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: Ciba Specialty Chemicals
Facility Address: 55 Crowley Rd. Lewiston, ME
Facility EPA ID #: MED001037126

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).

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	✓			See attached Table 1
Air (indoors)[2]		✓		
Surface Soil (e.g., <2 ft)	✓			See attached Table 4
Surface Water	✓			See attached Table 2
Sediment	✓			See attached Table 5
Subsurf. Soil (e.g., >2 ft)	✓			See attached Table 3
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):

Nine monitoring wells on site have concentrations of VOCs and SVOCs that are orders of magnitude above the associated exposure guidelines for drinking water (See Table 1).

Also, No Name Brook has been sampled and found to contain VOCs above the guidelines for human health for ingestion of water and organisms (See Table 2).

Levels of VOCs and SVOCs in Soils and Sediments have been measured at levels over 100 ppm. PCE has been measured to be above its associated Risk Based guideline (Table 3)

References: Compliance Order by Consent - MEDEP 3/97
Year 2000 Operations Report - Ciba 3/01

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.

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
~~Air (indoors)~~	X	X	X				
Soil (surface, e.g., <2 ft)	NO	NO	NO	NO	yes	NO	NO
~~Surface Water~~ Kmp	NO	NO			yes	NO NO	
Sediment	NO	NO			yes	NO NO	
Soil (subsurface e.g., >2 ft)				NO			NO
~~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): The site is not fenced, so people could enter areas with contamination such as No Name Brook. Trespassers would also possibly contact surface soil or sediment. This contact would likely be short term and incidental.

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

Current Human Exposures Under Control

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): As a result of the documentation of impacts to groundwater, surface water, and sediments on or near the site, A Human Health and Ecological Evaluation (HHEE) was conducted to evaluate the potential exposures and risks associated with VOC discharges into No Name Brook and exposure to standing groundwater on site.

The evaluation was based upon samples taken from No Name Brook surface water and sediments and from groundwater which ponded in low areas on site.

The evaluation concluded that potential surface water exposures to both humans + aquatic organisms are considered to be acceptable according to the standards established in the "Risk Assessment Guidance for Superfund: Human Health Evaluation Manual, and the Environmental Evaluation Manual" USEPA, 1989a+b.

Also for surface soils - levels of contaminants are below Remedial Action guidelines for trespassers from MEDEP guidelines 5/97. (Table 4).

References: "Human Health & Ecological Evaluation" (ABB-ES, 1991).
Compliance Order by Consent - MEDEP 3/97.

[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.

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):_____

1. 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 - 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 Ciba Specialty chemicals facility, EPA ID #MED001037126, located at Lewiston, Maine 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) Diana McKenzie Date 8/15/01
(print) DIANA McKENZIE
(title) ES III

Supervisor (signature) Stacy A. Ladner Date 8/16/01
(print) Stacy A. Ladner
(title) ES IV
(EPA Region or State) Maine DEP

Locations where References may be found:

Maine State Dept. of Env. Protection file room.
Augusta, Maine

Contact telephone and e-mail numbers

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(phone #) 207-287-7880
(e-mail) DIANA.M.McKENZIE@state.me.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.

Table 1
Summary of Volatile and Semi Volatile Organic Compounds Detected in Groundwater And Corresponding Drinking Water Guidelines Ciba Geigy Site, Lewiston, Maine

Contaminant	Maximum Detection (µg/Kg)	Risk Based Concentration
Naphthalene	190	14
Methylene Chloride	450,000	5
Acetone	1,100,000	700
Trichlorofluoromethane	1,900	2100
1,1-Dichloroethane	310	70
1,1,1-Trichloroethane	2,100,000	200
Carbon Tetrachloride	6,200	3
Trichloroethene	4,300	5
Tetrachloroethene	940,000	5
Benzene	15,000	5
1,1-Dichloroethene	65	0.6
Toluene	150,000	1000
Trans 1,2-Dichloroethene	1,400	100
Ethylbenzene	320,000	70
Total Xylenes	2,600,000	10,000

Value is the lower of EPA MCL or Maximum Exposure Guidelines, Maine Department of Human Services, January 20, 2000.

