detected concentration of 26.7 µg/L). In a letter dated September 26, 2012 (Ref. 9), NJDEP formally concurred that the arsenic and lead contamination in on-site groundwater monitoring wells at the CENJ site is the result of historic fill and not CENJ's activities. Because these exceedances are reflective of a regional rather than site-related groundwater quality issue, arsenic and lead need not be addressed further in this EI determination.

All groundwater contamination observed at the CENJ site has been attributed to regional quality issues and/or historic fill in the area. Because this contamination is unrelated to CENJ's operations (or S&W's former operations) at the site, this EI determination finds that the groundwater has not been contaminated above appropriately protective levels by releases subject to RCRA corrective action at or from the site.

References:

1. Final Remedial Investigation Report for S&W Waste. Prepared by Sadat Associates, Inc. Revised April 27, 1995.
2. Soil Removal Report for S&W Waste. Prepared by Sadat Associates, Inc. Dated April 1997.
3. Remedial Action Report for S&W Waste. Prepared by Sadat Associates, Inc. Dated December 1997.
4. Report Regarding Groundwater Sampling Program at S&W Waste. Prepared by Sadat Associates, Inc. Dated May 2001.
5. Remedial Action Report for Clean Earth of New Jersey, Inc. Prepared by Compliance Plus Services. Dated August 2008.
6. Groundwater Remedial Investigation Work Plan. Prepared by Compliance Plus Services. Dated August 2008.
7. Revised Supplemental Groundwater Remedial Investigation Report. Prepared by Compliance Plus Services. Dated July 17, 2009.
8. Letter from Donna Gaffigan, NJDEP, to Robert Fixture, CENJ, re: Remedial Action Report. Dated May 27, 2011.
9. Letter from Donna Gaffigan, NJDEP, to Robert Fixter, CENJ, re: Revised Supplemental Groundwater Remedial Investigation Report. Dated September 26, 2012.

3. Has the **migration** of contaminated groundwater **stabilized** (such that contaminated groundwater is expected to remain within "existing area of contaminated groundwater"[2] as defined by the monitoring locations designated at the time of this determination)?

___ 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"[2].

___ If no (contaminated groundwater is observed or expected to migrate beyond the designated locations defining the "existing area of groundwater contamination"[2]) - skip to #8 and enter "NO" status code, after providing an explanation.

___ If unknown - skip to #8 and enter "IN" status code.

Rationale:

This section is not applicable; see the response to Question 2.

[2] "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.

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

___ 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:

This section is not applicable; see the response to Question 2.

5. Is the **discharge** of "contaminated" groundwater into surface water likely to be **"insignificant"** (i.e., the maximum concentration[3] 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 ecosystems at these concentrations)?

___ 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[3] 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 ecosystem.

___ If no - (the discharge of "contaminated" groundwater into surface water is potentially significant) - continue after documenting: 1) the maximum known or reasonably suspected concentration[3] 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[3] greater than 100 times their appropriate groundwater "levels," the 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:

This section is not applicable; see the response to Question 2.

[3] As measured in groundwater prior to entry to the groundwater-surface water/sediment interaction (e.g., hyporheic) zone.

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 ecosystems that should not be allowed to continue until a final remedy decision can be made and implemented[4])?

___ 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 ecosystems), and referencing supporting documentation demonstrating that these criteria are not exceeded by the discharging groundwater; OR 2) providing or referencing an interim-assessment[5], appropriate to the potential for impact, that shows the discharge of groundwater contaminants into the surface water is (in the opinion of a trained specialist, including an ecologist) adequately protective of receiving surface water, sediments, and ecosystems, 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 "NO" status code, after documenting the currently unacceptable impacts to the surface water body, sediments, and/or ecosystem.

___ If unknown - skip to 8 and enter "IN" status code.

Rationale:

This section is not applicable; see the response to Question 2.

[4] Note, because areas of inflowing groundwater can be critical habitats (e.g., nurseries or thermal refugia) for many species, an 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.

[5] 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.

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?"

___ 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:

This section is not applicable; see the response to Question 2.

8. Check the appropriate RCRAInfo status codes for the Migration of Contaminated Groundwater Under Control EI (event code CA750), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (attach appropriate supporting documentation as well as a map of the facility).

_X_ YE - Yes, "Migration of Contaminated Groundwater Under Control" has been verified. Based on a review of the information contained in this EI determination, it has been determined that the "Migration of Contaminated Groundwater" is "Under Control" at the Clean Earth (formerly S&W Waste) site, EPA ID# NJD991291105, located at 115 Jacobus Avenue, Kearny, Hudson County, New Jersey. Specifically, this determination indicates that the migration of "contaminated" groundwater is under control, and that monitoring will be conducted to confirm that contaminated groundwater remains within the "existing area of contaminated groundwater." This determination will be reevaluated when the Agency becomes aware of significant changes at the facility.

___ NO - Unacceptable migration of contaminated groundwater is observed or expected.

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

Completed by: _____ Date:_____
Michele Benchouk
Environmental Consultant
Booz Allen Hamilton

Reviewed by: _____ Date:_____
Amy Brezin
Environmental Consultant
Booz Allen Hamilton

Also reviewed by: _____ Date:_____
Alan Straus, Project Manager
Hazardous Waste Programs Branch
EPA Region 2

_____ Date:_____
Philip D. Flax, Section Chief
Hazardous Waste Programs Branch
EPA Region 2

Approved by: Original signed by: Date: October 26, 2012
Adolph Everett, Chief
Hazardous Waste Programs Branch
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 numbers and e-mail:
Alan Straus
(212) 637-4160
straus.alan@epa.gov

Attachments

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

Attachment 1 – Summary of Media Impacts Table
Attachment 2 – Relevant Figures

Note: The attachments available upon request.

Attachment 1: Summary of Media Impacts Table

Clean Earth (formerly S&W Waste) Site
NJD991291105

AEC or SWMU	GW	AIR (Indoors)	SURF SOIL	SURF WATER	SED	SUB SURF SOIL	AIR (Outdoors)	CORRECTIVE ACTION MEASURE	KEY CONTAMINANTS
Groundwater	No	No	No	No	No	No	No	• Asphalt and concrete capping • Environmental contamination attributed to historic fill and regional groundwater quality issues	None

Attachment 2: Relevant Figures

Clean Earth (formerly S&W Waste) Site
NJD991291105

Note: The attachment available upon request.