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Occidental Chemical Corporation

RCRA FACILITY INVESTIGATION
• SUMMARY REPORT

Buffalo Avenue Plant

Module III
Corrective Action and Waste Minimization Requirements
DEC Permit Number 90-86-0707

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AUGUST 1994

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CONESTOGA-ROVERS & ASSOCIATES

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1.0 INTRODUCTION

The Occidental Chemical Corporation (OxyChem) Buffalo Avenue Plant (Plant) is located in the City of Niagara Falls, New York. The Plant is a chemical manufacturing facility which commenced operations in 1911. The Plant currently covers an area of approximately 130 acres.

A comprehensive RCRA Facility Investigation (RFI) for the Plant was approved by New York State (State) and the United States Environmental Protection Agency (EPA) as part of the Plant RCRA/Part 373 permits in July 1988. OxyChem commenced field work at the Plant in September 1988 and completed field activities in July 1993.

The completed RFI programs include:

- Supplemental Data Collection Program (SDCP);
- Dioxin Investigation Program (DIP);
- Source Investigation Program (SIP);
- Off-Site Investigation Program (OSI);
- Sewer Evaluation Program (SEP); and
- Existing and New Solid Waste Management Unit (SWMU) Assessments.

In addition to the above planned investigations, facility data have also been generated from historical studies. These were summarized in the report entitled "Historical Data Base - Buffalo Avenue Plant", dated August 1, 1994.

The following summary describes the RFI study findings for the Buffalo Avenue Plant.

2.0 OBJECTIVES

In addition to refining the previous understanding of Plant hydrogeologic conditions, the objectives of the RFI were to provide for the collection of information on the following:

- flow directions for groundwater and, to the extent practical, Non-Aqueous Phase Liquids (NAPL) in the overburden and bedrock;
- nature and distribution of the chemicals in the groundwater and of NAPL in both the overburden and bedrock;
- the overburden permeability and bedrock transmissivity of the various stratigraphic zones; and
- pathways resulting from Underground Works.

3.0 STUDIES

The following studies were undertaken during the RFI:

- Supplemental Data Collection Program (SDCP) performed from September 1988 to September 1990;
- Dioxin Investigation Program (DIP) performed from April 1990 to March 1993;
- Source Investigation Program (SIP) performed from November 1989 to May 1992;
- Sewer Evaluation Program (SEP) performed from February 1990 to December 1990; and
- Off-Site Investigation (OSI) performed from May 1991 to December 1993.

The above studies were performed in conformance with the protocols detailed in the work plans listed in Table 1. The detailed information collected during the RFI programs has been presented in the documents submitted to the EPA/State listed in Table 2. EPA/State approval documents and dates for each RFI study are shown in Table 2.

4.0 CONCLUSIONS

The RFI was completed in accordance with the approved Work Plans. The RFI studies involved the installation of boreholes and monitoring wells, aquifer injection and pumping tests and the collection of soil, sediment, outfall, sewer and groundwater samples.

Data collected during the RFI were submitted to the EPA/State in the form of Milestone Reports, Final Reports and other supplemental data submissions (see Table 2).

The data collected during the RFI improve and confirm the understanding of Plant conditions developed by previous investigations undertaken by OxyChem and provide new information regarding the quality of overburden and bedrock groundwater, NAPL presence, hydrogeologic conditions and soil chemical characteristics.

Based on the evaluation of information collected it is concluded that the database now sufficient to characterize Plant conditions and the nature of chemical migration from the Plant to allow development of a Corrective Measure Study (CMS) for the Plant as described in paragraph IIIE.(2) of the RCRA and Part 373 Permits. The following observations and conclusions are based on the results of the RFI.

4.1 GENERAL SUMMARY

The RFI is complete and has met the requirements of the Module III Corrective Action Requirements.

The data presented in the reporting documents of the SDCP, DIP, SIP, SEP, and OSI data are sufficient to develop a CMS. Figure 1.0 shows the Plant study area; whereas Figures 2.0 through 6.0 show the individual RFI study activities (i.e., SDCP, DIP, SIP, SEP, and OSI). Any additional data, if required, can be collected during the CMS.

Based upon the QA reviews performed, the analytical data reported are technically acceptable and adequately characterize the Plant conditions.

No areas within or beyond the Buffalo Avenue Plant boundary require additional investigations at this time to complete the CMS .

4.2 SPECIFIC SUMMARY

Figure 1.0 shows the study area of the Buffalo Avenue Plant property and internal Plant Area designations.

4.2.1 Geologic and Hydrogeologic Conditions

The local geology of the Plant consists of overburden materials overlying a series of bedrock formations. Typically, the overburden consists of a glacial till, overlain by glacial lake deposits, overlain by alluvial river deposits, overlain by fill. Bedrock members from uppermost downward consist of the Oak Orchard Formation followed by the Eramosa, Goat Island, Gasport, Decew and Rochester Formations. The surface of the Rochester Formation comprised the lower limit of the SDCP investigation; whereas the surface of the Gasport Formation comprised the lower limit of the OSI investigation. Figure 2.0 shows the overburden and bedrock well installations and outfall monitoring locations investigated during SDCP activities.

The overburden hydrogeologic unit is an upper, unconfined waterbearing unit consisting of mostly fill and alluvium stratigraphic units which exhibit hydraulic conductivities ranging from 3.8E-01 to 6.1E-06 cm/sec. This is underlain by a clay-till aquitard (hydraulic conductivity ≈ 4E-08 cm/sec) which separates the unconsolidated overburden unit and the upper bedrock waterbearing units throughout the entire Buffalo Avenue Plant with minor exceptions. This unit has been breached in various locations off Site and throughout the Plant by man-made structures which include the sanitary and storm sewers and building foundations. The average overburden thickness at the Plant is approximately 27 feet.

The bedrock hydrogeologic unit consists of two major waterbearing units (hydraulic conductivity ≥5E-05 cm/sec) located from 0 to 45 feet (D-Well) and 55 to 85 feet (C-Well) below top of rock (BTOR). These two bedrock waterbearing units are separated by a bedrock interval that is either non-waterbearing (hydraulic conductivity <5E-05 cm/sec) or has hydraulic conductivities up to two orders of magnitude less than the two waterbearing units. A third minor waterbearing unit was observed from 85 to 150 feet BTOR (B-Well). The bedrock interval from mid-Gasport to top of Rochester was non-waterbearing (A-Well). It should be noted that the quantity of water available from non-waterbearing units was small as shown by the many non-waterbearing intervals which had insufficient water volume available for sample collection during SDCP activities. On average, the depth to the Rochester Formation is on the order of 190 feet.

The overburden groundwater is highly influenced by the sanitary and outfall sewers and existing groundwater collection systems. Consequently, overburden groundwater flow is toward these systems with considerable migration via the sewer bedding and/or by infiltration into the sewers themselves. In addition, fluctuations in the river level both creates recharge to the overburden and acts as a discharge zone for local groundwater.

SDCP studies show that the majority (57 percent) of the wells monitored in the three bedrock waterbearing units were principally influenced by the New York Power Authority (NYPA) Conduit drain system water levels. A smaller portion (11 percent) of the wells were principally influenced by the River while for 17 percent of the wells, a definite identification of the principal influencing factor could not be made. No influence from either the NYPA conduit drain system water levels or the River was observed in 15 percent of the monitored wells. No apparent spatial or temporal correlation between the fluctuation ratio magnitude or lag time magnitude with distance was observed between either the wells and the Niagara River or the wells and the NYPA conduit drain system water levels.

Ultimately, shallow D-Zone bedrock groundwater from beneath the Plant is expected to be captured by either the NYPA conduits, Falls Street Tunnel, South Side Interceptor and/or the Resource Recovery Facility (RRF), formerly called Energy from Waste (EFW) dewatering system.

4.2.2 Chemical Analysis

In general, the analytical results for the SDCP-General Parameter (GP) Survey (overburden only) and both rounds of Site-Specific Indicator (SSI) sampling (overburden and bedrock) were similar.

Four chemical plumes were identified in the overburden groundwater regime on the Plant property. The four plumes coincide with the observed presence of NAPL in the overburden and historic plant operations.

Significant chemical migration through the overburden regime to off-Site areas adjacent to the Plant has not occurred.

The bedrock groundwater chemistry is representative of the pattern expected considering the overburden groundwater chemistry presence observed, NAPL presence detected, the downward vertical leakage from the overburden to the bedrock, and the vertical and horizontal bedrock groundwater flow directions in the successive bedrock intervals monitored by the D, C and B-Wells. In all four bedrock intervals monitored, the bedrock groundwater chemistry west of 47th Street was found to contain the highest concentrations, while the northeast quadrant of the Plant had the lowest concentrations (<70 μg/L of Total Organic SSI).

Elevated chemical concentrations are not present in the bedrock groundwater flow regime to the west of the Plant boundary or along a line of wells located 1,000 feet north of the Plant.

Elevated chemical concentrations in the bedrock groundwater flow regime were present at locations 1,500 feet north of the

Plant in the vicinity of Royal Avenue. This groundwater chemical plume did not originate from the Plant.

Figure 10.0 and 11.0 shows a summary of the NAPL presence areas identified within the overburden and bedrock regimes.

Figure 12.0 shows the Total Organic SSI concentrations detected in the overburden regime at the Plant and in off-Site areas.

Figures 13.0 through 16.0 show the Total Organic SSI concentrations detected in the D, C, B and A bedrock intervals at the Plant and in off-Site areas.

4.2.3 NAPL Observation

Areas of NAPL presence in the overburden coincide with the overburden groundwater total organic SSI plumes.

The occurrence of NAPL in localized areas indicates that the horizontal migration of NAPL through the overburden is confined to or adjacent to historic production and storage areas of the Plant. In general, the NAPL components present in each of the individual areas in the overburden are consistent with what would be expected based upon historic Plant operations (see Figure 10.0).

NAPL was observed in only a few locations in the bedrock (see Figure 11.0). Due to the NAPL's high specific gravity, it has migrated through the available fracture network to deeper units and has even been observed to be present in the A-Well unit. The pathway by which NAPL may have penetrated to the depth monitored by the A-Wells is uncertain. Once the NAPL reaches the A-Zone, however, its ability to migrate further is likely to be very limited due to the low hydraulic conductivity of this rock unit and the underlying Rochester Shale. The low hydraulic conductivity of these units indicates the tight nature of these formations. The presence of a regional upward gradient at this depth may also have a slight retarding effect on the downward migration of NAPL.

Interim Corrective Measures are underway collecting NAPL from Plant wells OW402A, OW413A and OW417A and incineration thereof.

NAPL within the bedrock regime was noted in off-Site areas (i.e. Royal Avenue) but it is believed that an off-Site source of NAPL exists north of Royal Avenue. The geologic, hydrogeologic and chemical distribution findings of the OSI support the conclusion that the chemistry noted in the vicinity of Royal Avenue did not originate from the Plant.

