DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

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

Facility Name: **Rutherford Chemicals, LLC (former Nepera Chemical Co, Inc.)**
Facility Address: **Route 17, Arden House Road, Harriman, NY, 10926**
Facility EPA ID #: **NYD002014595**

1. Has **all** available relevant/significant information on known and reasonably suspected releases to soil, groundwater, surface water/sediments, and air, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

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

   _____ If no - re-evaluate existing data, or

   _____ if data are not available skip to #6 and enter"IN" (more information needed) status code.

Definition of Environmental Indicators (for the RCRA Corrective Action)

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

Definition of "Current Human Exposures Under Control" EI

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

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Current Human Exposures Under Control" EI are for reasonably expected human exposures under current land- and groundwater-use conditions

ONLY, and do not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program's overall mission to protect human health and the environment requires that final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

Duration / Applicability of EI Determinations

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

Background

The Nepera facility, a division of Rutherford Chemicals LLC, is located on New York Route 17, in Harriman, Orange County, New York and encompasses 28.38-acres on two parcels (Figure 1)". The first parcel is 9.74 acres and contains the administration building, including the parking lot, State Pollutant Discharge Elimination System (SPDES) lagoon, and former "blind" lagoon. The second parcel, located across road, consists of 18.64 acres, and includes the plant processing areas. Both parcels are bordered by Route 17 to the north and they are separated only by Arden House Road which runs between them.

Industrial use of the facility began in 1942 when the Pyridium Corporation began manufacturing the chemical niacinamide. The Pyridium Corporation, and its affiliate, the former Nepera Chemical Company, continued operations at the facility from 1942 until 1956 at which time the companies were sold to the Warner-Lambert Company (WLC) and dissolved. In 1957, Nepera, Inc. was formed as a wholly-owned subsidiary of WLC. Nepera, Inc. owned and operated the plant from 1957 to 1976 at which time the company was sold to Schering AG of Germany, who in turn sold the company to the Cambrex Corporation in 1986. Bulk and fine pharmaceutical chemicals, hydrogels, and pyridine-based industrial chemical products and intermediates have been manufactured at the plant since 1942, and continued until the end of August 2005. A large number of chemical raw materials, intermediates, products, and wastes have been handled at the facility over the past 60 years (Reference 1).

Soils beneath the facility are composed mostly of Late Pleistocene glacially deposited sands and silty sands with some near-surface fill. Kame deposits of coarse to fine gravel and/or sand have been mapped in the vicinity of the facility. Glaciolacustrine deposits exist over most of the facility and thicken to the east. The overburden thickness ranges from less than 30 feet along the western side of the facility to over 100 feet along the east side of the facility, adjacent to the West Branch of the Ramapo River. Beneath the various overburden deposits lies dolomite bedrock. The dolomite bedrock slopes fairly steeply to the east (from an elevation of approximately 500 feet to 410 feet above mean sea level over a distance of about 1,300 feet, producing and average slope of about seven percent) and is approximately 150 to 300 feet thick. Fracturing in the bedrock is variable, although it generally decreases with depth (Reference 2).

Location

This facility is located on NY Route 17 in the Town of Harriman, Orange County approximately one mile west of Exit 16 of the NY State Thruway. (Figures 1 and 2). The southwest corner of the site is in the Town of Monroe. The facility is bound to the north-northeast by the West Branch of the Ramapo River, to the east-southeast by undeveloped land, to the west-southwest by Conrail railroad tracks, and to the northwest by New York Route 17 (Reference 3, Figure 3). An undeveloped, 103-acre parcel of land known as the "Avon" parcel is located south-southeast of the facility. The facility is presently zoned light industrial/commercial, with surrounding land uses being industrial to the north; residential and undeveloped land to the west; and undeveloped land to the east and south.

