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: **Aqualon Company, a Division of Hercules Incorporated and a Delaware Partnership**
Facility Address: **1111 Hercules Road, Hopewell, VA, 23860**
Facility EPA ID #: **VAD003121928**

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.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

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

Definition of "Current Human Exposures Under 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)?

Media	Yes	No	?	Rationale/Key Contaminants
Groundwater	X			VOCs, SVOCs, inorganics, alcohols
Air (indoors)[2]		X		No buildings located near potential sources
Surface Soil (e.g. < 2 ft.)	X			VOCs, dioxins/furans, inorganics
Surface Water	X			VOCs, SVOCs, inorganics, alcohols
Sediment	X			Due to groundwater discharge to surface water
Subsurf. Soil (e.g. >2 ft.)	X			Landfill waste materials
Air (outdoors)		X		No significant sources of air emissions

_____ 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):

The October 2001 Facility Lead Corrective Action Agreement Workplan identified 34 Solid Waste Management Units (SWMUs) at the Hercules – Aqualon facility (Facility). After a review of the operational histories and current status of the units, ten (10) SWMUs were identified as needing further investigative activities. The remaining 24 SWMUs were designated as No Further Action (NFA) units; specific unit descriptions and supporting evidence for the NFA designations can be found in the October 2001 Workplan previously submitted to and approved by USEPA. Characterization efforts for the Facility's Environmental Indicators have therefore been focused on these ten units. Hercules – Aqualon proposed and implemented two phases of field activities for the investigation of nine (9) of the ten (10) units. The 10th SWMU, the Natrosol Lagoon, was well characterized through a series of investigations during the 1990's.

Phase I was conducted in December 2001, and included the collection of environmental samples at the following units:

- SWMU #8, #29: Reten/Aqualon Basin/Anoxic Basin (RAB); (groundwater samples)
- SWMU #14: Sludge Drying Beds (SDB); (surficial soil samples)
- SWMU #15: Vacuum Filter Sludge Pile (VFSP); (surficial soil samples)
- SWMU #16: Solid Waste Incinerator (SWI); and (surficial soil samples)
- SWMU #34: Teepee Incinerator (TPI). (surficial soil samples)

A summary of the sampling results from Phase I was provided to USEPA in the February 2002 SWMU Summary Information Report – Phase I Investigation.

Phase II was conducted in November 2002, and included the installation and sampling of nine new groundwater monitoring wells associated with the following units:

- SWMU #3: Eastern Whitewater Lagoon;
- SWMU #4: Western Whitewater Lagoon; and
- SWMU #5: Old Landfill and Landfill #156.

A summary of the sampling results from Phase II was provided to USEPA in the April 2003 SWMU Summary Information Report – Phase II Investigation.

The following sections summarize the results of the investigations for the ten SWMUs for the four media identified as known or suspected to be "contaminated", as defined herein. The screening criteria used for evaluation of the analytical data was proposed and approved under the Sampling and Analysis Plans (SAPs) and Quality Assurance Project Plans (QAPPs) for each of the two phases of investigative activities.

GROUNDWATER:

Groundwater sampling data from the two phases of work were initially screened against USEPA Region III Risk-based Concentrations (RBCs) for Tap Water, and primary drinking water Maximum Contaminant Levels (MCLs). The following constituents were detected above the Region III Tap Water RBCs in site monitoring wells; in addition, thallium was detected above its Maximum Contaminant Level (MCL).

Volatile Organic Compounds (VOCs):

- Methylene chloride,
- Chloroform,
- 1,2-dichloroethane,
- 1,4-dioxane,
- Ethyl ether, and
- Trichloroethylene.

Alcohols

- 2-butoxyethanol,
- Tert-butyl alcohol,
- Ethanol, and
- Isopropyl alcohol.
- Bis (2-ethylhexyl) phthalate, and
- Bis (2-chloroethyl) ether.

Inorganics:

- Aluminum,
- Arsenic,
- Barium,
- Chromium,
- Cobalt,
- Iron,
- Manganese, and
- Thallium.

Semivolatile Organic Compounds (SVOCs):

Detection tables showing the screening exceedances are attached as ***Tables 1, 2, and 3.*** ***Figure 1*** shows the locations of the various monitoring wells sampled during the field investigations.

