WOODARD & CURRAN
Engineering • Science • Operations

PORTLAND CHEMICAL WORKS
ENVIRONMENTAL SITE ASSESSMENT
PHASE I REPORT

PREPARED FOR:
CITY OF MIDDLETOWN

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Prepared by:

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1.0 INTRODUCTION

Woodard & Curran Inc. (W&C) initiated the environmental site assessment of the Portland Chemical Works (PCW) site on June 1, 1998, in accordance with the contract scope of work presented in the work order agreement between W&C and the City of Middletown dated May 28, 1998. This report details the results of Phase I of the assessment, and presents our recommendations for Phase II investigation activities.

2.0 FILE REVIEW

W&C completed a review of available documents at the Connecticut Department of Environmental Protection (CTDEP) concerning the PCW site and abutting properties in order to determine whether there is any indication that conditions on these properties may have impacted the PCW site. It should be noted that the Phase II investigation will determine the presence or absence of contamination, and if contamination is identified that may originate from an off-site property, a more detailed background check of the property will be conducted.

A review of the USEPA NPL List, CERCLIS List, list of RCRA Hazardous Waste Handlers, State Sites, and the UST Program within the state of Connecticut was conducted for the subject property. A review of the Connecticut Water Management Bureau files and Waste Management Bureau files was also conducted for the site and two abutting properties, Primary Steel Inc. (formerly Concord Steel Inc.) and Town and Country Auto Dealership.

2.1 PORTLAND CHEMICAL WORKS SITE

The site is not listed on the USEPA NPL List nor is it listed on the USEPA CERCLIS List. The site is not listed on the Connecticut Inventory of Hazardous Waste Disposal Sites.

The three known underground storage tanks identified in the Middletown Request for Proposal are registered with the State of Connecticut Underground Storage Facilities Program. One 1,000-gallon unleaded gasoline steel tank was installed in 1978. One 3,000-gallon diesel fuel steel tank was installed in 1970. According to the UST Facility Notification form, the unleaded gasoline and diesel fuel tanks were still in use as of May 1986. Additionally, one 7,000-gallon heating fuel #2 steel tank was installed in 1962. According to the UST Facility Notification form, the heating fuel tank was last used in February 1986 and was emptied prior to being abandoned in place.

Review of the CTDEP Waste Management Bureau files identified previous investigations of the site performed by Rizzo Associates, Inc. (Rizzo) in early 1992. Rizzo was hired to investigate the presence of "half buried discarded, rotted-out drums and tanks toward the rear of the property" as mentioned in Notice of Violation No. 426 DEP/HW No. 083. The work performed by Rizzo consisted of removing the drums mentioned and sampling their contents. Rizzo was unable to identify the contents of the drums, which were described as a "white powder material"; however, they were found to not be a characteristic hazardous waste as defined by RCRA.

Additionally, Rizzo collected surface soil samples from the stained soil area beneath the loading rack near the railroad. Laboratory analysis identified the presence of 1,1-dichloroethane, 1,1,1-trichloroethane, toluene, ethylbenzene, and xylenes in the soil samples. The levels of these materials detected were reported as being "below applicable state and federal maximum contaminant levels identified for groundwater." No further action was recommended.

A review of the CTDEP Water Management Bureau files identified three drains on the site located in the "garage," the "warehouse," and the "drumming shed." Correspondence indicated that the garage and warehouse drains may lead to an area immediately behind the tank farm, and have been plugged with concrete. The drain located in the shed is apparently connected to an underground tank (see "chemical manhole" discussion in Section 3) and has not been plugged.

2.2 SURROUNDING PROPERTIES

Town and Country Auto Sales (Town and Country), is located immediately north of the site at 750 Newfield Street. A review of CTDEP files identified three underground storage tanks registered with the State of Connecticut Underground Storage Facilities Program. One 4,000-gallon gasoline steel tank, one 2,000-gallon heating fuel steel tank, and one 2,000-gallon waste oil steel tank were all installed in September 1975. According to the UST Facility Notification form dated April 1996, the gasoline and heating fuel tanks were last used in September 1984. The waste oil tank was still in use as of April 1996.

