Final

APPENDIX A

APPENDIX A

I. DEFINITIONS

A. CONTAINMENT AREA

Containment area is defined as the area within the "containment wall."

B. OFFSITE

Offsite is defined as all groundwater contaminated areas outside the "containment area" that are attributable to the Property.

C. TOTAL VOLATILE ORGANIC COMPOUNDS

Total Volatile Organic Compounds is defined as the sum of the concentrations of the volatile organic constituents listed in attached Table 1 as determined by a laboratory approved by the State of New York.

D. DISCHARGE CRITERIA

Discharge Criteria are the concentrations for those chemicals as listed in Table 1.

E. CONTAINMENT WALL

Containment wall is the wall to be installed as shown on "Site Plan" Sheet 1, Appendix D of the Camp, Dresser & McKee ("CDM") November 14, 1983 report entitled "Conceptual Design Report for Implementation of the Remedial Action Plan for the Mitchel Field Transit Facility Site" ("Phase 1 Report,") a copy of which is annexed as Exhibit 1.

II. LOCATION AND DIMENSIONS OF CONTAMINATED SOIL AND GROUNDWATER

A. SOIL CONTAMINATION

The location of the soil contamination is coextensive with the area enclosed by the containment wall.

B. GROUNDWATER CONTAMINATION

The approximate location and dimensions of the groundwater contamination are shown on the attached figures taken from the CDM October 1984 report entitled "Remedial Action Plan, Phase II Plume Remediation Study and Conceptual Design Report for the Former Purex Site ("Plume Report"). These figures are labeled as Figure 4-4A, "Observed Concentration of Total Volatile Organics at Wells at Top of Upper Glacial Aquifer"; Figure 4-4B, "Observed Concentration of Total Volatile Organics at Wells at Bottom of Upper Glacial Aquifer"; Figure 4-5, "Observed Concentration of Total Volatile Organics at Medium Wells"; and Figure 4-6, "Observed Concentration of Total Volatile Organics at Deep Wells," annexed as Exhibits 2(a), 2(b), 2(c) and 2(d) respectively.

III. REMEDIAL PROGRAM

The Remedial Program to be employed pursuant to the Consent Judgment includes seven items:

1) installation of the containment wall;
2) installation and operation of a soil flushing system;
3) installation and operation of six extraction wells installed within the containment area;
4) installation and operation of approximately six purge

wells in the offsite area;

5) construction and operation of a treatment plant capable of treating approximately 1,400 gpm of water;

6) construction and operation of treated water discharge system; and

7) installation and operation of monitoring wells.

This remedial system will be designed (except as already designed), constructed and installed by Purex.

The containment wall shall be constructed in accordance with pages 4-15 through 4-28 of the Phase I Report (attached as Exhibit 3) and Nassau County, New York, the Department of Public Works, Technical Specifications for Mitchel Field Transit Facility Site Remedial Action - Phase I, Town of Hempstead, New York, dated November 28, 1984 ("Tech Specs," a copy of which is annexed as Exhibit 5), amplified by additional comments as appropriate set forth in the correspondence annexed as Exhibit 4.

The soil flushing system shall be constructed in accordance with pages 4-54 through 4-58 of the Phase I Report (attached as Exhibit 6) and the Tech Specs, as amplified by Exhibit 4.

The extraction wells shall be installed inside the containment wall in accordance with pages 4-29 through 4-54 of the Phase I Report (attached as Exhibit 7) and the Tech Specs, as amplified by Exhibit 4.

The offsite purge wells shall be installed in accordance with concepts outlined in Sections 5 and 6 of the Plume Report (attached as Exhibit 8) as amplified by Exhibit 4.

The treatment plant shall be installed in accordance with

the concepts outlined in Section 6 of the Plume Report, as amplified by Exhibit 4. The design shall also consider the following:

(a) Redundancy of online components. Critical components of the treatment process may be installed in the plant in a redundant manner. That is, the piping may be split and two pumps installed where only one is required. The purpose of redundancy is to address two situations. The first situation allows maintenance of a component of the treatment process while the operation continues. The second situation is to provide for continuous operation of the treatment process in the event of a component failing to operate.