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

	Yes	No	?	Rationale / Key Contaminants
Groundwater	X			Groundwater monitoring./ Volatile Organic Contaminants(VOCs): See Table 1 Below:
Air (indoors)[2]	X			By 9/30/05, no buildings over contaminated GW or near contaminated soil will be occupied by people.
Surface Soil (e.g., <2 ft)	X			Soil sampling / Some VOCs, SVOCs, and metals have been detected at various areas of the plant.
Surface Water		X		Surface water data show no contamination of VOCs SVOCs or Mercury (Reference 1).
Sediment	X			Several locations have contaminated sediments, but PCB Contaminated sediment in the off-site Ramapo River was remediated.
Subsurf. Soil (e.g., >2 ft)	X			Soil sampling. / Some Metals and SVOCs.

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

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

Air (outdoors)	___	X	___	No evidence of outdoor air contamination based on test results during RFI investigation.

_____ 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

Bulk and fine pharmaceutical chemicals, hydrogels, and pyridine-based industrial chemicals were manufactured at this plant until August 2005. The facility is now in the process of being closed. Hazardous wastes, including drummed wastes, were disposed in several areas. A number of chemical spills have also occurred over the years. The first environmental investigation was conducted from 1984-1986 and resulted in the discovery and removal of drums buried near Plant 75. The second investigation in 1989 lead to an Interim Remedial Measure (IRM) for a groundwater pump and treat system. A Department of Environmental Conservation (DEC) consent order was signed by Nepera and Warner-Lambert for a Remedial Investigation/Feasability Study (RI/FS) that was completed in March 1996. The primary soil contaminants are benzene, toluene and xylenes. Polychlorinated Biphenyls (PCBs) were detected in sediments. The remedy outlined in the March 1997 Record of Decision (ROD) is for source reduction and groundwater pump and treat. The remedial design phase of this project started in November 1998. A drum and contaminated soil removal program was completed in the fall of 1999. A new drum nest was discovered and has been remediated.

Contamination, first observed in the 1980s, emanated as far west/southwest as MW-16 and MW-20S, moving off-site to the east, and northeast toward the West Branch of the Ramapo River. Contaminant concentrations in the source areas have fluctuated over time, but have generally decreased, particularly with the introduction of a bio-sparge pilot test in early 2001 (References 4, 5, 6, and 7). Well data, collected in November 2000 (Reference 8), indicated that the Volatile Organic Compound (VOC) contaminant plume in off-site overburden groundwater had been delineated to concentrations less than 1 µg/L in the open field to the east of the facility, and on the industrial property on the north side of the West Branch of the Ramapo River. VOCs in off-site bedrock groundwater were delineated to less than 1 µg/L to the north of the river.

<u>Contaminants and Potential Threats:</u>

<u>Contaminants</u>

Surface soil, deep soil, groundwater, and sediments at this site have been found to be contaminated. The three classes of contaminants discovered here are volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and inorganics. VOCs are carbon based chemicals that tend to evaporate relatively quickly when exposed to air at normal atmospheric conditions. SVOCs are carbon based chemicals that are resistant to evaporations into the surrounding air. Inrganics (usually metals) can be either elemental (pure) or metal atoms that are part of a larger molecule.

The primary VOCs of concern that have exceeded their appropriate media-specific Standards, Criteria, and Guidance Values (SCGs) at Nepera are, acetone, ammonia, benzene, 2-butanone, carbon disulfide, ethylbenzene, 4-methyl-2pentanone, toluene, trichloroethane, THP, and xylenes.

Facility-wide, the following are SVOCs of concern that have exceeded their SCGs at Nepera: a-picoline, 2-amino-pyridine, benzoic acid, bis(2-ethylhexyl)phthalate, 2,4-dimethlyphenol, 4-methlphenol, phenol, and pyridine.

