

DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA725)

Current Human Exposures Under Control

Facility Name: **OCCIDENTAL CHEMICAL CORPORATION**
Facility Address: **Buffalo Avenue Niagara Falls, New York**
Facility EPA ID #: **EPA I.D. No. NYD000824482**

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.,

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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)?

	<u>Yes</u>	<u>No</u>	<u>?</u>	<u>Rationale / Key Contaminants</u>
Groundwater	<u>X</u>	___	___	___ See accompanying back ground information ___
Air (indoors) ²	___	<u>X</u>	___	-----
Surface Soil (e.g., <2 ft)	<u>X</u>	___	___	-----
Surface Water	___	<u>X</u>	___	-----
Sediment	___	<u>X</u>	___	-----
Subsurf. Soil (e.g., >2 ft)	<u>X</u>	___	___	-----
Air (outdoors)	___	<u>X</u>	___	-----

_____ 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 DESCRIPTION**

The Occidental Chemical Corporation Buffalo Avenue Facility is located in Niagara Falls, New York on the East bank of the Niagara River between Lake Erie and Lake Ontario. The plant is one of the largest chemical production facilities in New York State. The plant occupies approximately 160

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) suggests 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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acres, employs about 800 persons, and operates , for the most part, on a 24 hours/day, 7 days/week basis. The plant produces both organic and inorganic chemicals. Some of the major products include monochlorotoluene, parachlorobenzotrifburide, benzoyl chloride, hydrochloric acid, chlorine, hydrogen, sodium hydroxide, and sodium hypochlorite. Hazardous wastes are generated as a result of some production activities.

RCRA Facility Investigation

OCC has completed the investigation of releases of hazardous waste constituents at the Buffalo Avenue facility. Overburden and bedrock geologic conditions underlying the Plant and adjacent off-site areas have been extensively investigated and are described in the following documents:

- Final SDCP Report - Buffalo Avenue Plant, April 1992
- OffSite Investigation Summary Report, August 1992
- OffSite Investigation Program Phase 2 Report, November 1993
- RCRA Facility Investigation Report, January 1995

As a result of the investigation, OCC has concluded that hazardous waste constituents have been released to the fill/soil and groundwater beneath the facility.

The extent of soil and groundwater contamination at the facility is such that the Department considers the entire facility an "Area of Contamination." The most significant sources of contaminants are located in the C-Area, D-Area, F-Area, M-Area, N-Area, U-Area, T-Area and Mercury Cell Area, (Figure II-1). The releases are related to spills and leaks associated with historical and present manufacturing activities.

The hazardous waste constituents which were released to the environment are present in the soil and groundwater as aqueous (dissolved) phase contaminant plumes and as dense non-aqueous phase liquids (DNAPL). A list of the Site Specific Indicators which have been released to the soil and groundwater, their historical range of concentrations in the groundwater and the "groundwater protection standard" for those hazardous waste constituents is included in Table II-1. The distribution of contaminants in the soil and groundwater is depicted on the attached figures.

<p>TABLE II-1 SITE SPECIFIC INDICATORS BUFFALO AVENUE PLANT</p>
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Analytes	Units	Max.	Min.	Mean	Ground water Protection Standard
Phosphorus, Total Soluble (As P)	µg-P/L	12,000	ND	721	NA
Arsenic	µg/L	11,072	ND	791	25
Mercury	µg/L	5.3	ND	0.17	2
Lead	µg/L	160	MD	19.2	25
Toluene	µg/L	8,400	ND	417	5
2 Chlorotoluene	µg/L	98,000	ND	1,853	5
4 Chlorotoluene	µg/L	8,500	ND	394	5
2,4/2,5-Dichlorotoluene	µg/L	1,800	ND	67	5
2,6-Dichlorotoluene	µg/L	230	ND	10	5
2,3/3,4-Dichlorotoluene	µg/L	830	ND	26	5
2,3,6-T richlo rotol uene	µg/L	230	ND	10	5
2,4,5 T richlo rotol uene	µg/L	160	ND	3.75	5
Benzene	µg/L	33,000	ND	2,840	1
Chlorobenzene	µg/L	150,000	ND	2,780	5
1,2-Dichlorobenzene	µg/L	12,000	ND	664	1
1,3-Dichlorobenzene	µg/L	1,300	ND	200	5
1,4-Dichlorobenzene	µg/L	19,000	ND	773	1
1,2,3-Trichlorobenzene	µg/L	5,100	ND	174	5
1,2,3,4-Tetrachlorobenzene	µg/L	1,700	ND	85	5
1,2,4,5-Tetrachlorobenzene	µg/L	515	ND	33	5
Hexachlorobenzene	µg/L	170	ND	4.1	1
Trichloroethylene	µg/L	140,000	ND	4,090	5
Tetrachloroethylene	µg/L	20,000	ND	635	5
2-Chlorobenzotrifluoride	µg/L	3,900	ND	108	5
4-Chlorobenzotrifluoride	µg/L	4,600	ND	217	5
2,4-Dichlorobenzotrifluoride	µg/L	79	ND	2.5	5
3,4-Dichlorobenzotrifluoride	µg/L	76	ND	2.8	5

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Analytes	Units	Max.	Min.	Mean	Ground water Protection Standard
Hexachlorocyclopentadiene	µg/L	12,000	ND	226	5
Octachlorocyclopentene	µg/L	1,200	ND	23	5
Perchloropentacyclododecane (Mirex)	µg/L	25	ND	0.79	.03
2,4,5-Trichlorophenol	µg/L	160	ND	3.75	1
a-Hexachlorocyclohexane	µg/L	340	ND	19	5
b-Hexachlorocyclohexane	µg/L	180	ND	8.0	5
g-Hexachlorocyclohexane	µg/L	250	ND	3.9	5
d-Hexachlorocyclohexane	µg/L	310	ND	8.4	5
Benzoic Acid	µg/L	150,000	ND	19,129	100
2-Chlorobenzoic Acid	µg/L	5,500	ND	951	5
3-Chlorobenzoic Acid	µg/L	12,000	ND	1,256	5
4-Chlorobenzoic Acid	µg/L	15,000	ND	2,461	5
Chlorobenzoic Acid, Total	µg/L	28,000	ND	4,654	5
Chlorendic Acid	Ug/L	12,000	ND	1,780	5

Aqueous phase contamination has been observed in the soils and unconsolidated sediments (overburden) at the facility and in the bedrock. The extent of the aqueous phase plume in the overburden appears to be limited to the facility property. The extent of the aqueous phase bedrock plume is considerably greater. Contamination of the D, C and B Zones (upper 125 feet of bedrock) extends from the facility to the Fall Street Tunnel, an historic sewer tunnel incised into the upper bedrock approximately 1,800 feet to the north of the facility, and to the New York Power Authority (NYPA) conduit drains which are cut deep into the bedrock near the western boundary of the property. The extent of the Overburden and Bedrock DNAPL plumes are largely confined to the site. The stratigraphic setting of the study area and geographic distribution of the contaminant plumes are depicted on Figures II-2 through II-7.

Aqueous phase contamination has also infiltrated into the sanitary sewers and outfall sewers at the facility.

- Are there **complete pathways** between “contamination” and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions? **NO**

Summary Exposure Pathway Evaluation Table Potential **Human Receptors** (Under Current Conditions)

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<u>“Contaminated” Media</u>	Residents	Workers	Day-Care	Construction	Trespassers	Recreation	Food ³
Groundwater	No	No	No	No	No	No	No
Air (indoors)	No	No	No	No			
Soil (surface, e.g., <2 ft)	No	No	No	No	No	No	No
Surface Water	No	No	No	No	No	No	No
Sediment	No	No	No	No	No	No	No
Soil (sub surface e.g., >2 ft)	No	No	No	No	No	No	
Air (outdoors)	No	No	No	No	No		

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.

 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): **OCC has taken the following actions to address potential exposure pathways.**

CORRECTIVE MEASURES STUDIES

**OCC HAS COMPLETED THE FOLLOWING CORRECTIVE MEASURES STUDIES (C
CORRECTIVE MEASURES STUDY, BEDROCK GROUNDWATER REMEDIATION
AUGUST 1992
CORRECTIVE MEASURES STUDY, OVERBURDEN GROUNDWATER
REMEDICATION, JANUARY 1994
CORRECTIVE MEASURES STUDY, OVERBURDEN SOILS, AUGUST 1996**

FINAL CORRECTIVE MEASURES STUDY, NOVEMBER 1998

Interim Corrective Measures

During the course of investigating and evaluating site conditions, OCC implemented a number of Interim Corrective Measures (ICMs) designed to mitigate the impacts associated with the observed contamination.