(b) Expandable design. In the event the plant cannot treat to the levels intended, the design should allow for expansion of the treatment process. This expansion may occur in two fundamental ways. Additional process units may be added in parallel to existing units in the treatment train or additional process units may be added in sequence at the end, middle, or beginning of the treatment train. Allowance may be provided in the design and construction of the facility to enable such expansion to easily take place.

(c) The design should provide for measures to inhibit and reduce vandalism or sabotage.

The treated water discharge system includes offsite recharge

wells, and piping from the treatment plant to a recharge basin and to the offsite recharge wells. The offsite recharge wells shall be located adjacent to but outside the containment wall.

The monitoring wells shall be installed and operated as outlined in the Monitoring Plan to be developed pursuant to Appendix C.

Final plans and specifications for the offsite purge wells, treatment plant, treated water discharge system and monitoring wells shall be designed and prepared by Purex. Such plans and specifications, including preliminary plans and specifications shall be submitted to the State and County in accordance with a reasonable schedule consistent with construction industry practice.

IV. OPERATION OF REMEDIAL PROGRAM

A. SHAKEDOWN AND STARTUP OPERATION

After construction of the entire remedial system, the system shall be operated by Purex in a shakedown mode in order to evaluate whether the system components are functioning according to specifications. As necessary, adjustments to equipment and processes will be made. The shakedown period will be complete after Purex demonstrates to the State and County that all equipment is functioning as designed.

The startup period will follow the conclusion of the shakedown period. The startup period will be at least six months long and will be complete when both of the following conditions are met:

1. Purex demonstrates to the State and County that during the last 3 months of the startup period the entire remedial system operates as designed.

2. The concentration of chemicals listed in Table 1 and Total Volatile Organic Compounds in the treated effluent discharge achieves the Discharge Criteria at a pumping rate of approximately 750 gpm and maintains these concentrations for 2 weeks of continuous operation at the end of the startup period.

The treated effluent discharge will be sampled and analyzed for the said chemicals and Total Volatile Organic Compounds in accordance with the Monitoring Plan developed pursuant to Appendix C.

During the shakedown and startup periods, treated effluent from either the containment or offsite areas may be discharged into the soil flushing system in accordance with the below described requirement for hydraulic balance and contaminant restrictions. Mounding within the containment area shall be prevented by maintaining a lower head within the containment area relative to the adjacent areas. If at any time all pumping from extraction wells inside the containment wall is terminated, discharge to the soil flushing system will also be terminated. Treated effluent not going to the soil flushing system will be discharged to an offsite recharge basin provided the effluent meets the Discharge Criteria or the Basin Ambient Criteria, whichever criteria or portion thereof is more stringent, or to recharge wells provided the effluent meets the Well Ambient Criteria. Effluent may be discharged to the recharge wells only when the offsite recharge basin(s) are approaching overflow conditions or the Discharge Criteria or Basin Ambient Criteria cannot be attained. Whichever discharge option is selected, either a hydraulic balance between withdrawal and discharge in the offsite area will be maintained or there will be a net withdrawal from the offsite area. Pumping rates of any

extraction or offsite purge well can be changed at any time during the shakedown and startup period.

B. NORMAL OPERATION

When all conditions described in shakedown and startup operation are met, the normal operation period will commence. Purex will operate the system for the first 12 months. In the event that the treated effluent does not meet the Discharge Criteria for more than 40 days within the 12 months, Purex shall operate the system beyond the 12 months for that period of time greater than 40 days which the effluent fails to meet the Discharge Criteria. Thereafter the County will administer the operation of the system.

The normal operation will be as follows:

1. Approximately 700 gallons per minute (gpm) of groundwater will be extracted from the six extraction wells installed in the containment area. This water will be treated at the treatment plant. The treated water shall meet the Discharge Criteria or the Basin Ambient Criteria, which ever criteria or portion thereof is more stringent prior to discharge to an offsite basin.
2. Initially, approximately 700 gpm of groundwater will be extracted from the purge wells within the offsite area. The pumping schedule and rates are recommended in the Plume Report and efficacy of each purge well will be periodically evaluated and adjustments to such rates will be made accordingly. This water will receive preliminary treatment as shown in Figure 6-2 of the Plume Report (attached as Exhibit 9). The preliminary treated

water will be discharged to the soil flushing system until pumping of the extraction wells is terminated. After the containment area has met the Remediation Criteria (as defined hereafter), the pumping rate of the purge wells will be increased to approximately 1,250 gpm and groundwater will be treated at the treatment plant.