Facility-wide, the following inorganic compounds exceeded their SCGs (provided in parenthesis) for at least one sampling location: aluminum (100 µg/L), antimony (3 µg/L), arsenic (25 µg/L), barium (1,000 µg/L), beryllium (3 µg/L), cadmium (5 µg/L), chromium (50 µg/L), cobalt (5 µg/L), copper (200 µg/L), cyanide (200 µg/L), iron (300 µg/L), lead (50 µg/L), magnesium (35,000 µg/L), manganese (300 µg/L), mercury (0.7 µg/L), nickel (100 µg/L), selenium (10 µg/L), silver (50 µg/L), sodium (20,000 µg/L), thallium (0.5 µg/L), vanadium (14 µg/L), and zinc (2,000 µg/L). Aluminum, calcium, iron, magnesium, manganese, sodium, and potassium were ubiquitous across the facility; however these constituents are not site-specific Contaminants of Concern (COCs). No inorganic trends were evident in the data; exceedances were dispersed randomly throughout the site. Inorganics were detected off-site in excess of SCGs, but were generally not related to facility processes (e.g., aluminum, iron, magnesium, sodium).

At some of the on-site unoccupied buildings, indoor air has the potential to be impacted by vapor intrusion from either contaminated groundwater plumes under the buildings or subsurface contaminated soil near the buildings. In either case a pathway to human exposure does not currently exist since the buildings are not occupied.

<u>Potential Threats From Contaminated Groundwater</u>

Groundwater at the facility is controlled by four hydrostratigraphic units: the perched water table unit, the overburden aquitard, the overburden aquifer, and the bedrock aquifer (Reference 2, Figures 4 and 5). The perched water table consists of saturated, permeable materials, both native and fill, and is discontinuous and localized on-site. While this aquifer serves as a reservoir for surface water infiltration, it has little affect on groundwater flow in the deeper units. The perched water table overlies the overburden aquitard unit, through which the perched groundwater slowly percolates (References 2 and 3).

The overburden aquitard is a low permeability unit composed of layers of fine-grained glaciolacustrine clays, silts, and sands. The clay layers greatly reduce the vertical permeability of the unit. However, higher permeability pathways occur horizontally along the sandy layers. The overburden aquitard is much thinner and locally absent in the western portion of the facility.

The overburden aquifer unit, which consists of glacial sands and gravels, is located below the overburden aquitard unit and above the bedrock. The unit is shallow along the western perimeter of the facility, becoming deeper in the east. The overburden aquifer is confined over most of the facility by the overburden aquitard, but is locally interconnected with both the perched water table and lower bedrock aquifer unit. Pump test data has indicated leaky aquifer conditions and lateral recharge boundaries. In addition, based on potentiometric measurements, water levels in the overburden aquifer respond quickly to rainfall events and droughts, which indicates an area of direct aquifer recharge upgradient of the facility.

The bedrock aquifer unit is located in the transmissive fractures within the bedrock. The most transmissive zones are found within the uppermost portion of the bedrock where the formation is weathered and fractured. Permeability generally decreases with depth but may be significant in localized fracture zones. Where the overburden aquitard is thinner or absent in the western portion of the facility, high rates of vertical recharge to the bedrock aquifer are facilitated, resulting in a groundwater mound in this unit that then extends towards the east-southeast. However, the vertical gradient at the facility transitions from downward in the west, to upward in the east, resulting in discharge to the river. Therefore, it has been concluded that the depth of groundwater circulation to the bedrock should be limited (References 2 and 3).

Groundwater flow at the facility within the perched water table and overburden aquifer unit is generally east-southeast toward the West Branch of the Ramapo River. The overburden aquifer is less transmissive along the downgradient side of the facility, which restricts flow through the overburden in that area. In the bedrock aquifer, groundwater flow occurs in a radially eastward direction from an area of higher water levels on the west side of the facility resulting from recharge where the overburden aquitard is locally absent.

<u>Potential Threats From Air Contamination (Indoor)</u>

Several buildings are situated over contaminated groundwater or soil. It is possible that VOCs or SVOCs may migrate up though the floors of the buildings and collect in the basement or the first floor of the buildings. At this time there is no proof that such indoor air vapor intrusion has occurred since no sub-slab soil vapor tests have been performed at any of these buildings.