The implemented ICMs include:

Bedrock Groundwater (See Figures II-8, II-9, II-10)

Extraction wells along the downgradient west and northwest Plant property boundaries in the D, C, and B Zones
NAPL collection from on-site bedrock wells

Overburden Groundwater (See Figure II-11)

FLOW ZONE 1 - STAGES 1, 3, AND 4 GROUNDWATER COLLECTION SYSTEM
FLOW ZONE 3 - ENERGY BOULEVARD DRAIN TILE SYSTEM (EBDTS)
INSTALLATION OF A BARRIER WALL ALONG THE NIAGARA RIVER

OVERBURDEN SOIL (SEE FIGURES II-12, II-13)

NON-AQUEOUS PHASE LIQUIDS (NAPL) RECOVERY (WHEN SUFFICIENT QUANTITY IS ENCOUNTERED) AND TREATMENT OF RECOVERED NAPL
CAPPING OF DIOXIN AND ELEMENTAL PHOSPHORUS AREAS AND SURFACE DRAINAGE CONTROL
DEMOLITION OF A FORMER MERCURY CELL PROCESSING BUILDING AND REMOVAL OF ELEMENTAL MERCURY FROM THE SOILS AND FILL BENEATH THE BUILDING
MAINTENANCE OF CAPPED AND EXISTING HARD SURFACED AREAS

THE ICMS, COMBINED WITH A DETAILED MONITORING AND RESPONSE PROGRAM AND WITH APPROPRIATE INSTITUTIONAL MEASURES HAVE SERVED AS THE BASIS FOR FINAL CORRECTIVE MEASURES FOR THE OCCIDENTAL CHEMICAL CORPORATION BUFFALO AVENUE PLANT.

CORRECTIVE MEASURES IMPLEMENTATION

THE FINAL CORRECTIVE MEASURES ARE SPECIFIED HEREIN.

BEDROCK GROUNDWATER: THE DEPARTMENT HAS DETERMINED THAT THE PRESENCE OF HAZARDOUS WASTE CONSTITUENTS IN THE BEDROCK GROUNDWATER AT THE FACILITY (SEE TABLE II-1) REPRESENTS A POTENTIAL THREAT TO HUMAN HEALTH AND THE ENVIRONMENT WHICH MUST BE ADDRESSED BY CORRECTIVE MEASURES. THE DEPARTMENT HAS ALSO DETERMINED THAT THE GROUNDWATER COLLECTION AND TREATMENT PROGRAM WHICH OCC HAS IMPLEMENTED IS THE MOST APPROPRIATE TECHNIQUE FOR LONG-TERM REMEDIATION OF THE BEDROCK GROUNDWATER CONTAMINATION, AND THAT THE TECHNIQUE, IN CONJUNCTION WITH OTHER CORRECTIVE MEASURES, IS CAPABLE OF ACHIEVING THE SPECIFIED REMEDIAL GOALS. THE CORRECTIVE MEASURES PROGRAM WHICH OCC MUST FOLLOW TO COLLECT AND TREAT THE BEDROCK GROUNDWATER CONTAMINATION AT THE FACILITY INCLUDES:

OBJECTIVES, BEDROCK GROUNDWATER CORRECTIVE MEASURES: THE PRIMARY GOALS OF THE BEDROCK GROUNDWATER REMEDIAL SYSTEM TO RESTRICT OFF-SITE MIGRATION OF HAZARDOUS WASTE CONSTITUENTS IN THE BEDROCK GROUNDWATER AND TO REDUCE THE CONCENTRATION OF HAZARDOUS WASTE CONSTITUENTS WITHIN THE BEDROCK GROUNDWATER WITH TIME. TO ACHIEVE THESE GOALS, A HYDRAULIC BARRIER IN THE D, C, AND B ZONES IS MAINTAINED ALONG THE NORTH AND WEST PLANT BOUNDARIES BY OPERATING A GROUNDWATER EXTRACTION SYSTEM. THE HYDRAULIC BARRIER S EXTEND FROM THE VICINITY OF WELL CLUSTER 401 NORTHWARD TO VICINITY OF WELL CLUSTER 404, AND THEN EASTWARD TO THE VICINITY OF WELL CLUSTER 408 (FIGURE II-8). THE LOCATION OF EACH EXTRACTION WELL NEST IS SHOWN ON FIGURE II-9.

OPERATION OF THE BEDROCK GROUNDWATER EXTRACTION AND TREATMENT SYSTEM COMMENCED ON APRIL 1, 1996. AS DISCUSSED IN THE "ONE YEAR PERFORMANCE EVALUATION" DATED JULY 1997, PERFORMANCE MONITORING DATA INDICATED THAT THE SYSTEM COULD NOT BE OPERATED AT THE DESIRED FLOW RATE DUE TO HIGH

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THAN ANTICIPATED VINYL CHLORIDE CONCENTRATIONS AND THE NEED FOR AN INCREASE IN TREATMENT CAPACITY. THEREFORE, THE OPTIMIZATION PERIOD WAS EXTENDED IN ORDER TO MAKE THE NECESSARY MODIFICATIONS TO THE TREATMENT PLANT. FULL-SCALE OPERATION OF THE SYSTEM COMMENCED IN JANUARY 1999.

NATURAL ATTENUATION: THE BEDROCK GROUNDWATER REMEDIAL SYSTEM COMPONENTS COLLECT AND TREAT BEDROCK GROUNDWATER FLOW AT THE NORTH AND WEST (DOWNGRAIENT) BOUNDARIES OF THE PLANT EXCEPT THE EAST PORTION OF THE NORTH PLANT BOUNDARY (EAST OF OW408). CONCENTRATIONS OF SITE-RELATED CHEMICALS IN THE BEDROCK GROUNDWATER IN THE EASTERN DOWNGRAIENT AREA ARE LOW AND HAVE BEEN DECREASING OVER TIME. THEREFORE, THE DEPARTMENT HAS DETERMINED THAT MONITORED NATURAL ATTENUATION OF THE BEDROCK GROUNDWATER IN THAT AREA IS AN ACCEPTABLE REMEDIAL APPROACH. IT SHOULD ALSO BE NOTED THAT ANY CONTAMINATED BEDROCK GROUNDWATER WHICH BYPASSES THE HYDRAULIC BARRIER IS CAPTURED BY THE FALL STREET TUNNEL SEWER AND IS TREATED BY THE CITY OF NIAGARA FALLS.

IF, BY APRIL 2009, NATURAL ATTENUATION FAILS TO REDUCE THE MEASURED CONCENTRATION OF SSI PARAMETERS IN BEDROCK GROUNDWATER IN THAT AREA BY 50%, OR, IF BY APRIL 2014, NATURAL ATTENUATION FAILS TO REDUCE THE MEASURED CONCENTRATION OF SSI PARAMETERS IN BEDROCK GROUNDWATER IN THAT AREA BY 75% (COMPARED TO OSI SAMPLING RESULTS), THE DEPARTMENT MAY REQUIRE OCC TO TAKE ADDITIONAL MEASURES TO REMEDIATE BEDROCK GROUNDWATER IN THAT AREA.

BEDROCK NON-AQUEOUS PHASE LIQUID (DNAPL): A DNAPL RECOVERY PROGRAM HAS BEEN IMPLEMENTED TO PROVIDE CONTAINMENT OF DNAPL IN THE BEDROCK BENEATH THE PLANT. THE COLLECTION AND INCINERATION OF DNAPL FROM THE BEDROCK BENEATH THE PLANT ARE CONSISTENT WITH THE GOAL OF REDUCTION OF THE CONCENTRATION OF HAZARDOUS WASTE CONSTITUENTS WITHIN THE BEDROCK. THE PROGRAM INVOLVES THE COLLECTION OF DNAPL FROM ANY BEDROCK WELL EXHIBITING COLLECTABLE QUANTITIES OF DNAPL.

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CURRENTLY, THERE ARE ONLY THREE BEDROCK WELLS THAT EXHIBIT COLLECTABLE QUANTITIES OF DNAPL: OW402A, OW413A, AND OW417A. THE FOLLOWING AMOUNTS OF DNAPL HAVE BEEN COLLECTED FROM THESE WELLS AS OF THE END OF 1998:

AMOUNT OF NAPL (GALLONS)	
OW402A	5,746
OW413A	330
OW417A	27

THE PROGRAM TO ADDRESS THE PRESENCE OF NAPL IN THE BEDROCK INVOLVES DNAPL COLLECTION AND MONITORING IN 17 A ZONE WELLS AS SHOWN ON FIGURE II-10. THE SCHEDULE FOR DNAPL MONITORING, COLLECTION and reporting activities for the bedrock regime is summarized below:

All bedrock A Zone wells are checked for DNAPL presence on an annual basis. If DNAPL is detected in an A Zone well, the corresponding B Zone well also is checked for DNAPL.

DNAPL is collected on a semi-annual basis from wells OW402A and OW413A. If the volume of DNAPL collected from either well is greater than 100 gallons during any one event, the collection frequency increases to quarterly until the volume collected in one event is less than 50 gallons, after which semiannual pumping resumes.

DNAPL is collected from well OW417A on an annual basis. If the volume of DNAPL collected during any one event is greater than 100 gallons, the pumping frequency increases to quarterly until the volume of DNAPL collected in one event is less than 50 gallons, after which annual pumping resumes.

Collected DNAPL is currently SHIPPED OFF-SITE FOR INCINERATION.

ON AN ANNUAL BASIS, OCC SUBMITS A REPORT THAT DESCRIBES THE RESULTS OF THE DNAPL PUMPING AND OBSERVATION PROGRAM WHICH OCC CONDUCTED DURING THE PREVIOUS CALENDAR YEAR, AND INCLUDES RECOMMENDATIONS FOR FUTURE DNAPL COLLECTION AND

MONITORING.

