

**EPA Superfund
Record of Decision:**

**WILLIAM DICK LAGOONS
EPA ID: PAD980537773
OU 01
WEST CALN TOWNSHIP, PA
06/28/1991**

RECORD OF DECISION SUMMARY
WILLIAM DICK LAGOONS SUPERFUND SITE

#SLD

I. SITE LOCATION AND DESCRIPTION

THE WILLIAM DICK LAGOONS SITE (THE SITE) IS LOCATED IN WEST CALN TOWNSHIP, CHESTER COUNTY, PENNSYLVANIA APPROXIMATELY 3.5 MILES SOUTH-SOUTHEAST OF THE VILLAGE OF HONEY BROOK. THE 4.4 ACRE SITE IS LOCATED WITHIN A LARGER 105-ACRE PARCEL OF LAND AND IS SITUATED IN A RURAL WOODED SETTING ON THE CREST OF A SMALL RIDGE KNOWN AS THE BARON HILLS. IT IS ACCESSIBLE VIA TELEGRAPH ROAD, AT APPROXIMATELY 2,500 FEET WEST OF NORTH SANDY HILL ROAD. THE NEAREST RESIDENCE IS LOCATED ROUGHLY 300 FEET TO THE NORTH AND APPROXIMATELY THIRTY HOMES ARE WITHIN 1000 FEET OF THE SITE. FIGURES 1 AND 5 PROVIDE A PERSPECTIVE OF THE SITE SETTING IN RELATION TO RESIDENTIAL PROXIMITY.

THE SITE CURRENTLY APPEARS AS A SPARSELY VEGETATED FIELD BEHIND SEVERAL RESIDENCES LOCATED ON THE SOUTH SIDE OF TELEGRAPH ROAD. THE SITE IS OBSCURED FROM VIEW BY BOTH THE SURROUNDING TREES AND ITS POSITION AT THE CREST OF A HILL. LAND USE SURROUNDING THE SITE IS PRIMARILY RESIDENTIAL, WITH A GENERALLY SPARSE POPULATION DENSITY. HOUSING DEVELOPMENT IN THE AREA IS PROGRESSING RELATIVELY QUICKLY AND SEVERAL NEW HOMES HAVE BEEN BUILT SINCE THE COMMENCEMENT OF SITE REMEDIAL INVESTIGATIVE ACTIVITIES. THE MAJORITY OF THE RESIDENCES ARE SINGLE FAMILY DWELLINGS WITH PRIVATE WELLS AND ONSITE SEPTIC SYSTEMS. SEVERAL TRAILER PARKS AND A CAMPGROUND EXIST WITHIN THE VICINITY OF THE SITE AND TWO SEPARATE AUTOMOBILE JUNKYARDS ARE LOCATED JUST NORTH OF THE SITE. MUCH OF THE AREA EXTENDING OUTWARD FROM THE NEAR-SITE RESIDENCES IS ACTIVELY FARMED. IMPORTANT CROPS INCLUDE CORN, WHEAT, OATS, SOY BEANS AND HAY. DAIRY CATTLE ARE ALSO RAISED WITHIN THE SURROUNDING COUNTRYSIDE.

TWO OTHER SUPERFUND SITES ARE LOCATED WITHIN FIVE MILES OF THE SITE. THE BLOSENSKI LANDFILL IS LOCATED APPROXIMATELY 1.7 MILES TO THE SOUTHEAST AND THE WELSH ROAD LANDFILL IS ROUGHLY 5 MILES TO THE NORTHWEST.

#SHEA

II. SITE HISTORY AND ENFORCEMENT ACTIVITIES

WASTE DISPOSAL ACTIVITIES AT THE SITE WERE INITIATED BY ITS FORMER OWNER, MR. WILLIAM DICK, IN THE LATE 1950S THROUGH MAY 1970. ORIGINALLY, THE SITE CONSISTED OF THREE UNLINED EARTHEN LAGOONS OR PONDS THAT WERE USED FOR THE DISPOSAL OF WASTEWATER. THE LAGOONS COVERED APPROXIMATELY 2.2 ACRES OF THE 4.4 ACRE SITE; THE REMAINING 2.2 ACRES SERVED AS A BORROW AREA FOR SOIL USED TO CONSTRUCT THE COMPACTED EARTHEN RIDGES OR BERMS AROUND THE PERIMETER OF THE LAGOONS (SEE FIGURE 2).

PRINCIPALLY, THE LAGOONS WERE USED TO DISPOSE OF FINAL RINSE WATERS FROM THE INTERIOR CLEANING OF TANK TRAILERS OWNED BY CHEMICAL LEAMAN TANK LINES INC. (CLTL). HOWEVER, IT HAS BEEN REPORTED THAT MINOR AMOUNTS OF RESIDUAL CHEMICAL PRODUCTS WERE OCCASIONALLY DISPOSED OF IN THE LAGOONS. THE TANK TRAILERS WERE USED FOR TRANSPORTING PETROLEUM PRODUCTS, LATEX, RHOPLEX, AND RESINS. FOLLOWING THE RINSING AND CLEANING OF THE TANK TRAILERS AT CHEMICAL LEAMAN'S DOWNINGTOWN, PENNSYLVANIA FACILITY, THE RINSE WATER WAS DELIVERED TO THE LAGOONS BY TANKER APPROXIMATELY EVERY THREE DAYS FOR DISPOSAL.

ON APRIL 26, 1970, 37 WILD GEESE WERE SHOT AT THE SITE BY THE DISTRICT GAME PROTECTOR FOR HUMANE REASONS. THE BIRDS' FEATHERS WERE COATED WITH WASTE AFTER THE BIRDS DESCENDED ONTO THE LAGOONS. IN MAY 1970, THE PENNSYLVANIA DEPARTMENT OF HEALTH (PADH) ORDERED THE LAGOONS CLOSED. ON JUNE 7, 1970, VANDALS ALLEGEDLY CAUSED A BREACH IN THE BERM OF THE SECOND LAGOON, RESULTING IN THE RELEASE OF AN ESTIMATED 300,000 GALLONS OF WASTEWATER THAT MOVED INTO BIRCH RUN, A TRIBUTARY OF THE WEST BRANCH OF BRANDYWINE CREEK. THE DISCHARGE CAUSED THE DEATH OF MORE THAN 2,600 FISH AND THE CLOSURE OF PUBLIC WATER SUPPLIES WHICH USED THE CREEK AS A WATER SOURCE AS FAR DOWNSTREAM AS WILMINGTON, DELAWARE.

IN EARLY 1971, PER AGREEMENT WITH PADH, CLTL AND WILLIAM DICK BEGAN WORK TO CLOSE THE LAGOONS. THIS ACTIVITY INCLUDED THE ADDITION OF ALUM TO THE LAGOON WASTEWATER, AND SPRAY IRRIGATION OF THE "TREATED" WASTEWATER INTO THE WOODS ADJACENT TO THE LAGOONS. SETTLED RESIDUE REMAINING IN THE BOTTOM OF THE LAGOONS WAS BURIED BY PUSHING THE EARTHEN BERMS INTO THE LAGOONS. THE LAGOONS WERE COMPLETELY FILLED IN WITH SOIL AND A VEGETATIVE COVER PLANTED ON THE SURFACE.

IN APRIL 1985, UNDER THE AUTHORITY OF THE COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT (CERCLA) OF 1980, AN EPA CONTRACTOR PERFORMED A SITE SAMPLING INSPECTION OF THE FORMER LAGOON SITE AND COLLECTED WELL WATER SAMPLES FROM SEVERAL SURROUNDING RESIDENCES. THIS INSPECTION WAS CONDUCTED IN RESPONSE

TO A 1981 CERCLA NOTIFICATION TO EPA BY CLTL WHICH INDICATED THAT THE FORMER LAGOONS MAY CONTAIN HAZARDOUS SUBSTANCES. DURING THE INSPECTION, ELEVATED LEVELS OF NUMEROUS ORGANIC COMPOUNDS WERE DETECTED IN THE SOIL SAMPLES COLLECTED FROM THE FORMER LAGOON AREA. A FEW SITE-RELATED COMPOUNDS ALSO WERE FOUND IN TWO RESIDENTIAL WELLS. IN MAY 1987, ADDITIONAL SAMPLING OF 28 RESIDENTIAL WELLS BY EPA'S TECHNICAL ASSISTANCE TEAM (TAT) FOUND TRICHLOROETHENE (TCE) TO BE THE MOST PREVALENT ORGANIC COMPOUND, AT THE HIGHEST CONCENTRATION, IN GROUNDWATER. THIS VOLATILE ORGANIC COMPOUND (VOC), A SUSPECTED CARCINOGEN AND COMMON INDUSTRIAL SOLVENT, WAS DETECTED IN TWO SPRING-FED WATER SUPPLIES AND FIVE WELLS. FOLLOWING THE COMPLETION OF THESE FOLLOW-UP EVALUATIONS, THE SITE WAS LISTED IN JULY 1987 ON THE NATIONAL PRIORITIES LIST (NPL) OF HAZARDOUS WASTE SITES ELIGIBLE FOR CLEANUP UNDER SUPERFUND.

AS PART OF AN IMMEDIATE ACTION TO MINIMIZE PUBLIC EXPOSURE TO SITE-RELATED CONTAMINANTS, CLTL AND EPA ENTERED INTO NEGOTIATIONS IN JULY 1987 TO LIMIT ACCESS TO THE AREA OF THE FORMER LAGOONS, CONDUCT MORE EXTENSIVE SAMPLING OF RESIDENTIAL WELLS, AND SUPPLY POINT-OF-ENTRY WATER TREATMENT UNITS TO HOMES WITH UNACCEPTABLE LEVELS OF CONTAMINANTS IN WELL WATER. IN SEPTEMBER 1987, CLTL CONTRACTED WITH THE ENVIRONMENTAL RESOURCES MANAGEMENT GROUP (ERM) FOR THIS WORK. ON JANUARY 27, 1988, EPA AND CLTL ENTERED INTO AN ADMINISTRATIVE ORDER ON CONSENT ("1988 REMOVAL ORDER") WHICH REQUIRED CLTL TO INSTALL A FENCE AROUND THE SITE, CONDUCT AT LEAST YEARLY MONITORING OF RESIDENTIAL WELLS (MORE FREQUENT MONITORING IN SOME CASES), AND INSTALL POINT-OF-ENTRY TREATMENT SYSTEMS FOR HOME WELL WATER EXCEEDING MAXIMUM CONTAMINANT LEVELS (MCLS). THE FENCE WAS INSTALLED AT THE SITE IN FEBRUARY 1988. THE SAMPLING AND TREATMENT UNIT PROVISION REQUIREMENTS OF THE CONSENT ORDER CONTINUE TO BE IN EFFECT.

AS A RESULT OF CLTL'S THREE INITIAL SAMPLING EVENTS IN 1987, TCE WAS DETECTED AT 23 OF THE 58 LOCATIONS SAMPLED. AS OF OCTOBER 1990,

APPROXIMATELY 130 HOME WELLS HAD BEEN SAMPLED. OF THE 130 HOME WELLS SAMPLED, 30 TO 40 ARE BELIEVED TO CONTAIN SITE-RELATED CONTAMINATION, THE PRIMARY CONTAMINANT BEING TCE. TWELVE OF THE 30 TO 40 HOMES HAVE BEEN FOUND TO HAVE LEVELS OF TCE CONTAMINATION ABOVE EPA'S MCL OF 5 PPB. TRACE CONCENTRATIONS OF A FEW ADDITIONAL CONTAMINANTS BELIEVED TO BE SITE-RELATED HAVE BEEN FOUND IN LIMITED HOMEOWNER WELLS, ALTHOUGH NONE EXCEED MCLS. THESE ADDITIONAL COMPOUNDS INCLUDE CHLOROFORM, 1,2-DICHLOROETHANE, CHLOROBENZENE, 1,4- 1,3- AND 1,2-DICHLOROBENZENE, 1,1- AND 1,2- DICHLOROETHENE, STYRENE, TOLUENE, 1,1,1-TRICHLOROETHANE, TETRACHLOROETHENE, AND DI-N-BUTYL PHTHALATE. DURING A SAMPLING EVENT IN MARCH OF 1991, THE COMPOUND BIS(2-ETHYLHEXYL)PHTHALATE WAS FOUND IN ONE WELL AT A LEVEL EXCEEDING THE PROPOSED MCL OF 4 PPB (BECAUSE THIS COMPOUND HAS APPEARED IN LABORATORY "BLANK" SAMPLES, ITS POSSIBLE PRESENCE IN SEVERAL ADDITIONAL WELLS EXCEEDING THE MCL CANNOT BE CONFIRMED.) THIS MARCH 1991 OCCURRENCE MARKS THE FIRST TIME THAT A COMPOUND OTHER THAN TCE, DETERMINED TO BE SITE-RELATED, HAS BEEN DETECTED IN A HOMEOWNER WELL ABOVE A PROPOSED OR FINAL MCL. (THE AFFECTED WELL WATER IS TREATED VIA CARBON FILTRATION.)

CLTL HAS SUPPLIED BOTTLED WATER TO ALL HOMES (APPROXIMATELY 34) IN WHICH TCE LEVELS BETWEEN 0 TO 5 PARTS PER BILLION (PPB) WERE DETECTED IN RESIDENTIAL WELLS. THE COMPANY HAS SUPPLIED BOTTLED WATER UNDER ITS OWN INITIATIVE; CLTL IS NOT REQUIRED TO DO SO BY EPA. TO DATE, CLTL HAS INSTALLED POINT-OF-ENTRY CARBON FILTRATION UNITS IN THE TWELVE HOMES WHERE TCE CONCENTRATIONS IN WELL WATER EXCEED EPA'S MCL OF 5 PPB.

ON SEPTEMBER 14, 1988, CLTL AND EPA SIGNED A SECOND ADMINISTRATIVE ORDER ON CONSENT, REQUIRING THAT A REMEDIAL INVESTIGATION/FEASIBILITY STUDY (RI/FS) BE CONDUCTED. CLTL AGAIN OBTAINED THE SERVICES OF ERM FOR THIS WORK. THE RI BEGAN IN DECEMBER 1988 AND PROGRESSED THROUGHOUT THE SPRING AND SUMMER OF 1989. BASED UPON BOTH EPA- AND ERM- IDENTIFIED DATA GAPS, A SECOND SHORTER PHASE OF RI WORK WAS INITIATED IN OCTOBER 1989. AN INTERIM RI REPORT WAS SUBMITTED TO EPA IN DECEMBER 1989. AFTER EPA COMMENTS, A MORE DETAILED DRAFT RI REPORT, ALONG WITH A DRAFT FS REPORT AND RISK ASSESSMENT (RA), WERE SUBMITTED FOR EPA REVIEW ON MARCH 8, 1990. FOLLOWING RECEIPT OF EPA COMMENTS, A PRELIMINARY FINAL RI/RA/FS WAS SUBMITTED ON SEPTEMBER 6, 1990. (THE RI, RA AND FS REPORTS ARE DESCRIBED AS "PRELIMINARY FINAL" UNTIL MINOR CHANGES IN LANGUAGE AND/OR EMPHASIS ARE INCORPORATED PER EPA DIRECTION. ANY CHANGES TO BE MADE TO THE RI/FS/RA DOCUMENTS WHICH HAVE A BEARING ON EPA'S DECISION ON A REMEDIAL ACTION HAVE ALREADY BEEN CONSIDERED AND DOCUMENTED IN THE ADMINISTRATIVE RECORD FOR THIS SITE.)

ON SEPTEMBER 24, 1990, EPA INFORMED THE ROHM & HAAS COMPANY OF PHILADELPHIA, PENNSYLVANIA OF ITS POTENTIAL RESPONSIBILITY REGARDING CONTAMINATION AT THE SITE. THIS NOTIFICATION WAS BASED ON INFORMATION RECEIVED ON THE COMPANY'S PAST INVOLVEMENT AT THE SITE THROUGH INTERVIEWS WITH FORMER CLTL EMPLOYEES.

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III. COMMUNITY RELATIONS HISTORY

IN ORDER TO KEEP THE COMMUNITY AWARE OF ONGOING ACTIONS, UNDERSTAND RESIDENTS' CONCERNS, AND ADDRESS PUBLIC INVOLVEMENT REQUIREMENTS UNDER CERCLA, EPA INSTITUTED SEVERAL MEASURES TO CONTACT AND CORRESPOND WITH SITE RESIDENTS. FOLLOWING IS A LISTING OF THE COMMUNITY RELATIONS EFFORTS CONDUCTED BY EPA:

- SUMMER 1987 - MEETING HELD WITH APPROXIMATELY 35 RESIDENTS AT A LOCAL RESIDENT'S HOME TO DISCUSS THE INITIAL SAMPLING RESULTS OF PRIVATE WELLS;
- FEBRUARY 1988 - MEETING HELD AT WAGONTOWN FIRE HALL WITH APPROXIMATELY 25 RESIDENTS TO DISCUSS UPCOMING RI/FS WORK AT THE SITE AND TO EXPLAIN THE SUPERFUND PROCESS;
- FEBRUARY 1988 TO MARCH 1990 - THIS PERIOD WAS MAINLY DEVOTED TO TELEPHONE CONTACT WITH INDIVIDUAL RESIDENTS CONCERNING ONGOING RI/FS WORK AND THE COLLECTION AND ANALYSIS OF RESIDENTIAL WELL SAMPLES;
- MARCH 1990 - "AT HOME" INTERVIEWS CONDUCTED WITH APPROXIMATELY 15 RESIDENTS TO GAUGE COMMUNITY INTEREST, CONCERNS, AND OPINIONS;
- JUNE 1990 - COMPLETION OF A COMMUNITY RELATIONS PLAN (CLP) THE GOAL OF WHICH IS TO ESTABLISH AND MAINTAIN OPEN COMMUNICATION AMONG FEDERAL, STATE, AND LOCAL OFFICIALS, AND THE RESIDENTS OF THE SITE AREA; ISSUED TWO FACT SHEETS TO RESIDENTS ON THE SITE MAILING LIST EXPLAINING THE SUPERFUND REMEDIAL PROCESS AND PROCEDURES FOR OBTAINING A TECHNICAL ASSISTANCE GRANT (TAG);
- JULY 1990 - ISSUED A FACT SHEET TO MAILING LIST SITE RESIDENTS AND GOVERNMENT OFFICIALS DESCRIBING THE RI/FS RESULTS AND UPCOMING ACTIONS;
- JULY 1990 - HELD PUBLIC MEETING WITH APPROXIMATELY 85 RESIDENTS TO EXPLAIN THE RI/FS RESULTS, RISK POSED BY THE SITE, FUTURE SITE ACTIONS, AND THE PROS AND CONS OF THE POTENTIAL REMEDIAL ALTERNATIVES FOR AN ALTERNATE WATER SUPPLY; SOLICITED PUBLIC COMMENT ON THE RESIDENTS' PREFERENCE FOR ALTERNATE WATER;
- DECEMBER 1990 - ISSUED FACT SHEET INFORMING RESIDENTS THAT THE PROPOSED REMEDIAL ACTION PLAN (PRAP) WILL BE ISSUED IN JANUARY 1991;
- JANUARY 1991 - ISSUED THE PRAP FOR THE SITE VIA PRESS RELEASE, NEWSPAPER PUBLICATION, AND DIRECT MAILING TO ALL INDIVIDUALS ON THE SITE MAILING LIST; ANNOUNCED PUBLIC MEETING IN FEBRUARY;
- FEBRUARY 1991 - HELD PUBLIC MEETING WITH APPROXIMATELY 70 INTERESTED INDIVIDUALS TO PRESENT EPA'S RATIONALE FOR THE PROPOSED REMEDIAL ALTERNATIVES PRESENTED IN THE PRAP; SOLICITED COMMENTS ON THE PRAP;
- FEBRUARY 1991 - CONDUCTED A TELEPHONE SURVEY TO REACH 50 RESIDENTS RESIDING WITHIN THE GROUNDWATER CONTAMINANT PLUME TO DETERMINE THEIR PREFERENCE FOR AN ALTERNATE WATER SUPPLY AND THEIR POSITION ON EPA'S PROPOSED REMEDY FOR ALTERNATE WATER.

IN ADDITION, EPA HAS FREQUENTLY PLACED COPIES OF RI/FS TECHNICAL REPORTS FOR PUBLIC REVIEW AT THE WEST CALN TOWNSHIP BUILDING AND HAS CONTINUALLY UPDATED THE ADMINISTRATIVE RECORD PLACED AT THIS LOCATION.

BASED ON PUBLIC COMMENTS RECEIVED TO DATE, COMMUNITY CONCERNS PRINCIPALLY RELATE TO THE CONTAMINATION OF PRIVATE WELL WATER, THE NATURE OF THE FINAL REMEDY FOR THIS PROBLEM, AND THE TIME REQUIRED FOR COMPLETION OF THE REMEDY. INDIVIDUALS HAVE ALSO EXPRESSED AN INTEREST IN THE TYPE OF REMEDY TO CLEAN UP SOILS AT THE SITE. AT THE FEBRUARY 14, 1991 PUBLIC MEETING, RESIDENTS EXPRESSED A STRONG DESIRE TO HAVE THE SITE RESPONSIBLE PARTY COMPENSATE RESIDENTS FOR ANY FUTURE WATER COST, WHATEVER THE CHOSEN REMEDY. DURING THE PRAP PUBLIC

COMMENT PERIOD, SEVERAL RESIDENTS EXPRESSED A DESIRE TO HAVE THE SITE RETURNED AS NEAR AS POSSIBLE TO ITS ORIGINAL UNCONTAMINATED STATE. EPA'S RESPONSE TO ALL COMMENTS RECEIVED DURING THE PRAP PUBLIC COMMENT PERIOD APPEAR IN THE RESPONSIVENESS SUMMARY AT THE END OF THIS ROD.