Indoor air was not evaluated in the risk assessment conducted as part of the 1995 RI or in subsequent years. Contaminant plumes do exist in groundwater below the manufacturing portions of the facility, and the potential exists for VOCs to be released into buildings on-site (i.e.: Buildings within Areas A, G, and H). However these buildings are currently not occupied by any workers.

<u>Potential Threats From Contaminated Soil (Surface and Subsurface)</u>

Various areas of this site have been contaminated with VOCs, SVOCs and petroleum products.
In general, the primary soil contaminants are benzene, toluene and xylenes, but one area also contained five underground storage tanks (USTs), which may have contributed to soil and groundwater contamination via spills and leakage.

Another area that was found to be contaminated is located in the south-eastern portion of the facility. This is a relatively undeveloped area which was historically utilized for storage. Most of this area may have been filled. Buried drums have been sporadically identified in this area. In November 1995, oil stained soils were also observed in this area during the excavation of test pits. This area was found to be contaminated with VOCs.

A small area in the southeastern region of the facility is contaminated with a variety of solvents. This area of the facility is reportedly constructed over a former "burning pit," used during the 1940s and 1950s to burn "off spec" materials, waste oils, spent drums and spent solvents.

Facility access is currently restricted by security fencing. Most of the facility is occupied by buildings, paved roads and walkways, parking lot, and spill prevention areas. Some unpaved areas exist in the eastern sections of the facility. The facility lies in the Hudson Highlands Physiographic Province within a northwest trending glacial valley, and is situated on a flood plain near the confluence of the main and west branches of the Ramapo River. The facility property slopes fairly steeply to the east-southeast towards the West Branch of the Ramapo River, which turns southward after passing the facility property, and the ground surface elevation ranges from 545 to 515 feet above mean sea level. Most of the facility however, is generally located at an elevation ranging from 520 to 530 feet above mean sea level (Reference 3, Figures 4 and 5).

The only work that could involve contact with contaminated soil or subsoils at this site are those involved in remediation efforts at the facility, and such personnel will be wearing appropriate protective equipment as specified in the health and safety section of the approved work plan.

Potential Threats From Surface Water

Surface water bodies in the area include the West Branch of the Ramapo River, running along the northeast side of the facility, and an on-site SPDES-permitted lagoon to the east of the parking lot. The West Branch of the Ramapo River receives effluent from a sewage treatment plant located immediately upstream of the facility. After flowing past the facility's northeast boundary, the river curves southward. Based on facility groundwater flow modeling, the SPDES lagoon leaks to the groundwater, creating a slight mound beneath the pond and a hydraulic divide between the facility and the West Branch of the Ramapo River in the vicinity of the lagoon (Reference 9). Stormwater runoff at the facility generally flows over road surfaces in an east-northeasterly direction toward Arden House Road or the open field and the West Branch of the Ramapo River. Some of the stormwater is collected by storm drains and channeled to the SPDES lagoon, which eventually discharges to the West Branch of the Ramapo River. Stormwater that collects in containment areas, such as tank or berm areas, was previously collected and burned in the on-site incinerator (Reference 2), but is now discharged to the SPDES lagoon. In addition, a former intermittent drainage path ran from the southern-most corner of the facility onto the adjacent Avon parcel, which is itself poorly drained and swampy (References 2 and 3). The drainage path has since been blocked off and stormwater runoff is directed to the SPDES lagoon.

An off-site well survey conducted as part of the 1995 Remedial Investigation identified 19 wells in the vicinity of the facility (Reference 2, Figure 2). Seven of the wells were municipal supply wells and the remainder were used as private commercial or private residential water supplies. Two of the wells were completed in the overburden sand and gravel, and the bedrock wells ranged in depth from 200 to 800 feet below ground surface (bgs). Four of the wells were reportedly inactive at the time of the survey, including the Mary Harriman Well No. 2 (MH-2), which was the closest well to the facility. The Mary Harriman Well No. 1 (MH-1) was a replacement well that was reportedly contaminated with chlorinated solvents believed to have originated from a facility located west of the MH wells. The Town of Woodbury is located downgradient of the facility, but no private or municipal supply wells were found in that direction in close proximity to the facility during the off-site well survey (Reference 2). According to information provided to the DEC, no private or municipal supply wells have been identified immediately downgradient of the facility.