Table 2
Summary of Volatile Organic Compounds
Detected in No Name Brook
And Corresponding Risk Based Exposure Standards
Ciba Geigy Site, Lewiston, Maine

Contaminant	Maximum Detection	Reporting Limit	Aquatic Standard	Human Health Standard
Methylene Chloride	14	0.85	None	4.65
1,1-Dichloroethane	20	0.23	None	None
1,1,1-Trichloroethane	100	0.56	None	None
Trichloroethene	52	0.32	21,900	2.7
Tetrachloroethene	40	0.24	840	0.8
1,1-Dichlorethene	12	0.16	1,160	0.057
Vinyl Chloride	7.6	0.43	None	2
trans 1,2-Dichloroethene	1.4	0.24	1,160	700
Chloroform	1.1	0.27	41	5.67
1,1,2-trichloroethane	0.56	0.26	9,400	0.605
Benzene	1.0	0.22	530	1.2
Ethylbenzene	0.56	0.31	320	3100

Notes:

1. All results in ug/L
2. Reporting Limit for USEPA method 601/602
3. Maine DEP Water Quality Criteria for Toxic Pollutants, Aquatic Life Average Concentration for Fresh Water and Human Health ingestion of water and organisms.
4. None means no standard established based on cuurent toxicity data.

Table 3
Summary of Volatile and Semi Volatile Organic Compounds
Detected in Soil Borings
Ciba Geigy Site, Lewiston, Maine

Contaminant	Maximum Detection (mg/Kg)	Risk Based Concentration*
Naphthalene	11	41,000
Bis(2-ethylhexyl)phthalate	2.7	410
Di-n-butyl phthalate	.68	200,000
Methylene Chloride	51	760
Acetone	12.5	200,000
1,1,1-Trichloroethane	2,200	570,000
Benzene	11	100
4-methyl 2-pentanone	.91	160,000
Tetrachloroethene	1,600	110
Toluene	150	410,000
Ethylbenzene	320	200,000
Total Xylenes	2,600	4,100,000

* Risk Based Concentration Table, USEPA Region III, October 5, 2000.

Table 4
Summary of Volatile and Semi Volatile Organic Compounds Detected in Surface Soil
Ciba Geigy Site, Lewiston, Maine