In April 1996, HRP Associates (HRP) performed a Phase II Subsurface Investigation at Town and Country. As a result of soil sampling, HRP recommended the removal of surficial soils and pavement with obvious petroleum staining on the northeast corner of the property. HRP also recommended the removal of soil in the vicinity of the former fuel oil underground storage tank. No further documentation regarding this issue was identified.

Primary Steel Inc. (PSI), formerly known as Concord Steel Inc. is located adjacent to the site in a northeasterly direction at 760 Newfield Street. Review of CTDEP files identified three underground storage tanks registered with the State of Connecticut Underground Facilities Program. One 10,000-gallon diesel fuel steel tank, one 2,000-gallon unleaded gasoline steel tank, and one 10,000-gallon heating oil steel tank were installed in June 1981. According to the UST Facility Notification form, the three tanks were still in use as of May 1986.

No other information regarding PSI was identified in the CTDEP file review.

The abutting properties to the south consist of a commercial shopping center and residential dwelling. Neither is suspected of having any issues that would be a significant concern to the Portland Chemical Works site.

Approximately one-quarter mile to the south of the Portland Chemical Works site is a bulky waste landfill operated by regional Transfer Systems, Inc. The landfill is currently closed, and during the file review at the CTDEP, recent correspondence was unavailable. Files regarding this landfill were unavailable at the time of W&C's assessment. Due to the sidegradient location of the landfill, it is not considered a likely source of impact to the PCW site.

3.0 SITE CONDITIONS

A detailed site walkover inspection was conducted by W&C on June 1, 1998. The inspection was conducted by three persons over a period of four hours. The objective of the inspection was to generally determine site characteristics, and to confirm existing Areas of Concern (AOCs) and identify any new AOCs.

The site including improvements generally conforms with the site description given in the Request for Proposal (RFP). There are, however, several features that were either incorrect or not mentioned in the

background documents. These features are discussed below. Our current understanding of the site characteristics is illustrated in Figure 1.

Northeast Corner – The northeast corner of the site was thought to consist of wetlands, with no issues associated with it. However, the wetland area was observed to be confined to the central portion of the site and surrounds the tank farm area, roughly in the area shown in Figure 1. The area to the northeast and east of the wetlands is wooded land sloping down to a stream which runs in an easterly direction toward the railroad tracks which make up the eastern boundary of the site. The on-site portion of the stream receives runoff from the wetland area as well as general runoff from the site as a whole.

The northern bank of the on-site stream is steep, extending upward approximately 15-20 feet. The bank appears to consist of fill material and debris, including a number of empty 55-gallon lube oil drums and at least two abandoned automobile gasoline tanks. There was no obvious visual evidence of contamination associated with these items on the day of the inspection.

The northeast area of the site in the vicinity of the stream is apparently where Rizzo Associates reported to have removed a number of drums of "unknown material", consisting of a "white powder" substance. On the day of the inspection W&C observed evidence of these former drums, in the form of at least on soil imprint indicative of an upright drum. There was no evidence of contamination associated with the area where this evidence was observed.

Drum Fill Building and Chemical Manhole – The manhole labeled "Chemical" was identified in the existing documents as an unknown; i.e., its origin, destination, and use were not known. W&C visually inspected the interior of the manhole, and reviewed previously unavailable documents in which this unit is discussed. Based on our investigation it appears that the chemical manhole is connected to a floor drain in the Drum Fill Building. This drain is located within ten feet of the pipe rack and drum filling station within the room.

A document located at the CTDEP indicated that the chemical manhole unit is actually an underground storage tank. This document did not include any construction details or other specific information. This evidence that the unit is a UST is consistent with the fact that there was no standing water observed in the unit, while wells located 10 feet away had water within two feet of ground surface. It is speculated that spills and/or floor washings in the drum fill building would have been directed to the floor drain and thence to this tank, perhaps for subsequent removal. One issue which raises the level of concern with this unit is the presence of the five monitoring wells located immediately downgradient, perhaps indicating a prior investigation of a release from the chemical manhole unit (tank).

W&C observed a large amount of soil within the unit, apparently dumped into the unit through the manhole opening. The source of this material is not known nor why it would have been placed here, although two possible explanations are that this material consists of soil cuttings generated when the nearby monitoring well borings were drilled, or that this simply represents a weak effort to abandon the unit in place.