A Remedial Investigation/Feasibility Study (RI/FS), including a baseline Risk Assessment, was conducted at the facility during 1994-1995. The purpose of the RI was to determine the nature and extent of contamination at the facility (Reference 2). The objectives of the Feasibility Study were to identify and evaluate alternatives for any necessary remedial action at the facility and for the prevention of off-site migration of contaminants (Reference 3). The purpose of the RI was to characterize the subsurface at the facility, including geologic and hydrogeologic conditions. Various environmental media, including groundwater, soil, surface water, and sediment, were sampled and analyzed for organic and inorganic contaminants. The Feasibility Study evaluated potential remedies against several criteria, including compliance with Applicable or Relevant and Appropriate Requirements (ARARs); protection of human health and the environment; short- and long-term effectiveness; reduction of toxicity, mobility, and volume of contaminants; implementability; and cost effectiveness. According to the 1997 ROD, the selected remedy included the design and implementation (including a pilot study) of a soil vapor extraction and groundwater remediation system; drum removal and soil sampling, excavation and removal in Area F; design and implementation of a groundwater remediation program; a sediment excavation program in Area K; an evaluation of appropriate remedies for mercury migration to surface water; institutional controls, including groundwater use restrictions; and long-term groundwater monitoring (Reference 1). The only surface water samples to show any contamination were collected in August 1991 from one location of standing water in the drainage pathway at the southern-most end of the facility, at the Avon Parcel. Aluminum (1,580 µg/L), iron (5,160 µg/L), manganese (607 µg/L), mercury (1.8 µg/L), sodium (36,200 µg/L), thallium (2.5 µg/L), and vanadium (20.1 µg/L) were detected at concentrations that exceeded their respective surface water SCGs (Reference 3). This area may no longer contain significant surface water since drainage from the nearby areas of the facility was diverted to the SPDES lagoon.

Surface Water Risk:

Recreational receptors may contact surface water in the West Branch of the Ramapo River. The Baseline Risk Assessment indicates that surface water is not expected to impact human health, despite the fact that some exceedances exist. The carcinogenic risk for the recreational receptor was calculated to be 3.4E-11 and 2.2E-09 for the West Branch of the Ramapo River and the drainage area of the "Avon Parcel"(Area K), respectively. The carcinogenic risk is well below the 10^{-4} to 10^{-6} range which is the level at which the EPA determines whether the exposure risk is acceptable or unacceptable. The non-carcinogenic risk is measured by the hazard index. A hazard index value of one or less means that no adverse non-cancer human health effects are expected to occur. The hazard index value for the recreational receptor was calculated to be 6.9E-06 and 2.7E-04 for the West Branch of the Ramapo River and Area K, respectively. Thus, there is no adverse risk or hazard associated with this pathway at this time.

Potential Threats From Sediments

Sediments

Sediment samples were collected in October 1995 from the West Branch of the Ramapo River and analyzed for mercury. The highest detected concentration of mercury was 0.824 mg/kg in a sample collected near where the mercury-laden calcium sulfate sludge was disposed of in Area B (Reference 1). The specific sample number was not identified.

Samples were collected in November 1995 from the West Branch of the Ramapo River and from a reported drainage path located in the "Avon" Parcel (Area K) near the southernmost corner of the facility. The sediment samples were analyzed for Target Compound List (TCL), VOCs, SVOCs, Pesticides/PCBs, TAL metals, cyanide, TPH, and site-specific parameters. Sample locations for VOCs and SVOCs are presented in the Feasibility Study Report (Reference 3). In addition, since sediment samples from Area K were collected from a drainage basin rather than a river or lake, detected concentrations were evaluated for inclusion in the Maximum Concentrations Table using soil criteria.

