DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION
Interim Final 2/5/99
RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA725)
Current Human Exposures Under Control

Facility Name: **The Rochester Group (Tyco Electronics)**
Facility Address: **751 Old Brandy Road, Culpeper, VA 22701**
Facility EPA ID #: **VAD 059 174 367**

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?

☒ 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

Rochester began manufacturing operations in Culpeper in 1941. Operations included the production of steel wire rope used in commercial ships, military ships, and other industrial/construction applications. In 1978, Rochester began manufacturing electro-mechanical cables and added the production of fiber optic cable in the 1980s. In 1996, Rochester divested the steel wire rope business and, therefore, no longer manufactures this product at this facility. Prior to 2002, the facility also operated a Paten Line that involved heat treatment of steel and used the application of molten zinc for anodization purposes. A bright wire process that involved the application of a zinc phosphate coating to prevent rust was also conducted at the facility as part of the Paten Line. The facility terminated all Paten Line Operations and removed all equipment associated with the Paten Line Process between January and February 2007.

As part of the former Paten Line Process, coal chips from the lead quenching process were occasionally scraped off the top of the lead quench bath and collected in a dumpster and disposed in an area known as the Former Coal–Lead Hazardous Waste Pile (SWMU No. 1). Small amounts of zinc slag or dross from the zinc coating of wire was also placed in the same bin with the coal-lead waste. The lead quench unit was replaced with a fluidized sand bed in the late 1980s.

The facility currently draws steel rods into wire and consumes approximately 70 percent of the steel wire it produces into its own manufactured products. The manufacturing process includes, but is not limited to, wire drawing using a sodium carbonate lubricant, extrusion (plastic), copper wire stranding, cabling, armoring, and some braiding. The facility also manufactures umbilicals that incorporate steel twisted around electro-mechanical and fiber optic cables for use in the operation of various robotic vehicles. The lubing material used in the wire drawing process consists of 8120 oil that contains a non-hazardous paraffinic base. The facility uses six wire-drawing machines that draw steel rods into wire of various gauges based on customer specifications.

A cable coating operation (with asphalt) is a part of the specialty cable manufacturing process at the facility. Manufacturing of stranded wire cables includes the application of blocking compounds to fill the hollow spaces or voids between the wires. In the past, blocking compounds were lead-based and created a D008 (lead) hazardous waste. The facility no longer uses lead blocking compounds; epoxy-based blocking compounds are currently used.

Wastewaters (rinse waters) generated from the bright wire and Paten Line Processes were at one time significant and were piped to the Rochester facility's on-site industrial WWTP (SWMU No. 2) for pre-treatment prior to discharge to the Town of Culpeper's Publicly Owned Treatment Works (POTW) system. The industrial wastewaters were discharged to the POTW system under a Virginia Pollution Discharge Elimination System (VPDES) Industrial Pretreatment Permit issued by

the Town of Culpeper. The on-site WWTP is no longer in use. The Rochester facility currently discharges industrial wastewaters consisting of water from extruders, a test tank, and sanitary wastewater to the Culpeper POTW.

Additional documents can be found in the Final RCRA Site Visit Report, dated May 6, 2009.

Definition of Environmental Indicators (for the RCRA Corrective Action)

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

Definition of "Current Human Exposures Under Control" EI

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

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Current Human Exposures Under Control" EI are for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program's overall mission to protect human health and the environment requires that Final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

Duration / Applicability of EI Determinations

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

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

	Yes	No	?	Rationale / Key Contaminants
Groundwater		X		Groundwater is approximately 35 to 50 feet below ground surface and not considered to be at risk.
Air (indoors)[2]		X		Facility operates under a general SOP with no history of complaints or exceedances.
Surface Soil (e.g., <2 ft)	X			Lead samples are above screening levels in soils.
Surface Water		X		Discharges are under a VPDES permit with annual monitoring requirement.
Sediment		X		Discharges are under a VPDES permit with annual monitoring requirement.
Subsurf. Soil (e.g., >2 ft)	X			Lead samples are above screening levels in soils.
Air (outdoors)		X		Facility operates under a general SOP with no history of complaints or exceedances.