Existing Monitoring Wells – A total of eight existing monitoring wells were identified on the property, in the approximate locations shown on Figure 1. These wells were obviously installed to investigate various AOCs, several of which coincide with the pre-inspection AOCs targeted by W&C in the April 9th proposal. Five of these wells are clustered in an arrangement that appears to target the chemical manhole unit located north of the drum fill building. Some of the wells are flush mounted, while others have casing "stick-ups" with locks. W&C was able to open the flush mounted wells and take depth measurements. These wells ranged in depth from 11 to 21 feet below ground surface (bgs). Water levels in the wells were observed to be fairly consistent at approximately 0-2 feet bgs. The locations, depths,

and condition of the wells are considered adequate to use them as reliable sources of groundwater samples.

Wetland Area – As shown in Figure 1, the on-site wetlands are concentrated in the center of the site with its southwest starting point at the drum fill building, extending northward almost to the on-site stream near the northern boundary of the site, from there in an arcing direction toward its southeastern boundary of a point located some forty feet east of the tank farm berm at the base of the railroad bed. The railroad bed forms the southern boundary of the wetland.

The wetland was observed to have standing water, with the primary vegetation consisting of cattails. Overflow pathways from several locations along the northeastern wetland boundary were observed, extending from the wetland to the on-site stream, running across the intervening wooded area.

The tank farm is located totally within the wetland area. The dike surrounding the tank farm was observed to be breached (cut) at its most downgradient location, this being the northeast corner of the dike. There was no obvious visual evidence of contamination in the wetland or within the tank farm dike on the day of the W&C inspection.

Aboveground Storage Tanks – Three 275-gallon aboveground storage tanks (ASTs) were observed located adjacent to the northeastern corner of Warehouse #2. The tanks appeared to be typical heating fuel storage tanks. Two of the tanks were apparently empty and were simply laying on the ground. The remaining tank was piped to the building and contained liquid, probably heating oil. Significant soil staining was observed on the ground in the immediate area of the tanks.

Tank Farm and Loading Rack – The tank farm and loading rack areas are located within the wetland. The tanks all appear to be empty of product, with only a small amount of residue in their bottoms. W&C observed no visual evidence of spills, releases, or contamination in the area of the tanks. The tank dike was observed to be breached, probably intentionally, at its northeast corner.

The loading rack area was covered in a layer of mud, with standing water in a small sump situated under the primary receiving pipe. The overall design of the unit did not appear to provide for adequate containment of spills or leaks, which would be expected to have occurred in this area. The loading rack area is highly suspect for residual contamination.

4.0 AREAS OF CONCERN

W&C has identified nine Areas of Concern (AOCs) at the Portland Chemical Works site. The AOCs issue(s) involved with each are listed in the Table 1 below. The list order is not intended to imply a perceived order of significance. Each of these AOCs will be addressed in the proposed Phase II scope of work. Refer to Figure 1 for locations.

Table 1: Areas of Concern

Area of Concern	Issue
1. Tank Farm	Chemical storage and pipe transfer, soil within diked area, dike breached to wetland
2. Loading Rack	Chemical pipe transfer, including hand hookups, inadequate spill containment
3. Heating Oil Underground Storage Tank (UST)	Potential release to subsurface
4. Gasoline and Diesel USTs	Potential release to subsurface
5. Chemical Manhole	Apparently designed to receive spilled chemicals from drum fill building, possible that releases triggered the installation of nearby monitoring wells
6. Aboveground Fuel-Oil Storage Tanks	Visual evidence of releases to surface soil
7. Debris Area on North Side of Stream	Presence of petroleum containers, general dump area.
8. Area behind Warehouse #1 (9,000 s.f. building)	Potential impacts associated with material handling in the vicinity of the warehouse
9. Area behind Warehouse #2 (8,000 s.f. building)	Potential impacts associated with material handling in the vicinity of the warehouse

5.0 PROPOSED PHASE II ACTIVITIES

W&C has developed a proposed scope of work (SOW) for a Phase II investigation. The Phase II is designed to investigate each AOC identified in the Phase I and determine the presence or absence of contamination which may present a risk of significant liability. At the end of Phase II, each AOC will either be eliminated as a continuing AOC or targeted for additional investigation in a subsequent Phase III delineation study.