PCB Sediments "Avon" Parcel (Area K)

Area K was an area of PCB-contaminated sediment located in the northwest corner of the "Avon" Parcel, off-site but adjacent to the southern corner of the Nepera facility. Area K encompasses a small area of land within the "Avon" Parcel. The area of contaminated sediment was listed as an Area of Concern (AOC) in the 1997 ROD. This section of land is poorly drained and swampy, and historically received stormwater from the facility. Currently all storm water discharges to the SPDES lagoon (Reference 2).

West Branch of the Ramapo River

Methylene chloride (8 J µg/kg – sample SDWW01) and total petroleum hydrocarbons (TPH) (36.4 J mg/kg – sample SDWW03) were the only VOCs detected in the sediment samples collected from the West Branch of the Ramapo River. Several SVOCs were detected, including phenanthrene, fluoranthene, pyrene, benzo(a)anthracene, chrysene, bis(2-ethylhexyl)phthalate, and benzo(b)fluoranthene, di-n-octylphthalate, benzo(a)pyrene, and benzo(g,h,i) perylene, but at levels below screening criteria. No pesticides or PCBs were detected in sediment samples collected from the West Branch of the Ramapo River. Inorganics detected above screening levels along with maximum detected concentrations include: aluminum (17,700 mg/kg – sample SDWW02), cadmium (3.3 mg/kg – sample SDWW01), chromium (31 mg/kg – sample SDWW02), copper (38 mg/kg – sample SDWW02), lead (64.2 mg/kg – sample SDWW02), manganese (9,200 mg/kg – sample SDWW02), nickel (41.8 mg/kg – sample SDWW02), and zinc (210 mg/kg – sample SDWW02) (References 2 and 3).

SPDES Lagoon and Catch Basins and Sewers

Most recently, sediment samples were collected in July 2002 from the catch basins and the SPDES Lagoon, and analyzed for mercury (Reference 10). Four samples were collected from both the catch basins and the SPDES Lagoon. The maximum detected mercury concentrations were 12.3 mg/kg from the SPDES Lagoon (sample Sed-2) and 38.7 mg/kg from the catch basins (sample Sed-8) (Reference 10, Figure 2). Furthermore, the SPDES Lagoon discharges to the West Branch of the Ramapo River. It should be noted that the mercury concentration detected in the sediment sample collected near the outfall from the SPDES Lagoon to the West Branch of the Ramapo River (Sed-3) was 3.88 mg/kg.

Biota

In November 1995, crayfish and caddis larvae specimens were collected from the West Branch of the Ramapo River and analyzed for mercury. The sample results are presented in Table 6 of the 1997 ROD. Mercury concentrations in biota were found to be greater in specimens collected at and downstream from the Route 17 bridge than the specimens collected at the River Road Bridge (Reference 1). It was noted in the 1997 ROD that this observation may or may not be statistically significant.

In June and July 2001, the NYSDEC conducted a fish sampling investigation in the Ramapo River near Harriman, New York. Samples were taken from nine locations in the river. Two locations were upstream of the dam that forms the pond in Harriman Park. Fish were also taken adjacent to the facility and at six other locations downstream of the plant. The furthest location was in Sloatsburg, 11 miles downstream of the Route 17 bridge. The average concentration of mercury in the 90 samples was 183 ppb. The samples upstream of the dam averaged 110 ppb, and the samples from the seven downstream locations averaged 196 ppb. Samples collected at the Sloatsburg sampling location had an average mercury concentration of 412 ppb. According to the NYSDEC Fact Sheet of the June/July 2001 sampling, the concentrations of mercury in fish from the Ramapo River are comparable to other bodies throughout New York State, and are less than the USFDA marketplace standard of 1000 ng/g. Fish sample locations for Ramapo River are shown in the NYSDEC June/July 2001 Ramapo River Fish Sampling Fact Sheet (Reference 11).

Potential Threats From Air Contamination (Outdoor).