4.2.4 Underground Works Assessments

Overburden NAPL does not migrate preferentially off Site through utility beddings.

The 47th Street sanitary sewer bedding monitored by BH1A-88 and the Iroquois Street sanitary sewer bedding monitored by BH10-88 were the only two preferential vertical and horizontal pathways identified for off-Site APL migration.

The bedding of the Industrial Intake Pipe Trench (IIPT) does not act as a preferential APL and NAPL horizontal migration pathway. However, at the Southwest corner of the Plant in the vicinity of OW300, the bedding acts as a preferential vertical APL migration pathway into the upper bedrock unit. The bedding in the vicinity of OW300 (IIPT) is not a preferential pathway for vertical migration of NAPL into bedrock. APL crosses the IIPT in the Southeast corner of the N Area between OW273 and OW269 and flows towards the Niagara River.

The NYPA Conduit drain system, Falls Street Tunnel (FST) and Southside Interceptor Tunnel dewater the upper bedrock (D and C-Zones) to the west and north of the Plant and act as regional line sinks for bedrock groundwater flow which includes bedrock groundwater from beneath the Plant. The NYPA Conduit drain system also influences the B-Zone bedrock. It is believed that the conduit drain system recharges the B-Zone bedrock.

Bedrock grouting and the Intake Wall for the NYPA conduits constructed on the southern boundary of the Plant have significantly affected the overburden and bedrock groundwater flow regimes across the southern boundary of the Plant.

4.2.5 Plant Sewer Assessment

Figures 7.0 and 8.0 show the sanitary and outfall sewer systems at the Buffalo Avenue Plant.

The Plant sanitary sewer system is extensive. Numerous sanitary sewer sections and contributing sanitary sewer stubs have been abandoned as a result of process closure and/or building demolition, and in an effort to minimize sanitary sewer flows via groundwater infiltration, surface water runoff or obsolete connections. Sanitary sewer flow is monitored at two locations: the 47th Street Monitoring Station and the Iroquois Street Monitoring Station.

Currently, five outfall systems service the Plant and discharge to the Niagara River. They are designated Outfall 001, 003, 004, 005 and 006. Outfall 002 was closed in 1983 and is not active. Each of the outfalls is equipped with a monitoring station to monitor quantity and quality of water leaving the Plant. The outfall systems typically accommodate the following wastewater discharges: non-contact cooling waters, River water filter backwash waters, steam/air conditioning condensate, monitored process water and surface water runoff.

The overall trend for the organic parameters examined in this study is a decreasing relationship with time. Total organic loadings consisting of toluene, benzene and the selected chlorinated compounds have decreased approximately 37 percent (from 30.5 lb/day in 1984 to 19.3 lb/day in 1990) for the sanitary sewers and 93 percent (from 116 lb/day in 1984 to 8 lb/day in 1990) for the sum of the outfalls over the last seven years. From 1986 to 1990, total organic carbon has decreased by approximately 75 percent (from 160.87 lb/day in 1986 to 39.5 lb/day in 1990) for the sum of the outfalls and has decreased slightly for the sanitary sewers.

The compounds that were selected for this assessment account for approximately 78 percent of the total parameter loading calculated from the results of the comprehensive analysis performed in April and May, 1989 for the outfall sewers. In general, the flow volumes discharged to both the sanitary and outfall sewers have decreased through the 1980s.

The comprehensive analysis on wells and outfalls has identified similarities in chemical presence that may be associated with groundwater infiltration. Overburden groundwater elevation data indicate that many portions of the storm sewer system leak in and act as groundwater sinks (receptors). In addition, NAPL infiltration to the sewers has been observed. Apart from overburden groundwater infiltration, other sources of water to the outfalls include non-contact cooling water, condensate blowdown and stormwater runoff. It is expected that these discharges contain relatively little chemistry and thus the majority of the monitored chemical loading is due to groundwater and NAPL infiltration.

The chemical loading to the sewers based on TOC and TOX data was estimated to be 45.2 lbs/day and 58.1 lbs/day for the sanitary and outfall sewers, respectively.

4.2.6 Soil Data Assessments

The USEPA collected 28 shallow soil and sediment samples in September 1986. This investigation was conducted in the A, C, D, F, M, N, U, W and V-Areas of the Plant. Parameters analyzed included VOCs, BNAs, Metals, Pesticides/PCB, chlorides and phosphorus.

The Dioxin Investigation Program (DIP) conducted between April 1990 and March 1993 involved the sampling of overburden soils, utility bedding soils and overburden groundwater (see Figure 3.0). Dioxin was detected in overburden subsurface soils within the X-Area (former radio tower property), U-Area and former TCP production area (D-Area). Interim Corrective Measures were completed in the X-Area where soils with Dioxin presence were consolidated by grading and the Area was capped and fenced. Interim corrective measures were not required for the U-Area and D-Area since the areas are paved and surficial migration of soils containing Dioxin is no longer possible.

Utility bedding soils were evaluated and low levels of Dioxin were detected. This presence does not pose a significant health risk as contact is not possible.

In general, Dioxin concentrations observed during the DIP were consistent with those observed during the 1986 Survey of TCDD Migration.

The SIP Phase I/Phase II activities show that the highest soil chemical concentrations observed were in soil samples collected within or adjacent to areas of known NAPL presence or areas suspected to contain waste materials. The chemical source areas are now defined and delineated. SIP activities were conducted in the C, D, F, M, N, and U-Areas of the Plant. Figure 9.0 shows the Solid Waste Management Units (SWMUs) identified at the Buffalo Avenue Plant.

4.2.7 Groundwater Chemical Migration Assessment

Only five (5) percent of the overburden groundwater is discharged off Site across the Buffalo Avenue Plant boundary. The majority (95 percent) infiltrates into the storm and sanitary sewer systems.

Of the five hydrogeologic units analyzed, groundwater flow through the overburden was the principal pathway of dissolved chemical migration across the Plant boundary.

The estimated total TOX/TOC chemical mass flux across the plant boundary from the various hydrogeologic units and sewers was:

Unit	*Mass Flux (lbs/day)*
Overburden	24.5
Bedrock D-Well Interval	1.3
Bedrock C-Well Interval	4.4
Bedrock B-Well Interval	0.25
Bedrock A-Well Interval	0.003
Subtotal	30.5
Sanitary Sewers	45.2
Outfall Sewers	58.1
Total	133.8

The majority of off-Site chemical migration through the overburden was in the southwest corner of the Plant. This discharge was subsequently drawn westward to discharge at the NYPA Conduits.

Small amounts of chemicals are migrating to the Niagara River immediately south of the Buffalo Avenue Plant. This discharge is expected to be drawn into the NYPA conduits which are immediately downstream of the Plant.

The southerly component of chemical migration through the overburden will be eliminated upon completion of the Plant and S-Area barrier walls along the Niagara River. Approximately 95 percent of the Plant barrier wall is complete (July 1994).

The majority of off-Site chemical migration through the D-Well and C-Well bedrock intervals was in the northwest corner of the Plant. The B-Well bedrock interval generally discharged to the northeast.

Small amounts of chemicals are migrating off-Site from the A-Well and B-Well bedrock intervals. The potential for off-Site NAPL migration in the B and A-Well bedrock intervals is increased by the presence of NAPL in wells OW401B, OW402A and OW413A. The data collected for the A-Well NAPL investigation program will be used to aid in evaluating this potential.

Horizontal migration of Dioxin in the overburden groundwater is minimal and quickly decreases in concentration with distance.

The mobility of Dioxin is not significantly enhanced by the presence of elevated concentrations of organic chemical compounds.

FIGURES

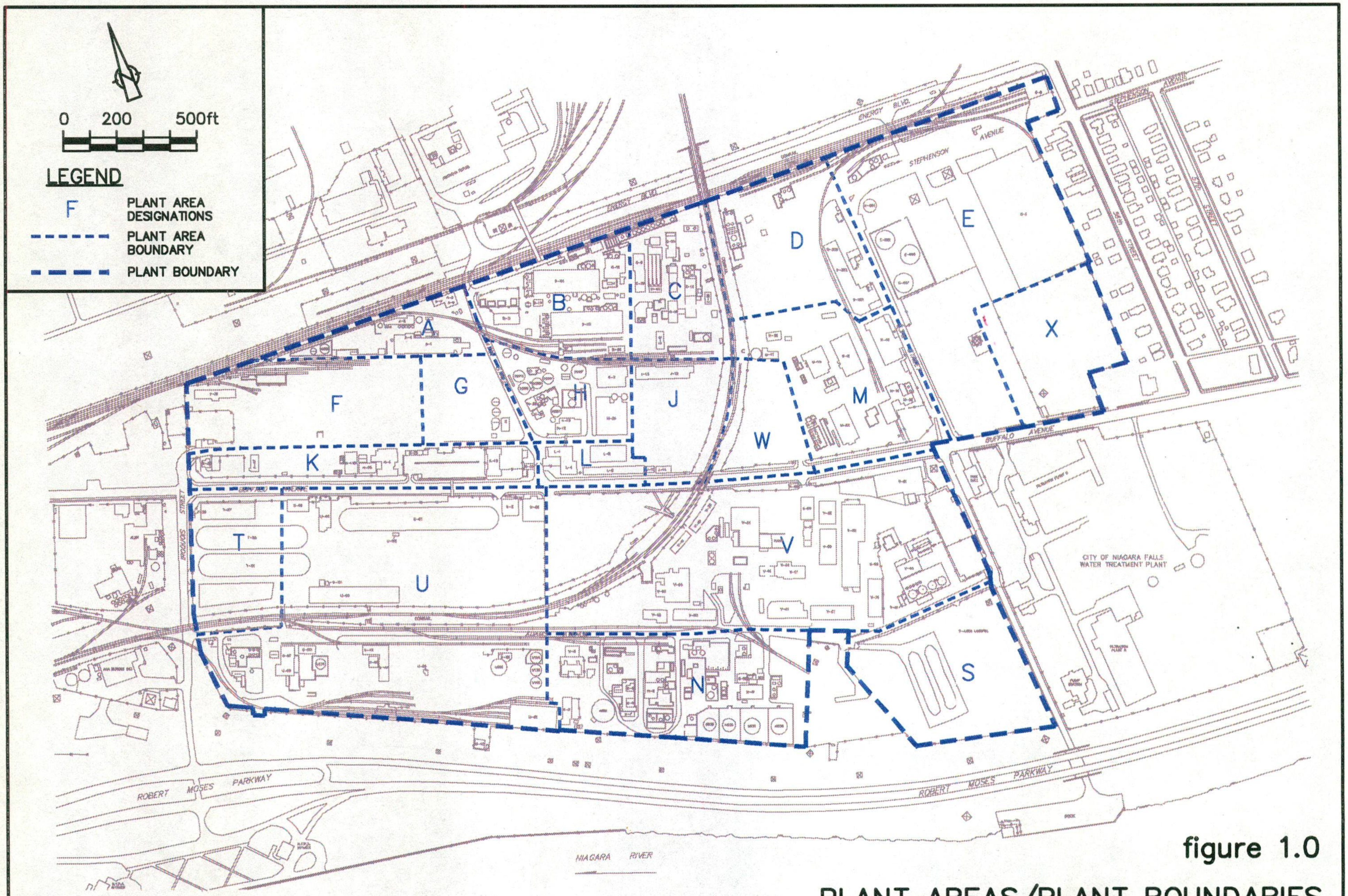

figure 1.0

PLANT AREAS/PLANT BOUNDARIES

Occidental Chemical Corporation – Buffalo Avenue Plant

CRA

2583 (140) AUG 11/94(W) REV.0 (P774)