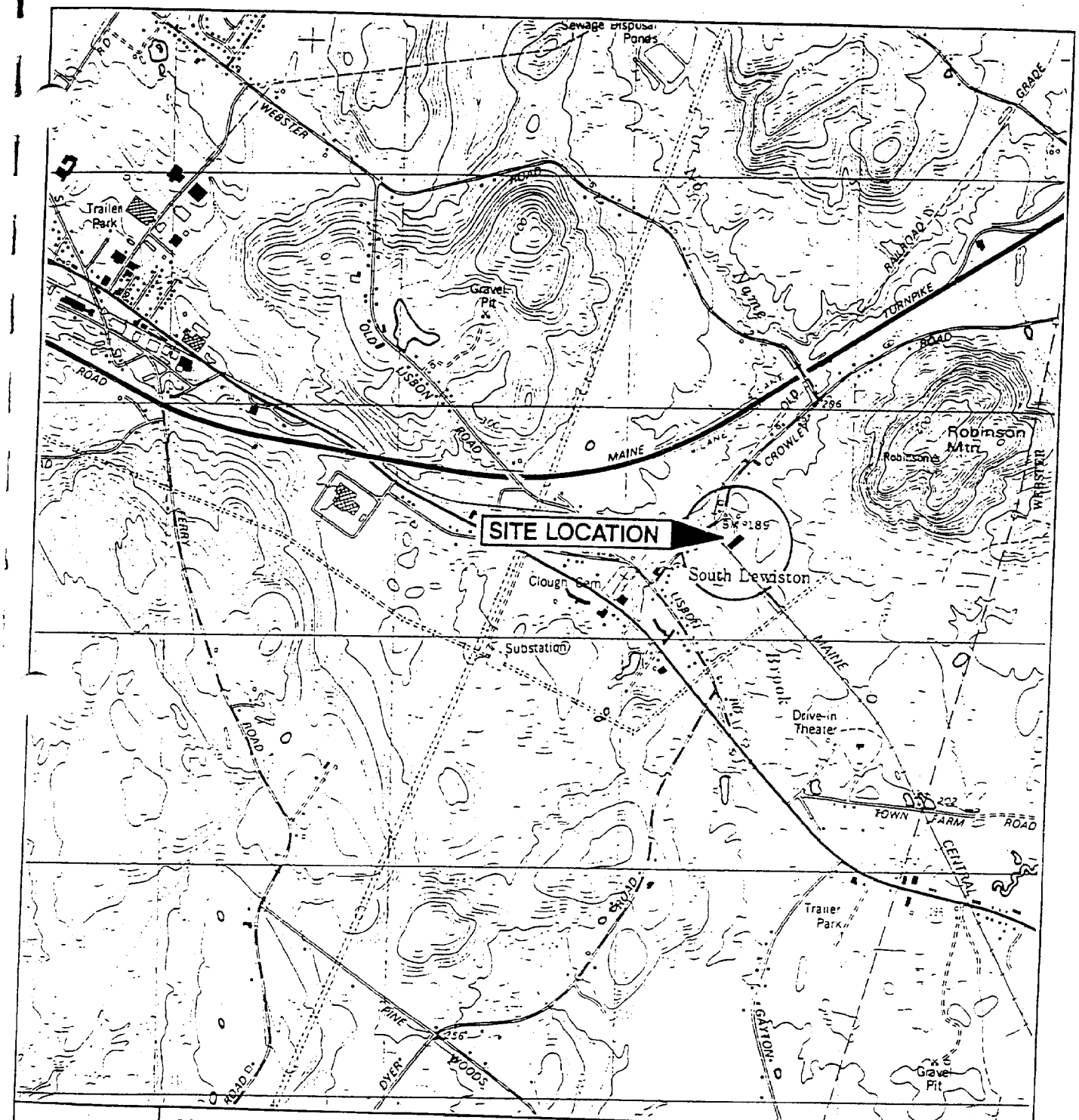
Contaminant	Maximum Detection (mg/Kg)	Remedial Action Guideline*
1,1,1-Trichloroethane	20	1840
1,2-Dichloroethene	125	940
Trichloroethene	2.0	400
Tetrachloroethene	28	65
Benzene	.08	105
Toluene	.41	10000
Ethylbenzene	2.0	10000
Xylene	2.0	10000
1,1-Dichloroethene	1.0	3
1,1-Dichloroethane	.022	4520
Vinyl Chloride	.0021	0.8
Chloroethane	.023	None
Methylene Chloride	.0071	275

* Remedial Action Guidelines for Contaminated Soils - Trespasser guideline 5/20/97 Maine Department of Environmental Protection

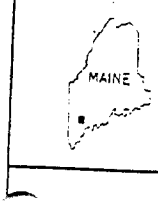
Table 5
Summary of Volatile and Semi Volatile Organic Compounds Detected in Sediment
Ciba Geigy Site, Lewiston, Maine

Contaminant	Maximum Detection (mg/Kg)
1,1,1-Trichloroethane	.62
1,2-Dichloroethene	24
Trichloroethene	50
Tetrachloroethene	320
Toluene	.047
1,1-Dichloroethane	.15
Methylene Chloride	.15

Note: No associated risk based guidelines for sediments are available



SOURCE: U.S.G.S., 7.5 MINUTE SERIES QUADRANGLE, LEWISTON, ME (1979)



SCALE

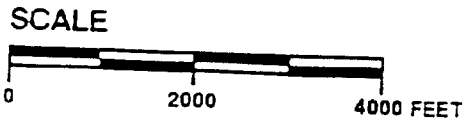


FIGURE 1
SITE LOCATION MAP
SITE INVESTIGATION REPORT
CIBA-GEIGY
HAMBLET & HAYES SITE
LEWISTON, MAINE

6062-19

ABB Environmental Services, Inc.