☐ 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.

☒ 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):

Several releases with the potential to impact groundwater have occurred at the site. These releases include leaking Underground Storage Tanks (USTs), a diesel spill, and the historic presence of an impoundment for coal-lead hazardous waste at the site. These releases have been addressed to the satisfaction of the Virginia Department of Environmental Quality (VDEQ). Sampling conducted in May, 2010 indicated the soil surrounding the former in-ground open-top concrete pickle liquor vault contained lead below non-residential Risk Based Concentration (RBC) values, with two samples slightly above residential RBC values. There have been no reported or documented spills or releases from the vault, which is in relatively good condition with no areas of significant deterioration. All other tanks formerly used to store the spent pickle liquor have been removed from the Facility. It should be noted that groundwater was not encountered in any of the excavations, and is estimated to be approximately 35 to 50 feet below ground surface (bgs). Installation of groundwater monitoring wells has not been required as part of prior remediation activities.

Soil contamination was confirmed at the site during various sampling initiatives. Areas of soil contamination included the coal-lead hazardous waste piles, UST excavations, a diesel spill, and the spent pickle liquor tank. Remedial measures have been taken to address the contamination at each of these locations.

The Former Coal-Lead Waste Pile area was located near the Rochester Facility's industrial WWTP. It consisted of a 130 foot by 50 foot ravine and potentially impacted an overall area of approximately 140 feet by 160 feet. The Facility began

disposing waste coal contaminated with lead from the Paten Line Process in this area sometime in the 1950s or 1960s. The lead quench unit that generated this waste was replaced with an air fluidized sand bed in the late 1980s.

The Former Coal-Lead Waste Pile area was closed under a Consent Order (CO) with the Virginia Department of Waste Management (DWM). Between September 1988 and May 1989, a total of 6,500 yd^3 of contaminated soil and fill material was removed from this area. Approximately 5,900 yd^3 of the material was disposed as hazardous waste. Clean closure was achieved based on verification samples that met the following requirements:

- EP Toxicity lead levels less than 5.0 mg/l
- Total lead and total zinc levels less than or not statistically significantly greater than the mean background concentrations of 512 ppm for lead and 224 ppm for zinc.

According to a June 29, 1990 letter from the DWM to the Rochester Corporation, the DWM found the coal-lead waste pile area had been successfully decontaminated or met the closure performance standards required by the Virginia Hazardous Waste Management Regulations (VHWMR) and RCRA Regulations. A closure verification inspection of the waste pile area was conducted by the DWM on October 23, 1990. Closure and formal agency approval of the "clean closure" of the former Coal-Lead Hazardous Waste Pile area was documented by a VDEQ letter dated July 23, 1996.

Two 20,000-gallon heating oil USTs and a 550-gallon kerosene UST (used to store heating oil) have been removed from the subject property. During removal of the two 20,000 gallon USTs, the tanks were found to be in good condition and confirmatory soil samples were below the State Water Control Board (SWCB) action level of 100 ppm Total Petroleum Hydrocarbons (TPH). Three additional USTs were removed from the West Plant, which was a non-contiguous parcel that has been sold off from the Rochester site and is not considered part of this Facility.

The 550 gallon kerosene UST was reportedly removed prior to regulations. However, documentation was later provided to satisfy SWCB requirements. At the time of the excavation, the tank was confirmed to have a minimum of two corrosion holes in the bottom. Composite samples of the soil removed from the top and sides of the tank met the SWCB action level of 100 ppm TPH. However, a sample collected from beneath the UST reported a TPH concentration of 7,900 ppm. Excavation continued beneath the kerosene UST until no visible, olfactory, or Photoionization Detector (PID) evidence of VOCs was detected. Approximately 20 yd^3 of contaminated soil was removed. Two confirmatory soil samples were collected from a depth of 13.5 feet bgs and were determined to be non-detect for TPH. According to August 24, 1990 SWCB correspondence, the SWCB indicated that little or no likelihood remains that state waters (ground or surface) may be degraded by kerosene from the tank or surrounding soil. Therefore, the SWCB considered the case to be closed, unless a future impact appears or occurs. Requirements for monitoring wells or additional investigations and/or reports were waived for this case.