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IV. SCOPE AND ROLE OF RESPONSE ACTION

BASED ON THE RESULTS OF THE PRELIMINARY FINAL RI/FS, EPA HAS DECIDED THAT REMEDIATION OF THE ENTIRE SITE CAN BEST BE APPROACHED BY CONSIDERING THE SITE AS CONSISTING OF THREE SEPARATE "UNITS". THESE UNITS INCLUDE:

- (1) RESIDENTIAL WATER USE (I.E. ALTERNATE WATER SUPPLY) INVOLVES A REMEDY TO PROTECT RESIDENTS FROM CONTAMINATED PRIVATE WELL WATER
- (2) GROUNDWATER INVOLVES A REMEDY TO REMEDIATE ALL OR PORTIONS OF THE CONTAMINATED GROUNDWATER AQUIFER
- (3) SOURCE CONTROL INVOLVES A REMEDY TO CLEAN UP CONTAMINATED SOILS AT THE SITE; CONTAMINATED SOIL IS THE MEDIA CONSIDERED TO BE THE "PRINCIPAL THREAT" AT THE SITE PER THE DEFINITION OF PRINCIPAL THREAT IN THE NCP. (SEE 40 CFR SECTION 300.430 (A)(1)(III).)

AT THIS TIME, EPA HAS DECIDED TO DEFER SELECTION OF THE REMEDY FOR UNIT 3 - SOURCE CONTROL FOR THE FOLLOWING REASONS:

(A) UNRESOLVED TECHNICAL QUESTIONS REGARDING THE APPROPRIATENESS OF THE SOIL LEACHING MODEL USED TO CALCULATE THE TYPE OF PROTECTIVE COVER NEEDED AT THE SITE FOLLOWING COMPLETION OF EPA'S PROPOSED REMEDY OF THERMAL DESORPTION;

(B) UNRESOLVED TECHNICAL QUESTIONS CONCERNING SOIL CLEANUP CRITERIA AT THE SITE AS IT INVOLVES THE IDENTIFICATION AND CONCENTRATION OF CONTAMINANTS TO BE INCLUDED IN THE ESTABLISHED CLEANUP LEVELS. IN ADDITION, CONCERNS REGARDING THE ABILITY OF EPA'S PROPOSED REMEDY TO MEET THE CLEANUP CRITERIA PROPOSED IN THE PRELIMINARY FINAL FS;

(C) STATE CONCERNS REGARDING ATTAINMENT OF STATE GROUNDWATER ARARS USING EPA'S PROPOSED REMEDY;

(D) RECENT EVALUATION AND DISCUSSION ON THE POTENTIAL USEFULNESS AND APPROPRIATENESS OF A TREATABILITY STUDY BEFORE A SOURCE CONTROL REMEDY IS SELECTED.

IN CONTRAST TO THE APPROACH PRESENTED IN THE PRELIMINARY FINAL FS, EPA HAS CHOSEN TO EVALUATE THE TWO REMAINING UNITS INDEPENDENTLY AGAINST THE NINE CRITERIA REQUIRED UNDER THE SUPERFUND PROGRAM (SEE FIGURE 3). THIS APPROACH DIFFERS FROM THAT PRESENTED IN THE PRELIMINARY FINAL FS WHICH EVALUATED EACH OF THE UNITS AGAINST EPA'S THREE SCREENING CRITERIA (EFFECTIVENESS, IMPLEMENTABILITY AND COST) BEFORE DEVELOPING SITE-WIDE ALTERNATIVES FOR NINE-CRITERIA EVALUATION. ALTHOUGH THE METHOD PRESENTED IN THE FS IS IN ACCORDANCE WITH EPA GUIDANCE, THE AGENCY HAS DECIDED TO PERFORM A COMPLETE EVALUATION OF INDIVIDUAL UNITS IN THIS ROD TO PRESENT A CLEARER VIEW OF WHY EACH PROPOSED UNIT REMEDIAL ALTERNATIVE WAS CHOSEN.

REGARDING UNIT (2) GROUNDWATER, THE AGENCY DOES NOT BELIEVE THAT SUFFICIENT INFORMATION EXISTS AT THIS TIME TO CONCLUDE THAT THE GROUNDWATER CAN BE PRACTICABLY RESTORED TO ITS BENEFICIAL USE AS A DRINKING WATER SOURCE WITHIN THE AREAS OF CONTAMINATION. THIS BELIEF IS BASED ON THE SITE AREA'S COMPLEX HYDROGEOLOGY AND THE RELATIVELY HIGH LEVELS OF CONTAMINATION FOUND IN THE DEEP FRACTURED AQUIFER DIRECTLY BELOW OR IMMEDIATELY SURROUNDING THE FORMER LAGOONS. FOR THIS REASON, EPA IS PROPOSING AN INTERIM REMEDIAL ACTION FOR THE GROUNDWATER UNIT WHICH WILL OBTAIN INFORMATION ABOUT THE RESPONSE OF THE AQUIFER TO REMEDIATION MEASURES IN ORDER TO DEFINE FINAL CLEANUP GOALS. THIS INTERIM REMEDY WILL ALSO INITIATE THE REDUCTION OF TOXICITY, MOBILITY AND VOLUME OF CONTAMINANTS AS WELL AS LIMIT CONTAMINANT MIGRATION. AFTER A PERIOD OF APPROXIMATELY FIVE YEARS OF INTERIM REMEDY OPERATION, EPA WILL SELECT A FINAL REMEDY FOR GROUNDWATER CLEANUP IN A SUBSEQUENT ROD.

EPA HAS ALSO CHOSEN TO REVISE OR ADD TO THE NUMBER OF UNIT ALTERNATIVES SCREENED OR EVALUATED IN THE PRELIMINARY FINAL FS. SPECIFICALLY, THE AGENCY HAS ADDED AN ALTERNATIVE FOR THE GROUNDWATER UNIT WHICH CALLS FOR PUMP AND TREAT AT AND ADJACENT TO THE SITE ONLY. EPA BELIEVES THIS ALTERNATIVE WARRANTS FINAL

CONSIDERATION. THE AGENCY HAS CHOSEN TO DELETE, IN CONTRAST TO THE PRELIMINARY FINAL FS, THE SPECIFIC TYPE OF TREATMENT TECHNOLOGIES TO BE EMPLOYED FOR GROUNDWATER REMEDIATION. EPA BELIEVES THAT A DECISION ON THE TYPE OF GROUNDWATER TREATMENT AT THIS STAGE IS PREMATURE AND WILL BEST BE DETERMINED DURING REMEDIAL DESIGN FOLLOWING THE PERFORMANCE OF TREATABILITY STUDIES. EPA HAS ALSO DELETED SPRING WATER TREATMENT OF THE GREGOR PROPERTY SPRING AS A REMEDIAL OPTION. THE AGENCY BELIEVES THAT THE SPRING IS MOST EFFICIENTLY ADDRESSED BY AN INTERIM GROUNDWATER REMEDY WHICH WILL ATTEMPT TO REMEDIATE WATER DISCHARGING AT THE SPRING.

FINALLY, IN CONTRAST TO THE PRELIMINARY FINAL FS, THE AGENCY DOES NOT VIEW THE DISCHARGE OF TREATED GROUNDWATER AS A SEPARATE UNIT REQUIRING DETAILED EVALUATION. TREATED GROUNDWATER IS GENERATED AS A RESULT OF A SELECTED REMEDY AT A SITE AND IS NOT AN EXISTING CONDITION NECESSITATING A CLEANUP OPTION. ALTHOUGH THE DETAILED EVALUATION IN THE PRELIMINARY FINAL FS IS APPRECIATED, THE AGENCY BELIEVES THAT ONLY ONE DISCHARGE ALTERNATIVE, STREAM DISCHARGE, IS APPLICABLE FOR THIS SITE. THE RATIONALE FOR THIS DECISION CAN BE OBTAINED FROM THE DISCUSSION PRESENTED IN THE PRELIMINARY FINAL FS AS WELL AS IN THE RESPONSIVENESS SUMMARY.

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V. SUMMARY OF SITE CHARACTERISTICS

THE MAJOR FINDINGS OF THE PRELIMINARY FINAL RI REPORT ARE SUMMARIZED BELOW. A DETAILED DISCUSSION OF ALL SITE CONDITIONS CAN BE FOUND IN THE PRELIMINARY FINAL RI.

GEOLOGY AND GROUNDWATER:

THE SITE IS LOCATED IN THE HONEYBROOK UPLIFT IN AN OUTCROP BELT OF A GEOLOGICAL STRUCTURE KNOWN AS THE CHICKIES FORMATION. IT IS SITUATED ON THE CREST OF THE BARON HILLS ANTICLINE IN A FAULT BLOCK BOUNDED BY TWO NORMAL FAULTS TO THE NORTH AND SOUTH. (THE CHICKIES IS A WHITE TO LIGHT GREY QUARTZITE WITH INTERBEDDED PHYLLITIC BEDS.) THE SITE IS LOCATED ON A GROUNDWATER DIVIDE. THE BEDROCK BENEATH THE LAGOONS IS HIGHLY WEATHERED AND FORMS A THICK SAPROLITE UP TO 100 FEET THICK. ALTHOUGH LABORATORY ANALYSIS INDICATES THAT THE SAPROLITE MATERIAL IS OF LOW PERMEABILITY, CONTAMINANTS HAVE MIGRATED TO THE GROUNDWATER TABLE (APPROXIMATELY 50 FEET BELOW THE SURFACE) THROUGH JOINTS AND FRACTURES IN THE SAPROLITE.

GROUNDWATER AT THE SITE, AS DETERMINED BY MONITORING WELL SAMPLING, IS CONTAMINATED PRIMARILY BY VOCS AND, TO A LESSER EXTENT IN FREQUENCY AND CONCENTRATION, SEMI-VOCS. AGAIN, TCE IS THE PREDOMINANT VOC (AVERAGE CONCENTRATION = 1200 PPB, MAXIMUM CONCENTRATION = 16,000 PPB) AND PHENOL IS THE PREDOMINANT SEMI-VOC (AVERAGE = 800 PPB, MAXIMUM = 14,000 PPB). OTHER COMPOUNDS FOUND LESS FREQUENTLY AND/OR IN LOWER CONCENTRATIONS INCLUDE CHLOROFORM, BENZENE, ACETONE, 2-METHYLPHENOL, 4-METHYLPHENOL, ISOPHORONE AND OTHER ORGANIC COMPOUNDS. VINYL CHLORIDE, A CONTAMINANT OF SPECIFIC CONCERN FROM A HUMAN HEALTH STANDPOINT, WAS DETECTED ON ONLY ONE OCCASION IN ONE MONITORING WELL DURING POST-RI/FS SAMPLING. TO DATE, THREE TO FOUR ROUNDS OF MONITORING WELL SAMPLES HAVE BEEN COLLECTED, DEPENDENT ON WELL LOCATION. SEE TABLE 1 FOR A LISTING OF MAXIMUM AND AVERAGE GROUNDWATER CONCENTRATIONS IN ONSITE MONITORING WELLS.

BY FAR, THE HIGHEST GROUNDWATER CONCENTRATIONS OF ORGANIC CHEMICALS ARE FOUND IN TWO OF THE TWELVE MONITORING WELLS INSTALLED AT THE SITE, WELLS MW-5 AND MW-7. IN ADDITION, THE SEVEN DEEPER MONITORING WELLS (110 TO 397 FEET DEEP) ARE GENERALLY MORE CONTAMINATED THAN THE SIX SHALLOW WELLS (70 TO 80 FEET DEEP). ALL WELLS WERE INSTALLED IN BEDROCK (SEE FIGURE 4). AT WELL MW-20, THE SOUTHWEST CORNER OF THE SITE, GROUNDWATER WAS FOUND TO BE CONTAMINATED DOWN TO A DEPTH OF 397 FEET.

THE GROUNDWATER SURROUNDING THE SITE UTILIZED BY RESIDENTS IS ALSO CHARACTERIZED BY LOW-LEVEL TCE CONCENTRATIONS. OF THE APPROXIMATELY 130 RESIDENTIAL WELLS SAMPLED TO DATE (SEE FIGURE 5), ROUGHLY 30 TO 40 APPEAR TO HAVE SOME SITE-RELATED CONTAMINATION. OF THESE 30 TO 40, ELEVEN HAVE CONCENTRATIONS OF TCE IN THE 5 TO 15 PPB RANGE (THE DRINKING STANDARD IS 5 PPB) AND ONE WELL CONTAINS TCE AT LEVELS FROM 20 TO 280 PPB, DEPENDENT ON THE SAMPLING SEASON. MANY OF THE RESIDENTIAL WELLS IDENTIFIED DURING COMMENCEMENT OF THE CONSENT ORDER WITH CLTL HAVE BEEN SAMPLED A TOTAL OF NINE TIMES TO DATE. HOMES WITHIN A PREDETERMINED RADIUS OF THE SITE ARE SAMPLED AT LEAST ONCE A YEAR; THOSE HOMES FOUND TO HAVE A DETECTABLE LEVEL OF TCE ARE SAMPLED TWICE A YEAR. DUE TO THE NUMBER OF HOMES WITHIN THE PREDETERMINED RADIUS OF THE SITE (1 MILE SOUTH, 1/2 MILE NORTH) THE SAMPLING SCHEDULE IS SET UP SO THAT SAMPLES ARE COLLECTED FROM 20 TO 25 HOME WELLS EVERY QUARTER OF THE YEAR.

THE RESULTS OF THE RI AND THREE YEARS OF RESIDENTIAL SAMPLING DATA INDICATE THAT TCE LEVELS ARE NOT SIGNIFICANTLY INCREASING AT THE BOUNDARY OF THE CONTAMINANT PLUME WHERE RESIDENTIAL WELLS ARE GENERALLY LOCATED. BASED ON THIS INFORMATION, THE BOUNDARY OF THE GROUNDWATER AREA AFFECTED BY SITE-RELATED CONTAMINANTS HAS BEEN RELATIVELY WELL-DEFINED (SEE FIGURE 6), ALTHOUGH ADDITIONAL CHARACTERIZATION WORK IS NEEDED.

THE REGIONAL GROUNDWATER FLOW AT THE SITE APPEARS TO BE TOWARD THE SOUTHEAST. THREE SIGNIFICANT BEDROCK FRACTURE FEATURES (TWO OF WHICH ARE FAULTS) ARE BELIEVED TO EXIST IN THE VICINITY OF THE SITE. EACH

APPEARS TO PROVIDE PATHWAYS FOR CONTAMINANT MIGRATION TO VARY FROM THE OVERALL SOUTHEASTERLY FLOW DIRECTION AND TWO MAY SERVE TO PARTIALLY BLOCK THE FLOW OF GROUNDWATER BEYOND THE FRACTURES. HOWEVER, IT SEEMS THAT INTERSECTING SMALLER FRACTURES ACT AS CONDUITS FOR GROUNDWATER CONTAMINATION TO MIGRATE BEYOND THE THREE LARGER FRACTURES, RESULTING IN A RATHER COMPLEX FLOW PATTERN.

ADDITIONAL GROUNDWATER MONITORING WELLS ARE NEEDED AND FURTHER STUDIES ARE NECESSARY TO CONFIRM THE THEORY THAT GROUNDWATER FLOW IS CONTROLLED BY SITE GEOLOGIC FRACTURES, TO DETERMINE THE EXTENT OF GROUNDWATER FLOW TO THE NORTH, AND TO DETERMINE THE SEVERITY OF CONTAMINATION IN THE AREA GENERALLY SOUTH OF THE SITE.

SOIL:

SOILS IN THE FORMER LAGOON ARE CONTAMINATED BY VOLATILE ORGANIC COMPOUNDS (VOCS), PRINCIPALLY TRICHLOROETHENE (TCE), WHICH WAS USED AT ONE TIME TO CLEAN OUT CHEMICAL TANK TRAILERS DISPOSING MATERIAL AT THE SITE, AND SEMI-VOCS, WHICH APPEAR TO BE PRIMARILY ASSOCIATED WITH FUEL OIL RESIDUES. OTHER THAN TCE, COMPOUNDS FOUND AT SIGNIFICANT LEVELS IN SITE SOILS ARE 2-BUTANONE, TOLUENE, STYRENE, XYLENES, ETHYLBENZENE, CHLOROBENZENE, AND TETRACHLOROETHENE (ALL VOCS); AND SEVERAL SEMI-VOCS, ESPECIALLY PHENOL, 1,2,4-TRICHLOROBENZENE, NAPHTHALENE AND BIS(2-ETHYLHEXYL) PHTHALATE. THE PESTICIDE DDE WAS ALSO FOUND IN CONCENTRATIONS SUGGESTING THAT IT WAS DISPOSED OF AT THE SITE. TABLE 2 PRESENTS A LISTING OF AVERAGE AND MAXIMUM SOIL CONTAMINANTS.

SOILS ARE HEAVILY CONTAMINATED FROM A DEPTH OF ABOUT ONE FOOT BELOW THE SURFACE DOWN TO APPROXIMATELY 20 FEET, DEPENDING ON SITE LOCATION. FORMER LAGOON #1 IS MOST HEAVILY CONTAMINATED, WITH CONCENTRATIONS DECREASING AS ONE MOVES ACROSS THE SITE TO FORMER LAGOON #2 AND LAGOON #3 (SEE FIGURES 2 AND 7). BECAUSE GROUNDWATER IS CONTAMINATED, AND THE WATER TABLE LIES AT APPROXIMATELY 50 FEET BELOW THE SITE, LOW-LEVEL SUBSURFACE SOIL CONTAMINATION EXISTS AS DEEP AS 50 FEET ALTHOUGH A SIGNIFICANT DROP-OFF IN LEVELS OCCURS AFTER APPROXIMATELY 20 FEET (SEE FIGURE 8 AND 9). CONTAMINATION OF SOILS AT AND BELOW THE SURFACE APPEARS TO BE CONFINED TO THE AREA OF THE THREE FORMER LAGOONS.

AS A RESULT OF THE REPORTED OCCASIONAL BURNING OF FLOATING OILS ON THE SURFACE OF THE LAGOONS, THE RI INCLUDED AN ANALYSES FOR DIOXINS IN THE SOIL (DIOXINS CAN BE CREATED FROM THE BURNING OF CHLORINATED PHENOLS AND HYDROCARBONS). ALTHOUGH DIOXINS WERE DETECTED IN THE PARTS PER TRILLION (PPT) RANGE (SEE TABLE 3), THE LEVELS DO NOT PRESENT AN UNACCEPTABLE RISK AND WILL NOT REQUIRE REMEDIATION. EPA GENERALLY CONSIDERS THE POTENTIAL NEED FOR REMEDIATION OF DIOXINS WHEN LEVELS ARE FOUND TO EXIST IN THE PPB RANGE OR HIGHER.

BASED ON THE RESULTS OF RCRA SUBTITLE C 40 CFR SECTION 261.24 TOXICITY CHARACTERISTIC LEACHING PROCEDURE (TCLP) ANALYSES OF THREE OF SIX SOIL BORING SAMPLES, THE SOIL/WASTE MIXTURE AT THE SITE WOULD BE CLASSIFIED AS CHARACTERISTIC HAZARDOUS WASTE UNDER RCRA. IN ADDITION, BASED ON EPA'S UNDERSTANDING OF THE NATURE OF THE OPERATIONS LEADING TO THE GENERATION OF WASTE MATERIALS DISPOSED OF AT THE SITE, EPA REGION III HAS INTERPRETED RCRA'S LAND DISPOSAL RESTRICTIONS (LDR) OF NOVEMBER 8, 1984 TO SUGGEST THAT THE SOIL/WASTE MIXTURE ALSO WOULD BE CLASSIFIED AS A LAND DISPOSAL RESTRICTED HAZARDOUS WASTE UNDER THE RCRA PROGRAM. THE WASTE DISPOSED AT THE SITE IS CONSIDERED BY THE AGENCY TO BE F001-F005 WASTE.

THE FORMER SPRAY IRRIGATION AND BERM BORROW AREAS (SEE FIGURE 7) ONLY HAVE MINOR LEVELS OF ORGANIC CONTAMINATION WHICH IS NOT EXPECTED TO PRESENT A DIRECT CONTACT RISK. (SEE TABLE 4 FOR SPRAY IRRIGATION AREA SAMPLING RESULTS.)

THE SITE DOES NOT APPEAR TO HAVE CAUSED INORGANIC CONTAMINATION OF SITE SOILS, ALTHOUGH LEVELS WERE OCCASIONALLY ABOVE BACKGROUND CONCENTRATIONS. THIS FINDING IS IN AGREEMENT WITH OUR UNDERSTANDING THAT ORGANIC CHEMICAL RINSEWATERS AND WASTES WERE DISPOSED OF AT THE SITE.

AIR:

THE SITE DOES NOT NEGATIVELY AFFECT AIR QUALITY BASED ON REAL-TIME AIR MONITORING RESULTS COLLECTED DURING BORING AND WELL INSTALLATION ACTIVITIES AS WELL AS AIR DISPERSION MODELING CONDUCTED FOR THE RISK ASSESSMENT.