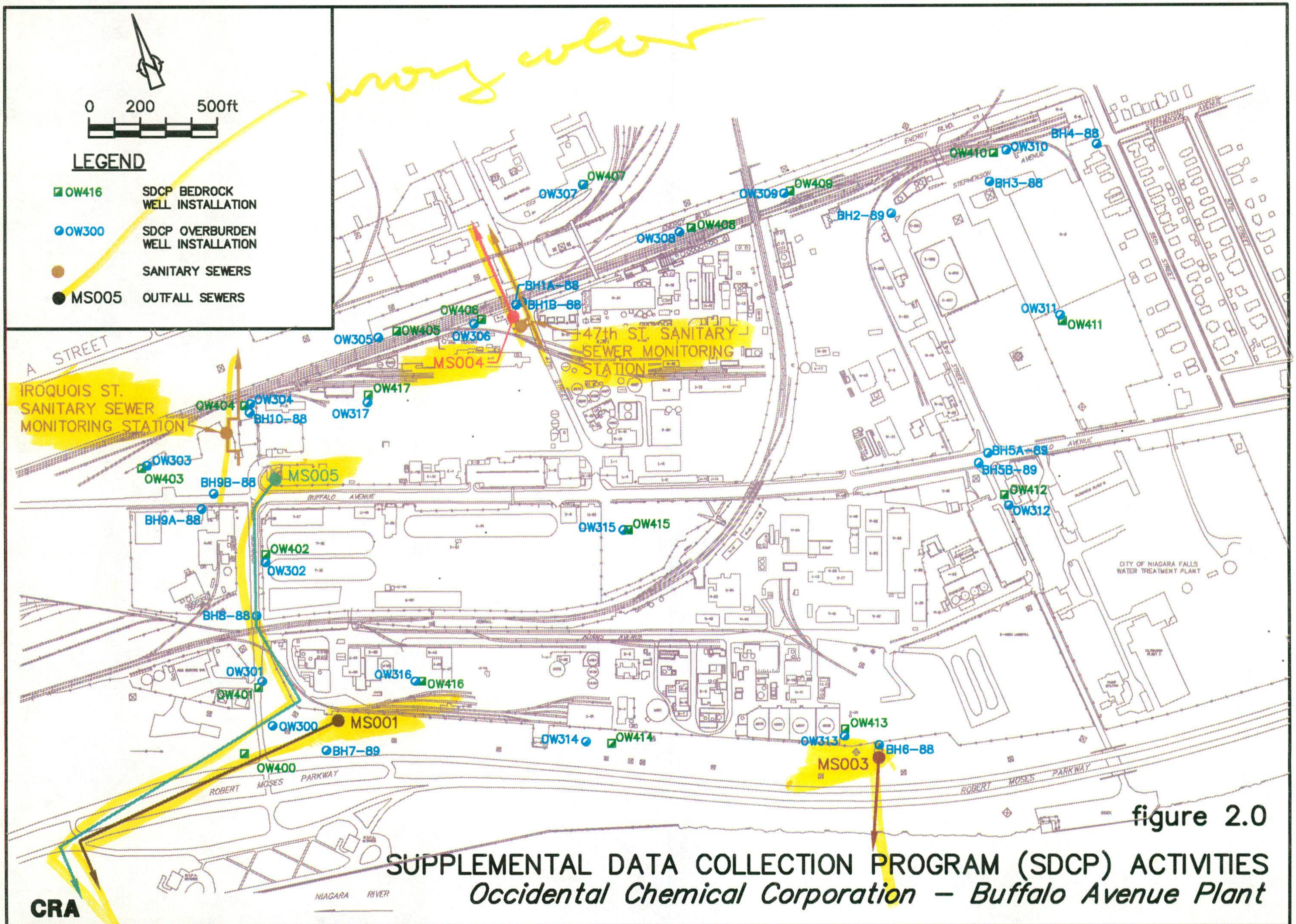

figure 2.0

SUPPLEMENTAL DATA COLLECTION PROGRAM (SDCP) ACTIVITIES

Occidental Chemical Corporation – Buffalo Avenue Plant

2583 (140) AUG 11/94(W) REV.0 (P778)

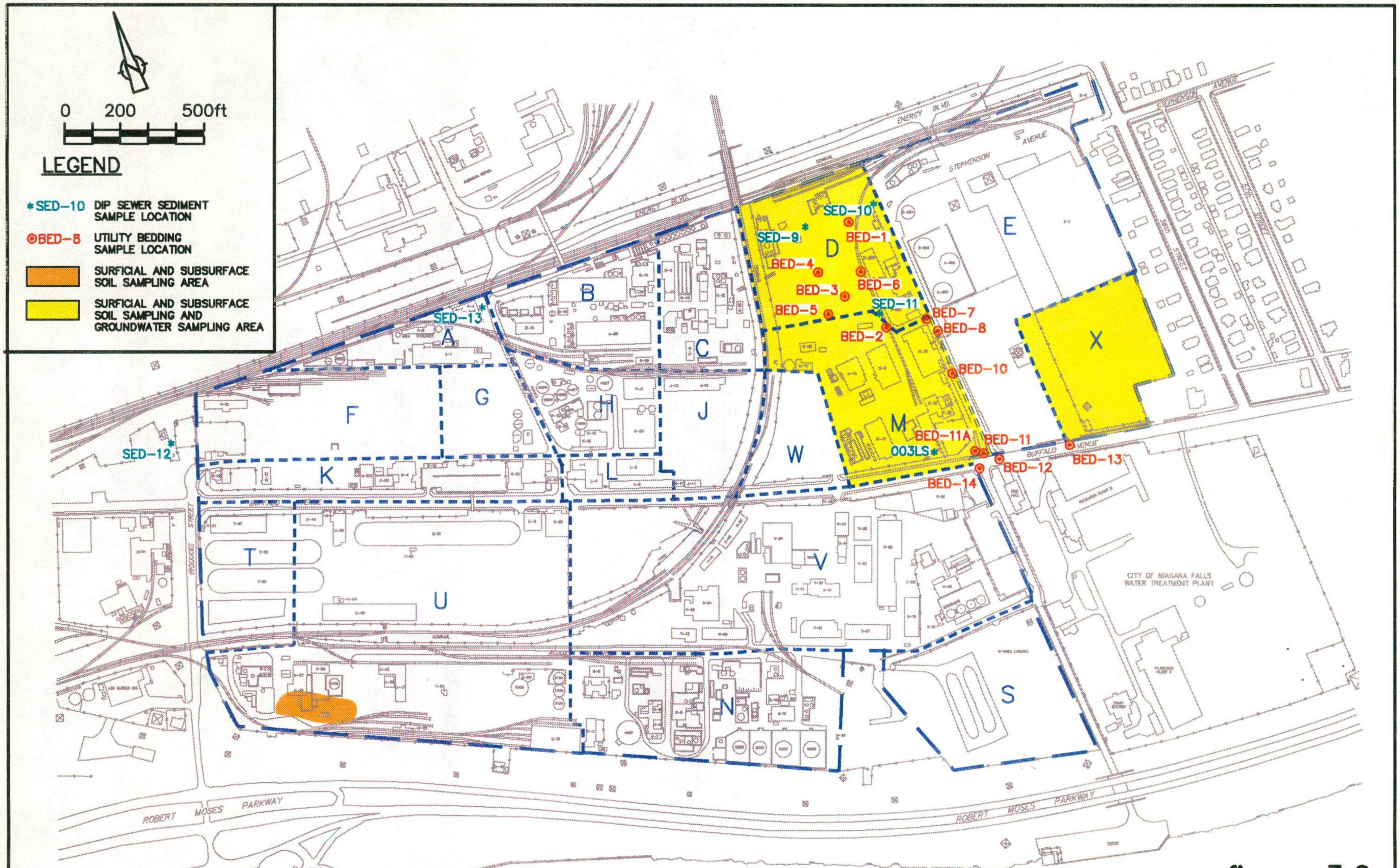

figure 3.0

DIOXIN INVESTIGATION PROGRAM (DIP) ACTIVITIES

Occidental Chemical Corporation – Buffalo Avenue Plant

CRA

2583 (140) AUG 11/94(W) REV.0 (P784)

figure 4.0

SOURCE INVESTIGATION PROGRAM (SIP) ACTIVITIES

Occidental Chemical Corporation – Buffalo Avenue Plant

CRA

2583 (140) AUG 11/94(W) REV.0 (P783)

