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: General Dynamics
Facility Address: Lakeside Ave. Burlington, VT 05401
Facility EPA ID #: VT D002083434

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

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	✓			TCE (32 ug/l), Aroclor 1254 (0.8 ug/l), benzene (45 ug/l) PCE (35
Air (indoors)[2]				
Surface Soil (e.g., <2 ft)	✓			B.a.p. Aprene (0.4 mg/Kg), Aroclor 1254 (4.0 mg/Kg)
Surface Water				
Sediment				
Subsurf. Soil (e.g., >2 ft)	✓			BAP (0.6 mg/Kg) Aroclor 1254 (3.9 mg/Kg) Ni (850 mg/Kg) Cu (3400 mg/
Air (outdoors)				

_____ 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): Levels above compared to Region III RBC's & VT groundwater standards.
References:
- RCRA Facility Assessment - 1989
- RCRA Piezometer & monitoring well installation - 1989, 1990, 1991
- RCRA CA Investigation - 1994
- CERCLA RI & FS - 1992
- CERCLA Additional RI - 1996
- Oil House Area Investigation - 1996, 1998

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	~~YES~~ NO	NO	Yes			NO
X Air (indoors)	X	X	X				
Soil (surface, e.g., <2 ft)	NO	NO		NO	NO	NO	NO
X Surface Water	X	X				X	X X
X Sediment	X	X				X	X
Soil (subsurface e.g., >2 ft)				Yes			NO
X Air (outdoors)	X	X		X	X	X	

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): Complete pathways only in groundwater & subsurface soil media for construction workers at or below 5 ft. where water table is encountered & soil most highly contaminated. The rest facility is paved around all bldgs. and Sumv's. References include:
- GE Geotechnical Borings Program - 1959-1961
- RCRA Facility Assessment at GE Plant - 1989
- RCRA GDP piezometer & monitoring well Installation - 1989, 1990, 1991
- RCRA: RCRA CA Investigation - 1994
- CERCLA: Remedial Investigations - 1990

[3] Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish, etc.)
- CERCLA - RI/FS - 1992
- CERCLA - ARI/AFS - 1996
- Former Oil House Area: Additional Investigation - 1996 - 1998

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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): The direct contact with contaminated media (soil) threat for the Construction worker Scenario below a depth of 5 feet is considered "unacceptable". PCB & PAH levels in Soils at certain locations around the ~~facility~~ facility and at depth contribute to the present (existing) unacceptable ~~risk~~ dermal contact risk to the Construction worker based on the 8hr/day - 180 days per year risk Scenario.
The groundwater exposure pathway is not considered an "unacceptable" risk since this medium would have to be ingested. Dermal Contact with this medium along would not contribute to an unacceptable risk. Groundwater on the facility site has been reclassified by the State as Class IV which is non-potable but useable for some commercial industrial and agricultural purposes.
References for the above are the same as listed in #3 above.

[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?

YE ✓ 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): General Dynamics recently completed a report titled: "RCRA Corrective Action Program Data Gap Analysis" prepared by their consultant and dated June 1999. In this report they discuss each SWMU (six total) providing contaminant type level and distribution as well as a comparison to standards including: State of VT groundwater standards, Region III RBC's Federal MCL's, Mass ~~DEP~~ Contingency Plan, Penn's Land Recycling Program Criteria. Levels of PAH's (especially B(a)P) and PCB's are below standards in the upper 5 feet of surficial soil.

There is an unacceptable dermal contact risk with soil below 5 feet from ground surface. This risk will be addressed by Institutional Controls.

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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):

YE — 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 General Dynamics facility, EPA ID # VT0002083434, located at Burlington, VT 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) E. Stanley Corneille Jr. Date 9/16/99
(print) E. Stanley Corneille Jr.
(title) Site Manager

Supervisor (signature) [illegible] Date 9/20/99
(print) GEORGE DESCH
(title) CHIEF, SITES MGT SECTION
(EPA Region or State) VT

Locations where References may be found:

Waste Management Division Office
103 South Main St. West Bldg.
Waterbury, Vermont 05676-0404

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.