OCC CHECKS EACH OF THE WELLS IN THE BEDROCK MONITORING NETWORK FOR THE PRESENCE OF DNAPL ON AN ANNUAL BASIS. IF DNAPL IS OBSERVED IN A WELL, OCC MUST NOTIFY THE AGENCIES IN WRITING WITHIN 30 DAYS. A PROPOSED DNAPL COLLECTION PROGRAM FOR THE WELL MUST BE INCLUDED WITH THE NOTIFICATION.

OVERBURDEN GROUNDWATER

CHEMICAL PRESENCE IN THE OVERBURDEN GROUNDWATER BENEATH THE PLANT WAS EXTENSIVELY INVESTIGATED DURING THE RFI AND EARLIER INVESTIGATIONS. FOUR OVERBURDEN GROUNDWATER ORGANIC CHEMICAL PLUMES WERE IDENTIFIED BENEATH THE PLANT AS SHOWN ON FIGURE II-4. THESE FOUR PLUMES COINCIDE WITH THE OBSERVED PRESENCE OF DNAPL IN THE OVERBURDEN

OBJECTIVES OVERBURDEN GROUNDWATER CORRECTIVE MEASURES: THE PRIMARY OBJECTIVES OF THE OVERBURDEN GROUNDWATER REMEDIAL SYSTEM ARE TO RESTRICT OFF-SITE MIGRATION OF HAZARDOUS WASTE CONSTITUENTS IN THE OVERBURDEN GROUNDWATER, TO REDUCE THE CONCENTRATION OF HAZARDOUS WASTE CONSTITUENTS WITHIN THE BEDROCK GROUNDWATER WITH TIME, TO RESTRICT MIGRATION OF HAZARDOUS WASTE CONSTITUENTS FROM THE OVERBURDEN TO THE BEDROCK, AND TO RESTRICT THE DISCHARGE OF HAZARDOUS WASTE CONSTITUENTS TO THE OUTFALLS. AN ADDITIONAL OBJECTIVE IS TO RESTRICT UNACCEPTABLE (AS DETERMINED BY THE NYSDE AND THE CITY OF NIAGARA FALLS) DISCHARGE OF HAZARDOUS WASTE CONSTITUENTS TO THE SANITARY SEWERS. HYDRAULIC CONTAINMENT OF CONTAMINATED PLUMES IS THE PRINCIPAL REMEDIAL APPROACH WHICH WILL BE EMPLOYED TO ACHIEVE THESE OBJECTIVES (FIGURE II-11).

GROUNDWATER EXTRACTION: THE OVERBURDEN GROUNDWATER EXTRACTION SYSTEM IS COMPRISED OF THE FOLLOWING COMPONENTS:

STAGE 1 COLLECTION SYSTEM (CONVERTED 002 OUTFALL)

STAGE 2 COLLECTION SYSTEM MONITORING

STAGE 3 COLLECTION SYSTEM (DRAIN TILE SYSTEM ABOVE STAGE 1)

STAGE 4 COLLECTION SYSTEM (DRAIN TILE SYSTEM -SOUTHWEST PLANT)

ENERGY BOULEVARD DRAIN TILE SYSTEM

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SANITARY SEWERS: HISTORIC SEWER INSTALLATIONS AT THE PLANT DID NOT USE WATERTIGHT CONSTRUCTION MATERIALS AND METHODS. CONSEQUENTLY, GROUNDWATER INFILTRATION INTO THE SANITARY SEWER SYSTEM OCCURS. THROUGHOUT THE LATE 1970S AND TO THE PRESENT, OCC HAS BEEN UPGRADING THE SEWERS TO IMPROVE THE QUALITY OF THE WATER LEAVING THE PLANT. THE CITY OF NIAGARA FALLS IS AWARE THAT INFILTRATION OF CONTAMINATED GROUNDWATER REPRESENTS A SOURCE OF CHEMICAL LOADINGS TO THE SEWERS. THE OCC SANITARY SYSTEMS CURRENTLY OPERATE WITHIN THE DISCHARGE LIMITS ESTABLISHED BY THE CITY OF NIAGARA FALLS (SIGNIFICANT INDUSTRIAL USER WASTEWATER DISCHARGE PERMIT NO. 22).

AS CONDITIONS CURRENTLY EXIST, THE OVERBURDEN FLOW WHICH DISCHARGES TO THE SANITARY SEWER IS TREATED BY THE CITY OF NIAGARA FALLS PRIOR TO DISCHARGE TO THE NIAGARA RIVER. THE SANITARY SEWER SYSTEM IS AN EFFECTIVE COLLECTION SYSTEM AND AS SUCH SERVES AS AN ESSENTIAL COMPONENT OF THE OVERALL PLANT REMEDIAL PLAN.

TO ENSURE THAT THE CITY OF NIAGARA FALLS CONTINUES TO BE AWARE OF THE ROLE OF GROUNDWATER INFILTRATION INTO THE SANITARY SEWERS, SUBSEQUENT RENEWALS OF PERMIT NO. 22 MUST INCLUDE A DESCRIPTION OF THE GROUNDWATER INFILTRATION TO THE SEWERS AND AN ESTIMATE OF THE CHEMICAL LOAD ASSOCIATED WITH THAT INFILTRATION.

OCC must comply with the discharge limits specified in Significant Industrial User Wastewater Discharge Permit No. 22. In the event that the City of Niagara Falls formally notifies OCC that the rate of groundwater infiltration into the sanitary sewers is unacceptable, or modifies the Discharge Permit to preclude such infiltration, OCC must take whatever actions are necessary to reduce unacceptable groundwater infiltration into the sewers.

Should the City of Niagara Falls so notify OCC, the company must, within 30 days of receipt of said notice, submit for Department review and approval a Plan to evaluate the impacts associated with the anticipated changes in the sewer infiltration rates, including a proposal for evaluating alternative remedial strategies for overburden groundwater. Thereafter, the Department will work with OCC and with the City TO IMPLEMENT ANY NECESSARY ENHANCEMENTS TO THE OVERBURDEN GROUNDWATER CORRECTIVE MEASUREMENT PROGRAM.

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OUTFALL SEWERS: OCC HAS MADE NUMEROUS MODIFICATIONS TO THE OUTFALL SEWER NETWORK BENEATH THE PLANT TO REDUCE CHEMICAL LOADINGS TO THE NIAGARA RIVER. MODIFICATIONS HAVE INCLUDED ABANDONING SEWER SECTIONS IN DEMOLISHED AREAS OF THE PLANT, REPLACING SEWERS WITH WATERTIGHT PIPING, LINING EXISTING SEWER PIPE, REPAIRING AND PATCHING MANHOLES, CLEANING AND CONDUCTING VIDEO INSPECTIONS OF SEWERS, AND SAMPLING SEWER FLOWS.

OUTFALL SEWER MODIFICATIONS HAVE REDUCED THE ESTIMATED TOTAL LOADING OF CHLORINATED COMPOUNDS AND BENZENE AND TOLUENE TO THE NIAGARA RIVER FROM THE OUTFALL SEWERS FROM APPROXIMATELY 119 LBS/DAY IN 1984 TO 8 LBS/DAY IN 1990 FOR THE SUM OF THE OUTFALLS. CURRENT ESTIMATED LOADING TO THE RIVER FROM THE OUTFALL SEWERS IS LESS THAN 5 LBS/DAY. THE RESULTS OF THE OUTFALL SEWER MODIFICATIONS ARE CONSISTENT WITH THE REMEDIAL GOAL OF RESTRICTING DISCHARGE OF OCC HAZARDOUS WASTE CONSTITUENTS TO THE OUTFALLS.

GIVEN THE NATURE AND EXTENT OF OVERBURDEN GROUNDWATER CONTAMINATION AND THE NATURE OF THE OUTFALL SEWER NETWORK, IT IS REASONABLE TO EXPECT THAT FUTURE UNACCEPTABLE LOADINGS FROM CONTAMINANT INFILTRATION OF THE SEWERS COULD TAKE PLACE. DISCHARGE OF CONTAMINANTS FROM THE OUTFALL SEWERS IS REGULATED BY THE DEPARTMENT UNDER SPDES PERMIT NO. NY0003336 (NYSDEC NO. 9-297-00112/00009-0). OCC MUST COMPLY WITH THAT PERMIT AND MUST TAKE WHATEVER ACTIONS ARE NECESSARY TO ENSURE THAT INFILTRATION OF CONTAMINATED GROUNDWATER DOES NOT CAUSE EXCEEDANCES OF THE PERMITTED DISCHARGE LIMITS, AND MUST RESPOND TO ANY EXCEEDANCE ASSOCIATED WITH SUCH INFILTRATION AS EXPEDITIOUSLY AS POSSIBLE.