The historical investigations of the Natrosol Lagoon included the monitoring of groundwater impacts through the installation and sampling of four monitoring wells (NAT-1 to NAT-4) surrounding the unit. Quarterly groundwater monitoring events have indicated detections of tert-butyl alcohol downgradient of the unit as high as 105,000 mg/L.

SURFICIAL SOILS:

Surficial soil sampling data collected from the two phases of work were initially screened against USEPA Region III RBCs for Industrial Soils and Residential Soils. The following constituents were detected above at least one of the Region III Soil RBCs.

Volatile Organic Compounds (VOCs):

- Acetone,
- 1,4-dichlorobenzene,
- 1,2-dichloroethane, and
- 1,1,2-trichloroethane.

Dioxins/Furans

- 1,2,3,7,8-Pentachlorodibenzofuran,
- 2,3,4,7,8-Pentachlorodibenzofuran, and
- 2,3,7,8-TCDD equivalents (TEQ).

Inorganics:

- Aluminum,
- Arsenic,
- Cadmium,
- Iron,
- Manganese,
- Vanadium, and
- Zinc.

Detection tables showing the screening exceedances are attached as ***Tables 4, 5, 6, and 7.***

SURFACE WATER AND SEDIMENT:

As shown on the attached ***Figure 1***, groundwater beneath the Facility discharges either into the onsite receiving steams of West Bear Creek and East Bear Creek, or directly into Cattail / Bailey Creek running along the southern property boundary of the site. West Bear Creek and East Bear Creek themselves also eventually discharge into Cattail / Bailey Creek, making it the ultimate discharge point. Various investigations at the site, including the monitoring well installation activities performed during the Phase II investigation, have identified the low-permeability clay of the Yorktown formation underlying the upper sand aquifer. As further detailed in the June 2002 Hydrogeologic Evaluation previously submitted to USEPA, this clay layer appears to effectively confine the upper aquifer, preventing significant contaminant transport into the lower sand aquifer identified in the deep monitoring wells at the site.

Most of the subject SWMUs are located significant distances from the receiving streams, preventing significant discharges from groundwater impacts to surface water. However, due to the proximity of the landfill units (SWMU #5) to Cattail Creek and Bailey Creek, the analytical detections in monitoring wells LF-1 to LF-4 are reasonably expected to discharge to surface water. Since the discharge of groundwater to the creeks likely emanates through the sediment beds of the creeks, some sediment contamination is also reasonably expected.

SUBSURFACE SOILS:

SWMU #5 consists of two landfill units, designated as the Old Landfill and Landfill #156, as shown on the attached ***Figure 1***. The Old Landfill is thought to have been an approximately 10-acre former trash-burning dump and landfill dating from the early 1930's. Landfill #156 was a permitted solid waste landfill (Health Department Permit #156) in operation from approximately 1972 to 1988, and closed under the guidance of VADEQ in 1989. Although there is no evidence that hazardous wastes were ever placed in either of the landfill units, some of the waste materials may have contained hazardous constituents from the plant operations.

Based on the known history of the SWMU, and on the groundwater sampling results from monitoring wells LF-1 through LF-5 (see attached ***Table 2***), the subsurface waste materials within the landfill units are reasonably expected to contain constituents above EPA Region III RBCs.

INDOOR AIR:

The analytical test results of groundwater sampling from monitoring wells located near (<400 ft) site structures generally show low levels or nondetections of VOCs. Regardless of groundwater quality, potential indoor air contamination would be inhibited by the site's subsurface geology. Boring logs from the various monitoring wells installed at the site show that the upper silty-sand aquifer is overlain by the orange-tan low-permeability silts and clays of the Marlboro formation. The monitoring wells located near site structures (7U / 7L, 1, and 2) generally show 15 to 20 feet of low-permeability soils above the water table, with some interbedded horizontal sand layers; additional information can be found on the boring logs previously submitted to EPA in the June 2002 *Hydrogeologic Evaluation.*

Finally, as shown on ***Figure 1***, the various site SWMUs are located significant distances from site structures that could be vulnerable to indoor air contamination. Based on the groundwater quality, the distance between the SWMUs and site structures, and the presence of the low-permeability silts and clays present across the site, no indoor air contamination is believed to exist at the facility.

Footnotes:

[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.