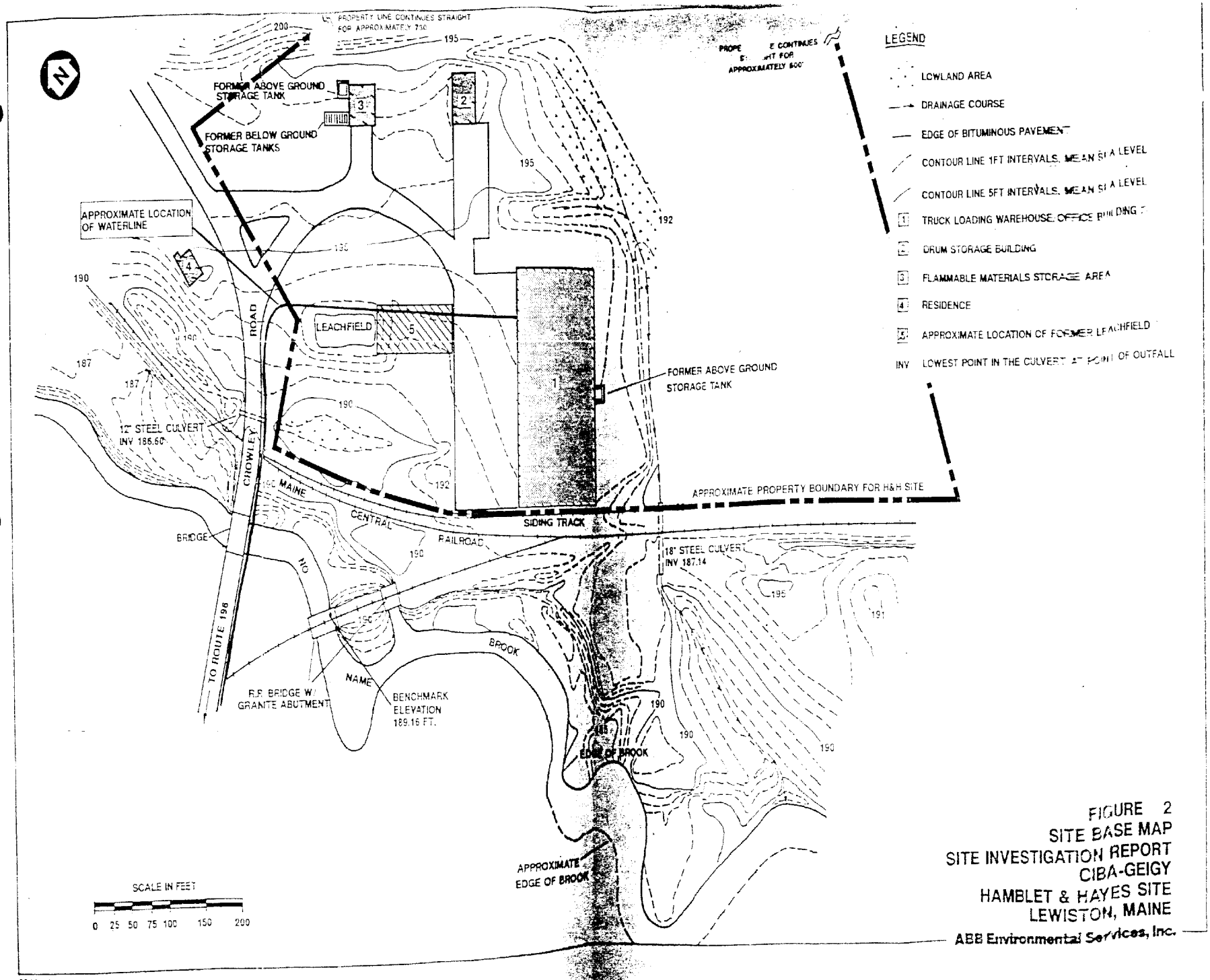


FIGURE 2
SITE BASE MAP
SITE INVESTIGATION REPORT
CIBA-GEIGY
HAMBLET & HAYES SITE
LEWISTON, MAINE
ABB Environmental Services, Inc.