OVERBURDEN BARRIER WALL: THREE BARRIER WALLS HAVE BEEN CONSTRUCTED SOUTH OF THE PLANT; THE NYPA INTAKE WALL, THE PLANT BARRIER WALL, AND THE S-AREA BARRIER WALL. THESE WALLS FORM A CONTINUOUS PHYSICAL BARRIER TO RESTRICT PLANT OVERBURDEN GROUNDWATER FROM MIGRATING TO THE UPPER NIAGARA RIVER. THE NYPA INTAKE WALL, WHICH EXTENDS FROM THE NYPA WATER CONDUITS AT THE WEST END TO THE PLANT BARRIER WALL AT THE EAST END, WAS CONSTRUCTED BETWEEN 1959 AND 1960 AS PART OF THE INTAKE STRUCTURES AND WATER CONDUITS. THE CONCRETE NYPA INTAKE WALL WAS CONSTRUCTED FROM

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GROUND SURFACE AND EXTENDS INTO THE TOP OF BEDROCK. THE UNDERLYING BEDROCK WAS GROUTED TO A DEPTH OF APPROXIMATELY 10 FEET BELOW THE TOP OF THE BEDROCK. THE PLANT BARRIER WALL, WHICH EXTENDS FROM THE NYPA INTAKE WALL AT THE WEST END TO THE S-AREA BARRIER WALL AT THE EAST END, WAS CONSTRUCTED BETWEEN 1993 AND 1994. THE PLANT BARRIER WALL, WHICH IS A SOIL-BENTONITE SLURRY WALL SANDWICHED BETWEEN SHEET PILE WALLS, WAS CONSTRUCTED FROM NEAR THE GROUND SURFACE TO THE CLAY/TILL CONFINING LAYER OR THE TOP OF BEDROCK. THE SOUTHERN SEGMENT OF THE S-AREA BARRIER WALL, WHICH ENCIRCLES THE S-AREA AND THE SOUTHERN PORTION OF THE V-AREA, WAS CONSTRUCTED IN 1994. THE S-AREA BARRIER WALL, WHICH ALSO IS A SOIL-BENTONITE SLURRY WALL SANDWICHED BETWEEN SHEET PILE WALLS, WAS CONSTRUCTED FROM NEAR THE GROUND SURFACE TO THE CLAY/TILL CONFINING LAYER OR THE TOP OF BEDROCK.

THESE BARRIER WALLS PROVIDE PHYSICAL CONTAINMENT THAT RESTRICTS DIRECT OVERBURDEN GROUNDWATER FLOW TO THE NIAGARA RIVER. IN THE EVENT THAT FUTURE REPAIR OF THE WALLS IS NECESSARY TO CONTINUE THEIR FUNCTION AS PHYSICAL BARRIERS, THE DEPARTMENT MAY REQUIRE OCC TO REPAIR OR ENHANCE THE WALLS.

OVERBURDEN DNAPL: AN ONGOING DNAPL COLLECTION PROGRAM HAS BEEN IMPLEMENTED AT THE PLANT. DNAPL IS MONITORED AND COLLECTED FROM THE OUTFALL 003 DNAPL COLLECTION TRENCH, OW313, ABANDONED SEWER MANHOLES, AND TWO DNAPL COLLECTION SUMPS IN THE N-AREA. DNAPL IS ALSO COLLECTED FROM THE ENERGY BOULEVARD DRAIN TILE SYSTEM. THE LOCATION OF THESE COLLECTION POINTS IS SHOWN ON FIGURE II-12. THE RESULTS OF DNAPL COLLECTION, ALONG WITH ANY PROPOSED CHANGES TO THE COLLECTION PROGRAM, SHALL BE SUBMITTED TO THE DEPARTMENT ANNUALLY.

THE PLANT'S STANDARD OPERATING PROCEDURES (SOP) FOR CONSTRUCTION ACTIVITIES MUST CONTAIN PROCEDURES TO IMPLEMENT A DNAPL COLLECTION PROGRAM. IN ADDITION, THE SOP MUST CONTAIN PROVISIONS FOR NOTIFYING THE DEPARTMENT IN THE EVENT THAT DNAPL IS ENCOUNTERED. MOBILE DNAPL THAT IS DETECTED DURING CONSTRUCTION ACTIVITIES WILL BE EXTRACTED USING EITHER EXTRACTION WELLS OR AN EXTRACTION TRENCH. THE MOST SUITABLE EXTRACTION METHOD WILL BE CHOSEN DEPENDING ON

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LOCAL CONDITIONS SUCH AS UNDERGROUND UTILITY CONGESTION, SOIL POROSITY AND QUANTITY OF MOBILE DNAPL AVAILABLE FOR EXTRACTION. EXTRACTED DNAPL WILL BE TREATED EITHER ON-SITE AT THE PLANT S LTDU OR OFF-SITE AT AN APPROVED FACILITY. DNAPL ENCOUNTERED IN SEWERS DURING MAINTENANCE OR CONSTRUCTION ACTIVITIES WILL BE EXTRACTED AND TREATED.

IN JUNE 1999, OCC CONDUCTED A COMPREHENSIVE OVERBURDEN DNAPL SURVEY AT THE PLANT. THE SURVEY INCLUDED ALL EXISTING PLANT OVERBURDEN WELLS. AFTER THE INITIAL SURVEY, THE PLANT OVERBURDEN WELLS WERE CATEGORIZED AS EITHER DNAPL-BEARING WELLS OR NON-DNAPL-BEARING WELLS. DNAPL-BEARING WELLS WERE PUMPED TO DETERMINE THE QUANTITY OF DNAPL PRESENT IN EACH WELL. THE WELLS WERE THEN FURTHER CATEGORIZED AS EITHER DNAPL-BEARING WELLS WITH GREATER THAN ONE GALLON OF MOBILE DNAPL OR DNAPL-BEARING WELL WITH LESS THAN ONE GALLON OF MOBILE DNAPL. ALL EXTRACTED DNAPL WILL BE TREATED EITHER ON-SITE AT THE PLANT S LTDU OR OFF-SITE AT AN APPROVED FACILITY. THE RESULTS OF THE SURVEY, ALONG WITH RECOMMENDATIONS FOR DNAPL COLLECTION, WERE SUBMITTED TO THE DEPARTMENT ON JULY 21, 1999.

AT A MINIMUM, WELLS WITH GREATER THAN ONE GALLON OF MOBILE DNAPL WILL BE PUMPED QUARTERLY. IF THE QUANTITY OF MOBILE DNAPL IN ONE OF THESE WELLS IS LESS THAN ONE GALLON ON EACH OF TWO CONSECUTIVE QUARTERLY PUMPING EVENTS, THE WELL WILL BE CATEGORIZED AS A DNAPL-BEARING WELL WITH LESS THAN ONE GALLON OF MOBILE DNAPL. WELLS WITH LESS THAN ONE GALLON OF MOBILE DNAPL WILL BE PUMPED SEMIANNUALLY. IF A WELL CONTAINS NO DNAPL AFTER TWO CONSECUTIVE SEMIANNUAL PUMPING EVENTS, IT WILL BE CATEGORIZED AS A NON-DNAPL-BEARING WELL.

A SECOND DNAPL SURVEY WILL BE CONDUCTED TWO YEARS AFTER THE INITIAL SURVEY. ONLY NON-DNAPL-BEARING WELLS WILL BE INCLUDED IN THE SECOND SURVEY. IF DNAPL IS DETECTED IN A WELL DURING THE SECOND SURVEY, THE WELL WILL BE CATEGORIZED AS A DNAPL-BEARING WELL AND PUMPING WILL BE CONDUCTED ACCORDING TO THE ABOVE SCHEDULE. IF DNAPL IS NOT DETECTED IN A WELL DURING THE SECOND SURVEY, NO FURTHER DNAPL MONITORING, EXCEPT AS SPECIFIED BELOW, NEEDS TO BE CONDUCTED AT THAT WELL UNLESS OTHERWISE DIRECTED BY THE

DEPARTMENT.

OCC CHECKS EACH OF THE WELLS IN THE OVERBURDEN MONITORING NETWORK FOR THE PRESENCE OF DNAPL ON AN ANNUAL BASIS. IF DNAPL IS OBSERVED IN A WELL, OCC MUST NOTIFY THE AGENCIES IN WRITING WITHIN 30 DAYS. A PROPOSED DNAPL COLLECTION PROGRAM FOR THE WELL SHALL BE INCLUDED WITH THE NOTIFICATION.

ON AN ANNUAL BASIS (DUE APRIL 1), OCC SHALL SUBMIT A REPORT THAT DESCRIBES THE RESULTS OF THE DNAPL PUMPING AND OBSERVATION PROGRAM WHICH OCC CONDUCTED, AND INCLUDES RECOMMENDATIONS FOR FUTURE DNAPL COLLECTION AND MONITORING.

MERCURY CELL AREA: INTERIM CORRECTIVE MEASURES FOR THE MERCURY CELL AREA (FORMER BUILDING U-75) WERE COMPLETED IN JANUARY 1992. A DESCRIPTION OF THE INTERIM CORRECTIVE MEASURES IMPLEMENTED IS PRESENTED IN THE DOCUMENT ENTITLED IMPLEMENTATION REPORT, BUILDING U-75 INTERIM CORRECTIVE MEASURE, AUGUST 1992. DURING THE INTERIM CORRECTIVE MEASURES, MORE THAN 33 TONS OF MERCURY WERE RECOVERED FROM THE AREA. THE REMAINING TRACE AMOUNTS OF MERCURY WERE CONTAINED WITHIN A SHEET PILE WALL THAT ENCIRCLED ALL OF BUILDING U-75 AND WERE KEYED INTO THE NATIVE TILL CONFINING UNIT. ALTHOUGH THE MERCURY CELL AREA WAS CONSIDERED AS A POTENTIAL CONTRIBUTOR OF MERCURY TO THE OVERBURDEN GROUNDWATER, MERCURY PRESENCE HAS ONLY BEEN DETECTED AT LOW CONCENTRATIONS IN THE GROUNDWATER BENEATH THIS AREA. THEREFORE, IT IS ASSUMED THAT THE MERCURY PRESENCE IN THE SOIL BENEATH THE MERCURY CELL AREA IS NO LONGER A SIGNIFICANT POTENTIAL SOURCE FOR ELEVATED MERCURY CONCENTRATIONS IN THE SURROUNDING SOIL OR GROUNDWATER.