SURFACE WATER AND SEDIMENTS:

SURFACE WATER AND SEDIMENT SAMPLES WERE COLLECTED FROM FIFTEEN STATIONS IN THREE STREAMS SURROUNDING THE SITE. THESE STREAMS INCLUDE THE WEST BRANCH OF BRANDYWINE CREEK, BIRCH RUN AND INDIAN SPRING RUN (SEE FIGURE 10). BASED ON SAMPLING RESULTS, THE STREAMS DO NOT APPEAR TO BE AFFECTED BY SITE-RELATED CONTAMINANTS (SEE TABLES 5 AND 6). ALTHOUGH A FEW SITE-RELATED COMPOUNDS WERE DISCOVERED IN SEDIMENTS, THE DATA DO NOT INDICATE A CONTAMINANT DISTRIBUTION PATTERN WITH RESPECT TO DILUTION OR ACCRETION OF CONCENTRATIONS ASSOCIATED WITH INCREASING DISTANCE FROM THE SITE OR TRIBUTARY HEADWATERS. THE CONTAMINANTS ARE SPATIALLY VARIABLE AND THEIR PRESENCE IN THE STREAMS MAY BE DUE TO OTHER SOURCES. IN ADDITION, THE COMPOUND LEVELS FOUND HAVE NOT BEEN SHOWN NOR ARE EXPECTED TO CAUSE AN ADVERSE IMPACT.

ECOLOGICAL ASSESSMENT:

ANALYSES OF SURFACE WATER AND SEDIMENT SAMPLES DURING THE RI DID NOT INDICATE THAT AQUATIC ENVIRONMENTAL RECEPTORS HAVE BEEN EXPOSED TO SITE-RELATED CONTAMINATION. FURTHER, THE HABITAT ASSESSMENT, BOTH OF AQUATIC AND TERRESTRIAL SPECIES SURROUNDING THE SITE, DID NOT IDENTIFY ANY POTENTIALLY ADVERSE EFFECTS OF SITE-RELATED CONTAMINATION TO THE WELL-BEING OF FLORA AND FAUNA.

THE ONLY AREAS VISIBLY AFFECTED BY CONTAMINATION ARE THE IMMEDIATE AREA OF THE FORMER LAGOONS AND FORMER BERM BORROW AREA. VEGETATION DIRECTLY IN THESE LOCATIONS IS VERY SPARSE, CONSISTING OF HARDY, PIONEER SPECIES.

NO WETLAND AREAS EXIST ONSITE. NARROW FRINGE, FORESTED WETLANDS ALONG THE VARIOUS STREAMS ADJACENT TO AND DOWNGRADIENT OF THE SITE DO NOT APPEAR TO BE AFFECTED BY SITE CONTAMINANTS.

#SSR

VI. SUMMARY OF SITE RISKS

A BASELINE RISK ASSESSMENT (RA) WAS PERFORMED FOR THE SITE IN ACCORDANCE WITH EPA GUIDELINES. THE RA PROVIDES AN ESTIMATION OF RISK TO PUBLIC HEALTH AND THE ENVIRONMENT POSED BY THE SITE IF NO REMEDIAL ACTIONS WERE TAKEN. IT INVOLVES ASSESSING THE TOXICITY OR DEGREE OF HAZARD POSED BY SUBSTANCES FOUND AT THE SITE BY CONSIDERING THE LEVELS AT WHICH THESE SUBSTANCES ARE PRESENT. THE RA ALSO ENTAILS DESCRIBING THE EXPOSURE ROUTES BY WHICH HUMANS AND THE ENVIRONMENT COULD COME INTO CONTACT WITH THESE SUBSTANCES.

WHEN ESTIMATING AN INDIVIDUAL'S EXPOSURE TO SITE SUBSTANCES, CONSERVATIVE ASSUMPTIONS REGARDING SUCH FACTORS AS LENGTH OF THE EXPOSURE PERIOD, FREQUENCY OF EXPOSURE, AMOUNT OF SKIN EXPOSED AND/OR QUANTITY OF SUBSTANCE INGESTED ARE PURPOSELY USED TO ENSURE THAT THE RISK IS NOT UNDERESTIMATED. AFTER EVALUATION OF THE SITE DATA, AN ASSESSMENT OF TOXICOLOGICAL INFORMATION AND POTENTIAL EXPOSURE IS PERFORMED, FOLLOWED BY CALCULATIONS OF THE RISKS POSED. SEPARATE CALCULATIONS ARE MADE FOR THOSE SUBSTANCES THAT CAN CAUSE CANCER AND FOR THOSE THAT CAN CAUSE OTHER, NON-CARCINOGENIC HEALTH EFFECTS. RISKS TO BOTH CHILDREN AND ADULTS ARE PRESENTED. GENERAL CONCLUSIONS OF THE RA PERTAINING TO PUBLIC HEALTH IMPACT ARE PRESENTED IN SECTIONS A THROUGH D BELOW.

A) CONTAMINANT IDENTIFICATION

THE INITIAL PHASE OF THE RA INVOLVES REVIEWING ALL RI DATA AND IDENTIFYING THE CHEMICALS OF POTENTIAL CONCERN FOUND IN ALL EXPOSURE MEDIA AT THE SITE FOR FURTHER RISK EVALUATION. THE EXPOSURE MEDIA INCLUDES ONSITE SOIL, GROUNDWATER, SURFACE WATER, SPRINGWATER, FUGITIVE DUST AND AIR EMISSIONS, AND DEER WHICH MIGHT GRAZE AT THE SITE. IDENTIFIED CHEMICALS ARE PRIMARILY CHOSEN BASED ON THEIR RELATIVELY HIGH TOXICITY, MOBILITY, PERSISTENCE AND PREVALENCE WHEN COMPARED TO ALL CONTAMINANTS PRESENT AT THE SITE. THE CHOSEN CHEMICALS ALSO PROVIDE A REPRESENTATIVE ANALYSES OF THE POTENTIAL RISKS AT THE SITE.

ARITHMETIC AVERAGE AND MAXIMUM CONCENTRATION LEVELS OF THE CHOSEN CONTAMINANTS ARE UTILIZED TO DEVELOP MOST PROBABLE AND MAXIMUM EXPOSURE SCENARIOS IN A LATER PHASE OF THE RA. A LISTING OF THE IDENTIFIED CHEMICALS OF CONCERN OR "INDICATOR" CHEMICALS APPEARS IN TABLE 7. BASED ON RI DATA, THE SELECTED CHEMICALS REPRESENT 99 PERCENT OF THE RISK ASSOCIATED WITH EACH EXPOSURE SCENARIO FOR EACH MEDIUM. SOURCES OF UNCERTAINTY IN SELECTING THE INDICATOR CHEMICALS ARE DISCUSSED IN THE RA.

B) EXPOSURE ASSESSMENT SUMMARY

THE NEXT STEP IN CONDUCTING THE RA IS AN EXPOSURE ASSESSMENT. THE OBJECTIVES OF THIS TASK ARE TO IDENTIFY POTENTIAL EXPOSURES ASSOCIATED WITH THE CHEMICALS OF CONCERN AT THE SITE AND TO ESTIMATE THE MAGNITUDE OF THESE EXPOSURES.

BASED ON THE SITE'S ENVIRONMENTAL SETTING, THIS RA HAS IDENTIFIED FIVE POTENTIAL POPULATIONS WHO COULD BE EXPOSED TO SITE CONTAMINANTS. IT SHOULD BE NOTED THAT ACTUAL EXPOSURE BY THESE GROUPS IS SEVERELY LIMITED HOWEVER, DUE TO CONTROLS IMPLEMENTED AT THE SITE TO DATE. FOLLOWING IS A LISTING OF THE POTENTIALLY EXPOSED POPULATIONS, WHICH SHALL BE REFERRED TO AS "POTENTIAL EXPOSURE PATHWAYS". RATIONALE FOR THEIR SELECTION APPEARS IN TABLE 8:

USE OF GROUNDWATER (VIA PRIVATE WELL) AS A RESIDENTIAL WATER SUPPLY BY RESIDENTS LIVING IN THE AREA OF ESTIMATED SITE-RELATED IMPACT. EXPOSURE INCLUDES DERMAL CONTACT WITH AND INGESTION OF GROUNDWATER AS WELL AS INHALATION OF VOLATILE ORGANIC CHEMICALS RELEASED DURING SHOWERING AND OTHER ACTIVITIES.

* DERMAL CONTACT WITH AND INCIDENTAL INGESTION OF CONTAMINATED ONSITE SOILS BY A CASUAL TRESPASSER.

- * INGESTION OF VENISON FROM DEER THAT MAY GRAZE ONSITE.
- * INHALATION OF VOLATILE ORGANIC CHEMICALS AND FUGITIVE DUST RELEASED FROM ON-SITE SOILS, AND
- * RECREATIONAL USE OF THE PONDS FED BY SPRING #48 (AKA THE BALDWIN CAMPGROUND SPRING). EXPOSURE INCLUDES DERMAL CONTACT WITH AND INCIDENTAL INGESTION OF WATER, AS WELL AS INHALATION OF VOLATILES RELEASED FROM THE WATER.
- * HYPOTHETICAL RESIDENTIAL USE OF GROUNDWATER FROM THE ONSITE MONITORING WELLS INSTALLED DURING RI FIELD WORK.

WHEN CALCULATING THE RISKS ASSOCIATED WITH EACH OF THESE PATHWAYS, THE RA CONSIDERS THREE AGE GROUPS AS POTENTIALLY EXPOSED: ADULTS, CHILDREN AGES 6 TO 12, AND CHILDREN AGES 2 TO 6 (SEE TABLE 9 FOR ADDITIONAL INFORMATION ON EXPOSURE DURATION.)

ACTUAL QUANTIFICATION OF POTENTIAL EXPOSURE INVOLVES ESTIMATING EXPOSURE POINT CONCENTRATIONS AND CALCULATING POTENTIAL INTAKES FOR EACH EXPOSURE PATHWAY IDENTIFIED ABOVE. EXPOSURE POINT CONCENTRATIONS (THE CONTAMINANT CONCENTRATION AT WHICH THE RESIDENT IS EXPOSED) WERE BASED ON THE ARITHMETIC AVERAGE AND MAXIMUM VALUES FOR EACH INDICATOR CHEMICAL FOUND IN EACH MEDIUM AT THE SITE. TO DETERMINE THE CONCENTRATION OF VOCS RELEASED FROM ONSITE SOILS AND THE POND FED BY SPRING #48, AND TO DETERMINE THE CONCENTRATIONS IN FUGITIVE DUST RELEASED FROM ONSITE SOILS, AIR SCREENING MODELS WERE UTILIZED. WHEN ESTIMATING VOC CONCENTRATIONS RELEASED DURING SHOWERING WITH PRIVATE RESIDENTIAL WELL WATER, AN INHALATION DOSE EQUIVALENT TO THAT EXPERIENCED VIA INGESTION OF SUCH WATER WAS ASSUMED. SUMMARIES OF THE AVERAGE AND MAXIMUM EXPOSURE POINT CONCENTRATIONS APPEAR IN APPENDIX A OF THIS ROD.

IN THE CALCULATION OF POTENTIAL INTAKES (HOW MUCH AND FOR HOW LONG ONE IS EXPOSED TO THE EXPOSURE POINT CONCENTRATIONS), THE CHARACTERISTICS OF THE VARIOUS EXPOSURE PATHWAYS MUST BE DEFINED. IMPORTANT PARAMETERS INCLUDE THE FREQUENCY, DURATION, AND DEGREE OF EXPOSURE AS WELL AS PHYSIOLOGIC CHARACTERISTICS OF THE EXPOSED POPULATION, SUCH AS BODY WEIGHT AND SKIN SURFACE AREA. ESTIMATES OF THESE PARAMETERS ARE BASED ON EPA GUIDELINES, RECOMMENDATIONS FOUND IN THE CURRENT LITERATURE, AND PROFESSIONAL JUDGMENT. THE EXPOSURE ASSUMPTIONS USED IN CALCULATING THE POTENTIAL INTAKES APPEAR IN TABLE 9.

SEVERAL ASSUMPTIONS MUST BE MADE REGARDING BOTH THE NATURE AND EXTENT OF CONTAMINATION PRESENT AT THE SITE AS WELL AS THE BEHAVIOR AND CHARACTERISTICS OF THE POPULATIONS POTENTIALLY EXPOSED TO THE CONTAMINATION. SOME OF THESE ASSUMPTIONS INCLUDE USE OF THE FOLLOWING:

- * MONITORING DATA TO REPRESENT EXPOSURE CONCENTRATIONS ACROSS A MEDIUM, SCREENING LEVEL MODELS TO REPRESENT EXPOSURE CONCENTRATIONS ACROSS A MEDIUM,
- * SINGLE VALUES FOR EXPOSURE PARAMETERS TO CHARACTERIZE THE BEHAVIOR OF AN ENTIRE POPULATION OVER AN EXTENDED PERIOD OF TIME, AND
- * THE INTAKE CALCULATIONS FOR THE DEER INGESTION SCENARIO, WHICH SHOULD BE CONSIDERED SEMI-QUANTITATIVE IN LIGHT OF THE NUMEROUS ASSUMPTIONS REQUIRED.

C) TOXICITY ASSESSMENT SUMMARY

THIS TASK REQUIRES THE ASSESSMENT OF THE INTRINSIC TOXICOLOGICAL PROPERTIES OF THE CHEMICALS OF POTENTIAL CONCERN. BOTH CARCINOGENIC AND NON-CARCINOGENIC EFFECTS FROM THE INDICATOR CHEMICALS MUST BE PRESENTED. A SUMMARY OF TOXICOLOGICAL INFORMATION ON ALL INDICATOR COMPOUNDS ASSESSED FOR THE SITE APPEARS IN TABLE 10. THIS TABLE IDENTIFIES THOSE COMPOUNDS WHICH ARE CONSIDERED POTENTIAL CARCINOGENS AND THOSE IDENTIFIED FOR NON-CARCINOGENIC EFFECTS. IN SOME CASES, COMPOUNDS ARE EVALUATED FOR BOTH TYPES OF EFFECT. IN REVIEWING TABLE 10, SEVERAL TERMS OR ACRONYMS REQUIRE DEFINITION.

CANCER POTENCY FACTORS (CPFS) HAVE BEEN DEVELOPED BY EPA'S CARCINOGENIC RISK ASSESSMENT VERIFICATION ENDEAVOR (CRAVE) FOR ESTIMATING EXCESS LIFETIME CANCER RISKS ASSOCIATED WITH EXPOSURE TO POTENTIALLY CARCINOGENIC CHEMICALS. CPFS, EXPRESSED IN UNITS OF (MG/KG-DAY)⁻¹, ARE MULTIPLIED BY THE ESTIMATED INTAKE OF A POTENTIAL CARCINOGEN, IN MG/KG-DAY, TO PROVIDE AN UPPER BOUND ESTIMATE OF THE EXCESS LIFETIME CANCER RISK ASSOCIATED WITH EXPOSURE AT THAT INTAKE LEVEL. THE TERM "UPPER-BOUND" REFLECTS THE CONSERVATIVE ESTIMATE OF THE RISKS CALCULATED FROM THE CPFS. USE OF THIS APPROACH MAKES UNDERESTIMATION OF THE ACTUAL CANCER RISK HIGHLY

UNLIKELY. CPFS ARE DERIVED FROM THE RESULTS OF HUMAN EPIDEMIOLOGICAL STUDIES OR CHRONIC ANIMAL BIOASSAYS TO WHICH ANIMAL-TO-HUMAN EXTRAPOLATION AND UNCERTAINTY FACTORS HAVE BEEN APPLIED.

REFERENCE DOSES (RFDs) HAVE BEEN DEVELOPED BY EPA FOR INDICATING THE POTENTIAL FOR ADVERSE HEALTH EFFECTS FROM EXPOSURE TO CHEMICALS EXHIBITING NONCARCINOGENIC EFFECTS. RFDs, WHICH ARE EXPRESSED IN UNITS OF MG/KG-DAY, ARE ESTIMATES OF DAILY EXPOSURE LEVELS FOR HUMANS, INCLUDING SENSITIVE INDIVIDUALS THAT ARE LIKELY TO BE WITHOUT AN APPRECIABLE RISK OF ADVERSE HEALTH EFFECTS. ESTIMATED INTAKES OF CHEMICALS FROM ENVIRONMENTAL MEDIA (E.G., THE AMOUNT OF CHEMICAL INGESTED FROM CONTAMINATED DRINKING WATER) CAN BE COMPARED TO THE RFD. RFDs ARE DERIVED FROM HUMAN EPIDEMIOLOGICAL STUDIES OR ANIMAL STUDIES TO WHICH UNCERTAINTY FACTORS HAVE BEEN APPLIED (E.G., TO ACCOUNT FOR THE USE OF ANIMAL DATA TO PREDICT EFFECTS ON HUMANS). THESE UNCERTAINTY FACTORS HELP INSURE THAT THE RFDs WILL NOT UNDERESTIMATE THE POTENTIAL FOR ADVERSE NONCARCINOGENIC EFFECTS TO OCCUR.

CARCINOGENIC CLASS REFERS TO EPA'S WEIGHT-OF-EVIDENCE SYSTEM FOR CLASSIFYING CHEMICALS SUSPECTED OF BEING HUMAN CARCINOGENS. SUBSTANCES ARE CLASSIFIED BASED ON THEIR EPIDEMIOLOGICAL ASSOCIATION WITH HUMAN CANCER, INDUCTION OF CANCER IN MULTIPLE SPECIES OF TEST ANIMALS, OR INDUCTION OF CANCER IN ONE SPECIES. FOLLOWING IS A BRIEF DESCRIPTION OF THE CLASSES APPEARING ON TABLE 10: GROUP A - HUMAN CARCINOGEN, GROUP B1 - PROBABLE HUMAN CARCINOGEN BASED ON LIMITED HUMAN DATA, GROUP B2 - PROBABLE HUMAN CARCINOGEN BASED ON SUFFICIENT EVIDENCE IN ANIMALS BUT LITTLE OR NO EVIDENCE IN HUMANS, GROUP C - POSSIBLE HUMAN CARCINOGEN, GROUP D - NOT CLASSIFIED AS TO HUMAN CARCINOGENICITY, GROUP E - EVIDENCE OF NONCARCINOGENICITY FOR HUMANS.

D) RISK CHARACTERIZATION

THE FINAL TASK OF THE RA IS TO INTEGRATE THE RESULTS OF THE EXPOSURE ASSESSMENT AND TOXICITY ASSESSMENT TO QUANTITATIVELY ESTIMATE THE POTENTIAL RISK ASSOCIATED WITH THE SIX EXPOSURE PATHWAYS PREVIOUSLY IDENTIFIED. BOTH CARCINOGENIC AND NONCARCINOGENIC EFFECTS WILL BE CONSIDERED.

CARCINOGENIC RISK - CARCINOGENIC RISK IS CALCULATED BY MULTIPLYING THE DAILY INTAKE OF EACH CHEMICAL, AVERAGED OVER THE YEARS OF EXPOSURE, BY THE APPROPRIATE CPF. RESULTS ARE PRESENTED IN PROBABILITIES EXPRESSED IN SCIENTIFIC NOTATION. FOR INSTANCE, A RESULT OF $1E-04$ ($1 \times (10^{-4})$) INDICATES, AS A PLAUSIBLE UPPER BOUND, THAT AN INDIVIDUAL HAS A ONE IN TEN THOUSAND CHANCE OF DEVELOPING CANCER AS A RESULT OF SITE-RELATED EXPOSURE TO THAT CHEMICAL UNDER THE SPECIFIC EXPOSURE CONDITIONS AT THE SITE. THIS ESTIMATE IS OFTEN EXPRESSED AS THE INCREMENTAL OR EXCESS INDIVIDUAL CANCER RISK ASSOCIATED WITH EXPOSURE TO A CHEMICAL.

THE RISK ASSOCIATED WITH EXPOSURE TO A SET OF CHEMICALS IS ESTIMATED BY ADDING THE RISKS ASSOCIATED WITH EXPOSURE TO EACH CHEMICAL. SEVERAL OF THE EXPOSURE SCENARIOS AT THE SITE MAY INVOLVE MORE THAN ONE ROUTE OF EXPOSURE. A SUMMARY OF THE RESULTS OF THE CALCULATIONS FOR EACH AGE GROUP UNDER EACH EXPOSURE SCENARIO, AS WELL AS A LIFETIME EXPOSURE SCENARIO (CALCULATED BY ADDING THE RISK FOR EACH AGE GROUP), IS PRESENTED IN TABLE 11. THIS TABLE ALSO PROVIDES A SUMMATION OF RISK ASSOCIATED WITH SIMULTANEOUS EXPOSURE UNDER MULTIPLE SCENARIOS. BASED ON EPA POLICY, A RISK EXCEEDING THE RANGE OF $1E-04$ TO $1E-06$ IS GENERALLY CONSIDERED AS EXCEEDING THE ACCEPTABLE RISK LEVEL.

NONCARCINOGENIC RISK - NONCARCINOGENIC RISK IS DETERMINED BY CALCULATING THE HAZARD INDEX (HI). THIS NUMBER IS FOUND BY DIVIDING THE DAILY INTAKE BY THE APPROPRIATE RFD. THE HI PROVIDES AN ESTIMATION OF THE POTENTIAL FOR TOXIC EFFECTS TO DEVELOP AS A RESULT OF EXPOSURE TO A CHEMICAL OR SET OF CHEMICALS UNDER THE ASSUMED CONDITIONS OF EXPOSURE.