In general, this Phase II scope is designed to look for significant subsurface soil and groundwater contamination. To this end the methodology includes near-surface soil sampling through the use of a hand auger, subsurface soil sampling through the installation of soil borings, and groundwater sampling from both new and existing groundwater monitoring wells

The Phase II scope is described below. Figure 2 illustrates the type and location of activity proposed for each AOC. Table 2 presents a summary of the Phase II activities for each AOC. All samples, soil and

groundwater, will be analyzed for Volatile Organic Compounds (VOC) via EPA Method 8260; Total Petroleum Hydrocarbons (TPH) via EPA Method 418.1 or equivalent; and the eight RCRA metals plus copper, nickel, and cyanide. In all cases, samples will be placed on ice and delivered to a Connecticut-certified laboratory for analysis in accordance with proper chain-of-custody procedures within allowable holding times.

5.1 Near-Surface Soil Sampling

Surface soil samples will be taken by hand auger in certain areas in order to determine the presence or absence of contamination in near surface soils. This approach is useful in that it is an efficient means of investigating the presence or absence of contamination that would be expected to be detected in shallow soils; for example materials released to the ground surface through leaks or spills from aboveground tanks or material transfer operations. In addition, hand augering allows sampling in areas where access for vehicle-mounted equipment is difficult or impossible.

Hand auger samples will be taken in the areas of concern listed below. Procedures to be used in conducting the sample collection follow this listing.

Tank Farm – Up to five hand auger samples will be taken in the diked area of the tank farm (AOC #1). Included in this seven is one sample on the exterior of the dike immediately downgradient of the breach in the dike.

Loading Rack – Up to four hand auger soil samples will be taken in the immediate area of the loading rack platform (AOC #2).

Aboveground Fuel-Oil Storage Tanks – Two hand auger soil samples will be taken in the immediate vicinity of the three aboveground fuel-oil storage tanks (AOC #6).

Chemical Manhole Unit – One hand auger soil sample will be taken of the soil identified in this unit. The interior of the unit will be probed in an attempt to get a better idea of the unit's construction and whether it is indeed a tank.

Stream Sediments – Two hand auger samples will be taken of stream sediments: one in the vicinity of the observed debris observed in and along the northern stream bank (AOC #7), and the other further downstream near the point where the stream exits the property to the east. The purpose of these samples is to identify the presence or absence of residual contamination in the sediments from possible releases from drums or other items placed in the northeastern portion of the property in the past.

The near surface soil samples will be obtained using a clean stainless steel hand auger. Samples will be obtained from a depth ranging from 0.5 to 4 feet bgs, depending on soil conditions and field observations. Augered soil will be placed in a clean stainless steel bowl or aluminum container, and placed in appropriate sample containers using a clean stainless steel spoon. The augers, bowls, and spoons will be decontaminated between samples using an accepted EPA three-step protocol. Augered soil not included in the sample will be placed back into the auger hole.

5.2 Soil Boring and Monitoring Well Installation

W&C proposes the installation of four soil borings/monitoring wells on the PCW property in the locations shown on Figure 2. With the exception of MW-201, which will be installed solely to determine upgradient groundwater quality, these borings/wells are proposed in order to characterize the subsurface

and to identify any subsurface soil or groundwater contamination originating from corresponding upgradient AOCs.

Soil borings will be installed using the standard hollow stem auger technique. Due to difficult access in the locations proposed for MW-203 and MW-204, drilling will be done using a bombadier rig. This equipment consists of a small auger rig mounted on an all-terrain vehicle. We assume that drilling conditions at the site are amenable to this technique. The borings will be installed to a depth of five to eight feet into the water table, or to a total depth of 20 feet, whichever is encountered first.

Soil samples will be taken and logged continuously to 15 feet below ground surface and then on five foot centers thereafter. Each sample will be visually inspected by the W&C field engineer/geologist and screened with a photoionization detector (PID) for evidence of contamination. With the exception of MW-201, which is the upgradient well and thus does not warrant soil sampling, one soil sample per boring will be selected for laboratory analysis from each boring based on (1) PID readings, or (if no readings) (2) field observation by the site engineer. If there is no evidence of contamination the sample immediately above the water table or, if no groundwater is encountered, at a depth determined based on field observations will be selected.