TO CONFIRM THAT ADDITIONAL SWMU-SPECIFIC CORRECTIVE MEASURES ARE NOT NEEDED IN THE MERCURY CELL AREA, OCC INSTALLED AND ROUTINELY SAMPLES AN OVERBURDEN MONITORING WELL IMMEDIATELY DOWNGRAD OF THE FORMER MERCURY CELL BUILDING (U75) FOR THE PRESENCE OF MERCURY.

NATURAL ATTENUATION: THE OVERBURDEN GROUNDWATER REMEDIAL SYSTEM

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COMPONENTS COLLECT AND TREAT OVERBURDEN GROUNDWATER FLOW AT THE SOUTHERN, WESTERN AND NORTHEASTERN (DOWNGRAIENT) BOUNDARIES OF THE PLANT (FLOW ZONES 1 & 3). WITH THE EXCEPTION OF NORTHWESTERN CORNER OF THE PLANT (WELLS OW304, BH10-88, OW317), CONCENTRATIONS OF SITE-RELATED CHEMICALS IN THE OVERBURDEN GROUNDWATER IN THE EASTERN, WESTERN AND NORTHWESTERN DOWNGRAIENT AREAS THAT ARE NOT CAPTURED BY EITHER THE OVERBURDEN GROUNDWATER DRAIN TILE SYSTEMS OR THE SANITARY SEWER SYSTEM ARE LOW AND HAVE BEEN DECREASING OVER TIME. THEREFORE, THE DEPARTMENT HAS DETERMINED THAT MONITORED NATURAL ATTENUATION OF THE OVERBURDEN GROUNDWATER IN THOSE AREAS IS AN APPROPRIATE REMEDIAL APPROACH.

IF, BY APRIL 2009, NATURAL ATTENUATION FAILS TO REDUCE THE MEASURED CONCENTRATION OF SSI PARAMETERS IN OVERBURDEN GROUNDWATER BY 75% OR, IF BY APRIL 2014, NATURAL ATTENUATION FAILS TO REDUCE THE MEASURED CONCENTRATION OF SSI PARAMETERS IN OVERBURDEN GROUNDWATER IN THAT AREA OF THE FACILITY BY 75% (COMPARED TO OSI NOVEMBER 1993 SAMPLING RESULTS, FIGURE II-16), THE DEPARTMENT MAY REQUIRE OCC TO TAKE ADDITIONAL MEASURES TO REMEDIATE OVERBURDEN GROUNDWATER IN THAT AREA OF THE FACILITY.

OVERBURDEN SOILS

OVERBURDEN SOIL CONTAMINANT CHARACTERISTICS AT THE PLANT ARE AFFECTED BY LOCALIZED CONDITIONS SUCH AS GEOLOGY, HYDROGEOLOGY, CHEMICAL SOURCE AREAS, SURFACE CONDITIONS, VARYING CHEMICAL COMPOSITIONS AND HYDRAULIC INFLUENCES. THEREFORE, DIFFERENT AREAS OF THE PLANT MAY REQUIRE SPECIFIC REMEDIAL TECHNOLOGIES TO ADDRESS THE LOCALIZED CONDITIONS ENCOUNTERED. AREAS OF DNAPL PRESENCE AND ELEVATED CHEMICAL CONCENTRATIONS FOR DIOXIN, ELEMENTAL PHOSPHORUS, AND MERCURY ARE PRIMARY CONCERN. THE FOUR CHEMICAL GROUPINGS ENCOUNTERED AT THE PLANT CAN BE DIVIDED INTO SEVEN AREAS THAT MUST BE ADDRESSED.

CONTAINMENT: THE DEPARTMENT HAS DETERMINED THAT A CONTAINMENT STRATEGY, IN CONJUNCTION WITH APPROPRIATE INSTITUTIONAL CONTROLS,

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IS AN ACCEPTABLE REMEDIAL APPROACH FOR OVERBURDEN SOILS. THE AREAS WHICH REQUIRE REMEDIATION OF OVERBURDEN SOILS AND THE CONTAINMENT MECHANISM FOR THOSE AREAS ARE DEPICTED ON FIGURE 1 AND ARE SUMMARIZED AS FOLLOWS:

<u>AREA</u>	<u>CHEMICAL GROUP</u>	<u>CURRENT STATUS OF AREA</u>	<u>FUNCTION</u>
C/D-AREA	DNAPL AND DIOXIN	ASPHALT CAP	SEPARATION, DUST, INFILTRATION CONTROL
ENERGY BLVD	DNAPL	COLLECTION TRENCH	CONTAINMENT
F-AREA	DNAPL AND DIOXIN	ASPHALT CAP GRAVEL SURFACE	SEPARATION, DUST, INFILTRATION CONTROL
T-AREA	DNAPL	ASPHALT CAP	SEPARATION & INFILTRATION CONTROL
U-AREA	DNAPL	ASPHALT CAP GRAVEL SURFACE	SEPARATION & INFILTRATION CONTROL
N-AREA	DIOXIN	ASPHALT CAP	SEPARATION & DUST CONTROL
N-AREA	MERCURY	ASPHALT CAP SHEET PILE WALL	CONTAINMENT
N-AREA	DNAPL	ASPHALT CAP	SEPARATION & INFILTRATION CONTROL CONTAINMENT
N-AREA	DNAPL	DNAPL COLLECTION TRENCH/SUMP/WELLS	CONTAINMENT
X-AREA	DIOXIN	SOIL/GRASS CAP	SEPARATION & DUST CONTROL

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<u>AREA</u>	<u>CHEMICAL GROUP</u>	<u>CURRENT STATUS OF AREA</u>	<u>FUNCTION</u>
V-AREA	ELEMENTAL PHOSPHORUS	ASPHALT CAP GRAVEL SURFACE	SEPARATION & INFILTRATION CONTROL

THE CONTAINMENT SURFACES DESCRIBED ABOVE MUST BE MAINTAINED SO TO FUNCTION AS DESIGNED. AT A MINIMUM OCC SHALL INSPECT THESE STRUCTURES ANNUALLY AND SHALL MAKE ANY REPAIRS NECESSARY TO ADEQUATELY MAINTAIN THEIR INTEGRITY. ANNUALLY, A COPY OF THE INSPECTION REPORT AND A SUMMARY OF ANY MAINTENANCE/REPAIRS WHICH WERE PERFORMED DURING THE PREVIOUS CALENDAR YEAR MUST BE SUBMITTED TO THE DEPARTMENT BY APRIL 1. THE SAME INFORMATION MUST BE KEPT ON FILE AT THE FACILITY. IN ADDITION, OCC MUST ENSURE THAT ANY USE OF AREAS FOR STORAGE/PARKING OF VEHICLES OR EQUIPMENT WILL NOT IMPAIR THE FUNCTION OF THE CONTAINMENT SURFACES.

SOIL STOCKPILES: EXCESS SOILS GENERATED DURING CONSTRUCTION OF CORRECTIVE MEASURES IMPLEMENTATION (CMI) ACTIVITIES, PLANT MAINTENANCE ACTIVITIES, AND PLANT REVITALIZATION ACTIVITIES HAVE BEEN HANDLED IN ACCORDANCE WITH THE PROCEDURES DESCRIBED IN THE FOLLOWING REPORTS:

“SOIL MANAGEMENT PLAN FOR CORRECTIVE MEASURES IMPLEMENTATION ACTIVITIES,” DATED JANUARY 1995; AND

“SOIL MANAGEMENT PLAN FOR CORRECTIVE MEASURES IMPLEMENTATION – OVERBURDEN ACTIVITIES,” DATED NOVEMBER 1995, AND AN ASSOCIATED ADDENDUM SUBMITTED TO NYSDEC UNDER LETTER ON JULY 17, 1997.

THE SOIL MANAGEMENT PLAN PROCEDURES ALLOWED HANDLING OF THE SOILS WITHOUT ACTIVELY MANAGING THE SOILS AND THEREBY DID NOT TRIGGER ANY “LAND BAN” RESTRICTIONS.