Treated water effluent from either the containment area or the offsite area may be discharged to the flushing system, offsite recharge wells or offsite recharge basin. Such discharge shall be consistent with the above described requirement for hydraulic balance and contaminant restrictions. The treated water effluent that is discharged to the offsite recharge basin shall meet the Discharge Criteria or the Basin Ambient Criteria, whichever criteria or portion thereof is more stringent. Treated water effluent that is recharged into the containment area shall meet the Property Ambient Criteria. Treated water effluent that is recharged into the recharge wells shall meet the Well Ambient Criteria.

If laboratory results for a given sample collected from effluent being discharged to a recharge basin pursuant to the Monitoring Plan indicate that the concentration of any of the chemicals listed in Table 1 or the Total Volatile Organic Compounds does not meet the Discharge Criteria or the Basin Ambient Criteria, whichever criteria or portion thereof is more stringent, then an additional sample shall be collected 24 hours later. The second sample shall be used for verification and analyzed for those chemical(s) as identified in the first sample as being at a

concentration in excess of the Discharge or Basin Ambient Criteria. If the second sample meets the Discharge or Basin Ambient Criteria, then the effluent will be deemed to meet the Discharge or Basin Ambient Criteria. However, if the first sample's Total Volatile Organic Compounds is above five hundred parts per billion, then the treated water effluent shall be immediately diverted as described in the following paragraphs.

If the sample fails the second test, then the treated water effluent shall be immediately diverted from the offsite recharge basin to the recharge wells or the onsite flushing system consistent with the requirements described herein regarding discharge into the recharge wells and containment area. Pumping rates of individual wells may be altered to meet operating conditions and corrective measures shall be taken to meet Discharge Criteria.

The treated water effluent flow may be restored to the recharge basin when the treated effluent meets the Discharge or Basin Ambient Criteria, whichever criteria or portion thereof is more stringent, for two consecutive days following collection and analysis of the first sample meeting the Discharge or Basin Ambient Criteria.

V. DATA EVALUATION

All data obtained from sample analyses shall be evaluated statistically using the "student-t" method. Each sample collected shall be analyzed in quadruplicate. "t" statistics shall be applied to the sample results and the 95% confidence interval shall be calculated.

Data comparisons will be between the calculated 95% confidence limits and the criteria established by the Consent Judgment. One of

the following conditions will eventuate:

(1) When the criteria value is within the 95% confidence interval, it shall be concluded that there is no statistically significant difference between the evaluated data and the criteria, and in such a case, the sample shall be deemed to have a concentration that meets the criteria value.

(2) When the criteria value is greater than the upper limit of the 95% confidence interval, the sample shall be deemed to have concentrations less than the criteria value.

(3) When the criteria value is less than the lower limit of the 95% confidence interval, it will be concluded that there is a statistically significant difference. The sample shall be deemed to have concentrations that do not meet the criteria value.

These analyses assume that the data to be analyzed are normally distributed. If the data are not normally distributed, then the data will be transformed so that the transformed data follow an approximate normal distribution and the above described analyses for normal distribution applied. If the data population is neither normally distributed nor can be transformed to an approximate normal distribution, then the distribution of data population will be appropriately defined and the statistical method for that population applied.

VI. SHUTDOWN

Shutdown at any one or more of the extraction or purge wells shall occur when the "Remediation Criteria" are met. The Remediation Criteria are met when either condition described below is met:

1. The Water Condition set forth in Table 2 is met for

three consecutive months, in accordance with the following methodology:

(a) Samples taken from the extraction or purge well and related monitoring wells will be analyzed and the data will be statistically evaluated to determine the concentrations for individual compounds and Total Volatile Organic Compounds. If there is no statistically significant difference between the data and the Water Condition at the 95 percent confidence limit (using "t" statistics) then the extraction or purge well may be shut down. In the event that the analysis of the extraction or purge well data meets the Water Condition and the related monitoring wells do not, the extraction or purge well may be shut down and the Remedial System adjusted as appropriate. The need for the installation of additional extraction or purge wells will be assessed on the basis of whether additional wells are necessary to affect the areas which are contaminated with chemicals attributable to the Property.