THE CALCULATION OF THE HI ASSUMES THAT THERE IS A THRESHOLD EXPOSURE, BELOW WHICH NO TOXIC EFFECTS ARE EXPECTED TO OCCUR. THEREFORE, A HI LESS THAN ONE INDICATES THAT NO TOXIC EFFECTS ARE EXPECTED TO OCCUR AS A RESULT OF A GIVEN EXPOSURE, WHILE A HI OF GREATER THAN ONE INDICATES THAT THERE IS A POTENTIAL FOR AN INDIVIDUAL TO EXPERIENCE ADVERSE HEALTH EFFECTS AS A RESULT OF A GIVEN EXPOSURE. NONCARCINOGENIC RISK ASSOCIATED WITH EXPOSURE TO A SET OF CHEMICALS IS CONSERVATIVELY ESTIMATED BY ADDING THE RISKS ASSOCIATED WITH EXPOSURE TO EACH CHEMICAL. A SUMMARY OF THE RESULTS OF THE HI CALCULATIONS FOR EACH AGE GROUP UNDER EACH EXPOSURE SCENARIO, INCLUDING A LIFETIME EXPOSURE SCENARIO, APPEARS IN TABLE 12. AS INDICATED IN THE CARCINOGENIC RISK SECTION, A MULTIPLE EXPOSURE SUMMATION ALSO APPEARS IN THIS TABLE.

ENVIRONMENTAL RISKS

DURING THE RI, AN ECOLOGICAL INVESTIGATION OF THE SURROUNDING SITE AREA WAS CONDUCTED TO ASSESS SITE-RELATED IMPACTS TO THE LOCAL FLORA AND FAUNA. THE OBJECTIVES OF THIS WORK WERE TO:

- 1) CHARACTERIZE THE TERRESTRIAL AND WETLAND COMMUNITIES OF THE SITE AND SURROUNDING AREA,
- 2) IDENTIFY THE MACROINVERTEBRATE COMMUNITIES OF THE DOWNGRAIENT TRIBUTARIES,

3) ASSESS ANY SITE-RELATED IMPACTS ON THESE VARIOUS ECOLOGICAL COMMUNITIES.

UTILIZING THE DATA OBTAINED FROM THE ABOVE TASKS, AN ECOLOGICAL ASSESSMENT OF THE SITE WAS CONDUCTED IN A METHODOLOGY SIMILAR TO THAT DESCRIBED ABOVE FOR PUBLIC HEALTH IMPACT. AFTER COMPLETION OF THE EXPOSURE ASSESSMENT AND TOXICITY ASSESSMENT PHASES OF THE TOTAL ECOLOGICAL ASSESSMENT, IT WAS DETERMINED THAT RI ANALYTICAL RESULTS OF SURROUNDING STREAM SAMPLES DID NOT INDICATE AN EXPOSURE OF AQUATIC ECOLOGICAL RECEPTORS TO SITE-RELATED CONTAMINANTS. IN FACT, THE MACROINVERTEBRATE COMMUNITY IN THE STREAMS SURROUNDING THE SITE WERE FOUND TO BE DIVERSE AND HEALTHY.

THE ONLY TERRESTRIAL RECEPTORS EXPERIENCING SITE-RELATED IMPACT WOULD BE THOSE TRESPASSING OR RESIDING DIRECTLY ON THE 2.2 ACRE FORMER LAGOON AREA. THE CHAIN LINK FENCE AROUND THE SITE AND THE LACK OF AN ADEQUATE FOOD SUPPLY ONSITE ACTS TO PREVENT SURROUNDING WILDLIFE FROM COMING INTO DIRECT CONTACT WITH SITE SOILS. THE VEGETATION SURROUNDING THE SITE APPEARS QUITE HEALTHY, AND IS NOT MEASURABLY AFFECTED BY THE SITE. WILDLIFE RESIDING AROUND THE SITE IS NOT EXPECTED TO BE IMPACTED BY THE SITE CONTAMINATION BASED ON EVALUATION OF THE RI DATA, LACK OF ACCESS TO THE SITE, AND THE RA ANALYSIS OF POTENTIAL EXPOSURE TO GRAZING DEER. DUE TO PAST ONSITE DUMPING ACTIVITIES, ONSITE VEGETATION IS QUITE SPARSE, RESULTING IN THE ONE MEASURABLE EFFECT OF THE SITE TO THE LOCAL ECOLOGY.

FINALLY, ALTHOUGH FRINGE, FORESTED WETLANDS EXIST ALONG THE STREAMS SURROUNDING THE SITE, THEY ARE DETERMINED NOT TO BE IMPACTED BASED ON BOTH VISUAL INSPECTION AND THE ANALYTICAL RESULTS OF STREAM SURFACE WATER AND SEDIMENT SAMPLES. BASED ON CONSULTATION WITH THE APPROPRIATE STATE AND FEDERAL AGENCIES, NO THREATENED OR ENDANGERED SPECIES ARE KNOWN TO EXIST IN THE SITE AREA, SAVE THE OCCASIONAL TRANSIENT SPECIES.

SIGNIFICANT SOURCES OF UNCERTAINTY

THE RA FOR THE SITE IS BASED ON CONSERVATIVE ASSUMPTIONS REGARDING EXPOSURE AND TOXICITY. IN MAKING ESTIMATES OF POTENTIAL EXPOSURE AND RESULTANT INTAKE, AN EFFORT WAS MADE TO SELECT PARAMETERS THAT OVERESTIMATE ACTUAL EXPOSURES, SO THAT THE RESULTING ESTIMATES OF POTENTIAL RISK ALSO OVERESTIMATES THE ACTUAL RISK ASSOCIATED WITH SITE-RELATED EXPOSURES. INCLUDED AMONG THE CONSERVATIVE ASSUMPTIONS UTILIZED ARE:

- * THE ASSUMPTION THAT AN INDIVIDUAL MAY BE EXPOSED TO ANY OF THESE EXPOSURE CONDITIONS OVER THE COURSE OF A LIFETIME,
- * THE ASSUMPTION THAT AN INDIVIDUAL MAY BE CHRONICALLY EXPOSED TO CONCENTRATIONS OF CONTAMINANTS APPROACHING THE VALUES USED IN THE RA,
- * THE ASSUMPTION THAT AN INDIVIDUAL MAY BE SIMULTANEOUSLY EXPOSED TO MULTIPLE PATHWAYS OF EXPOSURE OVER THE PERIOD OF A LIFETIME,
- * DELIBERATE OVERESTIMATION OF TOXICITY INDICES WHERE QUESTIONS EXIST ABOUT THE ACTUAL TOXICITY OR CARCINOGENICITY OF A SUBSTANCE OR GROUP OF SUBSTANCES. (ONE EXCEPTION TO THIS CONSERVATIVE METHODOLOGY IS THE RA'S ASSUMPTION THAT THE RISK ASSOCIATED WITH EXPOSURE TO MORE THAN ONE TOXICANT IS ADDITIVE. IN SOME CASES, DEPENDING ON THE CHEMICALS, RISK MAY BE GREATER THAN ADDITIVE.)

SEVERAL LIMITATIONS OF THE RA SHOULD ALSO BE NOTED:

- * ANALYTICAL RESULTS FROM ONLY FIVE SURFACE SOIL SAMPLES WERE AVAILABLE TO EVALUATE THE EXPOSURE PATHWAYS ASSOCIATED WITH DERMAL CONTACT, CONTAMINANT AIR RELEASES/FUGITIVE DUST EMISSIONS, AND INGESTION OF VENISON ASSOCIATED WITH DEER GRAZING ONSITE;
- * THE METHOD UTILIZED DURING THE RI TO IDENTIFY THE DEPTH INTERVAL OF SOIL BORINGS FOR SAMPLE ANALYSES MAY OR MAY NOT HAVE EXCLUDED SAMPLES WITH HIGHER CONCENTRATIONS OF SEMIVOLATILE ORGANIC COMPOUNDS:
- * THE SAMPLING DATA UTILIZED IN THE RA FOR EXPOSURE VIA USE OF RESIDENTIAL WELL WATER IS SOLELY COMPRISED OF VOLATILE

ORGANIC ANALYTICAL RESULTS, PER THE RESIDENTIAL WELL SAMPLING REQUIREMENTS IN THE EPA/CLTL CONSENT ORDER. FOR THIS REASON, EXPOSURE AND SIGNIFICANCE OF SUCH EXPOSURE OF RESIDENTS TO OTHER CHEMICALS ASSOCIATED WITH SITE SOILS, SUCH AS SEMIVOLATILE COMPOUNDS AND TENTATIVELY IDENTIFIED COMPOUNDS (TICS), IS UNCERTAIN, ALBEIT UNLIKELY. RESULTS FROM THE ONE ROUND OF SAMPLING OF RESIDENTIAL WELLS FOR SEMIVOLATILE ORGANIC ANALYSES WERE NOT USED BASED ON THE LIMITED DATA SET FOR THESE COMPOUNDS.

- * REGARDING EXPOSURE ASSUMPTIONS, THE USE OF MONITORING DATA, SINGLE CONCENTRATION VALUES, AND SCREENING LEVEL MODELS (ESPECIALLY IN THE AIR AND GRAZING DEER EXPOSURE SCENARIOS) ALL PRESENT A MEASURE OF UNCERTAINTY WHEN ESTIMATING ONE'S EXPOSURE TO SITE CONTAMINANTS.
- * THE RA IS BASED ON CONDITIONS OF NO ACTION AT THE SITE. PROTECTIVE MEASURES INSTITUTED AT THE SITE, INCLUDING THE INSTALLATION OF A FENCE AROUND THE SITE AND PROVISION OF POINT-OF-ENTRY CARBON TREATMENT UNITS TO HOMES WITH WELL WATER EXCEEDING MCLS, RESULTS IN RISKS CONSIDERABLY LOWER THAN THAT PREDICTED IN THIS RA.

CONCLUSIONS OF THE RISK ASSESSMENT

THE RESULTS OF THE CALCULATIONS PERFORMED IN THE RA USING THE AFOREMENTIONED EXPOSURE ROUTES INDICATE THAT THE ESTIMATE OF MOST PROBABLE RISK ASSOCIATED WITH ALL ROUTES OF EXPOSURE, EXCEPT THE HYPOTHETICAL RESIDENTIAL USE OF MONITORING WELL (OR "ONSITE") GROUNDWATER, IS WITHIN EPA'S RANGE OF ACCEPTABLE RISK. THE ESTIMATE OF MAXIMUM OR WORST CASE RISK EXCEEDS EPA'S RANGE FOR TWO EXPOSURE ROUTES; (1) THE HYPOTHETICAL RESIDENTIAL USE OF ONSITE GROUNDWATER AND (2) THE MORE REALISTIC AND ACTUAL RESIDENTIAL USE OF OFFSITE GROUNDWATER.

FOLLOWING IS A CONDENSED TABLE OF THE LIFETIME CARCINOGENIC RISKS CALCULATED FOR EACH EXPOSURE SCENARIO:

EXPOSURE ROUTE	MOST PROBABLE	WORST CASE
RESIDENTIAL USE OF OFFSITE GROUNDWATER	1 X (10 ⁻⁵)	3 X (10 ⁻⁴)*
CONTACT AND INGESTION OF ONSITE SOILS	9 X (10 ⁻⁶)	2 X (10 ⁻⁵)
DEER MEAT INGESTION	5 X (10 ⁻⁶)	1 X (10 ⁻⁵)
RECREATIONAL USE OF SPRING WATER AT CAMPGROUND	3 X (10 ⁻⁸)	3 X (10 ⁻⁸)
INHALATION OF DUST AND VAPOR FROM ONSITE SOILS	5 X (10 ⁻⁶)	1 X (10 ⁻⁵)
TOTAL OF ALL "CURRENT" EXPOSURES	3 X (10 ⁻⁵)	4 X (10 ⁻⁴)*
HYPOTHETICAL RESIDENTIAL USE OF MONITORING WELL GROUNDWATER	1 X (10 ⁻³)*	2 X (10 ⁻²)*

* OUTSIDE OF EPA'S ACCEPTABLE RISK RANGE

IT IS IMPORTANT TO NOTE THAT THE RA PRINCIPALLY EVALUATED THE RISK POSED BY THE SITE UNDER CURRENT CONDITIONS. DUE TO A LACK OF SUFFICIENT HYDROGEOLOGIC DATA, THE RA WAS NOT DESIGNED TO PREDICT THE FUTURE RISK ASSOCIATED WITH RESIDENTIAL WATER USE IF THE RELATIVELY HIGHLY CONTAMINATED GROUNDWATER BELOW THE SITE WERE TO MIGRATE TO RESIDENTIAL WELLS. THE EXPOSURE ROUTE HYPOTHETICAL RESIDENTIAL USE OF MONITORING WELL GROUNDWATER GIVES AN INDICATION OF THE CARCINOGENIC RISK WHICH WOULD BE POSED BY USE OF GROUNDWATER DIRECTLY BELOW AND ADJACENT TO THE SITE. WHEN AND IF THIS CONTAMINATED GROUNDWATER, AT OR NEAR TO THE CONCENTRATION

LEVELS FOUND BELOW THE SITE, COULD REACH RESIDENTIAL WELLS HAS NOT BEEN DETERMINED AT THIS POINT. USING A CONSERVATIVE APPROACH TO PUBLIC HEALTH PROTECTION ONE WOULD ASSUME THAT GROUNDWATER CONTAMINANT CONCENTRATIONS APPROACHING THOSE LEVELS BELOW THE SITE WOULD ULTIMATELY REACH RESIDENTIAL WELLS IF EITHER THE POLLUTANT SOURCE OR CONTAMINATED GROUNDWATER IS NOT CONTAINED OR REMEDIATED.

IN ADDITION TO CARCINOGENIC RISKS, THE RA CALCULATED RISKS TO HUMANS OF CONTRACTING NON-CARCINOGENIC HEALTH EFFECTS FROM SUBSTANCES ASSOCIATED WITH THE SITE USING THE SAME IDENTIFIED EXPOSURE ROUTES. THE RESULTS OF THESE CALCULATIONS FOR NON-CARCINOGENIC HEALTH EFFECTS WERE BELOW THE EPA GUIDELINE OF 1.0 FOR CHILDREN AND ADULTS FOR ALL EXPOSURE SCENARIOS EXCEPT BOTH THE MOST PROBABLE AND MAXIMUM HYPOTHETICAL USE OF ONSITE GROUNDWATER SCENARIOS. THESE RESULTS SUGGEST THAT EXPOSURE TO NON-CARCINOGENIC CHEMICALS AT THE SITE IS NOT ANTICIPATED TO RESULT IN ADVERSE HEALTH EFFECTS UNDER THE CURRENT CONDITIONS OF EXPOSURE. AS STATED ABOVE, HOWEVER, IT IMPLIES THAT GROUNDWATER CONTAMINANTS FOUND AT LEVELS DIRECTLY BELOW AND ADJACENT TO THE SITE COULD POSE NON-CARCINOGENIC HEALTH EFFECTS TO USERS. THEREFORE, IF GROUNDWATER CONTAMINANT CONCENTRATIONS AT OR APPROACHING THESE LEVELS WERE TO MIGRATE TO RESIDENCES, NON-CARCINOGENIC HEALTH EFFECTS WOULD BE EXPECTED.

FOR THE TWO GROUNDWATER EXPOSURE SCENARIOS EXCEEDING EPA'S CARCINOGENIC AND NONCARCINOGENIC GUIDELINES (RESIDENTIAL USE OF OFFSITE AND ONSITE GROUNDWATER), TCE IS THE CONTAMINANT WHICH POSES THE GREATEST CARCINOGENIC RISK AND CHLOROFORM AND TETRACHLOROETHENE POSE THE GREATEST NONCARCINOGENIC RISK.

UNDER THE SCENARIO HYPOTHETICAL RESIDENTIAL USE OF MONITORING WELL GROUNDWATER, IT SHOULD BE EMPHASIZED THAT NO ONE IS CURRENTLY USING THIS WATER. THIS SCENARIO PRESENTS THE RISK WHICH COULD BE POSED IF THE SITE WERE LEFT UNADDRESSED AND THE CONTAMINANT PLUME CONTINUED TO SPREAD.

IT IS SOMEWHAT REASSURING TO NOTE THAT THREE YEARS OF RESIDENTIAL WELL DATA INDICATE THAT RESIDENTIAL WELL CONCENTRATIONS ARE NOT SIGNIFICANTLY RISING AND SITE GROUNDWATER CONTAMINANT TRANSPORT SEEMS TO BE IN "STEADY-STATE". DESPITE THIS APPARENT CONDITION, SEVERAL FACTORS SUGGEST THAT FUTURE SITE GROUNDWATER CONDITIONS ARE UNCERTAIN, WARRANTING CAREFUL EVALUATION OF FUTURE RESIDENTIAL EXPOSURE TO GROUNDWATER CONTAMINATION. THESE FACTORS INCLUDE: (1) THE COMPLEX HYDROGEOLOGY OF THE SITE AREA, (2) LIMITED KNOWLEDGE OF GROUNDWATER CONTAMINANT CONCENTRATIONS AND FLOW PATTERNS BETWEEN THE SITE AND RESIDENTIAL WELLS, (3) CLOSE PROXIMITY OF HOMES TO THE SITE, AND (4) BASED ON THE HETEROGENOUS AND RELATIVELY UNKNOWN TYPES OF WASTE DISPOSED OF IN THE FORMER LAGOONS, THE POSSIBILITY, ALTHOUGH NOT CONSIDERED LIKELY, THAT COMPOUNDS OF AN UNKNOWN NATURE MAY BE PRESENT OR MIGRATING TO HOMEOWNER WELLS.

FROM AN ENVIRONMENTAL RISK PERSPECTIVE, ANALYSES OF SURFACE WATER AND SEDIMENT SAMPLES NEAR THE WILLIAM DICK LAGOONS SITE DO NOT INDICATE THAT THESE MEDIA ARE CURRENTLY MEASURABLY AFFECTED BY SITE-RELATED CONTAMINATION. FURTHER, EXCEPT FOR THAT OF THE IMMEDIATE AREA OF THE FORMER LAGOONS, THE ASSESSMENT MADE OF THE LOCAL ENVIRONMENT DID NOT IDENTIFY ANY POTENTIALLY ADVERSE EFFECTS OF SITE-RELATED CONTAMINATION TO THE WELLBEING OF PLANTS AND ANIMALS. THUS, IT APPEARS THAT THE SITE HAS HAD NO PERSISTENT ADVERSE EFFECT UPON THE SURROUNDING ECOSYSTEM.

EPA HAS DETERMINED THAT ACTUAL OR THREATENED RELEASES OF HAZARDOUS SUBSTANCES FROM THIS SITE, IF NOT ADDRESSED BY IMPLEMENTING THE RESPONSE ACTION SELECTED IN THIS ROD, MAY PRESENT AN IMMINENT AND SUBSTANTIAL ENDANGERMENT TO PUBLIC HEALTH, WELFARE, OR THE ENVIRONMENT.

#DRA

VII. DESCRIPTION OF REMEDIAL ALTERNATIVES

THE PRELIMINARY FINAL FS DISCUSSES THE ALTERNATIVES EVALUATED FOR THE SITE AND PROVIDES SUPPORTING INFORMATION LEADING TO ALTERNATIVE SELECTION BY EPA. THE PRELIMINARY FINAL FS INCLUDES CONSIDERATION OF ALL EPA COMMENTS ON THE DRAFT FS. AS MENTIONED, IT IS IDENTIFIED AS A PRELIMINARY DOCUMENT SINCE EPA IS CONDUCTING ONE FINAL REVIEW. ANY PAPER REVISIONS TO THE PRELIMINARY FINAL FS WILL NOT AFFECT EPA'S ALTERNATIVE SELECTION PROCESS SINCE THE RATIONALE FOR THESE CHANGES HAS ALREADY BEEN INCORPORATED INTO THE ADMINISTRATIVE RECORD.

AS INDICATED IN THE SECTION OF THIS ROD ENTITLED SCOPE AND ROLE OF REMEDIAL ACTION, THIS DOCUMENT ADDRESSES REMEDIAL ACTION FOR TWO OF THREE UNITS AT THE SITE. SPECIFICALLY, THIS ROD PRESENTS A REMEDIAL DECISION FOR UNIT 1-ALTERNATE WATER SUPPLY AND UNIT 2-GROUNDWATER. THE DECISION ON UNIT 3-SOURCE CONTROL, WILL BE DEFERRED TO A LATER DATE, AS PREVIOUSLY INDICATED. REMEDIAL OBJECTIVES FOR THE UNIT 1 AND 2 ALTERNATIVES FOCUS ON THE ELIMINATION OF UNACCEPTABLE HUMAN OR ENVIRONMENTAL HEALTH RISK AND THE REDUCTION OF CONTAMINANT CONCENTRATIONS IN GROUNDWATER TO MEET ARARS AND/OR RISK-BASED LEVELS.

SECTION 121 OF CERCLA REQUIRES THAT THE SELECTED REMEDIAL ALTERNATIVE TO ADDRESS CONTAMINATION AT A SUPERFUND SITE BE PROTECTIVE OF HUMAN HEALTH AND THE ENVIRONMENT, COMPLY WITH ARARS OR JUSTIFY A WAIVER, BE COST EFFECTIVE, UTILIZE PERMANENT SOLUTIONS AND ALTERNATIVE TECHNOLOGIES TO THE MAXIMUM EXTENT PRACTICABLE, AND

SATISFY THE PREFERENCE FOR TREATMENT AS A COMPONENT OF THE REMEDIAL ACTION OR EXPLAIN WHY THE PREFERENCE IS NOT SATISFIED.