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THREE SOIL CLASSIFICATIONS WERE USED TO CATEGORIZE THE SOILS:

CATEGORY ~~A0~~ PPM ORGANIC VAPOR CONCENTRATION AND NO OBSERVABLE
DNAPL PRESENT

CATEGORY ~~B0~~ PPM ORGANIC VAPOR CONCENTRATION AND NO OBSERVABLE
DNAPL

CATEGORY ~~C0~~ OBSERVABLE DNAPL PRESENT

CATEGORY C SOILS WERE HAULED OFF-SITE FOR DISPOSAL; NO CATEGORY C
SOILS MAY BE PLACED IN THE LONG-TERM STOCKPILES. AS OF OCTOBER 1999
THE VOLUME OF SOILS PLACED IN EACH AREA OF THE SOIL STOCKPILE WAS
FOLLOWS:

<u>LOCATION</u>	<u>SOIL CATEGORY</u>	<u>VOLUME (CUBIC YARDS)</u>
WEST PILE	CATEGORY A	8,950
	CATEGORY B	2,120
STORES ENCLOSURE AND	CATEGORY A	2,040
EAST PILE	CATEGORY A	6,060
	CATEGORY B	<u>1,310</u>
TOTAL		20,480

THE EXISTING AND PROPOSED EXTENT OF THE LONG-TERM SOIL STOCKPILE
PRESENTED ON FIGURE II-14. THE TOTAL CAPACITY OF THE LONG-TERM SOIL
STOCKPILES IS APPROXIMATELY 24,000 CUBIC YARDS. FUTURE ACTIVITIES THAT
MAY GENERATE EXCESS SOILS INCLUDE:

PLANT MAINTENANCE
ONGOING REVITALIZATION PROJECTS

SEDIMENT TRANSPORT AND SURFACE WATER RUNOFF FROM THE LONG-TERM
CATEGORY A STOCKPILE ARE CONTROLLED BY THE CONSTRUCTION OF
LOW-PROFILE SOIL BERMS CONSTRUCTED USING CATEGORY A SOILS.
PRECIPITATION FALLING WITHIN THE BERMED AREA WILL INFILTRATE INTO
THE GROUND.

SEDIMENT TRANSPORT FOR THE LONG-TERM CATEGORY B STOCKPILES IS

CONTROLLED BY:

LINING THE BOTTOM OF THE STOCKPILES WITH POLYETHYLENE SHEETING;
CONSTRUCTING LOW-PROFILE SOIL BERMS AROUND THE STOCKPILES USING CATEGORY A SOILS; AND
COVERING THE STOCKPILES WITH POLYETHYLENE SHEETING TO PREVENT DIRECT RUNOFF ONTO THE GROUND SURFACE OUTSIDE OF THE BERMED AREA.

THE LONG-TERM CATEGORIES A AND B SOIL STOCKPILES WERE GRADED TO PROMOTE POSITIVE DRAINAGE. THE MAJORITY OF THE WEST STOCKPILE WAS CLOSED IN SEPTEMBER 1998. THE STOCKPILE WAS COVERED WITH SIX INCHES OF SOIL CAPABLE OF SUSTAINING VEGETATIVE GROWTH AND THEN SEEDED IN AUGUST AND SEPTEMBER 1998. THE STORES ENCLOSURE PAD WAS COVERED WITH GRANULAR MATERIAL TO PROVIDE A STRUCTURAL BASE FOR EQUIPMENT STORAGE. FUTURE STOCKPILED CATEGORIES A AND B SOIL WILL BE COVERED WITH SIX INCHES OF SOIL CAPABLE OF SUSTAINING GROWTH AND WILL BE SEEDED.

- I. BIOREMEDIATION PILOT PROJECT: IN JULY 1994, OCC INITIATED A PILOT-SCALE FIELD STUDY TO TREAT CHLORINATED CHEMICALS IN SOIL USING ANAEROBIC BIOTECHNOLOGY AT THE PLANT. THE PILOT-SCALE TREATABILITY STUDY BEGAN IN AUGUST 1994 AND CONTINUED FOR APPROXIMATELY 30 MONTHS. THE PILOT-SCALE STUDY CONCLUDED IN JANUARY 1997. THE PILOT-SCALE STUDY CLOSURE WAS REPORTED IN THE DOCUMENT ENTITLED "FINAL REPORT: PILOT AND BENCH-SCALE TREATMENT STUDY, ANAEROBIC/AEROBIC BIODEGRADATION OF CHLORINATED CHEMICALS IN SOILS," DATED FEBRUARY 1998 (CLOSURE REPORT). THE RESULTS OF THE PILOT-SCALE STUDY SHOWED THAT THE CONCENTRATION OF CHLORINATED COMPOUNDS IN SOIL COULD BE EFFECTIVELY REDUCED BY ANAEROBIC AND AEROBIC DEGRADATION.

BASED ON THE CONCLUSIONS OF THE PILOT-SCALE STUDY, THE DEPARTMENT HAS DETERMINED THAT A FULL-SCALE TREATMENT DEMONSTRATION STUDY IS WARRANTED. THE FULL-SCALE STUDY WILL BE CONDUCTED IN THE EXISTING F-AREA SOIL STOCKPILE. THE OBJECTIVE OF THE FULL-SCALE STUDY WILL BE TO DEMONSTRATE THE FEASIBILITY OF USING ANAEROBIC FOLLOWED BY AEROBIC

BIOTREATMENT TECHNIQUES TO DEGRADE CHLORINATED BENZENES AND TOLUENES ON A LARGER SCALE.

II. INSTITUTIONAL CONTROLS:

- A. SOP - IN ORDER TO PRECLUDE UNINTENDED EXPOSURE TO, OR DISTRIBUTION OF CONTAMINATED SOILS, OCC HAS DEVELOPED AND IMPLEMENTED A SOP FOR CONDUCTING SUBSURFACE EXCAVATIONS AT THE PLANT. THE SOP WAS SUBMITTED TO THE STATE IN JUNE 1997 AND APPROVED IN A LETTER DATED JULY 29, 1997. THE SOP INCLUDES PROCEDURES FOR SOIL AND WATER HANDLING AND PRESENTS PLANS SHOWING THE POTENTIAL AREAL AND VERTICAL EXTENT OF DNAPL, DIOXIN, AND ELEMENTAL PHOSPHORUS, AND PROCEDURES TO REDUCE THE POTENTIAL FOR WORKER EXPOSURE. THE SOP ALSO CONTAINS PROCEDURES TO ENSURE THAT THE CONFINING CLAY/TILL UNIT IS NOT PENETRATED DURING CONSTRUCTION ACTIVITIES. IN ORDER TO RESTRICT THE POTENTIAL FOR DISTURBANCE OF THE SOILS, PREVENT CHEMICAL MIGRATION, AND TO PROTECT WORKERS WHO MAY PERFORM EXCAVATION ACTIVITIES, THE SOP MUST BE REFERRED TO AND FOLLOWED BY PLANT PERSONNEL AND CONTRACTORS BEFORE ANY SUBSURFACE WORK AT THE PLANT IS PERFORMED. AS NEW INFORMATION OR CONDITIONS AT THE SITE ARISE, OCC MUST UPDATE THE SOP TO ENSURE THAT IT FUNCTIONS PROPERLY. ANY CHANGES TO THE SOP MUST BE SUBMITTED TO THE DEPARTMENT.
- B. CITY OF NIAGARA FALLS WATER MAINS - AN SOP HAS ALSO BEEN DEVELOPED FOR REPAIR OF WATER MAINS. THE SOP CONTAINS PROCEDURES TO FLUSH OUT ANY GROUNDWATER THAT MAY HAVE ENTERED THE WATER MAIN FROM AN EXCAVATION DURING REPAIR ACTIVITIES. IN ADDITION, OCC MUST NOTIFY THE CITY OF NIAGARA FALLS WHENEVER GROUNDWATER INFILTRATION INTO THE WATER MAINS IS OBSERVED OR SUSPECTED.
- C. SECURITY - THE PLANT PERIMETER FENCE AND SECURITY SYSTEM MUST BE MAINTAINED TO ENSURE THAT UNAUTHORIZED PEOPLE CANNOT ACCESS THE PLANT SOIL. THIS WILL ENSURE THAT PEOPLE WHO ARE UNAWARE OF THE CHEMICAL PRESENCE IN THE SOIL WILL NOT BE

EXPOSED INADVERTENTLY.