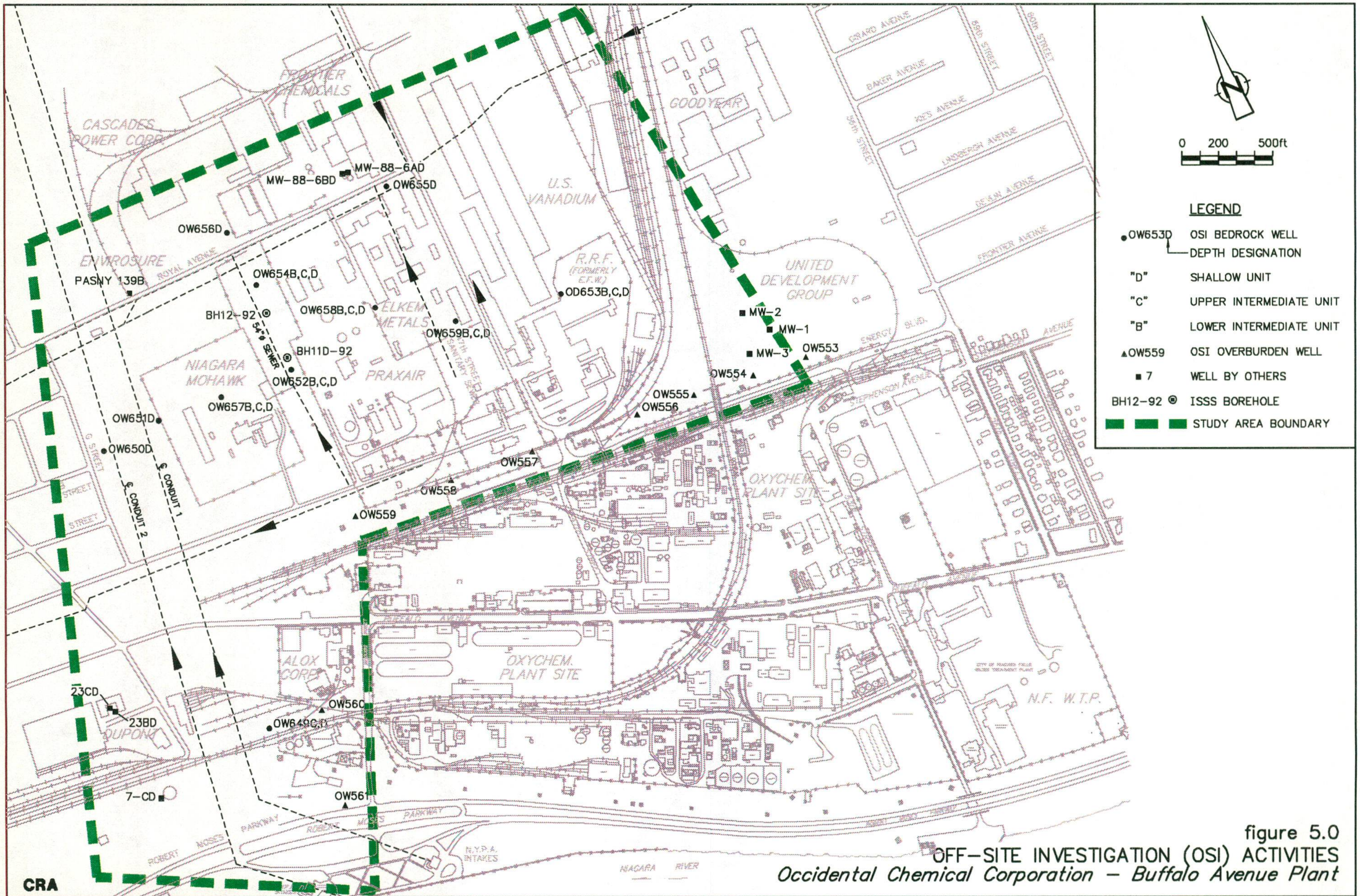

figure 5.0

OFF-SITE INVESTIGATION (OSI) ACTIVITIES

Occidental Chemical Corporation – Buffalo Avenue Plant

2583 (140) AUG 10/94(W) REV.0 (P780)

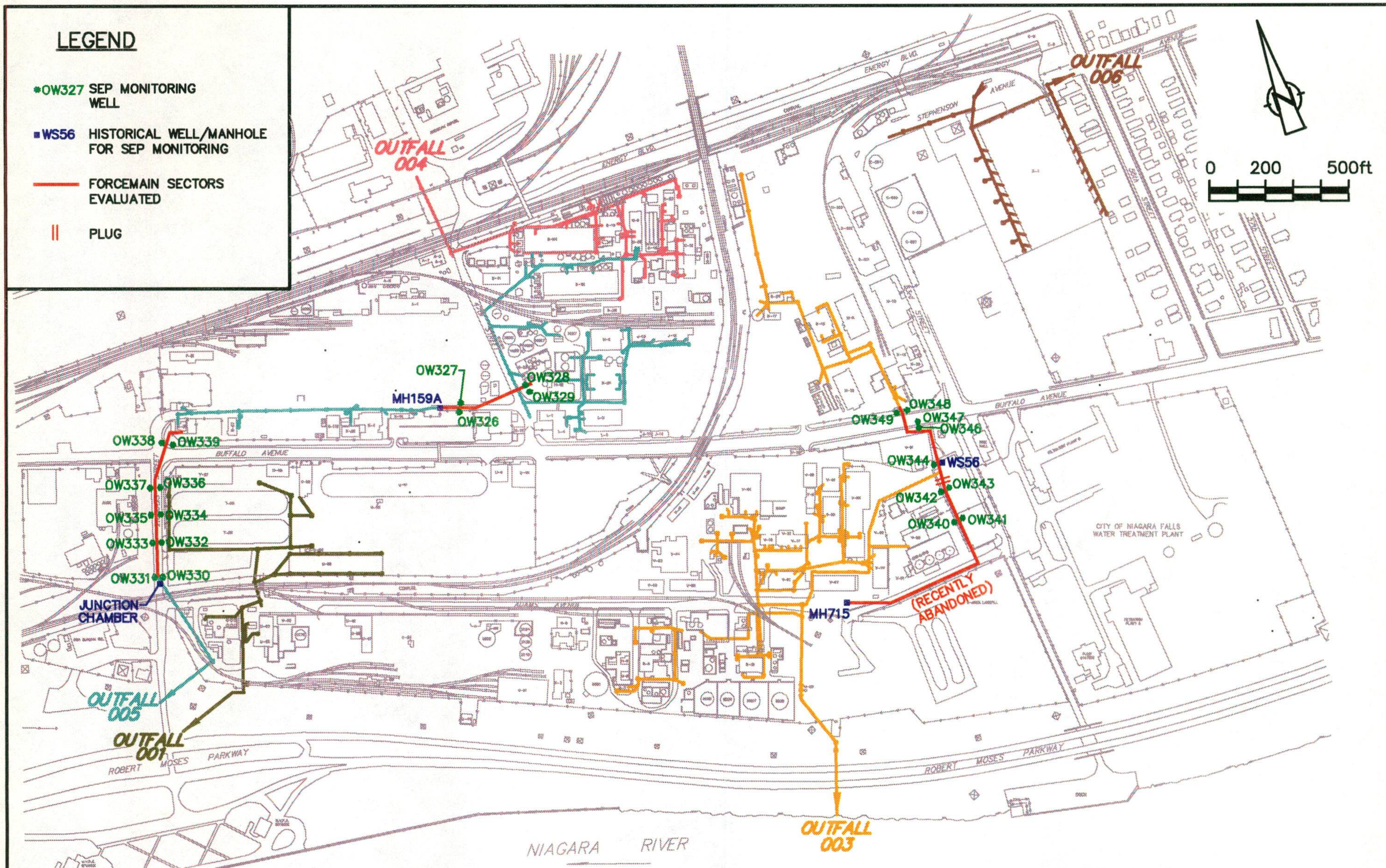

figure 6.0

SEWER EVALUATION PROGRAM (SEP) ACTIVITIES

Occidental Chemical Corporation–Buffalo Avenue Plant

CRA

2583 (140) AUG 11/94(W) REV.0 (P781)