A diesel fuel release occurred outside the East Plant area on December 4, 1997 when approximately 20 to 200 gallons of diesel fuel overflowed onto a concrete pad and gravel covered ground. Facility representatives notified VDEQ of the spill via telephone on December 4, 1997 and followed up with written notification on December 7, 1997. The notification indicated the release occurred when the float serving the day tank on a diesel powered generator malfunctioned and continuously signaled for the fuel pump to operate. The Facility indicated that immediate corrective action included turning off the generator upon discovery of the release and using absorbent pads to capture available free liquid. The fuel system was re-plumbed to eliminate the day tank before the generator was restarted. Most of the discharge was contained to underneath the pad and adjacent soil. No material entered nearby storm drains or waters of the Commonwealth. All contaminated soils from the diesel fuel release were removed from this area during November 2010. The Facility has since replaced the former 1,000-gallon Aboveground Storage Tank (AST) with a 2,500-gallon, double-walled AST. An earthen berm was constructed around the release area to provide containment in the event of a future spill.

The Facility historically generated and shipped significant volumes of spent pickle liquor off-site for subsequent treatment and disposal and/or beneficial use. RCRAInfo indicates the spent pickle liquor was generated at the Facility for a period of time from wire cleaning baths. Past wastes generated were a mixture of D002 (Corrosivity) and D008 (Lead) hazardous waste numbers/codes. Storage has varied over the years and has included use of a concrete vault that was located below grade as well as a poly tank equipped with secondary containment which was placed on steel supports above the former concrete vault. No documentation found in the files reviewed described decontamination and closure of the former in ground, open top concrete vault.

There have been no reported or documented spills or releases from the concrete vault and generally the concrete floor and sides are in the same, relatively good condition with no areas of significant deterioration (erosion, cracking, pitting, etc.). Just prior to the October 29, 2008 site visit, the Rochester Corporation collected several soil samples beneath the concrete floor and adjacent to the side walls of the concrete vault. Soil samples were also collected from beneath the concrete trench that contained the wastewater piping that led to this vault. The Facility compared the soil sample results to Voluntary Remediation Program (VRP) and Risk-Based Concentration (RBC) guidance values (industrial use RBC has a value of 800 mg/kg and residential RBC of 400 mg/kg for lead). Sampling results indicated the soil contains lead below industrial RBC values. One sample had a value of 704 mg/kg. Additional sampling conducted in May 2010 indicated the soil contains lead below industrial RBC values, with two samples above the residential RBC of 400 mg/kg.

A general State Operational Permit (SOP) was issued to the Rochester Facility by the Virginia Department of Environmental Quality (VDEQ) for air emissions from the diesel generator and wire extruders used at the site. Other potential sources of Volatile Organic Compounds (VOCs) covered by the Air Permit include: blocking operations, wire drawing, dye soaps (2% VOCs), natural gas boilers, asphalt tarring operations, and cleaning operations using solvents. The Air Permit also covers emissions from metal descaling and sanding operations in the wire drawing process, which removes rust from the rod stock. The metal scale removed from the descaling/sanding operations is collected by a large dust collection unit outside the building. No evidence of odor complaints or emissions exceedances were found in VDEQ or USEPA Region 3 files.

The closest notable surface water body to the site is Mountain Run. The Rochester Facility maintains a Virginia Pollution Discharge Elimination System (VPDES) Industrial Stormwater Management Permit for two stormwater outfalls, which was set to be renewed in 2009. Outfall 001 is associated with the pond overflow, which transports stormwater from the front of the Facility to Mountain Run Creek. Outfall 002 is associated with the ditch located at the backside of the site that also transports runoff stormwater to Mountain Run Creek. The VPDES Industrial Stormwater Permit requires quarterly surface water visual evaluations and reporting. The Facility is required to conduct annual sampling for zinc at both outfalls, as well as copper at Outfall 001 and aluminum at Outfall 002. The Facility maintains a Stormwater Pollution Prevention Plan and Spill Prevention Control and Countermeasures Plan. No evidence of exceedances of permit conditions were found in VDEQ or USEPA Region 3 files.