2. "Zero Slope Condition" is met as follows:

The Zero Slope Condition is met as follows: when the slope of the curve of the concentrations of the chemical listed in Table 2 and Total Volatile Organic Compounds, as calculated is deemed zero. The determination of said concentration shall be made on a well-by-well basis at all pertinent extraction, purge, and monitoring wells within the containment area

or within the offsite area. The determination of whether there is a zero slope shall be made as follows:

(a) Samples shall be taken at the locations and frequencies stated in the Monitoring Plan.

(b) The data collected over the preceding twelve (12) month period will be examined and the concentration values for the individual compounds and the Total Volatile Organic Compounds and the associated confidence limits will be computed and plotted.

(c) If the curve suggested by these data points is linear, then a straight line using least squares regression model shall be fitted to the data and the slope of the fitted line shall be considered as the estimated slope for purposes of this paragraph.

(d) If the data points suggest a non-linear form, then an exponential curve using a least squares regression model shall be fitted to the data. The estimated slope for purposes of this paragraph shall be the first derivative of the curve at a value of time halfway between the dates of the last two sample points.

(e) The estimated slope shall be deemed to be zero if:

1) that slope is less than or equal to zero and greater than or equal to negative 30 ppb/year; and

2) the rate of change of that slope is equal to

zero or indicates a continuously decreasing concentration.

(f) If the mean concentration in a well is less than or equal to 200 ppb, and the procedure defined above results in a positive slope, then the 95 percent confidence interval shall be calculated for the slope of the regression line; if a zero slope is within this confidence interval, then the estimated slope shall be deemed to be zero.

(g) The concentration at a well shall be deemed to meet the Zero Slope Condition if the estimated slope is deemed to be zero.

Data showing contamination that can statistically be demonstrated as not attributable to the original Purex Property may be excluded from the data evaluation used to determine whether the Remediation Criteria has been met. This exclusion shall be made upon confirmation of a non-Property source.

VII. POST SHUTDOWN

Post-shutdown monitoring shall be performed by the County for such period of time necessary to demonstrate that the Remediation Criteria continue to be met after the hydrogeological system has equilibrated. In the event that following equilibration there is a statistically significant deviation from the Remediation Criteria, the Remedial Program shall be reemployed until the contaminant concentration levels which were reached when the Remedial Program was shutdown are reached again for a period of 30 days and remain satisfied following subsequent post-shutdown monitoring. If, however,

a Requisite Remedial Technology has been employed pursuant to paragraph 27 of the Consent Judgment, the Remedial Program may be modified as appropriate.

VII. OPERATIONAL PLANS

A. OPERATION AND MAINTENANCE PLAN

An operations and maintenance plan shall be developed during the course of the construction of the treatment plant. It shall address the following:

(a) Spare parts and materials. Critical spare parts and materials may be stockpiled at the treatment facility. Spare parts and materials, especially those with long lead times, may be stored at the treatment plant site. The purpose of maintaining a parts and material stockpile is to facilitate replacement of components which have prematurely failed.

(b) Maintenance program. A detailed and fully scheduled preventive and breakdown maintenance program should be fully delineated. This program should describe all the parts, materials and supplies required to operate the facility and sources for those items. It should also describe all maintenance schedules required for all of the components of the remediation facility and should identify which individuals are specifically responsible for various operations and maintenance

activities.

(c) Shakedown and startup procedures. To assure that that the system operates adequately a three-step startu procedure should be planned. The first step should fully describe all activities to check out treatment components in a dry condition. The second step should be a test run of the treatment system with clean water. And the third step should be test running with contaminated water. After these three steps have been satisfactorily performed then the plant should be considered ready for startup operation.

(d) Emergency shutdown. A plan should be developed for all the steps and activities necessary in the event of an unexpected plant shutdown. The purpose of such a detailed procedure is to assure that the plant will be restarted in an adequate manner in the event of strike, major equipment failure or similar event.