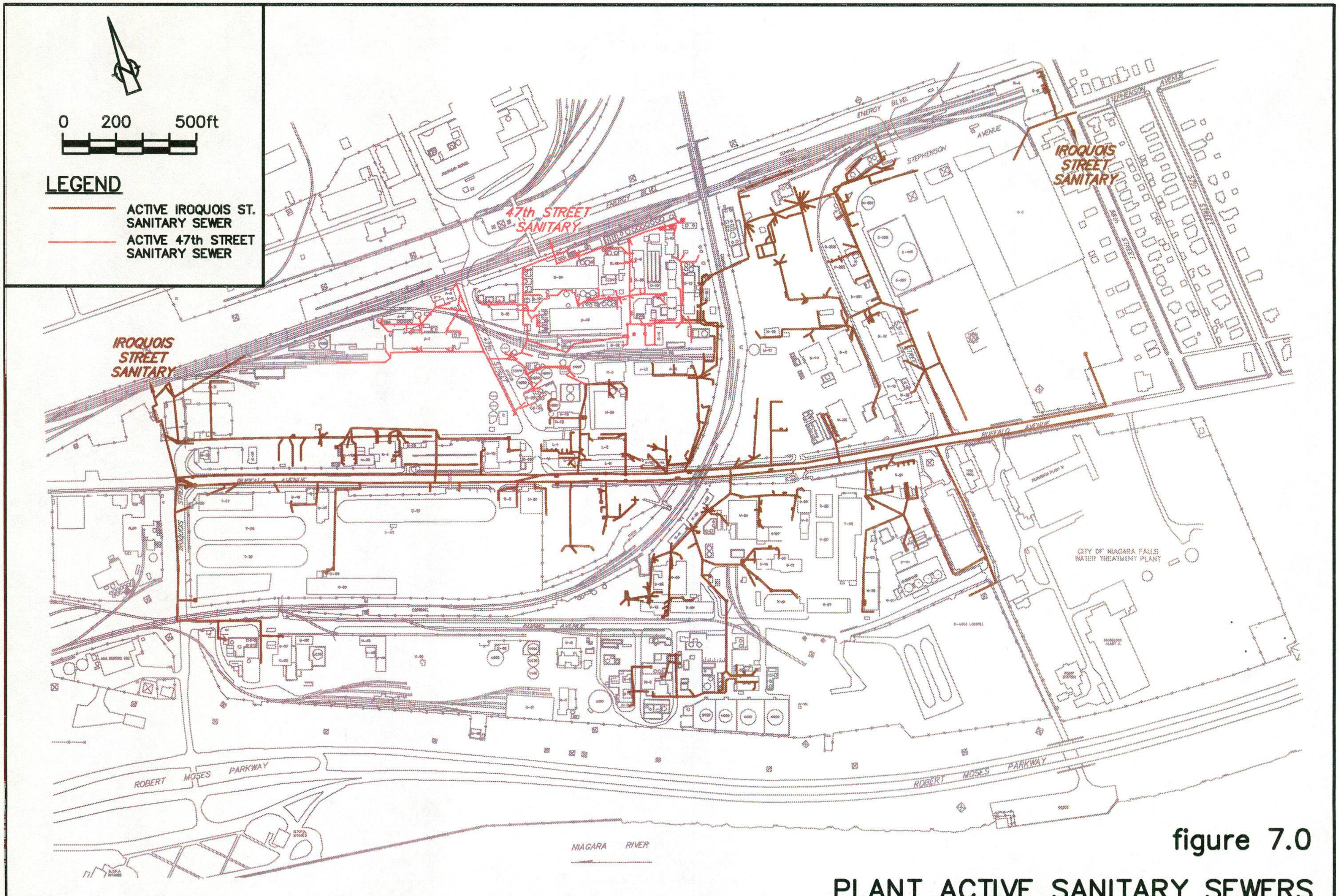

figure 7.0

PLANT ACTIVE SANITARY SEWERS

Occidental Chemical Corporation – Buffalo Avenue Plant

CRA

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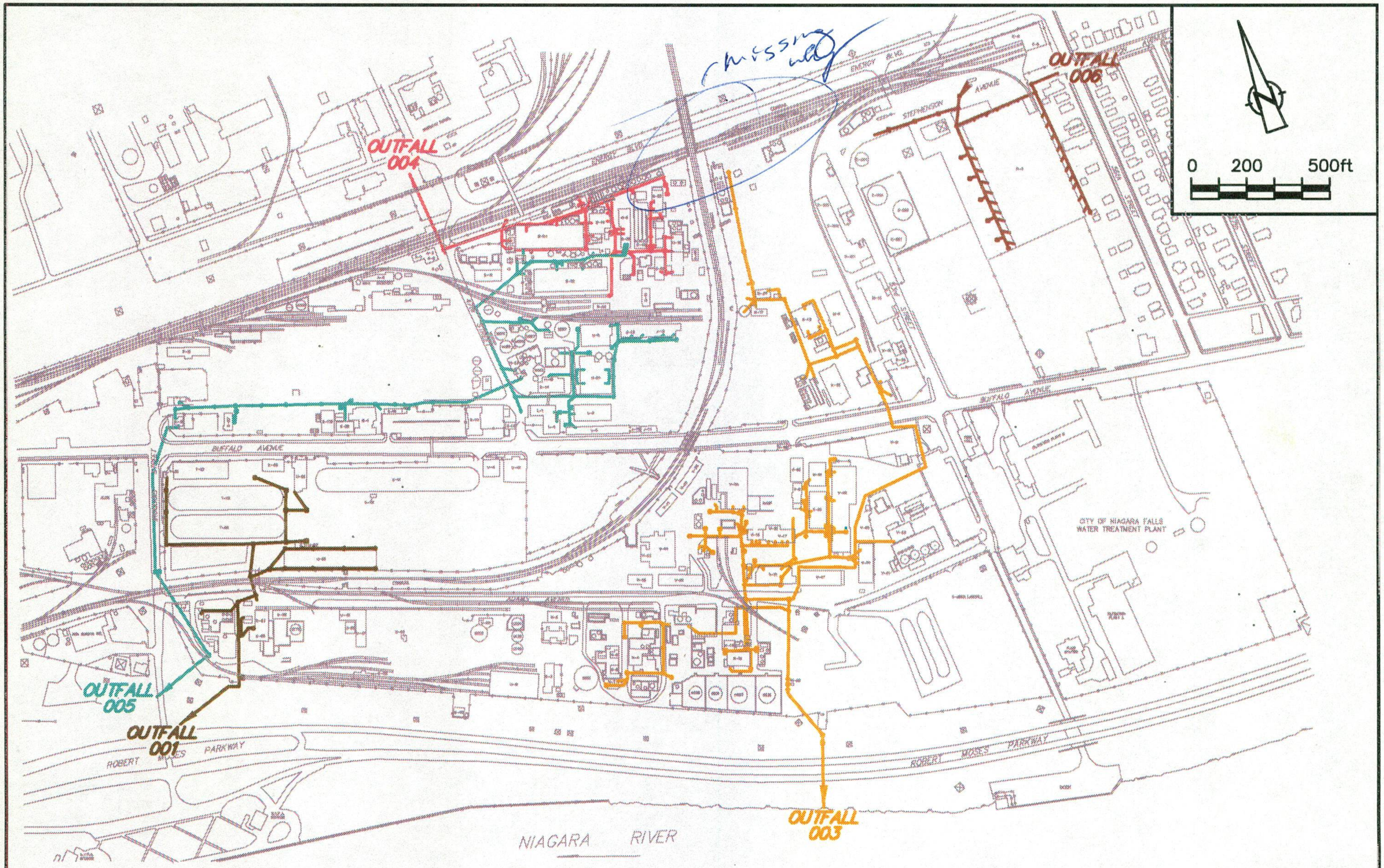


LEGEND

STORM SEWER AND MANHOLE

figure 8.0

PLANT ACTIVE OUTFALL SEWERS

Occidental Chemical Corporation–Buffalo Avenue Plant

CRA

2583 (140) AUG 11/94(W) REV.0 (P779)

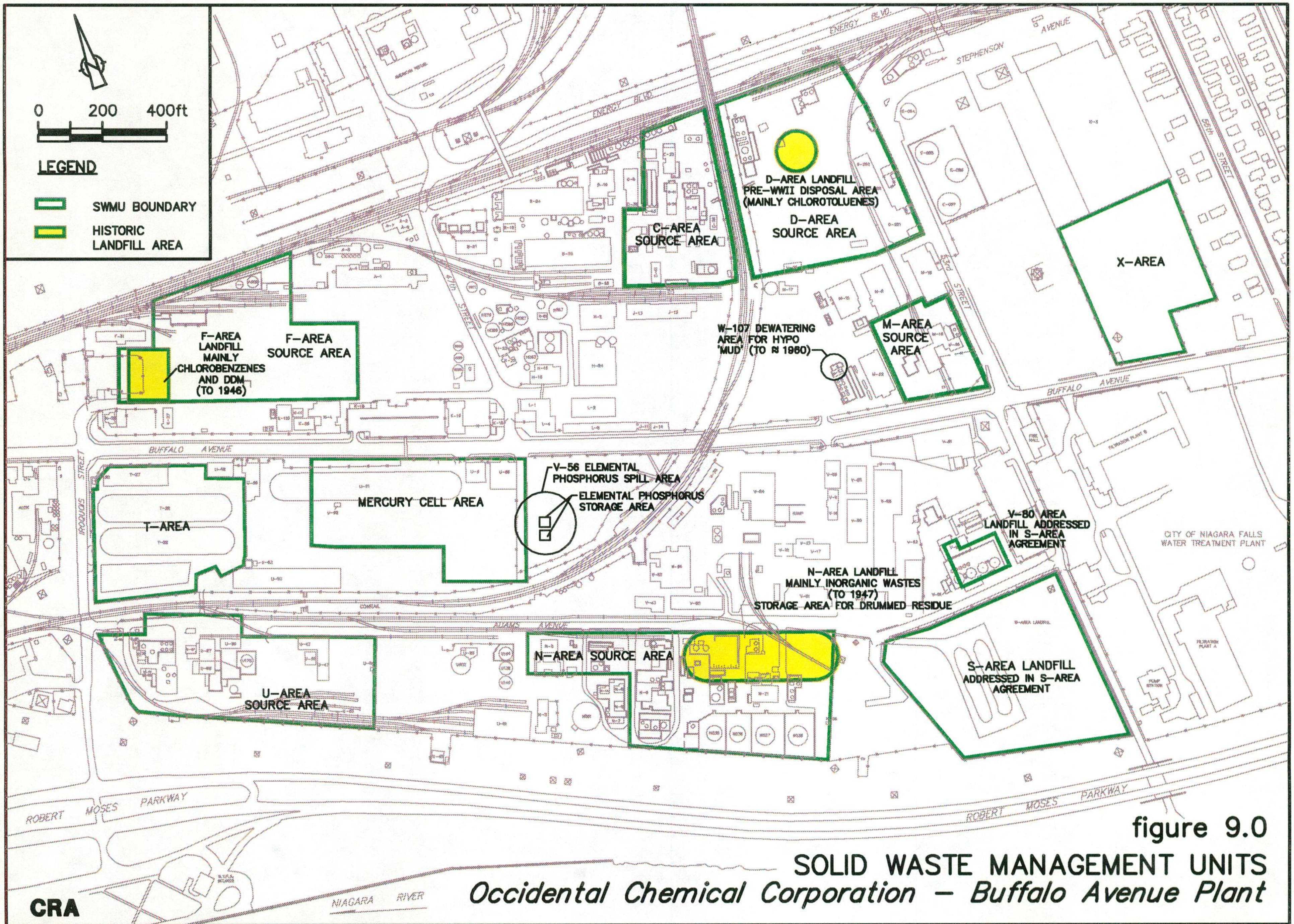


figure 9.0

SOLID WASTE MANAGEMENT UNITS

Occidental Chemical Corporation – Buffalo Avenue Plant

2583 (140) AUG 10/94(W) REV.0 (P775)

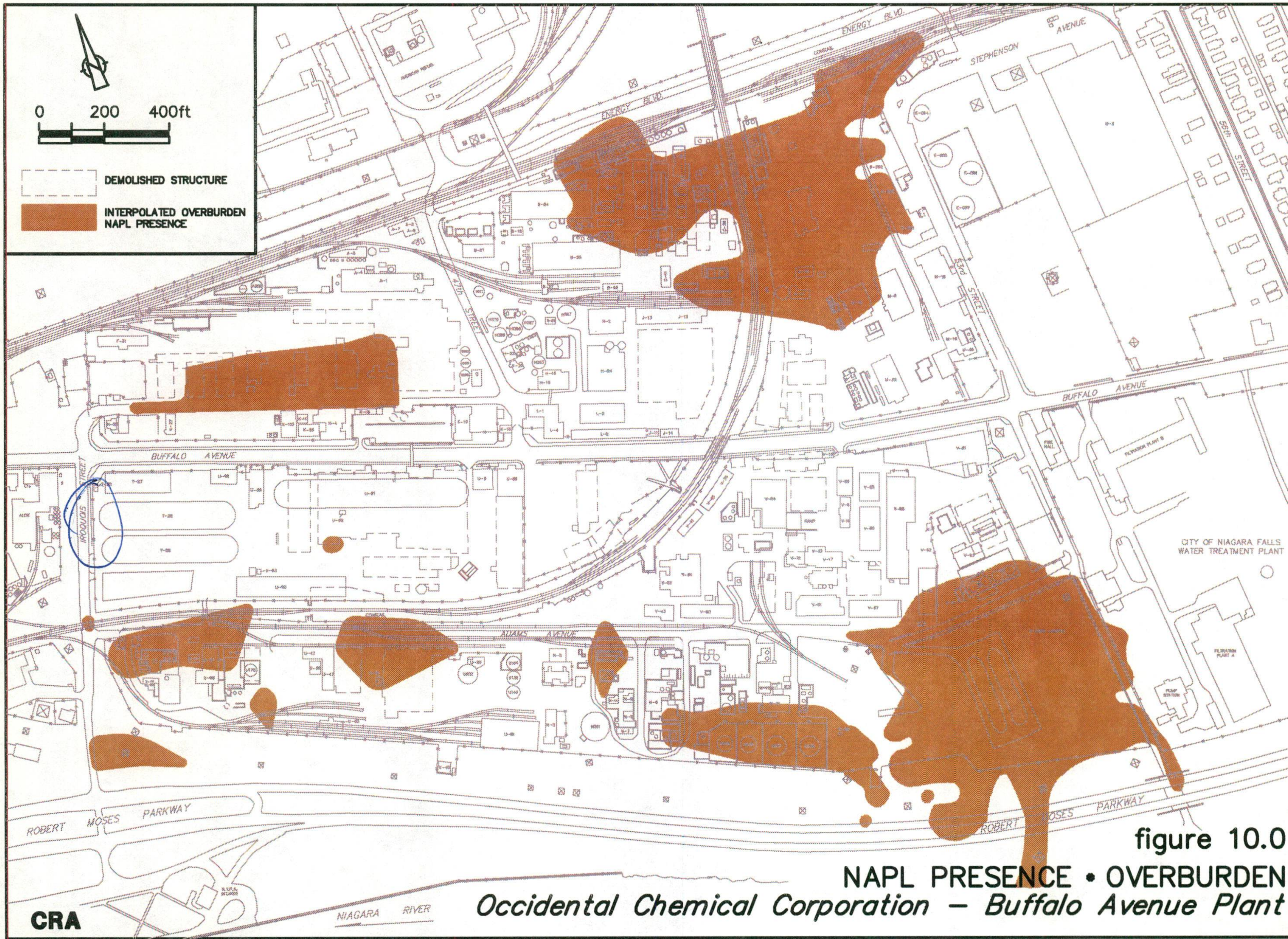


figure 10.0

NAPL PRESENCE • OVERBURDEN

Occidental Chemical Corporation – Buffalo Avenue Plant

2583 (140) AUG 11/94(W) REV.0 (P776)