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

Summary Exposure Pathway Evaluation Table

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

"Contaminated" Media	~~Residents~~	Workers	~~Day-Care~~	Construction	Trespassers	~~Recreation~~	~~Food~~[3]
~~Groundwater~~							
~~Air (indoors)~~							
Soil (surface, e.g., <2 ft)		Yes		Yes	Yes		
~~Surface Water~~							
~~Sediment~~							
Soil (subsurface e.g., >2 ft)		Yes		Yes	Yes		
~~Air (outdoors)~~							

Instructions for Summary Exposure Pathway Evaluation Table:

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

2. Enter "yes" or "no" for potential "completeness" under each "Contaminated" Media -- Human Receptor combination (Pathway).

Note: In order to focus the evaluation to the most probable combinations some potential "Contaminated" Media - Human Receptor combinations (Pathways) do not have check spaces ("___"). While these combinations may not be probable in most situations they may be possible in some settings and should be added as necessary.

☐ If no (pathways are not complete for any contaminated media-receptor combination) - skip to #6, and enter "YE" status code, after explaining and/or referencing condition(s) in-place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional Pathway Evaluation Work Sheet to analyze major pathways).

☒ 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):

Potential Human Receptors:
Tyco is an active manufacturing facility. Therefore, on-site industrial workers, on-site construction/excavation workers and trespassers were considered potential receptors. The manufacturing area is not fenced in. Impacted soils are contained within site boundaries. Therefore off-site industrial workers and off-site residential receptors were not evaluated. Sensitive receptors (such as daycare) are not located on or adjacent to the site. Therefore, these receptors were not considered potential receptors. Two samples from the soil were above residential SL for lead but below the industrial SL.

Potentially Complete Exposure Pathways by Media:
Surface and Subsurface Soil: There is limited potential for exposure to lead in surface soil for potential receptors.

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

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4. Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be **"significant"**[4] (i.e., potentially "unacceptable" because exposures can be reasonably expected to be: 1) greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the acceptable "levels" (used to identify the "contamination"); or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable "levels") could result in greater than acceptable risks)?

☒ 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):

There is limited potential for exposure to lead in surface soil for workers, construction workers or trespassers. There were no exceedances of the industrial soil screening level for lead. The lead level for soil is above residential screening levels but below industrial screening levels therefore the exposures are not expected to be significant.

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

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5. Can the "significant" **exposures** (identified in #4) be shown to be within **acceptable** limits?

☐ If yes (all "significant" exposures have been shown to be within acceptable limits) - continue and enter "YE" after summarizing and referencing documentation justifying why all "significant" exposures to "contamination" are within acceptable limits (e.g., a site-specific Human Health Risk Assessment).

☐ If no - (there are current exposures that can be reasonably expected to be "unacceptable")- continue and enter "NO" status code after providing a description of each potentially "unacceptable" exposure.

☐ If unknown (for any potentially "unacceptable" exposure) - continue and enter "IN" status code.

Rationale and Reference(s):

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6. Check the appropriate RCRIS status codes for the Current Human Exposures Under Control EI (event code CA725), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (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 Rochester Group (Tyco Electronics), EPA ID # VAD 059 174 367, located at 751 Old Brandy Road, Culpeper, Virginia 22701. Specifically, this determination indicates that the migration of "contaminated" groundwater is under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.

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

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

Completed by (signature) -s- Date 5/30/12
(print) Leonard E. Hotham
(title) Environmental Engineer

Supervisor (signature) -s- Date 5/30/12
(print) Luis Pizarro
(title) Associate Director
(EPA Region or State)

Locations where References may be found:

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