- III. DEED RESTRICTIONS: THERE ARE KNOWN AREAS OF SOIL AND GROUNDWATER CONTAMINATION AT THE FACILITY. THEREFORE, OCC HAS MADE A FORMAL NOTATION ON THE DEED TO THE FACILITY PROPERTY, THAT WILL IN PERPETUITY NOTIFY ANY POTENTIAL PURCHASER OF THE PROPERTY THAT:
- A. THE LAND HAS BEEN USED TO MANAGE HAZARDOUS WASTE. THE DEED RESTRICTIONS INCLUDE A DESCRIPTION OF THE POTENTIAL AREAS AND VERTICAL PRESENCE OF HAZARDOUS WASTE CONSTITUENTS WHICH HAVE BEEN DETECTED IN THE SOIL AND GROUNDWATER AT THE FACILITY, TYPICAL PROPERTIES OF THE CHEMICALS, A LIST OF THE POTENTIAL HUMAN EXPOSURE ROUTES, A REFERENCE TO THE PLANT HEALTH AND SAFETY PLAN FOR CONSTRUCTION ACTIVITIES (HASP), AND TO ALL SOPS DESCRIBED IN (4) (A) ABOVE.
 - B. USE OF CERTAIN AREAS OF THE FACILITY MAY BE RESTRICTED UNDER NYCRR PART 373-2.7, AS IF THEY WERE A HAZARDOUS WASTE DISPOSAL FACILITY.
 - C. OCC, FOR ITSELF, AND THE STATE OF NEW YORK, ACTING THROUGH THE NYSDEC OR ITS DESIGNEE, RETAIN THE RIGHT OF ACCESS TO AND USE OF THE PROPERTY, BUT WITHOUT THE RIGHT TO INTERFERE WITH, OBSTRUCT, OR OTHERWISE PHYSICALLY IMPACT ANY STRUCTURES NOW OR HEREAFTER ERECTED THEREON FOR THE COMMERCIAL USE OF ANY SUCH STRUCTURE, TO THE EXTENT NECESSARY TO COMPLETE THE WORK REQUIRED TO IMPLEMENT CORRECTIVE MEASURES, AND ANY FURTHER WORK DETERMINED TO BE NECESSARY AS A RESULT THEREOF INCLUDING BUT NOT LIMITED TO ANY GROUNDWATER MONITORING OR TREATMENT, SOIL MANAGEMENT, CAP AND COVER INSTALLATION MAINTENANCE. SUBSURFACE ALTERATIONS, CONSTRUCTION OR CHANGES IN EXISTING BUILDING FOUNDATIONS, SEWERS, UTILITIES, AND OTHER SUBSURFACE STRUCTURES, OR EXCAVATION ON THE PROPERTY SHOULD BE MADE WITH APPROPRIATE CAUTION.
 - D. FUTURE USE OF THE FACILITY PROPERTY IS RESTRICTED TO INDUSTRIAL OR COMMERCIAL USE ONLY; SAID USE SHALL TAKE INTO ACCOUNT THE NATURE AND DISTRIBUTION OF HAZARDOUS WASTE CONSTITUENTS

THE SOIL AND GROUNDWATER AT THE FACILITY.

VI. OFF-SITE GROUNDWATER: THE NATURE AND EXTENT OF OVERBURDEN AND BEDROCK GROUNDWATER CONTAMINATION NORTH AND WEST OF THE FACILITY IS DESCRIBED IN THE "OFF-SITE INVESTIGATION SUMMARY REPORT AUGUST 1992 AND THE "OFF-SITE INVESTIGATION (OSI) PROGRAM PHASE 2 REPORT," NOVEMBER 1993. ADDITIONAL INFORMATION HAS ALSO BEEN COLLECTED AS PART OF THE BEDROCK GROUNDWATER INTERIM CORRECTIVE MEASURES MONITORING PROGRAM. THE DISTRIBUTION OF CONTAMINATION IN THE OVERBURDEN GROUNDWATER IS DEPICTED ON FIGURE II-4. THE DISTRIBUTION OF CONTAMINATION IN THE BEDROCK GROUNDWATER IS DEPICTED ON FIGURE II-5.

BASED UPON THE INFORMATION COLLECTED TO DATE, IT APPEARS THAT THE MAGNITUDE OF BOTH OVERBURDEN AND BEDROCK GROUNDWATER CONTAMINATION DECREASES SUBSTANTIALLY AS GROUNDWATER FLOWS FROM THE FACILITY.

A. OFF-SITE OVERBURDEN GROUNDWATER: BECAUSE OVERBURDEN GROUNDWATER CONTAMINATION DECREASES SUBSTANTIALLY AS GROUNDWATER FLOWS FROM THE FACILITY, AND BECAUSE THE CORRECTIVE MEASURES WHICH HAVE BEEN IMPLEMENTED TO ADDRESS ON-SITE OVERBURDEN CONTAMINATION SHOULD RESTRICT FURTHER OFF-SITE MIGRATION OF CONTAMINATED OVERBURDEN GROUNDWATER IN THE FUTURE, THE DEPARTMENT HAS DETERMINED THAT ACTIVE REMEDIATION OF THE OFF-SITE OVERBURDEN GROUNDWATER IS NOT NECESSARY AT THIS TIME. THE DEPARTMENT HAS ALSO DETERMINED THAT MONITORED NATURAL ATTENUATION OF THE OFF-SITE OVERBURDEN GROUNDWATER IS AN ACCEPTABLE REMEDIAL APPROACH.

If, by April 2009, natural attenuation fails to reduce the measured concentration of SSI parameters in off-site overburden groundwater by 50%, or, if by April 2014, natural attenuation fails to reduce the measured concentration of SSI parameters in off-site overburden groundwater by 75% (compared to OSI November 1993 sampling results), the Department may require OCC to take additional measures to remediate offsite overburden groundwater.

B. OFF-SITE BEDROCK GROUNDWATER: OFF-SITE BEDROCK

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GROUNDWATER ADJACENT TO THE NORTH PLANT BOUNDARY FLOWS TOWARD AND IS COLLECTED BY THE BEDROCK GROUNDWATER EXTRACTION SYSTEM. BEDROCK GROUNDWATER BEYOND THE CAPTURE ZONE OF THE GROUNDWATER EXTRACTION SYSTEM NORTH OF THE PLANT IS INTERCEPTED BY THE NYPA CONDUIT DRAINS AND THE FALLS STREET TUNNEL WHICH ACT AS REGIONAL GROUNDWATER LINE SINKS. BEDROCK GROUNDWATER WEST OF THE PLANT IS IN THE CAPTURE ZONE OF THE NYPA CONDUIT DRAINS. THE NYPA CONDUIT DRAINS ACT AS A GROUNDWATER DIVIDE AND PREVENT GROUNDWATER FROM FLOWING FURTHER TO THE WEST. TO THE NORTH OF THE FACILITY, GROUNDWATER FROM THE NYPA CONDUIT DRAINS ALSO DISCHARGES TO THE FALLS STREET TUNNEL. ALL DRY WEATHER FLOW IN THE FALLS STREET TUNNEL IS TREATED IN THE CITY OF NIAGARA FALLS WASTEWATER TREATMENT PLANT.

BECAUSE BEDROCK GROUNDWATER CONTAMINATION DECREASES SUBSTANTIALLY AS GROUNDWATER FLOWS FROM THE FACILITY, AND BECAUSE THE CORRECTIVE MEASURES WHICH HAVE BEEN IMPLEMENTED TO ADDRESS ON-SITE BEDROCK CONTAMINATION SHOULD RESTRICT FURTHER OFF-SITE MIGRATION OF CONTAMINATED BEDROCK GROUNDWATER IN THE FUTURE, AND BECAUSE MOST OF THE OFF-SITE BEDROCK GROUNDWATER CONTAMINATION IS ULTIMATELY CAPTURED BY THE FALLS STREET TUNNEL AND TREATED BY THE CITY OF NIAGARA FALLS, THE DEPARTMENT HAS DETERMINED THAT ACTIVE REMEDIATION OF OFF-SITE BEDROCK GROUNDWATER ON THE PART OF OCC IS NOT NECESSARY AT THIS TIME.

BECAUSE OCC AND THE DEPARTMENT ARE RELYING IN PART ON THE FALLS STREET TUNNEL AND THE CITY OF NIAGARA FALLS FOR COLLECTION AND TREATMENT OF OFF-SITE BEDROCK GROUNDWATER, IT IS IMPORTANT THAT THE CITY OF NIAGARA FALLS CONTINUES TO BE AWARE OF THE ROLE OF GROUNDWATER INFILTRATION INTO THE FALLS STREET TUNNEL AND IS A WILLING PARTICIPANT IN ITS TREATMENT. THEREFORE, ON AN ANNUAL BASIS, OCC SHALL SUBMIT TO THE CITY OF NIAGARA FALLS AND TO THE DEPARTMENT, A DETAILED ESTIMATE OF THE POTENTIAL LOADINGS OF OCC-RELATED CHEMICALS TO THE FALLS STREET TUNNEL VIA INFILTRATION OF OFF-SITE GROUNDWATER. OCC SHALL ALSO REQUEST ACKNOWLEDGMENT FROM THE CITY OF NIAGARA FALLS.

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FALLS THAT THOSE POTENTIAL LOADINGS CAN BE ADEQUATELY TREATED BY THE CITY. IN ADDITION, IF REQUESTED BY THE CITY, OCC SHALL REIMBURSE THE CITY FOR REASONABLE TREATMENT COSTS ASSOCIATED WITH LOADINGS OF OCC-RELATED CHEMICALS TO THE FALLS STREET TUNNEL.

IN THE EVENT THAT THE CITY OF NIAGARA FALLS FORMALLY NOTIFIES OCC THAT THE RATE OF OCC RELATED CHEMICAL LOADING INTO THE FALLS STREET TUNNEL IS UNACCEPTABLE, OCC MUST TAKE APPROPRIATE ACTIONS TO REDUCE UNACCEPTABLE CHEMICAL LOADING INTO THE FALLS STREET TUNNEL. SHOULD THE CITY OF NIAGARA FALLS SO NOTIFY OCC, THE COMPANY MUST, WITHIN 30 DAYS OF RECEIPT OF SAID NOTICE, SUBMIT FOR DEPARTMENT REVIEW AND APPROVAL A PLAN TO EVALUATE THE IMPACTS ASSOCIATED WITH THE ANTICIPATED CHANGES IN THE FALLS STREET TUNNEL INFILTRATION RATES, INCLUDING A PROPOSAL FOR EVALUATING ALTERNATIVE REMEDIAL STRATEGIES FOR OFF-SITE GROUNDWATER.