If groundwater is encountered, a monitoring well will be installed in each of the borings. The wells will be constructed using 2-inch ID PVC pipe and will have ten-foot slotted PVC well screens installed so as to intercept the groundwater surface. Following installation, the monitoring wells will be developed through pumping or bailing until groundwater clarity stabilizes. Water levels in the wells will be surveyed in order to allow a determination of the groundwater flow direction.

Following installation and development, the monitoring wells will be allowed to stabilize for a period of one week and then sampled following EPA-approved protocol. One groundwater sample per well will be analyzed.

5.3 Sampling of Existing Wells

W&C recommends sampling the eight existing groundwater monitoring wells identified on the PCW site. These wells were obviously installed for a reason, and it would be prudent to sample them as part of our overall Phase II investigation. Several of the wells are situated in locations where we had planned to install wells: this actually reduces our field construction costs (although this task also has the effect of increasing laboratory costs somewhat; see Section 6 below).

The existing wells (designated MW-101 through MW-108 on Figure 2) will be developed, allowed to stabilize, sampled and surveyed in the same manner as the newly-installed wells. The resulting data will be incorporated with that from the new wells to develop a site-wide understanding of groundwater conditions, and in the evaluation of the specific AOCs.

5.4 Quality Assurance/Quality Control

The scope of work described above warrants the analysis of one trip blank, one soil duplicate, and one groundwater duplicate. These Quality Assurance/Quality Control (QA/QC) samples will be analyzed for the same parameters described above for other samples, in accordance with accepted EPA protocols. With the addition of the QA/QC samples, the assumed Phase II project scope will include a total of up to 19 soil samples and 15 water samples.

5.5 SUMMARY OF PHASE II ACTIVITIES

A summary listing of the proposed Phase II activities by Area of Concern is presented in Table 2.

Table 2: Summary of Phase II Activities

AREA OF CONCERN	PROPOSED PHASE II ACTIVITY
1. Tank Farm	Up to five near-surface soil samples in diked area, soil and groundwater samples from MW-203 and MW-204
2. Loading Rack	Up to four near-surface soil samples, soil and groundwater samples from MW-203
3. Heating Oil Underground Storage Tank (UST)	Soil and groundwater samples from MW-202
4. Gasoline and Diesel USTs	Groundwater sample from MW-101
5. Chemical Manhole	One soil sample from within unit, groundwater samples from five wells (MW-104, 105, 106, 107, and 108)
6. Aboveground Fuel-Oil Storage Tanks	Two near-surface soil samples
7. Debris Area on North Side of Stream and historic drums	Two near-surface soil/sediment samples
8. Area Downgradient of Warehouse #1 (9,000 s.f. building)	Groundwater sample from MW-102
10. Area Downgradient of Warehouse #2 (8,000 s.f. building)	Groundwater from three wells (MW-103, 104, and 202)

6.0 MODIFICATION OF PROPOSED PHASE II SITE ASSESSMENT

At the time W&C prepared the Proposal for the work at the Portland Chemical Works site, four AOCs had been identified. These included the above ground storage tanks (AOC #1), the loading rack area (AOC #2), and the two underground storage tank areas (AOC #3 and #4). The Phase II scope discussed in our April 9 proposal provided for the investigation of these areas.

Following the completion of the Phase I file review and site inspection, five new AOCs have been identified. These include: the chemical manhole/tank associated with the drum filling shed (AOC #5), the three 275-gallon oil storage tanks located north of Warehouse #2 (AOC #6), debris along the stream in the northeast corner of the property (AOC #7), and suspected material handling areas adjacent to Warehouses #1 and #2 (AOCs #8 and #9).

In addition, a total of eight existing monitoring wells were discovered on the site. W&C believes that data from these wells is important and proposes sampling each of the wells.

The Phase II Assessment program identified in this report includes investigation of the original four AOCs as well as the five most recently identified AOCs. Evaluation of the chemical manhole/tank will include sampling of the five existing monitoring wells adjacent to and downgradient of the manhole, and sampling and analysis of soil/sediment from within the tank. Investigation of the stained soil associated with AOC #6 will include sampling and analysis of two near-surface soil samples. Investigation of the debris area will include sampling and analysis of stream sediment. Soil and groundwater from the proposed boring/monitoring well MW-204 may also identify potential impacts from the debris. Finally, the impact of material handling that occurred around the warehouses will be evaluated through sampling and analysis of groundwater from well MW-102 for Warehouse #1, and installation and sampling of boring/well MW-202 for Warehouse #2.