THE ALTERNATIVES EVALUATED IN THIS ROD FOR UNITS 1 AND 2 APPEAR BELOW. AS DISCUSSED PREVIOUSLY, THE METHOD AND DETAIL OF ALTERNATIVE EVALUATION DIFFERS FROM THAT PRESENTED IN THE PRELIMINARY FINAL FS AND SEVERAL CHANGES TO THE ALTERNATIVES PRESENTED IN THE FS HAVE BEEN MADE.

ALTERNATE WATER SUPPLY - UNIT 1:

AWS 1: NO ACTION

ESTIMATED CAPITAL COST:	\$0
ESTIMATED ANNUAL OPERATION & MAINTENANCE (O&M):	\$0
ESTIMATED PRESENT WORTH:	\$0
ESTIMATED TIME TO COMPLETE:	IMMEDIATE

COSTS OF EXISTING REQUIREMENTS UNDER THE 1988 REMOVAL ORDER NOT INCLUDED.

THE SUPERFUND PROGRAM REQUIRES THAT THE NO ACTION ALTERNATIVE BE EVALUATED FOR EACH SITE UNIT IN ORDER TO ESTABLISH A BASELINE FOR COMPARISON. UNDER THIS ALTERNATIVE, EPA WOULD TAKE NO REMEDIAL ACTION AT THE SITE TO PREVENT RESIDENTIAL EXPOSURE TO CONTAMINATED GROUNDWATER. HOWEVER, CLTL WOULD CONTINUE THE PROVISION OF POINT OF ENTRY SYSTEMS (I.E. GRANULAR ACTIVATED CARBON (GAC) UNITS) AND SAMPLING OF RESIDENTIAL WELLS (AND SPRINGS) AS REQUIRED UNDER THE 1988 REMOVAL ORDER SIGNED WITH EPA. A FIVE YEAR REVIEW OF THIS REMEDY WOULD BE CONDUCTED IN ACCORDANCE WITH SECTION 121(C) OF CERCLA.

PROTECTION OF PUBLIC HEALTH AND COMPLIANCE WITH ARARS IS POTENTIALLY JEOPARDIZED UNDER THIS SCENARIO SINCE THE EXISTING REMOVAL ORDER WAS ESTABLISHED AS A TEMPORARY MEASURE AND MAY NOT CONTAIN A SUFFICIENT MONITORING SCHEDULE TO ENSURE THAT CONTAMINANTS HAVE NOT MIGRATED TO WELLS BETWEEN INDIVIDUAL MONITORING EVENTS. A RESIDENT(S) COULD BE EXPOSED TO CONTAMINANTS ABOVE MCLS UNTIL SUCH TIME AS SCHEDULED MONITORING DETERMINES THE PRESENCE OF CONTAMINANTS IN HIS/HER INDIVIDUAL WELL. OPERATION AND MAINTENANCE OF THE POINT OF ENTRY SYSTEMS AND MONITORING OF HOMES NOT SUPPLIED WITH POINT OF ENTRY SYSTEMS MUST BE PERFORMED WITH COMMITTED AND PERSISTENT APPLICATION FOR THIS REMEDY TO BE EFFECTIVE. COMPLIANCE WITH ARARS WILL REQUIRE THAT SPENT CARBON OR REGENERATION WASTE FROM USED SYSTEMS WILL BE DISPOSED OF IN ACCORDANCE WITH THE RESOURCE CONSERVATION AND RECOVERY ACT, 42 USC SECTION 6901 ET SEQ. (RCRA) AND STATE HAZARDOUS WASTE DISPOSAL REQUIREMENTS.

THE REMEDY MEETS THE STATUTORY REQUIREMENT FOR TREATMENT (AT THE RESIDENTIAL WELL ITSELF) BUT IS NOT A PERMANENT REMEDY SINCE OCCASIONAL REPLACEMENT OF THE CARBON IN THE POINT OF ENTRY SYSTEMS WILL BE NEEDED ON AN APPROXIMATELY TWO TO THREE YEAR BASIS.

THIS ALTERNATIVE WOULD PROVE TO BE DIFFICULT TO IMPLEMENT IF A PUMP AND TREAT REMEDY IS SELECTED FOR OPERABLE UNIT 2. THE INSTALLATION AND OPERATION OF RECOVERY WELLS TO COLLECT AND TREAT GROUNDWATER FOR OPERABLE UNIT 2 COULD ACT TO DRAW CONTAMINANTS INTO HOME WELLS SINCE THE COMPLEX SITE HYDROGEOLOGY MIGHT PREVENT THE ADEQUATE INSTITUTION OF PREVENTATIVE MEASURES TO PREVENT THIS EVENT. IN ADDITION, THE CONTINUED USE OF INDIVIDUAL RESIDENTIAL WELLS COULD ACT AS A DETERRENT TO THE ADEQUATE COLLECTION OF CONTAMINATED GROUNDWATER BY THE RECOVERY WELLS SINCE THE HOME WELLS MIGHT ACT TO DRAW GROUNDWATER AWAY FROM THE RECOVERY WELLS.

AWS2: INSTITUTIONAL CONTROLS

ESTIMATED CAPITAL COST:	\$10,000
ESTIMATED ANNUAL O&M COST:	\$2000
ESTIMATED PRESENT WORTH :	\$30,600
ESTIMATED TIME TO COMPLETE:	1 TO 2 YEARS

COSTS OF EXISTING REQUIREMENTS UNDER THE 1988 REMOVAL ORDER NOT INCLUDED. COSTS INCLUDE PERSONNEL OR MAN-HOUR EXPENDITURES FOR ESTABLISHING AND ADMINISTERING INSTITUTIONAL CONTROLS.

UNDER THIS ALTERNATIVE, THE EXISTING REMOVAL ORDER OF 1988 WOULD REMAIN IN EFFECT. IN ADDITION, THE ALTERNATIVE WOULD INCLUDE THE IMPOSITION OF INSTITUTIONAL CONTROLS SUCH AS DEED, ZONING, AND/OR OWNERSHIP RESTRICTIONS TO PREVENT RESIDENTIAL USE OF CONTAMINATED GROUNDWATER BY INDIVIDUALS MOVING INTO THE AREA OF THE CONTAMINATED GROUNDWATER PLUME. FOR EXAMPLE, A DEED RESTRICTION/ NOTICE OR PROPERTY TRANSFER ADVISORY COULD BE INSTITUTED FOR THE SALE OF PROPERTY WITHIN THE AREA OF THE CONTAMINATED PLUME.

THE CHESTER COUNTY HEALTH DEPARTMENT (CCHD) HAS ALREADY ESTABLISHED AN INTERNAL MECHANISM WHEREBY ALL NEW

PRIVATE WELLS DRILLED IN CHESTER COUNTY MUST FIRST OBTAIN A PERMIT FROM CCHD BEFORE DRILLING COMMENCES. FOR ANY PROSPECTIVE WELLS TO BE DRILLED WITHIN THE AREA OF THE CONTAMINANT PLUME SURROUNDING THE SITE, THE RESIDENT IS REQUIRED TO PERFORM SAMPLING AND ANALYSES OF THE WELL WATER IMMEDIATELY AFTER WELL CONSTRUCTION AND ON A YEARLY BASIS THEREAFTER. SHOULD THE WELL WATER SAMPLE RESULTS INDICATE A CONTAMINANT(S) ABOVE DRINKING WATER STANDARDS, TREATMENT OF THE WATER MUST BE IN PLACE PRIOR TO GRANTING OF APPROVAL OF PRIVATE WELL USE (SEE APPENDIX C). EPA WOULD PROVIDE INFORMATION TO CCHD TO ENFORCE THIS REQUIREMENT AT THE SITE SHOULD IT BE NECESSARY. EXISTING WELL OWNERS ARE ENTITLED TO PERIODIC SAMPLING AND PROVISION OF A POINT OF ENTRY TREATMENT SYSTEM (IF NEEDED) BY CLTL AS A RESULT OF THE 1988 REMOVAL ORDER BETWEEN EPA AND CLTL.

A FIVE YEAR REVIEW OF THIS REMEDY WOULD BE CONDUCTED PER SECTION 121(C) OF CERCLA. THE POTENTIAL FOR PROTECTION OF PUBLIC HEALTH AND COMPLIANCE WITH ARARS IS SLIGHTLY HIGHER UNDER THIS ALTERNATIVE DUE TO THE EMPHASIS PLACED ON INSTITUTIONAL CONTROLS. COMPLIANCE WITH THE STATUTORY REQUIREMENTS OF TREATMENT PREFERENCE, AND UTILIZATION OF A PERMANENT REMEDY/ALTERNATIVE TREATMENT TECHNOLOGY WHENEVER PRACTICABLE, IS IDENTICAL TO THAT OF AWS1. SHOULD A PUMP AND TREAT REMEDY FOR OPERABLE UNIT 2 BE SELECTED, THE SAME POTENTIAL PROBLEMS ARE ASSOCIATED WITH THIS REMEDY AS IDENTIFIED FOR AWS1.

AWS 3: POINT OF ENTRY SYSTEMS WITH INSTITUTIONAL CONTROLS

ESTIMATED CAPITAL COST:	\$0
ESTIMATED ANNUAL O&M COST:	\$16,000 TO \$74,500
ESTIMATED PRESENT WORTH:	\$720,000 TO \$1,158,000
ESTIMATED TIME TO INSTALL/COMPLETE:	SEVERAL WEEKS AFTER MCL EXCEEDANCE

RANGE IN COSTS BASED ON PRESENT AND FUTURE CASE SCENARIOS. COSTS INCLUDE THOSE ASSOCIATED WITH EXISTING 1988 REMOVAL ORDER PLUS ADDITIONAL MONITORING REQUIREMENTS.

THE MONITORING OF RESIDENTIAL WELL WATER (AND SPRINGS) AND PROVISION AND MONITORING OF POINT OF ENTRY SYSTEMS WOULD CONTINUE AS CURRENTLY PROVIDED UNDER THE 1988 REMOVAL ORDER. HOWEVER, BECAUSE THE REMOVAL ORDER REQUIREMENTS WERE ORIGINALLY ENVISIONED AS A TEMPORARY MEASURE, AND THIS DECISION CONTEMPLATES A FINAL REMEDY, EPA WOULD INSTITUTE STEPS TO INCREASE THE FREQUENCY AND POTENTIALLY THE SCOPE OF MONITORING ABOVE THAT CURRENTLY PROVIDED BY CLTL. CURRENTLY, THE FREQUENCY OF MONITORING FOR THIS ALTERNATIVE IS EXPECTED TO BE THAT APPEARING ON PAGES 3-13 AND 3-14 OF THE PRELIMINARY FINAL FS. THE SCOPE OF MONITORING WOULD INCREASE IF THE AGENCY DETERMINES THAT HOMES LOCATED OUTSIDE OF THE CURRENT SAMPLING RADII (1/2 MILE NORTH AND 1 MILE SOUTH OF THE FORMER LAGOONS) REQUIRE PERIODIC MONITORING. THIS WOULD BE DETERMINED WHEN PLANNING FOR AND/OR DURING THE ADDITIONAL HYDROGEOLOGIC WORK SCHEDULED FOR OPERABLE UNIT 2. SUCH EFFORTS WOULD CONTINUE UNTIL THE CONTAMINATED GROUNDWATER IS RESTORED TO ITS BENEFICIAL USE. THE INSTITUTIONAL CONTROLS DISCUSSED UNDER AWS2 WOULD ALSO BE A COMPONENT OF THIS ALTERNATIVE.

THIS ALTERNATIVE HAS A GREATER PROPENSITY THAN AWS1 AND AWS2 FOR MEETING THE STATUTORY REQUIREMENTS TO PROTECT PUBLIC HEALTH AND COMPLY WITH ARARS DUE TO THE INCREASED SCOPE AND FREQUENCY OF MONITORING FOR THIS OPTION. COMPLIANCE WILL REQUIRE VIGOROUS EFFORTS TO ENSURE THAT POINT OF ENTRY UNITS ARE PROPERLY MONITORED AND MAINTAINED INCLUDING THE PROPER DISPOSAL OF CONTAMINATED CARBON FROM SPENT UNITS.

A FIVE YEAR REVIEW OF THIS REMEDY WOULD BE CONDUCTED PER SECTION 121(C) OF CERCLA. COMPLIANCE WITH THE STATUTORY REQUIREMENTS OF TREATMENT PREFERENCE, AND UTILIZATION OF A PERMANENT REMEDY/ALTERNATIVE TREATMENT TECHNOLOGY WHENEVER PRACTICABLE, IS IDENTICAL TO THAT OF AWS1 AND AWS2. SHOULD A PUMP AND TREAT REMEDY FOR OPERABLE UNIT 2 BE SELECTED, THE POTENTIAL INCOMPATIBILITY PROBLEMS IDENTIFIED FOR AWS1 AND AWS2 ALSO APPLY TO THIS ALTERNATIVE.

AWS 4: EXTENSION OF THE COATESVILLE WATER LINE WITH INSTITUTIONAL CONTROLS

ESTIMATED CAPITAL COST:	\$1,631,000 TO \$2,187,000
ESTIMATED ANNUAL O&M COST:	\$21,000 TO \$46,000
ESTIMATED PRESENT WORTH:	\$2,034,000 TO \$3,071,000
ESTIMATED TIME TO INSTALL/COMPLETE:	2+ YEARS

RANGE IN COSTS BASED ON CURRENT UNCERTAINTY REGARDING LENGTH OF WATER LINE EXTENSION AND THE IDENTIFICATION OF ALL RESIDENTS TO BE SERVICED.

THIS ALTERNATIVE ADDRESSES RESIDENTIAL WATER USE BY EXTENDING THE CITY OF COATESVILLE AUTHORITY'S (CCA) WATER LINE FROM ITS CURRENT LOCATION AT THE INTERSECTION OF COFFROATH ROAD AND NORTH SANDY HILL ROAD. PUBLIC WATER FROM THE CITY OF COATESVILLE'S INTAKES ON BIRCH RUN, ROCK RUN, AND/OR OCTORARO CREEK, AFTER TREATMENT, WOULD

BE SUPPLIED TO AFFECTED AND POTENTIALLY AFFECTED SITE RESIDENTS (I.E. HOMES LOCATED WITHIN THE SITE GROUNDWATER CONTAMINANT PLUME). A WATER STORAGE TANK WOULD BE INSTALLED AT A LOCATION NEAR THE SITE TO PROVIDE STORAGE AND PRESSURE FEED FOR WATER LINE CONNECTIONS.

EPA WILL WORK WITH THE APPROPRIATE LOCAL AUTHORITIES TO DEVELOP AND/OR ENFORCE INSTITUTIONAL CONTROLS IN AN ATTEMPT TO ENSURE THAT CURRENT AND FUTURE RESIDENTS WITHIN THE CONTAMINATED GROUNDWATER PLUME EITHER OBTAIN THEIR WATER FROM THE NEWLY INSTALLED WATER LINE, OR, SHOULD THEY DECLINE TO CONNECT, THAT THEIR GROUNDWATER WELL BE PERIODICALLY ANALYZED FOR SITE CONTAMINANTS. SEVERAL EXISTING RULES AND REGULATIONS OF THE CHESTER COUNTY HEALTH DEPARTMENT (CCHD) APPLY TO THIS SITUATION:

SECTION 501.14 OF THE RULES AND REGULATIONS OF THE CCHD REQUIRES THAT NO INDIVIDUAL WATER SUPPLY WELL MAY BE USED, CONSTRUCTED OR MAINTAINED WHERE A PUBLIC WATER SUPPLY PIPE IS WITHIN 150 FEET OF THE STRUCTURE TO BE SERVED BY WATER (PROVIDED THE STRUCTURE IS LOCATED WITHIN THE FRANCHISE AREA OF THE WATER SUPPLIER.)

THE CCHD INTERPRETS SECTION 501.3.1. OF THE CCHD RULES AND REGULATIONS TO REQUIRE THAT ALL RESIDENTS CONNECTING TO A PUBLIC WATER SUPPLY MUST "ABANDON" THEIR PRIVATE WELL. ABANDONMENT OF A WELL REQUIRES FILLING AND SEALING OF THE WELL AS DEFINED IN SECTION 501.9 OF THE CCHD RULES AND REGULATIONS.

SECTION 501.13.2.3.3. OF THE CCHD RULES AND REGULATIONS GRANTS CCHD THE AUTHORITY TO REQUIRE OWNERS OF NEWLY DRILLED PRIVATE WELLS TO ANALYZE THE WELL WATER FOR HARMFUL SUBSTANCES WHICH THE CCHD SUSPECTS ARE PRESENT. THE CCHD HAS ESTABLISHED AN INTERNAL MECHANISM WHEREBY ALL NEW PRIVATE WELL DRILLERS IN CHESTER COUNTY MUST FIRST OBTAIN A PERMIT FROM CCHD BEFORE DRILLING COMMENCES. FOR ALL NEW WELLS DRILLED WITHIN THE AREA OF THE CONTAMINANT PLUME SURROUNDING THE SITE, THE RESIDENT IS REQUIRED TO PERFORM SAMPLING AND ANALYSES OF THE WELL WATER IMMEDIATELY AFTER WELL CONSTRUCTION AND ON A YEARLY BASIS THEREAFTER. SHOULD THE WELL WATER SAMPLE RESULTS INDICATE A CONTAMINANT(S) ABOVE DRINKING WATER STANDARDS, TREATMENT OF THE WATER MUST BE IN PLACE PRIOR TO GRANTING OF APPROVAL OF PRIVATE WELL USE (SEE APPENDIX C).

IF CONTINUED USE OF A WELL BY A NON-CONNECTING RESIDENT IS DETERMINED TO PRESENT AN UNACCEPTABLE ENVIRONMENTAL OR PUBLIC HEALTH IMPACT, EPA MAY INITIATE EFFORTS TO CLOSE THE WELL UNDER ITS CERCLA SECTION 106 AUTHORITY. TO DETERMINE THE RISK POSED BY EXPOSURE TO WELL WATER BY ANY INDIVIDUAL WITHIN THE GROUNDWATER CONTAMINANT PLUME WHO DECLINES TO CONNECT TO THE WATER LINE AND MAINTAINS AND CONTINUES TO USE A PRIVATE WELL, EPA MAY ATTEMPT TO REQUIRE PERIODIC MONITORING OF THE WELL WATER BY THE RESIDENT THROUGH COOPERATIVE ENFORCEMENT EFFORTS WITH THE CCHD. SECTION 501.13.2.3.3. OF THE CCHD RULES AND REGULATIONS MAY PROVIDE A MECHANISM FOR THIS ACTION VIA APPLICATION TO EXISTING WELL OWNERS. IF NECESSARY, MONITORING COULD BE CONDUCTED BY EPA.

BASED ON EXISTING DATA, IT IS ANTICIPATED THAT THE LINE WOULD BE EXTENDED UP NORTH SANDY HILL ROAD TOWARD THE SITE AND WOULD EXTEND WESTWARD TO SERVICE AFFECTED OR POTENTIALLY AFFECTED RESIDENTS ON TELEGRAPH ROAD. AT THIS TIME, IT IS NOT KNOWN IF THE WATER LINE WOULD BE EXTENDED TO SERVICE RESIDENTS ON HILL ROAD OR RESIDENTS LIVING NORTHEAST OF THE SITE NEAR THE INTERSECTION OF NORTH SANDY HILL ROAD AND TELEGRAPH ROADS. A DETERMINATION OF ALL RESIDENTS WHO WILL BE OFFERED THE OPPORTUNITY TO CONNECT TO THE LINE WILL BE DECIDED DURING WATER LINE DESIGN AND FOLLOWING COMPLETION OF ADDITIONAL HYDROGEOLOGIC STUDY SCHEDULED TO COMMENCE DURING MID-1991 (SEE THE DISCUSSION OF ALTERNATIVES FOR UNIT 2). ONE OF THE MAJOR TASKS OF THE ADDITIONAL HYDROGEOLOGIC WORK WILL BE TO MAKE A DEFINITIVE DETERMINATION ON THE EXTENT OF THE PLUME AND THUS DETERMINE WHICH RESIDENTS WILL BE ELIGIBLE FOR WATER LINE CONNECTION.

CURRENT DATA INDICATES THAT APPROXIMATELY 50 RESIDENTIAL LOCATIONS LIE WITHIN THE ESTIMATED GROUNDWATER PLUME AREA (AS IDENTIFIED IN THE RI). THE ADDITIONAL HYDROGEOLOGIC WORK IN 1991 MAY INDICATE THAT A SIGNIFICANTLY LARGER NUMBER OF RESIDENTS MAY BE AFFECTED OR POTENTIALLY AFFECTED BY SITE GROUNDWATER CONTAMINATION. IT IS EXPECTED THAT WATER LINE DESIGN WILL COMMENCE AS ADDITIONAL HYDROGEOLOGIC WORK PROCEEDS.

A REPRESENTATIVE PORTION OF EXISTING RESIDENTIAL LOCATIONS BEYOND THE REACH OF THE PROPOSED LINE WOULD UNDERGO PERIODIC SAMPLING OF PRIVATE WELLS IF THERE IS CONCERN THAT THE GROUNDWATER CONTAMINANT PLUME COULD MIGRATE AND IMPACT SUCH WELLS DURING THE PERIOD OF THE REMEDIATION ACTIVITY SELECTED FOR OPERABLE UNIT 2. IF SUCH RESIDENCES WERE TO WARRANT CONNECTION TO THE CCA WATER SUPPLY IN THE FUTURE, EPA WOULD TAKE APPROPRIATE ACTIONS TO EXTEND THE LINE. NEARBY SPRINGS WILL ALSO BE MONITORED UNDER THIS ALTERNATIVE.