THEREAFTER, THE DEPARTMENT WILL WORK WITH OCC AND WITH THE CITY TO IMPLEMENT ANY NECESSARY ENHANCEMENTS TO THE OFF-SITE GROUNDWATER CORRECTIVE MEASURES PROGRAM.

- C. OFF-SITE DNAPL: THE PERIMETER WELLS SHOWN ON FIGURE II-15 WILL BE MONITORED FOR DNAPL ON AN ANNUAL BASIS TO ENSURE THE DNAPL IS NOT MIGRATING TO OFF-SITE AREAS. MONITORING REPORTS WILL BE PREPARED AND SUBMITTED TO THE EPA/STATE ANNUALLY. THE REPORTS WILL CONTAIN A DESCRIPTION OF ALL MONITORING CONDUCTED IN THE PREVIOUS YEAR AND THE MONITORING RESULTS. THESE WELLS WILL BE MONITORED FOR TWO YEARS FOLLOWING THE INITIAL DNAPL SURVEY. THE PROGRAM WILL BE REEVALUATED AFTER THE TWO-YEAR PERIOD AND, BASED ON PREVIOUS MONITORING RESULTS, THE PROGRAM MAY BE MODIFIED OR DISCONTINUED AT THE DISCRETION OF THE DEPARTMENT.

IF THE DEPARTMENT DETERMINES THAT SIGNIFICANT QUANTITIES OF DNAPL EXIST OFF-SITE OF THE FACILITY, OCC WILL BE REQUIRED TO DEVELOP A REMEDIAL PROGRAM TO ADDRESS THE PRESENCE OF OFF-SITE DNAPL.

INDOOR AIR

AT THE REQUEST OF THE NYSDEC, OCC SAMPLED INDOOR AIR FOR SITE SPECIFIC ORGANIC CONSTITUENTS AT THREE OFFICE BUILDINGS AND ONE OUTDOOR LOCATION. THE SAMPLING RESULTS INDICATED THE PRESENCE OF LOW LEVELS ND-34 MG/M³ OF TOLUENE (INCLUDING 14 MG/M³ IN OUTDOOR AIR) AND IN ONE OFFICE SAMPLE, 69 MG/M³ OF 1,4-DICHLOROBENZENE. IT IS BELIEVED THAT THE PRESENCE OF TOLUENE REFLECTS AMBIENT CONDITIONS UNRELATED TO GROUNDWATER VOLATIZATION OF THE COMPOUND INTO THE OFFICES. THE SOURCE OF THE 1,2-DICHLOROBENZENE REMAINS UNDETERMINED AT THE PRESENT. IN ORDER TO DETERMINE WHETHER IT COULD BE RELATED TO VOLATILIZATION FROM THE GROUNDWATER, THE NYSDEC ASKED OCC TO SAMPLE AN HISTORIC WELL IN THE IMMEDIATE VICINITY OF THE BUILDING. THE RESULTS OF SAMPLING REVEAL INDICATE THAT THE GROUNDWATER IS NOT THE SOURCE OF THE 1,2-DICHLOROBENZENE (OBSERVED CONCENTRATION WAS 1 PPB).

- 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 INDIVIDUAL EXPOSURES ARE NOT EXPECTED TO BE "SIGNIFICANT") AND CONTAMINANT CONCENTRATIONS (WHICH MAY BE SUBSTANTIALLY ABOVE THE ACCEPTABLE "LEVELS") COULD RESULT IN GREATER THAN ACCEPTABLE RISKS)? NOT APPLICABLE

_____ 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 DESCRIPTION (OF EACH POTENTIALLY "UNACCEPTABLE" EXPOSURE)

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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): _____

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?

NOT APPLICABLE

_____ 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): _____

6. CHECK THE APPROPRIATE RCRIS STATUS CODES FOR THE CURRENT HUMAN EXPOSURES UNDER CONTROL EI EVENT CODE (CA725), AND OBTAIN SUPERVISOR

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(OR APPROPRIATE MANAGER) SIGNATURE AND DATE ON THE EI DETERMINATION BELOW (AND ATTACH APPROPRIATE SUPPORTING DOCUMENTATION AS WELL AS A MAP OF THE FACILITY):

YES - 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 OCCIDENTAL CHEMICAL CORPORATION BUFFALO AVENUE FACILITY, EPA ID NYD000824482, LOCATED AT NIAGARA FALLS, NY 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.

RATIONALE AND REFERENCE(S): EVALUATION OF THE REMEDY

THE DEPARTMENT, IN CONSULTATION WITH THE NEW YORK STATE DEPARTMENT OF HEALTH, HAS DETERMINED THAT THE FINAL CORRECTIVE MEASURES ARE SUFFICIENTLY PROTECTIVE OF HUMAN HEALTH AND THE ENVIRONMENT.

PERFORMANCE MONITORING PROGRAM: ON AUGUST 11, 1999, OCC SUBMITTED FOR DEPARTMENT REVIEW AND APPROVAL, A PERFORMANCE MONITORING PLAN IS USED TO EVALUATE THE EFFECTIVENESS OF THE CORRECTIVE MEASURES SPECIFIED HEREIN. THE PERFORMANCE MONITORING PROGRAM INCLUDES HYDRAULIC MONITORING TO ESTABLISH THE EXTENT OF PLUME CAPTURE, AND CHEMICAL MONITORING TO EVALUATE THE CHANGES IN GROUNDWATER CHEMISTRY WHICH TAKE PLACE THROUGH TIME. OCC CURRENTLY PERFORMS ROUTINE MONITORING AT SELECT GROUNDWATER MONITORING WELLS AND EXTRACTION WELLS TO EVALUATE THE PERFORMANCE OF THE REMEDIAL SYSTEMS. DURING EACH MONITORING EVENT, THE HYDRAULIC PERFORMANCE OF THE SYSTEMS IS EVALUATED TO DETERMINE IF THE SYSTEMS ARE OPERATING IN ACCORDANCE WITH THE INTENT OF THE SYSTEM'S

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OBJECTIVE. IN ADDITION, DURING EACH MONITORING EVENT CHEMICAL ANALYSIS OF GROUNDWATER SAMPLES FROM SELECT WELLS IS PERFORMED. AN EVALUATION OF THE GROUNDWATER CHEMISTRY IS ALSO USED TO DETERMINE IF THE SYSTEMS ARE OPERATING IN ACCORDANCE WITH THE INTENT OF THE SYSTEM'S OBJECTIVE.

THE REVIEW OF THE HYDRAULIC AND CHEMICAL RESPONSE IN THE BEDROCK DUE TO THE OPERATION OF THE GROUNDWATER RECOVERY SYSTEM INDICATES THE SYSTEM IS OPERATING IN ACCORDANCE WITH THE DESIGN OBJECTIVES. THE CONSISTENT CONTAINMENT OF BEDROCK GROUNDWATER (SEE FIGURE II-15, FIGURE II-16 AND FIGURE II-17).

THE HYDRAULIC AND CHEMICAL RESPONSE DUE TO THE OPERATION OF THE OVERBURDEN SYSTEM HAS GENERALLY MET THE DESIGN EXPECTATIONS OF ESTABLISHING A ZONE OF GROUNDWATER CAPTURE OVER IN THE SPECIFIED LOCATIONS. ALTHOUGH A SIGNIFICANT GROUND WATER CAPTURE ZONE HAS BEEN ESTABLISHED ALONG THE SOUTHERN PROPERTY BOUNDARY OF OCC. AT THE REQUEST OF THE NYSDEC, THE COMPANY HAS RECENTLY ENHANCED THE GROUNDWATER CAPTURE ALONG THE SOUTHERN BOUNDARY OF THE FACILITY BASED UPON INFORMATION CONTAINED IN THE "MONTHLY PROGRESS REPORT AUGUST 2001", WATER LEVELS IN THE COLLECTION TRENCH ARE AT LEAST THREE FEET BELOW THE WATER LEVELS IN ALL SURROUNDING WELLS.

RECENT PERFORMANCE MONITORING DATA CAN BE FOUND IN "CORRECTIVE MEASURES IMPLEMENTATION ANNUAL PERFORMANCE EVALUATION, JANUARY THROUGH DECEMBER 2000 DATED MARCH 2001, AND "QUARTERLY PROGRESS REPORT APRIL THROUGH JUNE 2001 DATED JULY 2001. THE GROUNDWATER RECOVERY SYSTEMS ARE CAPTURING IN EXCESS OF 80 POUNDS OF ORGANIC CONTAMINANTS PER DAY.

COMPLETED BY (SIGNATURE) _____ DATE
SEPTEMBER 26, 2001

(PRINT) WILLIAM E. WERTZ, PH.D.
(TITLE) SENIOR ENGINEERING GEOLOGIST

SUPERVISOR (SIGNATURE) _____ DATE SEPTEMBER 26
2001

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(print) Paul J. Merges, Ph.D.

(title) Director, Bureau of Radiation & Hazardous Site Management

(EPA Region or State) NYSDEC

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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.