(e) Emergency response. Detailed procedures for responding to emergency situations should be fully described. Such situations should include the spillage or leakage of any materials contaminated with hazardous waste.

(f) Vandalism and sabotage. The plan should also address specific actions to be taken to inhibit and reduce vandalism and in the event of vandalism

or sabotage.

B. CONTINGENCY PLAN

Purex shall prepare a contingency plan within 120 days of entry of the Consent Judgment. It shall address the following:

(a) failure of the plant to operate in accordance with design or law;

(b) failure of the plant to meet the Discharge Criteria; and

(c) failure to hydraulically contain the currently defined groundwater contamination.

Causes of these basic kinds of conditions may be many and varied. The contingency plan should take into account a wide range of causes for these problems and define specific steps that will be to taken to remedy each situation.

C. OTHER DOCUMENTS

In addition to a operations and maintenance plan and contingency plan, there may be other documents and plans necessary for the construction and operation of this facility. Such documents may include operations and maintenance manuals, operations plans, startup plans, staffing plans, and other similar documents.

TABLE 1

TABLE 1

	Discharge Criteria
Benzene	1.5
Bromodichloromethane	50
Bromoform	50
Bromomethane	*
Carbon Tetrachloride	5
Chlorobenzene	*
Chloroethane	*
2-Chloroethylvinyl Ether	*
Chloroform	0.2
Chloromethane	*
Dibromochloromethane	50
1,2-Dichlorobenzene	*
1,3-Dichlorobenzene	*
1,4-Dichlorobenzene	4.7
1,1-Dichloroethane	50
1,2-Dichloroethane	1.0
1,1-Dichloroethene	0.9
trans-1,2-Dichloroethene	2.0
1,2-Dichoropropane	*
cis-1,3-Dichloropropene	2.0
trans-1,3-Dichloropropene	2.0
Ethyl Benzene	*
Methylene Chloride	10
1,1,2,2-Tetrachloroethane	0.3
Tetrachloroethene	2.2
Toluene	50
1,1,1-Trichloroethane	50
1,1,2-Trichloroethane	0.5
Trichloroethene	5
Trichlorofluoromethane	*
Vinyl Chloride	*
Xylene (o-m-p isomers)	50
cis-1,2-Dichloroethene	0.9
trans 1,2-Dichloropropene	*
1,1,2-Trichloro-1,2,2-triflouroethane	50
Total Volatile Organics	100

1) ug/liter (micrograms/liter), parts per billion
2) Total concentration for these compounds should not exceed 50 ug/l
3) Total concentration for these 3 compounds shall not exceed 2 ug/l
4) Total concentration for these 6 compounds shall not exceed 50 ug/l

TABLE 1 (cont'd)

5) Total Volatile Organics is defined as the sum of all volatile compounds listed above.

6) As set forth in Appendix C, Section 6, the methodologies to be used are EPA methods 624 and 625. Any analyte not found at or above the method's detection limit shall be deemed to meet the Discharge Criteria.

Reported concentrations of these compounds from treated effluent samples to be included only in the the Total Volatile Organic determination.

Table 2

Water Condition

Parameter	Concentration
Benzene	5
Toluene	50
Xylene	50
Trichloroethene	50
Tetrachloroethene	50
1,1-Dichloroethene	5
cis-1,2-Dichloroethene	50
trans-1,2-Dichloroethene	50
trans-1,3-Dichloropropene	2
cis-1,3-Dichloropropene	2
Methylene Chloride	50
Chloroform	100[2]
1,1,2-Trichloroethane	50
1,2-Dichloroethane	5
1,1,2,2-Tetrachloroethane	50
1,1,1-Trichloroethane	50
1,1,2-Trichloro-1,2,2-trifluoroethane	50
Bromodichloromethane	100[2]
Dibromochloromethane	100[2]
Bromoform	100[2]
1,1-Dichloroethane	50
Carbon Tetrachloride	50
1,4-Dichlorobenzene	50
Vinyl Chloride	5
Chlorobenzene	50
Ethyl Benzene	50
Total Compounds	100

NOTES:

(1) Concentrations in ug/l (micrograms/liter), parts per billion.

(2) Sum of these four compounds shall not exceed 100 ug/l.