THIS ALTERNATIVE MEETS ALL OF THE STATUTORY REQUIREMENTS OF SECTION 121 OF CERCLA. THE COATESVILLE WATER SUPPLY IS IN COMPLIANCE WITH ARARS UNDER THE SAFE DRINKING WATER ACT AND 25 PA CODE CHAPTER 109. IT IS A PERMANENT ALTERNATE WATER SUPPLY REMEDY. THE STATUTORY PREFERENCE FOR TREATMENT UNDER CERCLA WILL BE MET BY THE GROUNDWATER REMEDY SELECTED FOR UNIT 2. ALTHOUGH THE ESTIMATED COST IS HIGHER THAN THE OTHER ALTERNATIVES, THE COST IS NOT EXCESSIVELY ELEVATED IN VIEW OF THE PERMANENCE AND RELIABILITY OF THE REMEDY AND THE ELIMINATION OF THE LONG-TERM NEED FOR FUTURE OPERATION AND MAINTENANCE.

CONCERNING THIS ALTERNATIVE'S PROTECTION OF PUBLIC HEALTH, AN ADDED CARCINOGENIC RISK OCCURS AS A RESULT OF

EXPOSURE TO TRIHALOMETHANES IN THE CITY OF COATESVILLE AUTHORITY'S (CCA) WATER SUPPLY. THESE COMPOUNDS (CHLOROFORM, BROMODICHLOROMETHANE, CHLORODIBROMOMETHANE, AND BROMOFORM AS IDENTIFIED BY STATE LAW FOR MONITORING PURPOSES) ARE CREATED AS A RESULT OF THE CHLORINATION OF SURFACE WATERS CONTAINING NATURAL ORGANIC PRECURSOR SUBSTANCES SUCH AS HUMIC ACID, FULVIC ACID, AND PLANT EXTRACTIVES.

BASED ON A LIMITED DATA BASE, THE CALCULATED CURRENT RISK ASSOCIATED WITH TRIHALOMETHANES IN THE CCA WATER SUPPLY IS APPROXIMATELY EQUAL TO THAT OF THE CURRENT RISK FROM THE USE OF RESIDENTIAL WELL WATER CONTAMINATED WITH SITE-RELATED CHEMICALS. SPECIFICALLY, THE CURRENT AVERAGE CASE TOTAL CARCINOGENIC RISK POSED BY THE INGESTION AND INHALATION OF SITE-RELATED GROUNDWATER COMPOUNDS, USING DATA COLLECTED FROM THE 1988 REMOVAL ORDER REQUIREMENTS, IS CALCULATED TO BE 7.58E-05 (OR 1 ADDITIONAL CANCER PER 13193 EXPOSED INDIVIDUALS). THE CURRENT WORST-CASE RISK IS CALCULATED TO BE 2.92E-04 (OR 1 ADDITIONAL CANCER PER 3425 INDIVIDUALS).

THE CURRENT AVERAGE CASE TOTAL CARCINOGENIC RISK POSED BY THE INGESTION AND INHALATION OF TRIHALOMETHANES IN THE CCA WATER SUPPLY, USING QUARTERLY MONITORING DATA OBTAINED FROM COATESVILLE FOR THE PERIOD OF MARCH 1990 TO MARCH 1991, IS CALCULATED TO BE 1.05E-04 (OR 1 ADDITIONAL CANCER PER 9488 INDIVIDUALS). THE CURRENT WORST-CASE RISK IS CALCULATED TO BE 1.6E-04 (OR 1 ADDITIONAL CANCER PER 6097 INDIVIDUALS).

ALTHOUGH THE CURRENT RISK SCENARIOS DESCRIBED ABOVE ARE ROUGHLY EQUAL, IT IS IMPORTANT TO NOTE THAT THE CCA WATER SUPPLY HAS BEEN IN COMPLIANCE WITH ALL DRINKING WATER STANDARDS FOR TRIHALOMETHANES (I.E., A MAXIMUM CONTAMINANT LEVEL (MCL) OF 100 PPB FOR TOTAL TRIHALOMETHANES) AT LEAST OVER THE LAST THREE YEARS. IN ADDITION, EPA'S DRINKING WATER PROGRAM IS SCHEDULED TO PROPOSE NEW NATIONAL STANDARDS FOR TRIHALOMETHANES IN JUNE OF 1993, WITH PROMULGATION OF SUCH STANDARDS SCHEDULED FOR JUNE OF 1995. CURRENT INDICATIONS ARE THAT THE TRIHALOMETHANE STANDARDS WILL BE SET AT A LOWER LEVEL, THUS REDUCING THE CARCINOGENIC RISK POSED BY THESE COMPOUNDS. IF THE STANDARD IS REDUCED, THE CCA WILL BE REQUIRED TO COMPLY WITH THE NEW STANDARD WITHIN A FEW YEARS OF PROMULGATION. FINALLY, THE CCA HAS EXPRESSED A DESIRE TO REDUCE TRIHALOMETHANE LEVELS AS EVIDENCED BY ITS INTENTION, EXPRESSED TO EPA IN APRIL OF 1991, TO CONVERT ITS DISINFECTION SYSTEM FROM CHLORINATION TO CHLORINE DIOXIDE TREATMENT. HOWEVER, TOXICITY CONCERNS REGARDING CHLORINE DIOXIDE TREATMENT RESIDUALS CAUSED THE CCA TO POSTPONE ITS PLANS FOR DISINFECTION CONVERSION.

EPA ALSO CONSIDERED THE RISK, AGAIN UTILIZING A LIMITED DATA BASE, ASSOCIATED WITH THE PRESENCE OF NATURAL RADIOACTIVE SUBSTANCES (I.E., RADON, RADIUM, AND URANIUM) IN RESIDENTIAL WELLS LOCATED NEAR THE SITE. THESE SUBSTANCES APPEAR IN ELEVATED LEVELS IN SITE GROUNDWATER AS A RESULT OF THE GEOCHEMICAL CHARACTERISTICS OF THE CHICKIES ROCK FORMATION, WHERE THE SITE LIES. (DUE TO ITS USE OF SURFACE WATER AS A SOURCE OF DRINKING WATER, THE CCA WATER SUPPLY DOES NOT CONTAIN ELEVATED LEVELS OF RADIOACTIVE SUBSTANCES.)

THE AGENCY HAS LIMITED AUTHORITY, UNDER CERCLA (SEE CERCLA SECTIONS 104 (A)(3) AND (4)), TO TAKE A REMEDIAL ACTION TO ADDRESS A RELEASE OR A THREATENED RELEASE OF A NATURALLY-OCCURRING SUBSTANCE IN ITS UNALTERED FORM, OR ALTERED SOLELY THROUGH NATURALLY OCCURRING PROCESSES OR PHENOMENA, FROM A LOCATION WHERE IT IS NATURALLY FOUND. HOWEVER, WHEN RISK RESULTS FROM BOTH NATURAL AND MAN-MADE SOURCES, THE AGENCY CONSIDERS IT APPROPRIATE TO EVALUATE THE OVERALL RISK ASSOCIATED WITH THE USE OF WATER FROM EACH SOURCE. SUCH AN ANALYSIS PRESENTS A COMPLETE PICTURE OF THE HEALTH RISK ASSOCIATED WITH EACH WATER SUPPLY ALTERNATIVE.

AN ASSESSMENT PERFORMED FOR EXPOSURE TO THE NATURAL RADIOACTIVE SUBSTANCES IN SITE GROUNDWATER FOUND THAT PROVISION OF COATESVILLE WATER TO SITE RESIDENTS WOULD ACTUALLY REDUCE THE RISK OF ADDED CANCER SINCE IT WOULD ELIMINATE THE NATURAL BUT RATHER SIGNIFICANT RISK POSED BY EXPOSURE TO RADIONUCLIDES IN SITE GROUNDWATER. THE CURRENT AVERAGE CARCINOGENIC RISK ASSOCIATED WITH EXPOSURE TO RADIONUCLIDES IN GROUNDWATER (NOT INCLUDING THE RISK POSED BY SITE-RELATED COMPOUNDS), UTILIZING DATA COLLECTED BY THE US GEOLOGICAL SURVEY AND ERM DURING 1988, IS CALCULATED TO BE 7.07E-04 (OR 1 ADDITIONAL CANCER PER 1,400 EXPOSED PERSONS). THE CURRENT WORST-CASE CARCINOGENIC RISK ASSOCIATED WITH THIS EXPOSURE IS CALCULATED TO BE 2.7E-03 (OR 1 ADDITIONAL CANCER PER 370 EXPOSED INDIVIDUALS). THESE CALCULATED RISKS ARE SUBSTANTIALLY HIGHER THAN THE RISKS POSED BY EITHER SITE-RELATED CHEMICALS IN GROUNDWATER OR TRIHALOMETHANES IN THE CITY WATER SUPPLY.

A COMPLETE EVALUATION OF THE RISKS FROM ALL THREE EXPOSURE SCENARIOS APPEARS IN APPENDIX B OF THIS ROD.

NOTE: UNDER ALTERNATIVE AWS 4, THE CAMPGROUND AND TRAILER PARK LOCATED APPROXIMATELY 3/4 MILE AND 1/2 MILE SOUTHWEST OF THE SITE WOULD NOT RECEIVE PUBLIC WATER DUE TO: (1) THEIR REMOTE LOCATION FROM THE REMAINING AFFECTED RESIDENCES, (2) THE CONSIDERABLE COST (ROUGHLY \$360,000) ASSOCIATED WITH THE EXTENSION OF A WATER LINE SEVERAL THOUSAND FEET TO SERVICE ONLY A FEW RESIDENTS, AND (3) THE LACK OF CONTAMINANTS FOUND IN THEIR WELL WATER TO DATE. INSTEAD, THIS REMEDY WOULD PROVIDE A POINT OF ENTRY SYSTEM WITH APPLICABLE MONITORING, SIMILAR TO THAT WHICH IS CURRENTLY PERFORMED.

AWS 5: PRIVATE WATER COMPANY WITH INSTITUTIONAL CONTROLS

ESTIMATED CAPITAL COST: \$1,190,000 TO \$1,748,000
ESTIMATED ANNUAL O&M COST: \$21,000 TO \$23,100

ESTIMATED PRESENT WORTH: \$1,706,000 TO \$2,298,000
ESTIMATED TIME TO
INSTALL/COMPLETE: 2+ YEARS

RANGE IN COSTS BASED ON CURRENT UNCERTAINTY REGARDING LENGTH OF WATER SERVICE LINE AND THE IDENTIFICATION OF ALL RESIDENTS SERVICED.

THIS ALTERNATIVE INVOLVES INSTALLATION OF A HIGH CAPACITY WATER SUPPLY WELL(S) IN AN UNCONTAMINATED GROUNDWATER LOCATION NEAR THE SITE TO BE UTILIZED BY RESIDENTS WITHIN THE CONTAMINATED GROUNDWATER PLUME. THE WATER WOULD BE TREATED AT AN ONSITE TREATMENT PLANT AND DISTRIBUTED TO RESIDENTS FOR HOUSEHOLD USE. WATER QUALITY AND OPERATION PROCEDURES WOULD BE REQUIRED TO MEET ALL FEDERAL AND PENNSYLVANIA STANDARDS FOR A PUBLIC WATER SUPPLY. THE WELL AND TREATMENT PLANT WOULD BE MAINTAINED BY A LICENSED OPERATOR.

AS IN AWS 4, INSTITUTIONAL CONTROLS WOULD BE IMPLEMENTED (SEE THE EARLIER DISCUSSION ON EXISTING CCHD REGULATIONS) IN AN ATTEMPT TO ENSURE THAT ALL CURRENT OR FUTURE RESIDENTS RESIDING IN THE GROUNDWATER CONTAMINANT PLUME BE REQUIRED TO CONNECT TO THIS WATER SUPPLY WELL TREATMENT SYSTEM. SHOULD A RESIDENT WITHIN THE PLUME DECLINE TO CONNECT AND INSTEAD MAINTAINS A PRIVATE WELL, EPA MAY WORK WITH THE CCHD TO DEVELOP INSTITUTIONAL CONTROLS TO REQUIRE PERIODIC MONITORING OF THE PRIVATE WELL WATER BY THE OWNER TO DETERMINE THE LEVEL OF SITE CONTAMINANTS. EPA COULD MONITOR THE WELL WATER IF DETERMINED TO BE NECESSARY. THE AGENCY WOULD TAKE EFFORTS TO CLOSE THE WELL IF THE WELL WATER IS DETERMINED TO POSE AN UNACCEPTABLE RISK TO HEALTH OR THE ENVIRONMENT.

THE IDENTIFICATION OF ALL RESIDENTS TO BE OFFERED AN OPPORTUNITY TO CONNECT TO THIS SYSTEM WOULD BE DETERMINED DURING REMEDIAL DESIGN AND COMPLETION OF THE ADDITIONAL HYDROGEOLOGIC INVESTIGATION AS DISCUSSED UNDER AWS4. LIMITED MONITORING OF NEARBY SPRINGS AND RESIDENTIAL WELLS LOCATED OUTSIDE THE WELL SYSTEM CONNECTION AREA ALSO WOULD OCCUR.

THIS ALTERNATIVE COULD MEET ALL OF THE STATUTORY REQUIREMENTS OF CERCLA SECTION 121 IF DESIGNED AND OPERATED PROPERLY. HOWEVER, A SIGNIFICANT CONCERN EXISTS REGARDING THE INABILITY TO ADEQUATELY ENSURE THE EXISTENCE OF A LONG-TERM OPERATOR FOR A NEW WATER SUPPLY SYSTEM. (CERCLA DOES NOT PERMIT EPA TO EXPEND SUPERFUND MONIES TO OPERATE AND MAINTAIN A WATER TREATMENT PLANT.) IN ADDITION, THE TYPE AND COST OF TREATMENT WHICH WOULD BE REQUIRED AT THE GROUNDWATER SUPPLY WELL IS UNCERTAIN AT THIS TIME. BASED ON THE GEOCHEMICAL CHARACTERISTICS OF THE HYDROGEOLOGY OF THE AREA, TREATMENT FOR RADIOACTIVE SUBSTANCES MAY BE NECESSARY IF LEVELS IN THE WELL WATER EXCEED DRINKING WATER STANDARDS.

NOTE 1: UNDER ALTERNATIVE AWS 5, THE CAMPGROUND AND TRAILER PARK LOCATED APPROXIMATELY 3/4 MILE AND 1/2 MILE SOUTHWEST OF THE SITE WOULD NOT RECEIVE PUBLIC WATER DUE TO: (1) THEIR REMOTE LOCATION FROM THE REMAINING AFFECTED RESIDENCES, (2) THE CONSIDERABLE COST (ROUGHLY \$360,000) ASSOCIATED WITH THE EXTENSION OF A WATER LINE SEVERAL THOUSAND FEET TO SERVICE ONLY A FEW RESIDENTS, AND (3) THE LACK OF CONTAMINANTS FOUND IN THEIR WELL WATER TO DATE. INSTEAD, THIS REMEDY WOULD PROVIDE A POINT OF ENTRY SYSTEM WITH APPLICABLE MONITORING, SIMILAR TO THAT WHICH IS CURRENTLY PERFORMED.

GROUNDWATER - UNIT 2 (INTERIM REMEDY)

SCOPE OF GROUNDWATER REMEDY

AS PREVIOUSLY INDICATED, THE REMEDY FOR THIS UNIT IS AN INTERIM MEASURE BASED ON THE LACK OF SUFFICIENT DATA TO PREDICT THE RESPONSE OF THE AQUIFER TO PUMPING AND THEREBY ESTABLISH CLEANUP LEVELS AND TIME FRAMES. THE GOAL OF THE SELECTED INTERIM REMEDY WILL BE THE COLLECTION OF HYDROGEOLOGIC DATA AND COMMENCEMENT OF AN INITIAL PUMP AND TREAT SYSTEM GEARED TOWARD (1) INITIATION OF THE REDUCTION OF GROUNDWATER CONTAMINANT TOXICITY, MOBILITY, AND VOLUME, AND (2) THE COLLECTION OF DATA ON AQUIFER AND CONTAMINANT RESPONSE TO REMEDIATION MEASURES.

THE ULTIMATE GOAL FOR REMEDIATION WILL BE DETERMINED IN A FINAL ROD FOR GROUNDWATER AT THE SITE, WHICH SHALL BE PREPARED AFTER EVALUATING DATA GENERATED DURING THE INTERIM ACTION. EPA ESTIMATES THAT A FINAL ROD WILL BE PREPARED WITHIN FIVE YEARS OF INTERIM REMEDY IMPLEMENTATION. IT IS POSSIBLE THAT SUFFICIENT DATA MAY BE OBTAINED BEFORE THAT TIME TO ENABLE SELECTION OF A FINAL REMEDY. THE INTERIM ACTION WILL CONTINUE UNTIL THE SELECTED FINAL GROUNDWATER REMEDIAL ACTION IS CHOSEN OR IMPLEMENTED. THE EXTRACTION AND TREATMENT OPERATION OF THE INTERIM REMEDY MAY BECOME A MAJOR COMPONENT OF THE FINAL REMEDY.

EPA HAS DECIDED THAT SPECIFICATION OF THE TYPE OF GROUNDWATER TREATMENT TECHNOLOGIES TO BE UTILIZED AT THE SITE IS PREMATURE AT THIS TIME. THE SPECIFIC TYPE OF TECHNOLOGIES WILL BE DETERMINED DURING INTERIM REMEDIAL DESIGN AND ARE EXPECTED TO CONSIST OF CHEMICAL PRECIPITATION AND ONE OR MORE OF THE FOLLOWING: GRANULAR ACTIVATED CARBON (GAC), CHEMICAL OXIDATION, AND AIR STRIPPING WITH POSSIBLE EMISSIONS CONTROLS. DATA PRESENTED IN THE PRELIMINARY FINAL FS INDICATES THAT THE COST OF ALL POSSIBLE COMBINATIONS OF THESE

TECHNOLOGIES WHICH COULD BE UTILIZED AT THE SITE ARE WITHIN THE RANGE OF FIFTEEN PERCENT FROM ONE ALTERNATIVE TO THE NEXT. THE DIFFERENCES AMONG THE ALTERNATIVES PRESENTED BELOW PRIMARILY FOCUS ON THE SCOPE OF THE INTERIM REMEDY IN ADDRESSING ALL OR PORTIONS OF THE CONTAMINANT PLUME.

GWS 1: NO ACTION

ESTIMATED CAPITAL COST: \$0
ESTIMATED ANNUAL O&M COST: \$0
ESTIMATED PRESENT WORTH: \$0
ESTIMATED TIME TO INSTALL/COMPLETE: IMMEDIATE

THE SUPERFUND PROGRAM REQUIRES THAT THE NO ACTION ALTERNATIVE BE EVALUATED FOR EACH SITE UNIT IN ORDER TO ESTABLISH A BASELINE FOR COMPARISON. UNDER THIS ALTERNATIVE, EPA WOULD TAKE NO ACTION AT THE SITE TO ATTEMPT TO CLEANUP THE CONTAMINATED GROUNDWATER. THE CONTAMINATED GROUNDWATER PLUME COULD INCREASE IN VOLUME AND SEVERITY AND MIGHT WELL AFFECT ADDITIONAL RESIDENTIAL WELLS AND MIGRATE TO ECOLOGICAL RECEPTORS. UNLESS AN ALTERNATE WATER SUPPLY IS PROVIDED, RESIDENTS WOULD BE EXPOSED TO VARYING LEVELS OF CONTAMINANTS. AT LEAST INITIALLY, 12 RESIDENTIAL WELLS WILL HAVE CONTAMINANTS IN EXCESS OF MCLS. A FIVE YEAR REVIEW OF THIS ACTION WOULD BE PERFORMED UNDER CERCLA SECTION 121(C) SINCE WASTES WOULD BE LEFT ONSITE ABOVE HEALTH BASED LEVELS.

THIS REMEDY WOULD NOT MEET THE STATUTORY REQUIREMENTS TO PROTECT HUMAN HEALTH OR THE ENVIRONMENT AND DOES NOT SATISFY THE PREFERENCE FOR TREATMENT NOR UTILIZE PERMANENT SOLUTIONS/ALTERNATIVE TECHNOLOGIES WHENEVER PRACTICABLE. SINCE NO ACTION IS TAKEN, ARARS DO NOT APPLY.

GWS 2: ADDITIONAL HYDROGEOLOGIC STUDY/PUMPING WELLS (AT/ADJACENT TO FORMER LAGOONS) WITH GROUNDWATER TREATMENT, STREAM DISCHARGE

ESTIMATED CAPITAL COST: \$1,078,000
ESTIMATED ANNUAL O&M: \$166,700
ESTIMATED PRESENT WORTH: \$2,289,000
ESTIMATED TIME TO
INSTALL/COMPLETE: 2+ YEARS/5+ YEARS

(COSTS ASSUME 5 YEARS OF GROUNDWATER PUMP AND TREAT)

THIS INTERIM ALTERNATIVE INITIALLY CALLS FOR THE COLLECTION OF ADDITIONAL HYDROGEOLOGIC DATA FOLLOWED BY PUMPING AND TREATING FROM THE CONTAMINATED PORTION OF THE AQUIFER DIRECTLY BELOW AND/OR ADJACENT TO THE FORMER LAGOONS.