The modification of the original Phase II work scope is necessary in order to address actual site conditions as determined through the Phase I investigation. The identification of the additional AOCs and existing site monitoring wells results in a net increase in the budget necessary to complete the Phase II investigation. The estimated costs to complete the modified Phase II program is summarized below.

Field Labor and Expenses	$5,000
Drilling Subcontractor	3,500
Soil/Sediment Analytical Subcontractor	8,200
Groundwater Analytical Subcontractor	4,500
Report Preparation	6,000
Meetings with Client	900
TOTAL PHASE II COST ESTIMATE	$28,100

The revised costs estimate to complete the Phase II portion of the work is $28,100. While this estimate is greater than the originally proposed cost of $21,000 it includes investigation of five additional AOCs, and it includes sampling and analysis of eight existing monitoring wells. It should be noted that at least some of the existing monitoring wells will be substituted for wells which would likely have been installed in the subsequent Phase III delineation study. Thus, it is possible that the Phase III will not require a large number of monitoring wells to be installed and may instead focus on a determination of the extent of soil contamination constituting potential source areas. Because of this we are hopeful that our overall project budget target of $55,000 will not change.

Newfield

Town & Country
Auto Sales

Primary Steel, Inc.
Facility

N

⑦ Debris Area

⑥

103

Connected

⑨

104

Wetland

cut here

Warehouse #1
(9000 ft²)

102

Warehouse #2
(8000 ft²)

⑧

105

⑤

106

108

①

②

③

④

101

107

Drum Fill Building

Ramp

Street

(AOC) Area of Concern

① Tank Farm AOC
② Loading Rack AOC
③ Heating Oil UST AOC (approximate)
④ Gasoline and Diesel USTs AOC (approximate)
* ⑤ Chemical Manhole size?
⑥ Three 275-gallon ASTs with staining on ground
⑦ Debris Scattered on Stream Embankment
⑧ Warehouse #1 Materials Handling Area
⑨ Warehouse #2 Materials Handling Area

LEGEND

103 ⊕ Existing Monitoring Well

Bot Mem - some locked some not

Scale in Feet
0 100 200

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DES.BY: GFF	DR.BY: CSW	CK.BY: GFF

FORMER PORTLAND CHEMICAL WORKS
MIDDLETOWN, CONNECTICUT

FIGURE 1

EXISTING CONDITIONS

SCALE: AS SHOWN	JOB NO.: 98053.01
DATE: 6/98	FILE NAME: SITEPLAN

WOODARD & CURRAN
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Newfield

Street

Town & Country
Auto Sales

Primary Steel, Inc.
Facility

N

Debris Area

Wetland

Warehouse #1
(9000 ft²)

Warehouse #2
(8000 ft²)

Drum Fill Building

Ramp

101 102 103 104 105 106 107 108 201 202 203 204

① Tank Farm AOC
② Loading Rack AOC
③ Heating Oil UST AOC (approximate)
④ Gasoline and Diesel USTs AOC (approximate)
⑤ Chemical Manhole
⑥ Three 275-gallon ASTs with staining on ground
⑦ Debris Scattered on Stream Embankment
⑧ Warehouse #1 Materials Handling Area
⑨ Warehouse #2 Materials Handling Area

Volatile organic compounds
TPH
metals - heavy metals
Copper
Ni
cyanide

100 feet of existing low permeability

LEGEND

- 103 Existing Monitoring Well
- 201 Proposed Monitoring Well
- Proposed Surface Soil Sample Location
- Proposed Sediment Sample Location

Scale in Feet
0 100 200

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DES.BY: GFF	DR.BY: CSW	CK.BY: GFF

FORMER PORTLAND CHEMICAL WORKS
MIDDLETOWN, CONNECTICUT

FIGURE 2

PROPOSED SAMPLING LOCATIONS

SCALE: AS SHOWN	JOB NO.: 98053.01
DATE: 6/98	FILE NAME: SITEPLAN

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