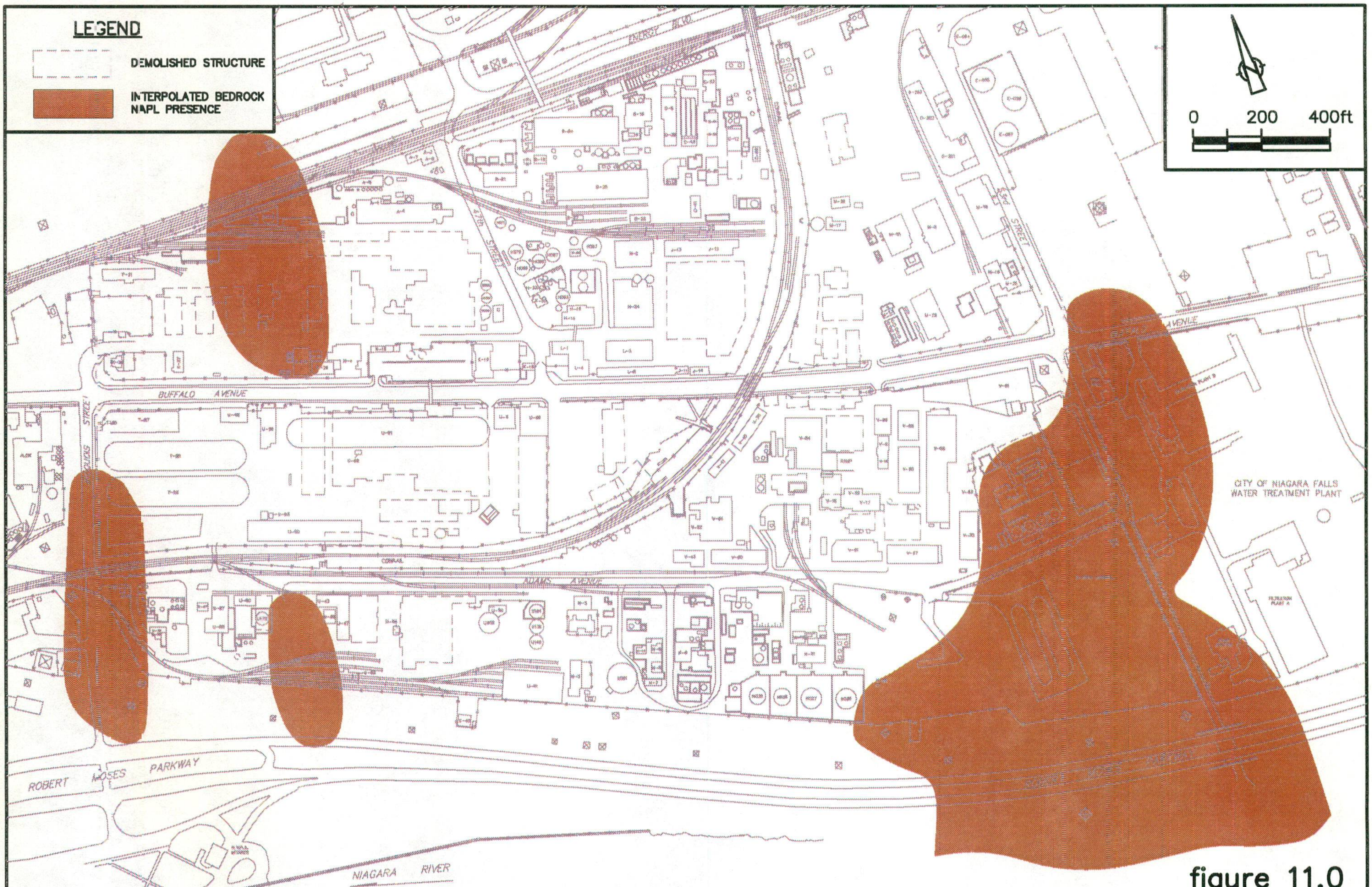


figure 11.0

NAPL PRESENCE • BEDROCK

Occidental Chemical Corporation – Buffalo Avenue Plant

CRA

2583 (14), AUG 11/94(W) REV.0 (P777)

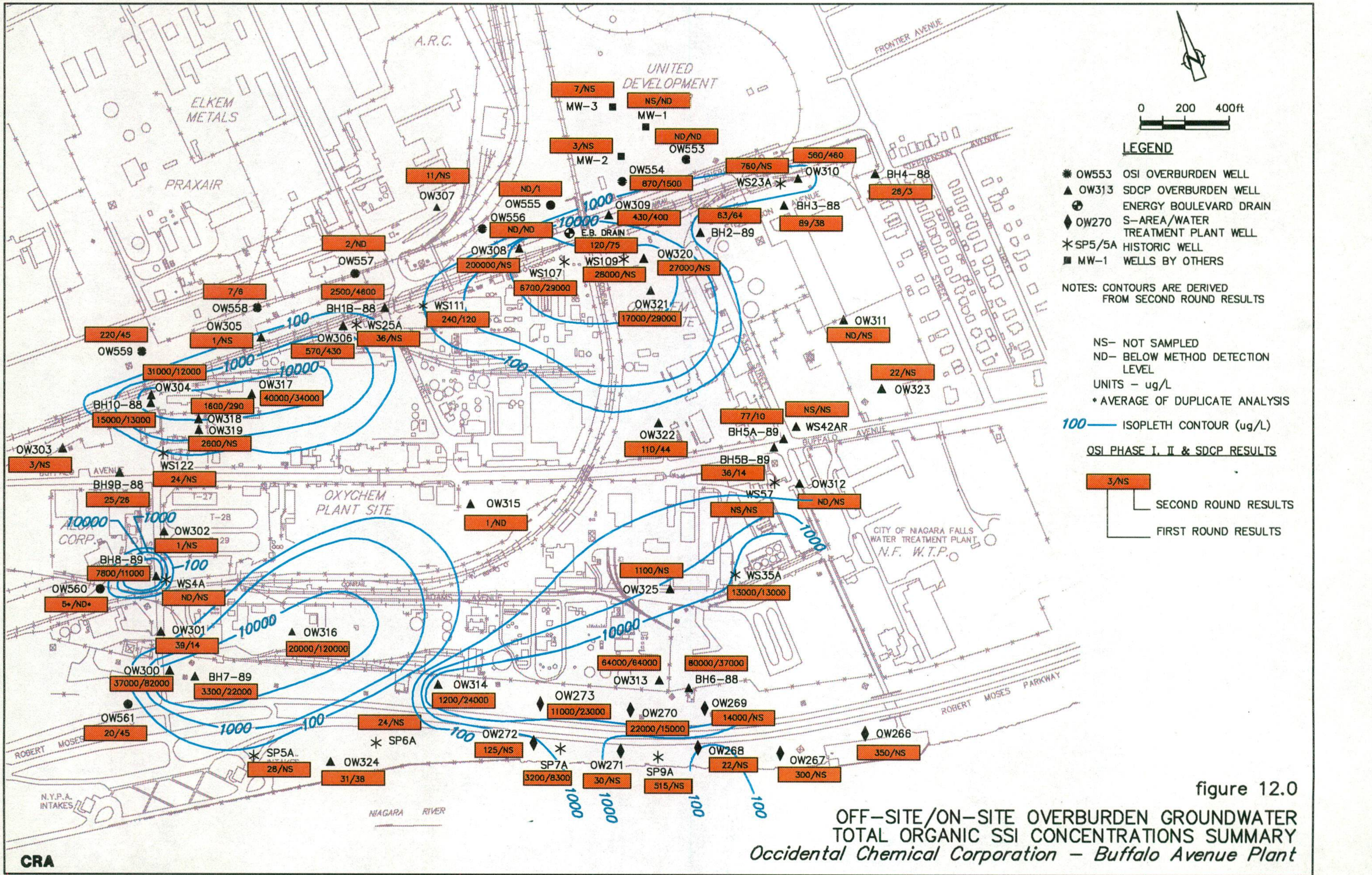


figure 12.0

OFF-SITE/ON-SITE OVERBURDEN GROUNDWATER TOTAL ORGANIC SSI CONCENTRATIONS SUMMARY

Occidental Chemical Corporation – Buffalo Avenue Plant

2583 (140) AUG 12/94(W) REV.0 (P702)