(3) Total compounds are defined as the sum of all the compounds listed above.

(4) As set forth in Appendix C, Section 6, the methodologies to be used are EPA methods 624 and 625. Any analyte not found in concentrations at or above the method's detection limit shall be deemed to meet the Water Condition.

C.T.M
Final Copy
7/11/95

APPENDIX B

ENVIRONMENTAL HEALTH AND SAFETY PLAN

The Environmental Health and Safety Plan (EHSP) shall be prepared during the final design of the site remediation program. A general outline of the EHSP is attached at the end of this appendix. The outline indentifies structure of the EHSP and includes the items that shall be covered to ensure that safe and healthy working conditions exist at all times during the site remediation program. The EHSP shall be designed to conform with or exceed all federal, state, and local regulations. Major scopes of remediation work that shall be addressed by the Health and Safety Plan include the following:

(1) Containment Wall and Soil Flushing System Construction - During the construction of the containment wall and the installation of the soil flushing system within the containment area, an 8-foot high chain-link security fence shall be erected that completely encircles the construction area. Access to the construction site will be limited to authorized personnel only. The EHSP shall address the health and safety protocols and procedures for handling of the excavated materials, which may be contaminated. These protocols will include procedures for air monitoring of the work area, types of protective equipment to be worn by workers within the construction area, and the entrance and exit procedures for the secure work area.

2. Installation of Wells - Wells will be installed both in the containment and offsite areas. A secure area shall be designated around each work area by rope fencing. The EHSP shall address the health and safety protocols and procedures for handling the drill cuttings, fluids, and samples. These protocols will include procedures for air monitoring of the work area, the types of protective equipment to be worn by workers, the entrance and exit procedures for the secure work area, and the security of the work area during non-work periods.

3. Treatment Plant Construction - Depending upon the location selected for the treatment plan facility, foundation excavations may encounter contaminated soil. The EHSP shall consider this possibility and address the procedures for handling the excavated materials, the air monitoring while the excavations are open, the protective equipment, the security fencing around the area, and the entrance and exit procedures of the work area. Once the foundation construction work is complete and all excavations are properly backfilled, normal construction procedures for a non-contaminated site shall be followed.

4. Remedial System Operation - The EHSP shall provide for measures adequate to protect the health and safety of all persons operating the remedial system and any other persons who may be exposed to contaminants generated in the course of construction and operations.

GENERAL OUTLINE
HEALTH AND SAFETY PLAN

1.0 Introduction

- 1.1 Site Description
- 1.2 Work Description
- 1.3 Hazard Assessment

2.0 Organization and Responsibilities

- 2.1 Project Manager
- 2.2 Health and Safety Officer
- 2.3 Field Site Safety Officer
- 2.4 Field Personnel
- 2.5 Subcontractors

3.0 General Health and Safety Practices

- 3.1 Unsafe Situations
- 3.2 Initial Site Monitoring
- 3.3 Handling of Contaminated Soils and Water
- 3.4 Forbidden Practices
- 3.5 Health and Safety Training
- 3.6 Hazard Zone Classification
- 3.7 Personal Protective Equipment
- 3.8 Contaminant Monitoring
- 3.9 Inspections and Field Operations Audits
- 3.10 Accident Reporting and Investigation

4.0 Medical Surveillance Program

- 4.1 Assessment of the Health Status of Individuals Prior to Site Work
- 4.2 Support of the Health of the Workers at Work
- 4.3 Postmedical Monitoring
- 4.4 Required Reports and Actions

5.0 Health and Safety Training Program

- 5.1 General
- 5.2 Health and Safety Training

6.0 Health and Safety Procedures for Field Evacuations

- 6.1 Personal Protection
- 6.2 Field Activity Requirements.
- 6.3 Task Specific Field Activity Requirements

GENERAL OUTLINE (CONTINUED)

7.0 Emergency Procedures

- 7.1 In the Event of an Emergency
- 7.2 Evacuation and Hazardous Situations

Annex A - Protective Clothing and Equipment

Annex B - Accident Report Forms

Annex C - Physicians, Facilities, and Medical Questionnaires and Forms

Annex D - Training Documentation Forms

Annex E - Emergency Information and Numbers