MONITORING WELLS WOULD FIRST BE INSTALLED AND AQUIFER TESTS CONDUCTED TO BETTER DEFINE SITE HYDROGEOLOGIC CONDITIONS; INCLUDING FLOW PATTERNS, CONTAMINANT EXTENT AND AQUIFER INHOMOGENEITIES. FOLLOWING THIS WORK, AN INTERIM GROUNDWATER REMEDY FOR THE HIGHLY CONTAMINATED PORTION OF THE AQUIFER WOULD BE DESIGNED AND INSTALLED. WELLS WOULD BE LOCATED BELOW OR ADJACENT TO THE SITE AND POSSIBLY IN THE NEARBY BEDROCK FRACTURES WHICH MAY CARRY THE MAJORITY OF CONTAMINATED GROUNDWATER FROM THE SITE. THE INTENT OF THIS CONCEPTUAL DESIGN WOULD BE TO CAPTURE GROUNDWATER MOVING UNDER THE FORMER LAGOON AREA TO LIMIT THE MIGRATION OF CONTAMINANTS IN THE AQUIFER CURRENTLY USED BY NEARBY RESIDENTS. (THE COSTS FOR THIS CONCEPTUAL RECOVERY SYSTEM DESIGN APPEAR IN APPENDIX E OF THE PRELIMINARY FINAL FS AS THE 8 WELL RECOVERY SYSTEM UNDER ALTERNATIVES GW7 AND D1. COSTS FOR ADDITIONAL HYDROGEOLOGIC WORK ARE BASED ON THE GERAGHTY & MILLER PROPOSAL OF DECEMBER 12, 1990.)

THE GROUNDWATER RECOVERY SYSTEM AND HYDROGEOLOGIC CHARACTERIZATION UNDER THIS ALTERNATIVE WOULD NOT ATTEMPT TO GATHER DATA REGARDING, NOR ATTEMPT TO DETERMINE THE POTENTIAL FOR REMEDIATION OF, THE REMAINDER OF THE PLUME. THIS OPTION ASSUMES THAT, AS THE CONTAMINATED UPGRADIENT GROUNDWATER IS CLEANED, CONTAMINATED WATER NEAR RESIDENTIAL WELLS SHOULD IMPROVE IN QUALITY OVER TIME. VERIFICATION OF THIS SCENARIO OR A TIME FRAME FOR THIS IMPROVEMENT CANNOT BE PROVIDED WITH CURRENT HYDROGEOLOGIC DATA.

THE CAPTURED GROUNDWATER WOULD BE PIPED TO AN ONSITE TREATMENT PLANT, SPECIFIC COMPONENTS OF WHICH WILL BE DEVELOPED DURING REMEDIAL DESIGN. THE PLANT IS EXPECTED TO INCLUDE CHEMICAL PRECIPITATION AND ONE OR MORE OF THE FOLLOWING TECHNOLOGIES: AIR STRIPPING, GRANULAR ACTIVATED CARBON ABSORPTION AND CHEMICAL OXIDATION. APPROPRIATE EMISSIONS CONTROLS WILL BE REQUIRED AS NEEDED TO MEET STATE AND FEDERAL AIR EMISSIONS STANDARDS. RESIDUALS GENERATED DURING WATER OR AIR TREATMENT WILL BE DISPOSED OFFSITE OR REGENERATED AS REQUIRED BY REGULATIONS UNDER RCRA AND 25 PA CODE SECTIONS 75.260.1 THROUGH 75.270.4. FOLLOWING TREATMENT, GROUNDWATER IS EXPECTED TO BE DISCHARGED TO INDIAN SPRING RUN LOCATED NORTH OF THE SITE. DISCHARGE WATER WILL BE REQUIRED TO MEET EFFLUENT LIMITATIONS AND WATER QUALITY CRITERIA REQUIREMENTS SET BY THE PENNSYLVANIA DER UNDER 25 PA CODE CHAPTERS 92 AND 93.

THIS ALTERNATIVE, IN CONJUNCTION WITH AN ACTION-ORIENTED REMEDY FOR UNIT 1, WOULD PROVIDE A MEASURE OF PROTECTION TO HUMAN HEALTH AND THE ENVIRONMENT BY BEGINNING TO REDUCE THE TOXICITY, VOLUME, AND MOBILITY OF CONTAMINANTS AND MAY SERVE TO IMPEDE THE FLOW OF CONTAMINANTS TO RESIDENTIAL WELLS AND ECOLOGICAL RECEPTORS. HOWEVER, IT IS NOT INTENDED TO REDUCE CONTAMINANT LEVELS THROUGHOUT THE PLUME AND ITS INTERIM NATURE DOES NOT ENSURE THAT PUMPING AND TREATING WILL CONTINUE UNTIL COMPLETE REMEDIATION. IT WILL RESULT IN THE COLLECTION OF DATA NEEDED TO DETERMINE A FINAL REMEDY ON REMEDIATING ALL OR AT LEAST PORTIONS OF THE AQUIFER. THE REMEDY DOES NOT SET SPECIFIC CLEANUP STANDARDS BUT IT WILL ATTEMPT TO DETERMINE WHETHER OR NOT STATE AND FEDERAL GROUNDWATER STANDARDS CAN BE MET. DUE TO THE REMEDY'S INTERIM NATURE, STATE AND FEDERAL GROUNDWATER, CHEMICAL-SPECIFIC CLEANUP ARARS (I.E., "BACKGROUND" WATER QUALITY FOR THE STATE AND DRINKING WATER STANDARDS OR MCLS FOR FEDERAL) WILL NOT AND NEED NOT BE ATTAINED PER THE ARAR WAIVER PROVISIONS OF SECTION 121(D)(4)(A) OF CERCLA. HOWEVER, ALL REGULATED ACTIVITIES ASSOCIATED WITH THE OPERATION OF THE PUMP AND TREAT SYSTEM WILL COMPLY WITH STATE AND FEDERAL ARARS.

THE REMEDY DOES NOT MEET THE STATUTORY PERMANENCY REQUIREMENT BASED ON ITS INTERIM NATURE. THIS SITUATION IS JUSTIFIED SINCE ADEQUATE DATA IS LACKING TO MAKE A DECISION ON A PERMANENT REMEDY. THE STATUTORY PREFERENCE FOR TREATMENT WILL BE MET.

GWS 3: ADDITIONAL HYDROGEOLOGIC STUDY/PUMPING WELLS (AT/ADJACENT TO AND WITHIN THE PLUME) WITH GROUNDWATER TREATMENT, STREAM DISCHARGE

ESTIMATED CAPITAL COST: \$2,232,000
ESTIMATED ANNUAL O&M: \$284,000
ESTIMATED PRESENT WORTH: \$3,957,000
ESTIMATED TIME TO
INSTALL/COMPLETE: 2+ YEARS/5+ YEARS

(COSTS ASSUME 5 YEARS OF GROUNDWATER PUMP AND TREAT)

THIS INTERIM ALTERNATIVE IS SIMILAR TO OPTION GWS 2 EXCEPT THAT THE INTENT OF BOTH HYDROGEOLOGIC DATA COLLECTION AND THE PUMP AND TREAT SYSTEM IS TO DETERMINE THE POTENTIAL FOR AND FEASIBILITY OF CAPTURING AND TREATING THE ENTIRE CONTAMINATED GROUNDWATER PLUME. MONITORING WELLS WILL ALSO BE PLACED IN AN ATTEMPT TO FURTHER CHARACTERIZE THE PLUME AND TO OBTAIN SUFFICIENT DATA TO DETERMINE THE EXTENT OF SITE-RELATED GROUNDWATER CONTAMINATION. SPECIFICALLY, WELLS WILL BE PLACED TO DETERMINE IF THE SITE (1) IS IMPACTING OR MAY IMPACT GROUNDWATER LOCATED BEYOND THE MAJOR FAULT LOCATED APPROXIMATELY 1/2 MILE SOUTH OF THE SITE AND (2) IS IMPACTING OR MAY IMPACT GROUNDWATER UTILIZED BY RESIDENTS LOCATED NORTH AND NORTHEAST OF THE SITE ALONG TELEGRAPH ROAD, UPPER NORTH SANDY HILL ROAD AND HILL ROAD EAST AND WEST OF NORTH SANDY HILL ROAD.

THIS REMEDY GENERALLY ENTAILS THE INSTALLATION OF SEVERAL RECOVERY AND/OR MONITORING WELLS LOCATED AT A DISTANCE FROM THE SITE TO OBSERVE HOW LARGE PORTIONS OF THE CONTAMINANT PLUME WILL RESPOND TO RECOVERY OPERATIONS AND TO DETERMINE THE PRACTICABILITY OF ADDRESSING THIS ENTIRE PLUME IN A FINAL DECISION FOR THE SITE. (THE ESTIMATED COSTS FOR THIS CONCEPTUAL RECOVERY SYSTEM DESIGN ARE BASED ON THE 47 WELL RECOVERY SYSTEM FOR ALTERNATIVES GW7 AND D1 APPEARING IN APPENDIX E OF THE PRELIMINARY FINAL FS. ESTIMATED COSTS PRESENTED HEREIN ARE LOWER THAN THOSE APPEARING IN THE PRELIMINARY FINAL FS DOCUMENT SINCE EPA BELIEVES THAT THE STATED GOALS OF THIS INTERIM REMEDY DO NOT SUGGEST THE INSTALLATION OF 47 WELLS. A TOTAL OF 15 RECOVERY WELLS WAS USED FOR COSTING PURPOSES FOR THIS INTERIM REMEDY ALTHOUGH THE ACTUAL NUMBER OF WELLS INSTALLED MUST AWAIT THE RESULTS OF THE INITIAL HYDROGEOLOGIC DATA. THE ACTUAL RECOVERY WELL NUMBER MAY BE MORE OR LESS THAN 15. THE COST FOR THE ADDITIONAL HYDROGEOLOGIC WORK REQUIRED IN THIS REMEDY IS BASED ON THE GERAGHTY & MILLER PROPOSAL OF DECEMBER 12, 1990.)

ALTHOUGH INSTALLATION OF RECOVERY AND MONITORING WELLS IS EXPECTED TO OCCUR IN A STAGED APPROACH, THE INTENT OF THE REMEDY IS TO DETERMINE THE PRACTICABILITY OF REMEDIATING THE ENTIRE CONTAMINANT PLUME, NOT SIMPLY THE GROUNDWATER CONTAMINATION NEAREST THE FORMER LAGOONS. IF THE COLLECTION AND EVALUATION OF DATA DURING THE INTERIM REMEDY SUGGESTS TO EPA THAT REMEDIATION OF THE ENTIRE CONTAMINATED PLUME IS IMPRACTICABLE, THE FINAL ROD WILL INDICATE WHICH AREAS OF THE PLUME WILL REQUIRE REMEDIATION AND TO WHAT CONTAMINANT LEVELS REMEDIATION WILL BE ATTEMPTED.

SIMILAR TO AWS 2, AND IN CONJUNCTION WITH AN ACTION-ORIENTED REMEDY FOR UNIT 1, THIS ALTERNATIVE PROVIDES A MEASURE OF PROTECTION TO PUBLIC HEALTH AND THE ENVIRONMENT BY BEGINNING TO REDUCE THE TOXICITY, MOBILITY, AND VOLUME OF CONTAMINANTS AND IT MAY SERVE TO IMPEDE THE FLOW OF CONTAMINANTS TO RESIDENTIAL WELLS AND ECOLOGICAL RECEPTORS. BECAUSE THE SCOPE OF THIS REMEDY IS BROADER THAN AWS 2 IN THAT IT ATTEMPTS TO DETERMINE THE POTENTIAL FOR CLEANUP OF THE ENTIRE CONTAMINATED PLUME, THE EXTENT OF CONTAMINANT REDUCTION SHOULD BE GREATER. THIS REMEDY ALSO DOES NOT SET CLEANUP STANDARDS ALTHOUGH THE ACTION HAS GREATER POTENTIAL FOR DETERMINING WHETHER OR NOT AND AT WHAT COST FEDERAL AND STATE GROUNDWATER STANDARDS CAN BE MET THROUGHOUT THE ENTIRE PLUME. THIS ALTERNATIVE DOES NOT ENSURE THAT PUMPING AND TREATING OF THE AQUIFER WILL CONTINUE UNTIL COMPLETE REMEDIATION BUT IT WILL COLLECT THE INFORMATION NECESSARY TO MAKE A WELL-INFORMED DECISION ON

SUCH ACTION. WAIVER OF GROUNDWATER CLEANUP ARARS IS JUSTIFIED AND WOULD BE INVOKED BASED ON THE INTERIM NATURE OF THE REMEDY AND THE PROVISIONS OF SECTION 121(D)(4)(A) OF CERCLA. ARARS WILL BE ATTAINED FOR ALL REGULATED ACTIVITIES ASSOCIATED WITH THE OPERATION OF THE PUMP AND TREAT SYSTEM.

NOTE: BOTH ALTERNATIVES GWS 2 AND GWS 3 WILL REQUIRE MONITORING OF THE MACROINVERTEBRATE COMMUNITY AT STATIONS 1 AND 2 ON INDIAN SPRING RUN AND STATIONS 5, 6 AND 7 ON BIRCH RUN AS IDENTIFIED IN THE ECOLOGICAL ASSESSMENT PORTION OF THE RI. ALTHOUGH THE POTENTIAL IS CONSIDERED MINIMAL, THIS ACTIVITY WILL BE CONDUCTED TO ENSURE THAT THE PUMPING OF GROUNDWATER DOES NOT RESULT IN HASTENING OF THE MOVEMENT OF GROUNDWATER CONTAMINANTS INTO NEARBY STREAMS. SUCH MONITORING WILL INCLUDE THE EPT RATIO (FOR EPHEMEROPTERA, PLECOPTERA, AND TRICOPTERA) AS FOUND IN EPA'S RAPID BIOASSESSMENT PROTOCOLS FOR USE IN STREAMS AND RIVERS, BENTHIC MACROINVERTEBRATES AND FISH, (EPA/444/4-89-001, MAY 1989). IF THE MONITORING PROGRAM INDICATES A DECLINE IN NUMBERS, DIVERSITY, ABUNDANCE, OR EPT RATIO, CHRONIC TOXICITY TESTING OF SURFACE WATERS AND SEDIMENTS SHOULD BE INCORPORATED. (ADDITIONAL MONITORING REQUIREMENTS FOR THE STREAM SELECTED FOR DISCHARGE OF TREATED GROUNDWATER WILL BE DETERMINED BY THE STATE OF PENNSYLVANIA DURING ISSUANCE OF A NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT.)

AS THE FREQUENCY, DURATION AND SPECIFIC DETAILS OF THE MONITORING PROGRAM WILL BE DETERMINED DURING DESIGN OF THE PUMP AND TREAT SYSTEM, ADEQUATE COST FIGURES CANNOT BE MADE AT THIS TIME AND DO NOT APPEAR IN THE COST FIGURES FOR ALTERNATIVES GWS 2 AND GWS 3. HOWEVER, IT IS ROUGHLY ESTIMATED THAT COSTS OF THE EPT RATIO WORK WILL NOT EXCEED \$10,000 PER YEAR.

#CAA

VIII. COMPARATIVE ANALYSIS OF THE ALTERNATIVES:

EACH OF THE REMEDIAL ALTERNATIVES UNDER BOTH SITE UNITS HAS BEEN EVALUATED WITH RESPECT TO THE NINE EVALUATION CRITERIA IN THE NATIONAL CONTINGENCY PLAN, 40 CFR PART 300.430(E)(9). A DESCRIPTION OF THESE CRITERIA APPEARS IN FIGURE 3. THE ACTUAL EVALUATION OF THE CRITERIA FOR EACH UNIT APPEARS IN TABLES A AND B.

#SR

IX. THE SELECTED REMEDY:

BASED UPON CONSIDERATION OF THE REQUIREMENTS OF CERCLA, THE DETAILED ANALYSIS OF THE ALTERNATIVES, AND PUBLIC COMMENTS, THE REMEDIAL ALTERNATIVES SELECTED FOR IMPLEMENTATION AT THE WILLIAM DICK LAGOONS SITE ARE ALTERNATIVE AWS4, EXTENSION OF THE COATESVILLE WATER LINE W/INSTITUTIONAL CONTROLS AND ALTERNATIVE GWS3, ADDITIONAL HYDROGEOLOGIC STUDY/PUMPING WELLS (AT/ADJACENT TO AND WITHIN THE PLUME) WITH GROUNDWATER TREATMENT, STREAM DISCHARGE.

THE GOAL OF THE SELECTED REMEDY FOR OPERABLE UNIT 1, THE ALTERNATE WATER SUPPLY, IS TO PROVIDE A PROVEN, PROTECTIVE AND PERMANENT WATER SUPPLY FOR THE AFFECTED AND POTENTIALLY AFFECTED RESIDENTS SURROUNDING THE SITE. AN ADDITIONAL GOAL IS TO ATTEMPT TO ADEQUATELY MEET THE STATUTORY PREFERENCES UNDER CERCLA DESCRIBED IN SECTION X OF THIS ROD. THE CHOSEN REMEDY WAS ESPECIALLY SELECTED TO ELIMINATE RISK ASSOCIATED WITH POTENTIAL FUTURE SITE EXPOSURE SCENARIOS.

THE PRIMARY GOAL OF THE CHOSEN REMEDY FOR OPERABLE UNIT 2, GROUNDWATER, IS TO COLLECT THE NECESSARY DATA TO MAKE A FINAL DECISION ON THE FEASIBILITY OF COMPLETE GROUNDWATER RESTORATION AND TO COMMENCE WORK TO REDUCE THE MOBILITY, TOXICITY AND VOLUME OF GROUNDWATER CONTAMINATION. AN ADDITIONAL GOAL OF THE INITIAL HYDROGEOLOGIC STUDY PORTION OF THE REMEDY IS TO DETERMINE WHICH RESIDENTS, BASED ON POTENTIAL GROUNDWATER IMPACT FROM THE SITE, WILL REQUIRE CONNECTION TO THE WATER LINE EXTENSION CHOSEN FOR OPERABLE UNIT 1.

THE COMPONENTS OF EACH REMEDY HAVE BEEN DISCUSSED THROUGHOUT THIS DOCUMENT. A BREAKDOWN OF THE CAPITAL, OPERATION AND MAINTENANCE, AND PRESENT WORTH COSTS ASSOCIATED WITH THE TWO REMEDIES CAN BE FOUND IN TABLES 13 AND 14.

CURRENT DATA GAPS REGARDING THE EXTENT OF THE GROUNDWATER CONTAMINANT PLUME PRECLUDE AN EXACT DELINEATION OF THE WATER LINE CONFIGURATION AND RESIDENTS TO BE SERVICED. THIS INFORMATION WILL BE OBTAINED FOLLOWING COMPLETION OF THE HYDROGEOLOGIC STUDY PLANNED FOR OPERABLE UNIT 2, THE GROUNDWATER REMEDY. THE CURRENT DRAFT PLAN FOR THE HYDROGEOLOGIC STUDY CONSISTS OF THE INSTALLATION OF 10 TO 17 MONITORING WELLS WITH SUBSEQUENT SAMPLING, WATER LEVEL MONITORING, AND AQUIFER TESTING.

ALTHOUGH COST ESTIMATING NEEDS REQUIRED SELECTION OF A SPECIFIC GROUNDWATER TREATMENT TECHNOLOGY (I.E., PUMPING WELLS, IRON PRECIPITATION, AIR STRIPPING WITH EMISSIONS CONTROLS, CHEMICAL OXIDATION, STREAM DISCHARGE), THE ACTUAL TYPE OF TREATMENT WILL BE SELECTED AFTER THE ROD PENDING TREATABILITY STUDIES. THE ACTUAL NUMBER OF RECOVERY WELLS TO BE INSTALLED AND VOLUME OF GROUNDWATER TO BE TREATED WILL BE DETERMINED AFTER THE INITIAL HYDROGEOLOGIC STUDY (FOR COSTING PURPOSES, 15 WELLS WERE SELECTED, PUMPING AT A RATE OF 8

GALLONS PER MINUTE). THE NUMBER OF WELLS MAY BE AUGMENTED DURING THE LIFE OF THE INTERIM REMEDY AS THE WORK IS EXPECTED TO TAKE PLACE IN AN ITERATIVE FASHION, REACTIVE TO CONTINUING DATA COLLECTION EFFORTS.

#SD

X. STATUTORY DETERMINATIONS

SECTION 121 OF CERCLA ESTABLISHES SEVERAL REQUIREMENTS AND PREFERENCES WHEN SELECTING REMEDIAL ACTIONS AT SUPERFUND SITES:

- (1) THE SELECTED REMEDY SHOULD BE PROTECTIVE OF HUMAN HEALTH AND THE ENVIRONMENT;
- (2) IT SHOULD ATTAIN ARARS (OR ADEQUATELY EXPLAIN THE RATIONALE FOR INVOKING A WAIVER);
- (3) IT SHOULD BE COST-EFFECTIVE;
- (4) IT SHOULD UTILIZE PERMANENT SOLUTIONS AND ALTERNATIVE TREATMENT TECHNOLOGIES OR RESOURCE RECOVERY TECHNOLOGIES TO THE MAXIMUM EXTENT PRACTICABLE;
- (5) IT IS PREFERABLE THAT THE REMEDY PERMANENTLY AND SIGNIFICANTLY REDUCE THE TOXICITY, MOBILITY, OR VOLUME OF HAZARDOUS SUBSTANCES.

FOLLOWING IS A DISCUSSION OF HOW THE SELECTED REMEDY FOR EACH UNIT SATISFIES THE ABOVE STATUTORY REQUIREMENTS:

PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT

ALTERNATE WATER SUPPLY - EXTENSION OF THE CITY OF COATESVILLE AUTHORITY (CCA) WATER LINE WITH INSTITUTIONAL CONTROLS WAS SELECTED PRIMARILY TO: (1) ELIMINATE THE CURRENT RISK ASSOCIATED WITH THE USE OF CONTAMINATED GROUNDWATER, AND (2) ELIMINATE THE POTENTIAL FUTURE RISK ASSOCIATED WITH THE MIGRATION OF SITE GROUNDWATER CONTAMINANTS TO RESIDENTIAL WELLS.