Outdoor Air

Air quality was not tested during the RI, but the RI states that it is routinely monitored by plant operations. Therefore, the air pathway was evaluated using modeled air concentrations from soil emissions (i.e. air emissions modeling and air dispersion modeling). The Baseline Risk Assessment performed as part of the RI concluded that outdoor air for an off-site resident is a potential pathway of concern. The estimated lifetime cancer risks associated with inhalation exposure for an off-site resident (3.09E-06, Table 8.20 of the RI) and off-site resident child (2.70E-06, Table 8.20 of the RI) fall within the 10^{-4} to 10^{-6} range, the level at which the EPA determines whether the exposure risk is acceptable or unacceptable. Though these number are borderline, the fact that the majority of the site is covered with pavement further reduces the chance that anyone will contact these airborne contaminants.

If the pavement is disturbed for construction or remedial work, the worker safety will be addressed by the Health and Safety section of the project work plan.

Soil Gas

A soil gas survey was completed during April and May of 1991. Soil gas samples were collected from 122 locations on-site. Detected compounds included benzene, toluene, ethylbenzene, and xylenes

(BTEX), chlorobenzene, and pyridine. The most prevalent compounds identified on-site were benzene, toluene, and pyridine compounds. Other BTEX compounds were detected spatially across the facility at various concentrations. Based upon the soil gas results, it was determined that the soils in Areas A, G, H, and I were significantly contaminated with VOCs (Reference 2). The results of the soil gas investigation were confirmed during the soil sampling.

The buildings with potential soil gas contamination and subsequent vapor intrusion are all unoccupied manufacturing buildings. Therefore, worker exposure via inhalation is not a current pathway.

In General

Groundwater plumes at the site have responded to treatment and the levels of contaminates have been reduced.

References:

1. *Record of Decision: Nepera, Inc. – Harriman.* NYSDEC, Division of Environmental Remediation. March 1997.

2. *Remedial Investigation, Harriman Site.* Conestoga-Rovers & Associates. November 1995.

3. *Feasibility Study Report, Harriman Site.* Conestoga-Rovers & Associates. September 1995.

4. *Interim Pilot Study Report – Harriman Site, Harriman, New York.* ARCADIS Geraghty & Miller, Mahwah, New Jersey. March 21, 2002.

5. Letter from Tom Eng, ARCADIS G&M Inc., to Michael Mason, NYSDEC, re: Monthly Project Progress Report –April 2002, Harriman Inactive Waste Disposal Site. May 14, 2002.

6. *Building 13 Seep Investigation Report.* ARCADIS Geraghty & Miller, Mahwah, New Jersey. October 3, 2002.

7. Letter from Tom Eng, ARCADIS G&M Inc., to Michael Mason, NYSDEC, re: Monthly Project Progress Report – December 2002, Harriman Inactive Waste Disposal Site. January 6, 2003.

8. *Groundwater Monitoring Data Tables and Figures, November 2000 Sampling Event – Harriman Site, Harriman, New York.* ARCADIS Geraghty & Miller, Mahwah, New Jersey. March 2, 2001.

9. *Summary of a Groundwater Flow and Solute Transport Model.* ARCADIS Geraghty & Miller, Mahwah, New Jersey. August 1, 2002.

10. *Revised Pollutant Minimization Plan.* ARCADIS Geraghty & Miller, Mahwah, New Jersey. August 29, 2002.

11. "Fact Sheet: Ramapo River Fish Sampling – June/July 2001." NYSDEC, Division of Environmental Remediation.

Site Responsibility and Legal Instrument

Permit Status

Nepera's 373 Permit expired on July 22, 2004. A Permit renewal application submitted on January 23, 2004, was under review until August 26, 2004, when Nepera / Rutherford Chemicals submitted a closure plan for the facility. The facility's current 373 Permit is extended under SAPA until a new permit covering corrective action is issued or until corrective action is completed at the site.

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

Summary Exposure Pathway Evaluation Table

Potential **Human Receptors** (Under Current Conditions)

"Contaminated" Media	Residents	Workers	Day-Care	Construction	Trespassers	Recreation	Food[3]
Groundwater	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
Air (indoors)	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
Soil (surface, e.g., <2 ft)	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
~~Surface Water~~							
Sediment	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
Soil (subsurface e.g., >2 ft)	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
~~Air (outdoors)~~							

Instructions for Summary Exposure Pathway Evaluation Table:

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

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

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.