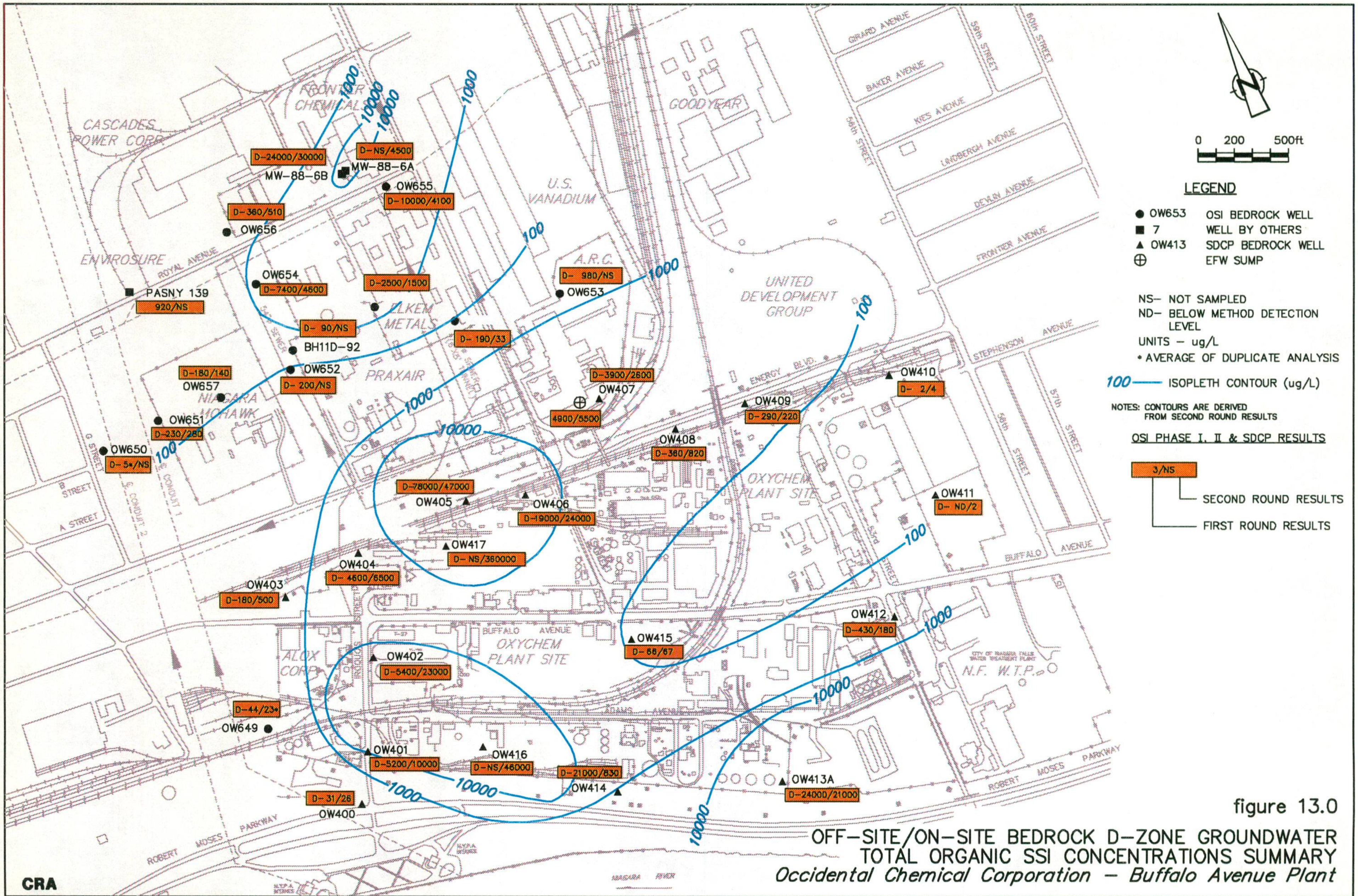


figure 13.0

OFF–SITE/ON–SITE BEDROCK D–ZONE GROUNDWATER TOTAL ORGANIC SSI CONCENTRATIONS SUMMARY

Occidental Chemical Corporation – Buffalo Avenue Plant

CRA

2583 (140) AUG 11/94(W) REV.0 (P703)

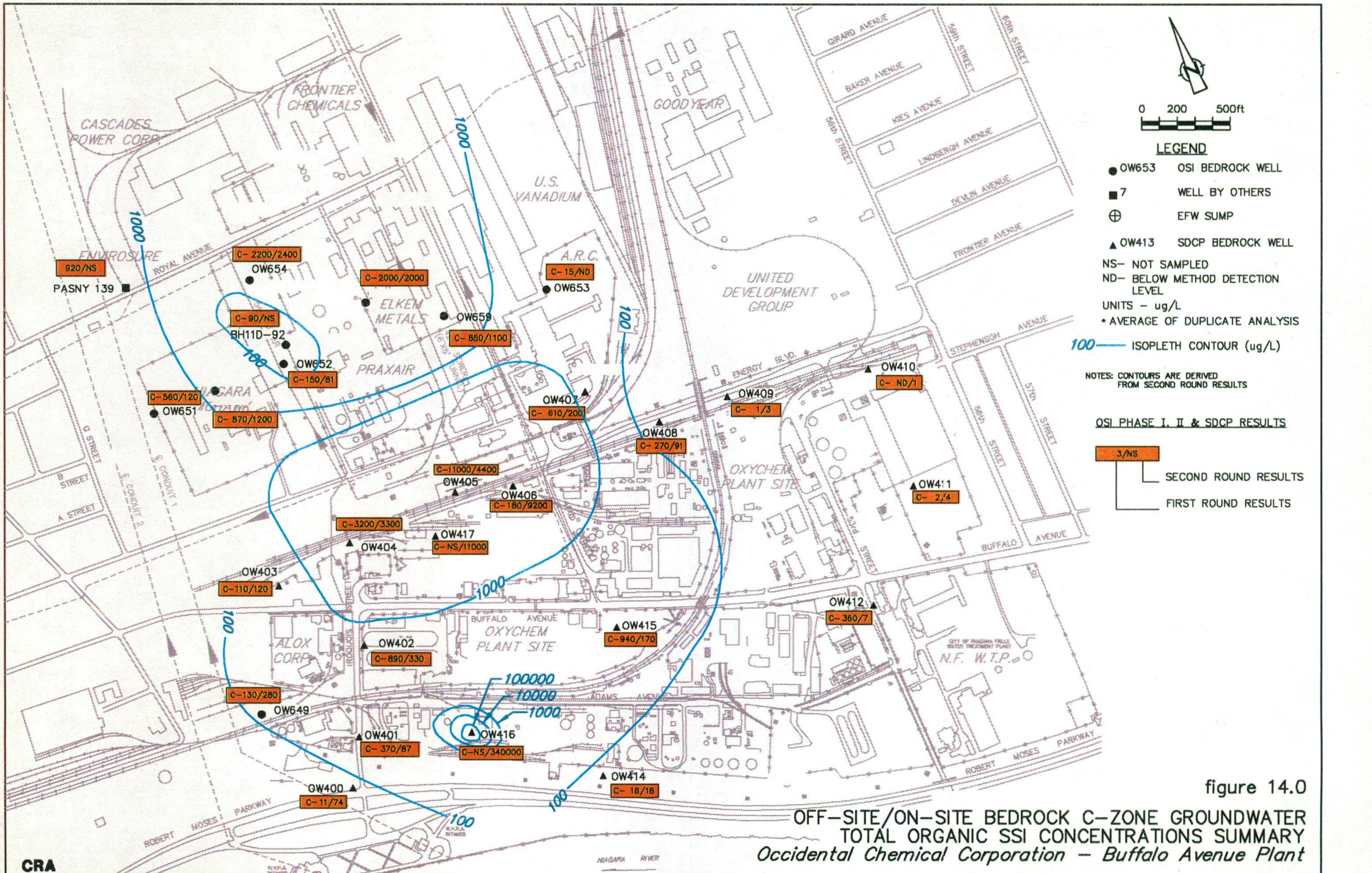


figure 14.0

OFF-SITE/ON-SITE BEDROCK C-ZONE GROUNDWATER TOTAL ORGANIC SSI CONCENTRATIONS SUMMARY

Occidental Chemical Corporation – Buffalo Avenue Plant

CRA

2583 (140) AUG 10/94(W) REV.0 (P704)

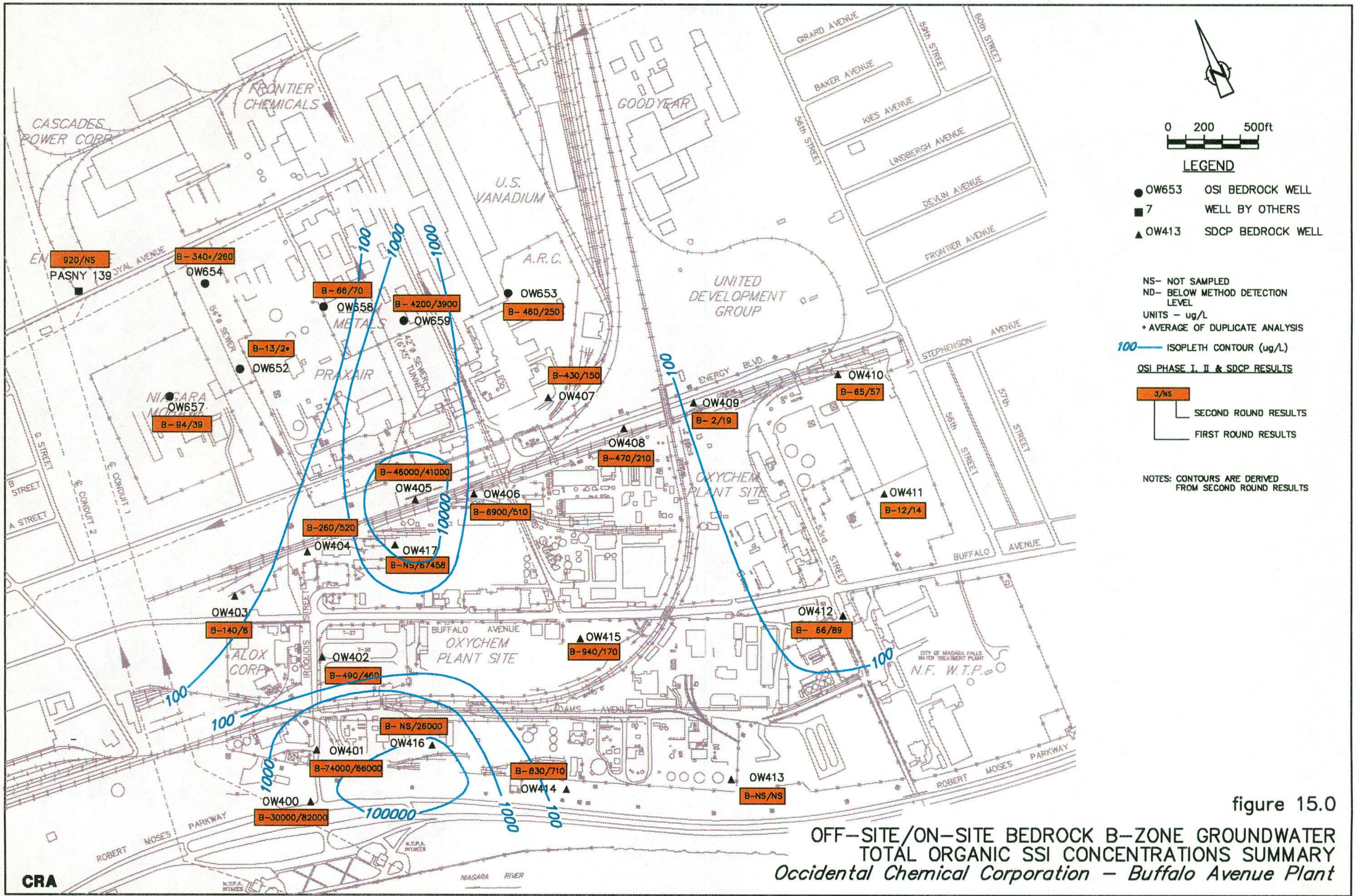


figure 15.0

OFF-SITE/ON-SITE BEDROCK B-ZONE GROUNDWATER
TOTAL ORGANIC SSI CONCENTRATIONS SUMMARY

Occidental Chemical Corporation - Buffalo Avenue Plant

2583 (140) AUG 11/94(W) REV.0 (P705)