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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	No	No	No	No	No	No	No
~~Air (indoors)~~							
Soil (surface, e.g. <2 ft)	No	No	No	No	No	No	No
Surface Water	No	No	No	No	Yes	Yes	Yes
Sediment	No	No	No	No	Yes	Yes	Yes
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.

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

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

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

__**X**__ If yes (pathways are complete for any "Contaminated" Media - Human Receptor combination) - continue after providing supporting explanation.

_____ If unknown (for any "Contaminated" Media - Human Receptor combination) - skip to #6 and enter "IN" status code

Rationale and Reference(s):

GROUNDWATER:

No complete exposure pathways for contaminated groundwater exist at the Facility. As described above, groundwater from the uppermost aquifer discharges primarily into Cattail Creek running along the southern property boundary of the site, and is confined by the underlying low-permeability clay of the Yorktown formation. No drinking water wells are located on the site property, and there are no other uses of groundwater by the Facility. Potable water for the Facility is supplied by the City of Hopewell, whose surface water intake is located on the Appomattox River, approximately 1¼ miles from the confluence of the Appomattox and the James Rivers. Groundwater / surface water from the Facility eventually discharges to Bailey Creek, which empties into the James River two to three miles downstream of the confluence with the Appomattox.

Discussions with the City of Hopewell Public Utility Department and the Hopewell Health Department have indicated that any new applications for permits for drinking water wells within the City of Hopewell limits would be rejected due to the availability of publicly-supplied water. The Hopewell Health Department also indicated that a review of their records indicates that no drinking water wells are known to exist within ¼-mile radius of the Facility property.

The closest residential areas to the site are located approximately 1,000 feet to the west, on the opposite side of Cattail and Bailey Creeks. Based on the groundwater contours shown on ***Figure 1***, the Creeks are clearly the discharge point for site groundwater, and may also potentially serve as a hydraulic barrier between the Facility and these residential areas. However, additional hydrogeological information would be necessary to confirm that the creeks do serve as a hydraulic barrier. Regardless of whether or not on-site groundwater impacts can reach off-site groundwater beyond the creeks, there is no complete pathway due to the lack of users of groundwater or surface water as drinking water within a ¼-mile radius of the site property.

SURFICIAL SOILS:

The Facility is located on an industrial-zoned property in accordance with the City of Hopewell zoning code and 1991 Land Use Plan, and is largely surrounded by other industrial uses or undeveloped land. The site property is bounded by a seven-foot-high fence topped with barbed wire, and both vehicular and pedestrian access are controlled through the plant main gate. Facility employees, contractors, and visitors are all required to carry identification badges issued at the main gate, and visitors are also given an orientation briefing regarding potential hazardous exposures, required personal protective equipment (PPE), and Facility policies and procedures.

Security at the Facility is provided by Pinkerton Security, and the main gate is manned by a security officer 24 hours per day, seven days per week. Pinkerton Security's post orders are attached.

Based on the zoning, security, and access control measures in place at the Facility, unauthorized personnel, i.e. residents, trespassers, etc…, are prevented from coming into contact with potentially contaminated surficial soils. As such, no complete pathway between contamination and *Residents / Daycare / Trespassers / Recreation* Human Receptors exists. In addition, the status of the Facility as an active industrial plant with restricted access allows the use of only the EPA Region III Industrial Soil RBCs, rather than the Residential values.

The Facility also employs a combination of Work Instruction and Permitting Protocols to limit potential exposures to site personnel, i.e. *Workers* and *Construction* Human Receptors. The Safe Access of Solid Waste Management Units (SWMUs) Work Instruction (attached) restricts work activities, including excavation, demolition, groundwater removal, or other construction tasks, in the vicinity of the identified SWMUs. Essential work activities must be performed under a Restricted Work Permit, which must be reviewed and approved by the Facility Environmental Engineering and Safety staff.

The Restricted Area Permit Work Instruction (attached) outlines the requirements for obtaining the necessary work permit, including the requirements for training, permit limitations (area, duration, and types of personnel), and the necessary approvals. The combination of the two Work Instructions is designed to effectively prevent exposures to site personnel or contractors from potential contamination.