__X__ 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).

____ 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

Groundwater at this site is contaminated with some VOCs and SVOCs but the flow of the contaminant plumes is being controlled with a pump and treat system. Contaminated groundwater is not leaving the facility property at this time, the flow is monitored on an ongoing basis and the pump and treat system can be adjusted if needed to keep the contaminant plume from traveling off-site. At this time, no contaminated groundwater is being used as potable water.

Air (indoor)

Although some of the buildings at this facility may have VOCs or SVOCs vapor intrusion, they will not be subject to any indoor air testing since they are now unoccupied. DEC was informed of Nepera's decision to close the facility on August 15, 2005. On August 26, 2005, Nepera submitted a formal closure plan for its facility to this office. The plan is currently under review.

Soil (Surface and Subsurface)

The surface soils and subsurface soils at several areas of the site are primarily contaminated with VOCs, SVOCs and petroleum products. No adverse risk is expected for on-site industrial workers and construction workers according to the Baseline Risk Assessment conducted as part of the 1995 RI. Although on-site industrial worker and construction worker receptors may contact surface soil, all onsite activities for these receptors will be governed by the use of PPE, as specified in the work plan for the project, which will effectively eliminate any potential exposure. The very few on-site general workers that remain after the closure of the facility are not expected to encounter surficial soil as there are paved walkways throughout the facility grounds. The facility is also fenced and patrolled by 24-hour security thus eliminating the potential for trespassers.

Surface Water

At this time there is no surface water problem at this site, and no human exposure exits.

Sediment

There are contaminants in various sediments at the facility, however these sediments are not migrating and since the facility is closing, it is unlikely that any of the regular workers will be exposed to the materials. As further corrective measures are conducted at the site, some workers may be exposed to contaminated sediments when catch basins are disturbed for construction or remedial work, however, worker safety will be addressed by the Health and Safety section of the project work plan.

If the sediments are disturbed for construction or remedial work, the issue of worker safety will be addressed by the Health and Safety section of the project work plan. The facility is also fenced and patrolled by 24-hour security thus eliminating the potential for trespassers

Sewers

There may be some contaminated sediments in the catch basins of some of the sewers leading to the SPDES (Blind) Lagoon, these sediments are not accessible by the few plant personnel that will remain at Nepera during and after the closure of the facility. If any work is performed that may expose these sediments, the personnel performing the work will be covered by the Health and Safety section in the approved work plan. Also, the facility is fenced and patrolled by 24-hour security thus eliminating the potential for trespassers.

4 Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be **"significant"**[4] (i.e., potentially "unacceptable" because exposures can be reasonably expected to be: 1) greater in magnitude (intensity, frequency and/or duration) than assumed in

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

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)?

_____ 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):

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 <u>and</u> 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):

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

__**X**__ YE - Yes, "Current Human Exposures Under Control" has been verified. Based on a review of the information contained in this EI Determination, "Current Human Exposures" are expected to be "Under Control" at the _Nepera_ facility, EPA ID # _NYD002014595_, located at Route 17, Arden House Road, Harriman, NY, 10926 under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.

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

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

Completed by: ____________________________ Date: September 22, 2005

Paul Patel, P.E.
Environmental Engineer 2
New York State Department of Environmental Conservation (NYSDEC)

Supervisor: ______________________________ Date: September 22, 2005

Daniel J. Evans P.E.
Chief, Eastern Corrective Action Section
NYSDEC

Director: ______________________________ Date: September 22, 2005

Edwin Dassatti P.E.
Director, Bureau of Solid Waste & Correction Action
NYSDEC

Locations where References may be found:

NYSDEC
Division of Solid and Hazardous Materials
625 Broadway - 9th Floor
Albany, NY 12233-7252

Contact telephone and e-mail numbers

Paul Patel (518) 402-8594 E-Mail: appatel@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.