Marcy Call

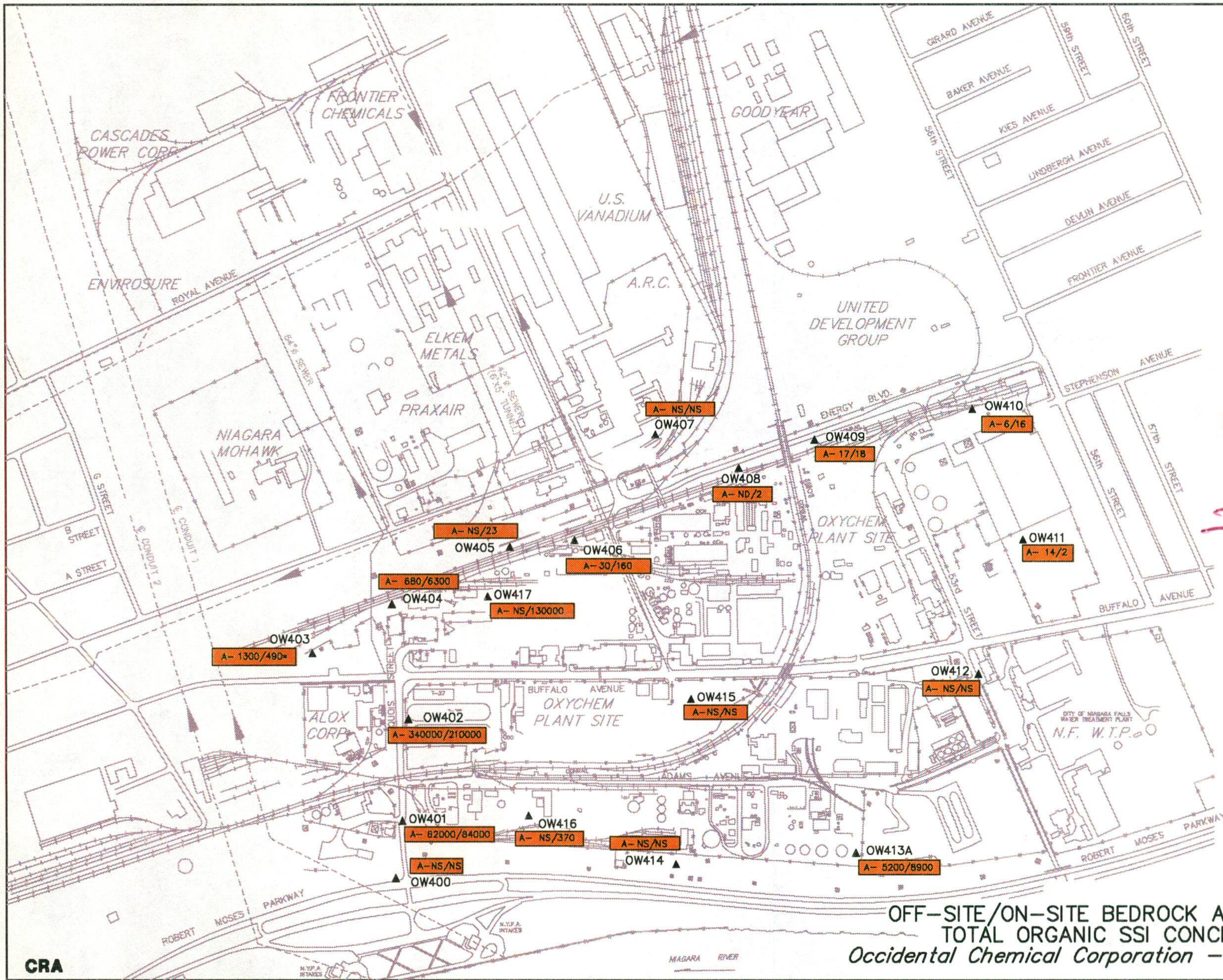
tommorrow

Jan 9th

330
500

1½

930



LEGEND

▲ OW413 SDCP BEDROCK WELL

NS – NOT SAMPLED

ND – BELOW METHOD DETECTION LEVEL

UNITS – ug/L

* AVERAGE OF DUPLICATE ANALYSIS

SDCP

A– NS/NS: WELL ZONE; SECOND ROUND RESULTS; FIRST ROUND RESULTS

NOTE: THE BEDROCK A– ZONE WAS NOT EVALUATED IN OFF-SITE AREAS.

Don
Maronde
Jim Kay

figure 16.0

OFF–SITE/ON–SITE BEDROCK A–ZONE GROUNDWATER TOTAL ORGANIC SSI CONCENTRATIONS SUMMARY

Occidental Chemical Corporation – Buffalo Avenue Plant

CRA

2583 (140) AUG 10/94(W) REV.0 (P706)

TABLES

TABLE 1

RFI WORK PLAN SUMMARY
BUFFALO AVENUE PLANT
OCCIDENTAL CHEMICAL CORPORATION

Program	*Work Plan*
SDCP	Occidental Chemical Corporation Buffalo Avenue Plant Supplemental Data Collection Program • Appendix A Site Operations Plan • Appendix B Environmental Health and Safety Plan • Appendix C Chemical Sampling and Quality Assurance Plan March 1988
DIP	Work Plan Dioxin Investigation Buffalo Avenue Plant January 1990
SIP	Work Plan Source Investigation Program Buffalo Avenue Plant April 1989
SEP	Work Plan Sewer Evaluation Program January 1990
OSI	Off-Site Investigation Work Plan Buffalo Avenue Plant October 1990

TABLE 2

RFI REPORTING SUMMARY
BUFFALO AVENUE PLANT
OCCIDENTAL CHEMICAL CORPORATION

RFI/Plant Program (Performance Date)	*Data Assessment Reporting Documents*	*EPA/State Approval Date*
i) Historical Studies (1979 to 1984)	Historical Data Base Buffalo Avenue Plant August, 1984	
ii) SDCP (Sept. 1988 to Sept. 1990)	Technical and Quarterly Progress Reports #1,2 - December 1988 #3 - March 1989 #4 - June 1989 #5 - September 1989 #6 - December 1989 #7 - March 1990 #8 - June 1990	
	General Parameter Survey Program February 1989	
	Underground Works Utility Investigation Installation Summary June 1989	
	Outfall and Sanitary Sewer Chemical Data Compilation July 1989	
	Comprehensive Analysis Survey Program July 1989	
	Analytical Summary for Round 1 SSI December 1989	
	Continuous and Monthly Hydraulic Monitoring Program May 1990	
	Analytical Summary for Round 2 SSI June 1990	
	Analytical Summary for Outfall Sewer Comprehensive analysis and TCDD analysis of suspended sediments July 1990	

TABLE 2

RFI REPORTING SUMMARY
BUFFALO AVENUE PLANT
OCCIDENTAL CHEMICAL CORPORATION

RFI/Plant Program (Performance Date)	*Data Assessment Reporting Documents*	*EPA/State Approval Date*
ii) SDCP (Cont'd) (Sept. 1988 to Sept. 1990)	Addendum to Continuous and Monthly Hydraulic Monitoring Program Report October 1990	
	Bedrock Pumping Tests February 1991	
	Revised Bedrock Pumping Tests August 1991	
	Final SDCP Report Buffalo Avenue Plant March 1991	April 15, 1992
iii) DIP (April 1990 to March 1993)	Dioxin Investigation Program • Summary Report November 1990	
	Quality Assurance Report March 1991	
	X-Area Additional Sample Results Submitted April 1991	
	Utility Bedding Analytical Results Sumbitted May 1992	
	Dioxin Investigation Program 1992 Addendum August 1992	
	Utility Bedding Analytical Results Submitted March 1993	
	Dioxin Investigation Program • Final Data Submission from Additional Boreholes (Letter - March 12, 1993)	April 7, 1993

TABLE 2

RFI REPORTING SUMMARY
BUFFALO AVENUE PLANT
OCCIDENTAL CHEMICAL CORPORATION

RFI/Plant Program (Performance Date)	*Data Assessment Reporting Documents*	*EPA/State Approval Date*
iv) SIP (Nov. 1989 to May 1992)	Source Investigation Program • Program Status Report of Phase I Activities May 1990	
	Source Investigation Program • Report of Phase II Activities October 1990	
	Source Investigation Program • Letter - Addendum to Report of Phase II Activities July 1991	
	Source Investigation Program Summary Report • NAPL Monitoring Results in the Vicinity of Iroquois Street and Buffalo Avenue April 1993	
	NAPL Monitoring Results in the vicinity of Iroquois Street and Buffalo Avenue April 1992	
	Source Investigation Program • Letter - NAPL Presence Findings U-Area May 1992	September 21, 1992

TABLE 2

RFI REPORTING SUMMARY
BUFFALO AVENUE PLANT
OCCIDENTAL CHEMICAL CORPORATION

RFI/Plant Program (Performance Date)	*Data Assessment Reporting Documents*	*EPA/State Approval Date*
v) OSI (May 1991 to Dec. 1993)	Interim Report Round 1 SSI Results March 1992	
	Off-Site Investigation (OSI) Program • Summary Report August 1992	
	Off-Site Investigation (OSI) QA/QC Review • Round 1 Site Specific Indicators • Round 2 Site Specific Indicators September 1992	
	Monitoring Well Status and D-Well NAPL Monitoring Correspondence Submitted February 1993	
	Notification of Well repair/well abandonment activities completed June 1993	
	Off-Site Investigation (OSI) Program • Phase II Report November 1993	January 18, 1994
vi) SEP (Feb. 1990 to Dec. 1990)	Sewer Evaluation Program • Summary Report January 1991	July 6, 1992
vii) SWMU's	• Existing SWMU's Evaluated Within SIP Program • Newly Identified SWMU's Reported During the RFI Activities: - NaOH Spills Identified (April 17/18, 1993) U-Area Notification Performed April 21, 22, 1993 - T-Area SWMU Identified (April, 1989) Notification Performed May 4, 1989 - U-75 (Mercury Cell Area) SWMU Identified (August, 1990) Notification Performed October 4, 1990	