SURFACE WATER AND SEDIMENT:

As described above, the proximity of SWMU #5 to Cattail / Bailey Creek may potentially allow the discharge of contaminants from groundwater through the creek sediment beds into surface water. Initial evaluation of the potential impacts to surface water was performed by comparing the detections in groundwater to 10x the National Recommended Water Quality Criteria (November 2002) for Organisms and Water + Organisms. ***Tables 1, 2, and 3*** show the calculated criteria and resulting screening. Of the constituents exceeding groundwater criteria, only one SVOC, bis (2-chloroethyl) ether, and three (3) inorganics, arsenic, iron, and manganese, exceed at least one of the modified Water Quality criteria.

However, the actual dilution capacities of Cattail and Bailey Creeks are believed to be significantly greater than provided by the generic 10x dilution criteria. Although direct stream gauging data is not available, the Virginia Water Control Board Office of Water Quality Assessments calculated 7Q10 flows of 0.330 cfs for Cattail Creek and 1.860 cfs for Bailey Creek based on comparisons with other streams of similar type, size, and drainage area. The corresponding November 1991 and May 1992 Memorandums are attached. Based on the available data regarding site hydrogeology (hydraulic gradients and hydraulic conductivities) and the waste materials identified in SWMU #5, an estimate of the actual dilution capacities of the two creeks can be calculated. The dilution factor calculation

worksheet, including documentation of assumptions and information sources, is attached. The resulting dilution of 127% for Bailey Creek further reduces the constituents expected to exceed surface water criteria to iron and manganese.

Use of the 7Q10 flows for calculation of dilution also neglects the effects of the tidal influences on Bailey and Cattail Creeks. Previous estimates of the range of tides in Bailey Creek have been as high as 2.6 feet. Since the tides operate independently of the low flow of the stream (which is dependent on precipitation, surface water flows, and groundwater recharge), the actual dilution capacities are even greater than that calculated.

For the SWMUs other than the Old Landfill and Landfill #156 (SWMU #5), there is a significant distance from the SWMUs prior to discharge into surface water. For the Natrosol Lagoon (SWMU #7), analysis of two surface water monitoring points (SWMP1 and SWMP2) showed a decreasing trend in constituents from upstream to downstream. The surface water data is provided in the Annual Monitoring Report – Natrosol Lagoon (September 1999 through June 2000), dated October 2000, which has been attached. The most downstream monitoring point (SWMP2) was located greater than 1,500 feet from the discharge of Bear Creek into Cattail Creek. The decreasing trend in contaminants would continue over this stretch of Bear Creek prior to discharge into Cattail Creek.

The Facility has also historically performed a variety of monitoring at its outfalls for its VPDES permit. Monitoring at Outfall 006 on West Bear Creek also included acute toxicity testing from 1987 to 1990. Surface water has been sampled in the past at the VPDES discharge into East Bear Creek and at a location in the Creek downgradient of the Natrosol Lagoon for acute and chronic toxicity from 1993 through 1997. All LC50 results exceed 100% effluent concentration.

SUBSURFACE SOILS:

The landfill areas are covered with a final soil cover that ensures that no waste materials are exposed. In addition, vegetative growth is maintained on the surface in order to provide stability and control erosion. The VADEQ Solid Waste division inspects the landfill units on an annual basis in accordance with the requirements of the Virginia Solid Waste Management Regulations (VSWMR), and documents their findings in their Post-Closure Care Compliance Reports. A copy of one of the more recent Compliance Reports, which includes confirmation of the lack of exposed waste materials as well as verification of the integrity of the soil and vegetative cover, is attached.

The presence of the final cover system eliminates exposure pathways by preventing contact between the waste materials and potential human receptors. In addition, due to the isolated location of the landfill areas (see ***Figure 1***), potential exposures to Facility employees would be infrequent and short in duration. No Facility employees work full-time near the landfill areas, and most contact periods are short (less than one hour) and occur during infrequent sampling or inspection events performed by the Facility's Environmental Technicians.

Finally, exposure pathways to subsurface soils through excavation or other construction activities are also controlled by the zoning, security, Work Instruction, and permitting protocols in place at the Facility, as described above.

Footnotes:

[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)?

__X__ If no (exposures can not be reasonably expected to be significant (i.e., potentially "unacceptable") for any complete exposure pathway) - skip to #6 and enter "YE" status code after explaining and/or referencing documentation justifying why the exposures (from each of the complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

_____ If yes (exposures could be reasonably expected to be "significant" (i.e., potentially "unacceptable") for any complete exposure pathway) - continue after providing a description (of each potentially "unacceptable" exposure pathway) and explaining and/or referencing documentation justifying why the exposures (from each of the remaining complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

_____ If unknown (for any complete pathway) - skip to #6 and enter "IN" status code

Rationale and Reference(s):

SURFACE WATER:

As described above, the concentrations of several inorganic compounds may potentially exceed surface water quality standards in Cattail Creek immediately adjacent to SWMU #5. The only potential complete pathway to human receptors appears to be ingestion of fish or other freshwater organisms that are exposed to these inorganic concentrations. However, the inorganic compounds in question do not readily bioaccumulate in freshwater organisms. The November 2001 USEPA *National Study of Chemical Residues in Lake Fish Tissue* (Fact Sheet: EPA-823-F-01-028), which identifies persistent, bioaccumulative, and toxic chemical residues in fish tissues in freshwater environments based on a four-year study, did not identify any of the subject inorganics as potentially significant compounds to bioaccumulate in fish tissue. Not surprisingly, the most recent sampling results from this study indicate that only highly persistent chemicals such as mercury, dioxins/furans, polychlorinated biphenyls (PCBs), and pesticides are commonly detected in fish tissues.

Furthermore, full completion of the exposure pathway is likely to occur rarely, if at all. Cattail Creek is not a readily fishable water body due to its small size, the presence of the beaver dams both upstream and downstream of the site property, and its location among the various industrial facilities in eastern Hopewell. Although exposed organisms could certainly swim / be transported further downstream to a more fishable water body, this would further reduce the potential intensity of exposure; i.e. reduce the risk that human receptors could receive more than one exposure by consuming multiple exposed organisms.

Based on the magnitude of the surface water quality standard exceedances, the lack of bioaccumulativity among the subject compounds, and the low potential intensity of exposures, the subject inorganic compounds in surface water are not expected to pose a significant threat to human receptors due to ingestion.

SEDIMENT:

Exposures to potentially-contaminated sediments are also not expected to be significant. Although the contaminated groundwater emanates through the sediments as it discharges to surface water, the individual contaminants must resorb from the aqueous groundwater to the soil particles of the sediment. Based on the type and levels of compounds identified in site groundwater, and the effects of the groundwater-to-sediment transfer, sediment contamination levels are anticipated to be in the low to undetectable range. To complete the human exposure pathway, contaminants must then be absorbed or ingested by fish or other freshwater organisms which are

consumed, or must be directly absorbed by a human receptor. For the reasons outlined above for the surface water pathway, full completion of the exposure pathway is likely to occur rarely, if at all.

Based on the anticipated low levels of sediment contamination, and on the low potential intensity of exposures, the potentially-contaminated sediments are not expected to pose a significant threat to human receptors.

Footnotes:

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 (and attach appropriate supporting documentation as well as a map of the facility):

__X__ 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 **Aqualon** facility, EPA ID # **VAD003121928**, located at **1111 Hercules Road, Hopewell, Virginia** 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 /s/ Date 9/29/04

Michael Zickler

Remedial Project Manager

Supervisor /s/ Date 9/30/04

Robert E. Greaves

Chief, General Operations Branch

EPA Region 3

Locations where References may be found:

All references have been included as attachments to this document.

Contact telephone and e-mail numbers

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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.

LIST OF ATTACHMENTS:

Figure 1: Site Map

Table 1: WWL Monitoring Well Detection Table

Table 2: LF Monitoring Well Detection Table

Table 3: RAB Monitoring Well Detection Table

Table 4: Sludge Drying Beds Detection Table

Table 5: Vacuum Filter Sludge Pile Detection Table

Table 6: Solid Waste Incinerator Detection Table

Table 7: Teepee Incinerator Detection Table

- Pinkerton Security Post Orders
- Safe Access of Solid Waste Management Units (SWMUs) Work Instruction
- Restricted Area Permit Work Instruction
- November 1991 and May 1992 Virginia Water Control Board Memorandums
- Dilution Factor Calculation Worksheet
- VADEQ Post-Closure Care Compliance Report
- October 2000 Annual Monitoring Report – Natrosol Lagoon (September 1999 through June 2000)