THE AGENCY ALSO HAS CHOSEN THE WATER LINE EXTENSION SINCE IT IS A PERMANENT AND REGULATED REMEDY NOT SUBJECT TO THE CONSTANT MONITORING OF INDIVIDUAL HOME WELLS FOR AN UNSPECIFIED PERIOD OF TIME. IT PROVIDES A MORE MANAGEABLE WATER SUPPLY IN THAT THE SPECIFIC TYPES OF CHEMICALS DISPOSED OF AT THE WILLIAM DICK LAGOONS SITE ARE BASICALLY UNKNOWN. SUCH A SCENARIO PRESENTS RISKS ASSOCIATED WITH THE INABILITY, DUE TO ANALYTICAL LIMITATIONS, TO IDENTIFY ALL SITE-RELATED CHEMICALS POTENTIALLY IN GROUNDWATER AND AVAILABLE FOR HUMAN OR ENVIRONMENTAL EXPOSURE. ALTERNATIVE AWS 4 ALSO PREVENTS ANY FUTURE EXPOSURE RISK TO RESIDENTS SHOULD CONTAMINATED GROUNDWATER DIRECTLY BELOW THE SITE MIGRATE TO RESIDENTIAL WELLS. THIS POSSIBILITY IS A SIGNIFICANT CONCERN SINCE:

- (1) GROUNDWATER DIRECTLY BELOW THE SITE PRESENTS RELATIVELY HIGH RISKS (MAXIMUM CARCINOGENIC RISK = $2.0E-02$ OR 2 CANCERS PER 100 INDIVIDUALS EXPOSED, AVERAGE CARCINOGENIC RISK = $1.0E-03$ OR 1 CANCER PER 1000 INDIVIDUALS EXPOSED, MAXIMUM NONCARCINOGENIC HAZARD INDEX = 30, AVERAGE NONCARCINOGENIC HAZARD INDEX = 2 (A HAZARD INDEX ABOVE 1 SUGGESTS THE POTENTIAL FOR TOXIC EFFECTS)), (2) SEVERAL RESIDENTIAL HOMES EXIST WITHIN 500 FEET OF THE SITE AND OVER 70 RESIDENCES ARE WITHIN 1/2 MILE OF THE SITE, (3) DETAILS OF GROUNDWATER CONTAMINANT FLOW, DIRECTION OF GROUNDWATER FLOW, AND THE PROXIMITY OF ELEVATED CONCENTRATIONS OF CONTAMINANTS TO RESIDENTIAL WELLS ARE NOT WELL KNOWN AT THIS POINT, (4) THE TECHNICAL FEASIBILITY OF FULLY REMEDIATING THE GROUNDWATER CONTAMINANT PLUME AT THIS SITE IS QUESTIONABLE DUE TO THE COMPLEX HYDROGEOLOGY OF THE AREA. A DECISION ON WHETHER OR NOT SUCH ACTION CAN OCCUR MAY REQUIRE FIVE YEARS OR MORE OF GROUNDWATER STUDY AND PARTIAL GROUNDWATER PUMPING AND TREATING, AND (5) THE REMEDY SELECTED FOR OPERABLE UNIT 2 WILL REQUIRE THE PUMPING OF GROUNDWATER FROM SEVERAL RECOVERY WELLS. IT IS POSSIBLE THAT THE ACTIVE PUMPING OF THESE WELLS, ALONG WITH THE ACTIVE PUMPING OF SURROUNDING RESIDENTIAL WELLS, COULD RESULT IN THE MIGRATION OF CONTAMINANTS INTO HOME WELLS.

BASED ON THE ASSESSMENT PRESENTED IN APPENDIX B AND DISCUSSED EARLIER IN THE DESCRIPTION OF REMEDIAL ALTERNATIVE AWS4, THE AGENCY ACKNOWLEDGES THAT A CURRENT CARCINOGENIC RISK EXISTS AS A RESULT OF THE PRESENCE OF TRIHALOMETHANES IN THE CCA WATER SUPPLY. IN FACT, THE RISK CURRENTLY POSED BY USE OF CCA WATER, IN COMPARISON TO THE USE OF UNTREATED GROUNDWATER CONTAMINATED WITH SITE-RELATED COMPOUNDS, IS APPROXIMATELY EQUAL. HOWEVER, IT IS IMPORTANT TO NOTE THAT EPA UTILIZED THE STANDARD ASSUMED EXPOSURE PERIOD OF A LIFETIME OR 70 YEARS WHEN CALCULATING THE CARCINOGENIC RISK POSED BY EACH WATER SOURCE. BECAUSE THE AGENCY CURRENTLY IS SCHEDULED TO PROPOSE AND PROMULGATE NEW STANDARDS FOR TRIHALOMETHANES IN 1993 AND 1995, RESPECTIVELY, AND SUCH STANDARDS ARE CURRENTLY EXPECTED TO BE LOWERED, IT IS POSSIBLE THAT CCA WATER USERS WILL NOT BE EXPOSED TO EXISTING TRIHALOMETHANE LEVELS FOR MORE THAN 6 TO 8 YEARS (POSSIBLY LESS IF CCA VOLUNTARILY ACTS TO REDUCE TRIHALOMETHANE LEVELS SOONER). A DECREASE IN THE PERIOD OF EXPOSURE WOULD SERVE TO SUBSTANTIALLY REDUCE THE CARCINOGENIC RISK ASSOCIATED WITH THIS REMEDY.

ALTHOUGH NOT A BASIS FOR UNDERTAKING REMEDIAL ACTION AT THIS SITE, ALTERNATIVE AWS 4 ALSO PROVIDES AN INCIDENTAL BENEFIT IN THAT IT WILL ELIMINATE THE RESIDENTIAL USE OF GROUNDWATER CONTAMINATED WITH NATURALLY OCCURRING RADIOACTIVE SUBSTANCES. BECAUSE SUCH RISK IS SIGNIFICANT, AWS4 WILL INCIDENTALY RESULT IN GREATER PROTECTION OF PUBLIC HEALTH. APPENDIX B DISCUSSES THIS RISK SCENARIO FURTHER.

IT SHOULD BE NOTED THAT THE RISK INCURRED BY CONSUMERS OF BOTH GROUNDWATER AND PUBLIC WATER DOES NOT END WITH THE CONTAMINANTS REFERRED TO ABOVE. THERE ARE MANY ADDITIONAL CHEMICAL AND BACTERIAL WATERBORNE HEALTH THREATS WHICH ARE GENERICALLY ASSOCIATED WITH WATER BODIES AND HAVE LITTLE RELATION TO THE SITE. A REGULATED PUBLIC WATER SUPPLY CAN BEST ADDRESS THE MAJORITY OF THESE POTENTIAL WATERBORNE CONTAMINANTS VIA THE RELATIVELY STRINGENT MONITORING REQUIREMENTS OF OVER 100 SUBSTANCES (BOTH CHEMICAL AND BIOLOGICAL) AS IMPOSED BY THE COMMONWEALTH OF PENNSYLVANIA VIA CHAPTER 109 OF TITLE 25 OF THE PENNSYLVANIA CODE. MANY OF THE SUBSTANCES MONITORED IN A PUBLIC WATER SUPPLY WILL NOT BE ADDRESSED VIA THE CONTINUED USE OF PRIVATE WELLS. ONLY CONTAMINANTS KNOWN TO BE ASSOCIATED WITH THE SITE WILL BE MONITORED. (SEE APPENDIX D FOR A DISCUSSION OF THIS ISSUE AND RELATED MATTERS CONCERNING ALTERNATE WATER OPTIONS.)

SHOULD SUCH MEASURES BE NEEDED, INSTITUTIONAL CONTROLS WILL BE ESTABLISHED, AS LEGALLY AVAILABLE, TO ASSIST IN PROTECTING PUBLIC HEALTH AND THE ENVIRONMENT FROM THE USE OF WELL WATER BY RESIDENTS NOT SELECTED OR NOT CHOOSING TO CONNECT TO THE WATER LINE. (A MORE DETAILED DISCUSSION OF INSTITUTIONAL CONTROLS APPEARS IN SECTION VII. DESCRIPTION OF REMEDIAL ALTERNATIVES)

FINALLY, THERE ARE NO UNACCEPTABLE SHORT-TERM RISKS ASSOCIATED WITH THE IMPLEMENTATION OF THIS REMEDY. NO CROSS MEDIA IMPACTS ARE EXPECTED. IN FACT, THIS REMEDY AVOIDS THE EFFECTS OF POTENTIAL CROSS-MEDIA IMPACTS TO RESIDENTIAL WATER USE THAT MIGHT OCCUR DURING THE IMPLEMENTATION OF PUMP AND TREAT MEASURES UNDER THE UNIT 2 REMEDY.

GROUNDWATER - SELECTED ALTERNATIVE GWS 3 IS AN INTERIM GROUNDWATER REMEDY WHICH WILL BE DESIGNED TO COLLECT SUFFICIENT ADDITIONAL DATA AND COMMENCE AN INITIAL PUMP AND TREAT ACTION TO ENABLE EPA TO MAKE A FINAL DECISION ON GROUNDWATER REMEDIATION WITHIN APPROXIMATELY FIVE YEARS. THIS INTERIM REMEDY, ALTHOUGH NOT INTENDED TO CLEAN GROUNDWATER TO BACKGROUND QUALITY OR RISK-BASED LEVELS, WILL PROVIDE A MEASURE OF PROTECTION BY REDUCING THE MOBILITY, TOXICITY, AND VOLUME OF GROUNDWATER CONTAMINANTS. THE REMEDY MAY RESULT IN A MITIGATION OF CONTAMINANT FLOW TO RESIDENTIAL WELLS ALTHOUGH CONTAINMENT OF THE GROUNDWATER PLUME IS NOT A PRIMARY GOAL OF THIS ACTIVITY.

ANY POTENTIAL UNACCEPTABLE SHORT-TERM RISKS ASSOCIATED WITH THIS REMEDY WILL BE CONTROLLED VIA PROPER IMPLEMENTATION. ANY POTENTIAL CROSS MEDIA EFFECTS, INCLUDING REDUCTION IN THE AVAILABILITY OF RESIDENTIAL WELL WATER OR AUGMENTATION OF CONTAMINANT MIGRATION FROM THE SITE TO PRIVATE WELLS, WILL BE ADDRESSED DURING DESIGN AND OPERATION. POTENTIAL IMPACTS TO STREAM ECOLOGY WILL BE EVALUATED VIA THE MACROINVERTEBRATE MONITORING PROGRAM IDENTIFIED IN THE SELECTED ALTERNATIVE.

COMPLIANCE WITH ARARS

THE FOLLOWING ARARS, EXPRESSED AS CHEMICAL-, LOCATION-, AND ACTION-SPECIFIC (AS WELL AS TO-BE-CONSIDERED MATERIALS), ARE IDENTIFIED FOR THE TWO SELECTED REMEDIES:

ALTERNATE WATER SUPPLY - ALL OF THE ARARS IDENTIFIED FOR THE SELECTED REMEDY FOR THIS UNIT ARE EXPECTED TO BE MET:

(1) CHEMICAL-SPECIFIC

(A) MAXIMUM CONTAMINANT LEVELS (MCLS) AND MONITORING REQUIREMENTS PROMULGATED UNDER THE SAFE DRINKING WATER ACT (SDWA), 40 CFR PARTS 141 AND 143 ARE APPLICABLE TO THE WATER TO BE SUPPLIED TO THE RESIDENTS SINCE THE CHOSEN REMEDY OBTAINS WATER FROM A REGULATED PUBLIC WATER SUPPLY;

(B) PENNSYLVANIA STATE LAW REQUIREMENTS ESTABLISHED IN 25 PA CODE CHAPTER 109 ARE APPLICABLE AS THEY APPLY TO STANDARDS SET FOR DRINKING WATER SYSTEMS AND DRINKING WATER QUALITY.

(2) ACTION-SPECIFIC

(A) 25 PA CODE CHAPTER 102 REQUIREMENTS CONCERNING THE CONTROL OF SOIL EROSION AND SEDIMENTATION FROM EARTH-MOVING ACTIVITIES ARE APPLICABLE;

(B) OSHA STANDARDS FOR WORKER PROTECTION, 29 CFR PARTS 1904, 1910, AND 1926 ARE APPLICABLE.

(3) LOCATION-SPECIFIC

(A) DEPENDING ON THE LOCATION OF THE PROPOSED WATER TANK, 40 CFR PART 6, APPENDIX A AS IT PERTAINS TO PROVISIONS FOR CARRYING OUT EXECUTIVE ORDER 11990 (PROTECTION OF WETLANDS) MAY BE APPLICABLE.

(4) TO-BE-CONSIDERED MATERIAL:

(A) SECTION 501.14 OF THE RULES AND REGULATIONS OF THE CHESTER COUNTY HEALTH DEPARTMENT (CCHD) REQUIRES THAT NO INDIVIDUAL WATER SUPPLY WELL BE USED, CONSTRUCTED OR MAINTAINED WHERE A PUBLIC WATER SUPPLY PIPE IS WITHIN 150 FEET OF THE STRUCTURE TO BE SERVED BY WATER. SECTION 501.13.2.3.3. OF THE CCHD RULES AND REGULATIONS GRANTS CCHD THE AUTHORITY TO REQUIRE NEW WELL DRILLERS TO ANALYZE WELL WATER FOR HARMFUL SUBSTANCES WHICH THE CCHD SUSPECTS ARE PRESENT. THE CCHD INTERPRETS SECTION 501.3.1 OF THE CCHD RULES AND REGULATIONS TO REQUIRE THAT ALL RESIDENTS CONNECTING TO A PUBLIC WATER SUPPLY MUST "ABANDON" THEIR PRIVATE WELL. ABANDONMENT OF A WELL REQUIRES FILLING AND SEALING OF THE WELL AS DEFINED IN SECTION 501.9 OF THE CCHD RULES AND REGULATIONS. DEPENDING ON THE CONFIGURATION OF THE WATER LINE AND/OR THE DEVELOPMENT OF NEW HOUSING WITHIN THE SITE AREA, THESE REQUIREMENTS WOULD BE APPLICABLE.

(B) PAGE 3-13 OF THE GUIDANCE DOCUMENT FOR PROVIDING ALTERNATE WATER SUPPLIES, OSWER DIRECTIVE 9355.3-03, EPA/540/6-87/006, FEBRUARY 1988, STRONGLY ENCOURAGES CONNECTION TO EXISTING WATER SUPPLIES WHEN CONSIDERING ACTIONS FOR ALTERNATE WATER SUPPLY PROVISION. THE SELECTED REMEDY FOLLOWS THIS RECOMMENDATION.

GROUNDWATER - THE FOLLOWING IDENTIFIED ARARS FOR THE CHOSEN REMEDY GWS 3 ARE DESCRIBED IN TERMS OF COMPLIANCE CAPABILITY:

1) CHEMICAL-SPECIFIC

(A) MCLS PROMULGATED UNDER SDWA 40 CFR SECTIONS 141 AND 143 ARE RELEVANT AND APPROPRIATE IN TERMS OF ATTAINING THESE CRITERIA TO RESTORE THE CLASS II AQUIFER TO ITS BENEFICIAL USE AS A DRINKING WATER SOURCE:

(B) 25 PA CODE SECTIONS 75.264.90 - 75.264.100, PARTICULARLY 25 PA CODE SECTIONS 75.264.97(I),(J) AND 75.264.100(A)(9), MAINTAIN THAT ALL GROUNDWATER CONTAINING HAZARDOUS SUBSTANCES MUST BE RESTORED TO "BACKGROUND" QUALITY. EPA RECOGNIZES THIS REQUIREMENT AS AN ARAR FOR REMEDIATION OF GROUNDWATER AT SUPERFUND SITES.

NOTE: EPA IS WAIVING THE REQUIREMENT TO COMPLY WITH THE ABOVE TWO ARARS BASED ON THE INTERIM NATURE OF THE SELECTED REMEDY, IN ACCORDANCE WITH CERCLA SECTION 121(D)(4)(A). THIS INTERIM REMEDY WILL ATTEMPT TO OBTAIN SUFFICIENT DATA TO SUPPORT SELECTION OF A REMEDY MEETING ALL ARARS IN A SUBSEQUENT ROD.

ALL OF THE REMAINING ARARS FOR THIS REMEDY ARE EXPECTED TO BE COMPLIED WITH:

2) ACTION-SPECIFIC

(A) SINCE THE SITE GROUNDWATER IS CONTAMINATED BY THE LEACHING OF RCRA-LISTED WASTE, THE GROUNDWATER TREATMENT PLANT WILL BE DESIGNED AND OPERATED IN ACCORDANCE WITH RELEVANT AND APPROPRIATE RCRA SUBTITLE C MISCELLANEOUS TREATMENT UNIT STANDARDS (40 CFR SECTION 264, SUBPART X) AND/OR TANK SYSTEM STANDARDS (40 CFR PART 264, SUBPART J), AS APPROPRIATE. THE GROUNDWATER WILL BE MANAGED IN ACCORDANCE WITH THE

"CONTAINED-IN INTERPRETATION" (EPA OSW MEMORANDUM OF NOVEMBER 13, 1986, M. WILLIAMS, DIRECTOR OF OFFICE OF SOLID WASTE TO P. TOBIN, DIRECTOR OF WASTE MANAGEMENT DIVISION, REGION 4);

(B) THE POTENTIAL USE OF A CARBON ADSORPTION SYSTEM TO TREAT GROUNDWATER AND/OR EMISSIONS FROM AIR STRIPPING PROCESSES WILL RESULT IN THE GENERATION OF SPENT CARBON OR LIQUID REGENERATION WASTE. THESE WASTES ARE EXPECTED TO BE CHARACTERISTIC WASTES UNDER RCRA AS WELL AS LISTED RCRA WASTES AS A RESULT OF THE DERIVED-FROM RULE FOUND AT 40 CFR 261.3(C)(2). THESE WASTES WILL REQUIRE TREATMENT AND/OR DISPOSAL. THE FOLLOWING ARARS ARE THEREFORE APPLICABLE:

RCRA SUBTITLE C 40 CFR PART 261 FOR THE LISTING AND IDENTIFICATION OF CHARACTERISTIC HAZARDOUS WASTES. RCRA SUBTITLE C 40 CFR PARTS 262 AND 263 AND DEPARTMENT OF TRANSPORTATION REGULATIONS AT 49 CFR PARTS 171-179 FOR THE GENERATION AND TRANSPORTATION OF HAZARDOUS WASTES. RCRA SUBTITLE C 40 CFR PART 264 FOR THE MANAGEMENT OF HAZARDOUS WASTES. RCRA SUBPART C 40 CFR PART 268 WHICH ESTABLISHES LAND DISPOSAL RESTRICTIONS FOR THE MANAGEMENT OF HAZARDOUS WASTE.

25 PA CODE SECTIONS 75.259 THROUGH 75.270.42 WHICH ESTABLISH STATE REQUIREMENTS FOR THE GENERATION, TRANSPORTATION, STORAGE AND TREATMENT OF HAZARDOUS WASTES ARE ALSO APPLICABLE. SPECIFICALLY, 25 PA CODE SECTION 75.262 REQUIREMENTS FOR GENERATORS OF HAZARDOUS WASTES, 25 PA CODE SECTION 75.263 REQUIREMENTS FOR THE TRANSPORTATION OF HAZARDOUS WASTES, AND 25 PA CODE SECTION 75.264 REQUIREMENTS FOR THE TREATMENT, STORAGE AND DISPOSAL OF HAZARDOUS WASTES.

(C) USE OF CHEMICAL PRECIPITATION TO REMOVE IRON AND MANGANESE IS EXPECTED TO RESULT IN THE GENERATION OF NON-HAZARDOUS SLUDGES REQUIRING STORAGE, TRANSPORTATION AND DISPOSAL. THE FOLLOWING ARAR IS THEREFORE APPLICABLE:

25 PA CODE CHAPTER 299 SETS FORTH PROVISIONS FOR THE COLLECTION, STORAGE AND TRANSPORTATION OF RESIDUAL WASTE. DEPENDENT ON THE TYPE OF DISPOSAL CHOSEN, ONE OR MORE OF THE FOLLOWING APPLY: 25 PA CODE CHAPTERS 287, 288, 289, 291 AND 297.

IF THE IRON AND MANGANESE SLUDGE SHOULD FAIL THE TOXICITY CHARACTERISTIC LEACHING PROCEDURE (TCLP) TEST ESTABLISHED UNDER 40 CFR SECTION 261.3, REQUIREMENTS FOR THE GENERATION, STORAGE, TRANSPORTATION AND DISPOSAL OF THE SLUDGE UNDER 40 CFR SECTIONS 262-264 THE LAND DISPOSAL RESTRICTIONS OF SECTION 268 WOULD BE APPLICABLE. IN ADDITION, 25 PA CODE SECTIONS 75.259 THROUGH 75.270.42, ESTABLISHING REQUIREMENTS FOR THE GENERATION, STORAGE, TRANSPORTATION AND TREATMENT OF HAZARDOUS WASTES, ALSO WOULD BE APPLICABLE. SPECIFICALLY, 25 PA CODE SECTION 75.262 REQUIREMENTS FOR GENERATORS OF HAZARDOUS WASTES, 25 PA CODE SECTION 75.263 REQUIREMENTS FOR THE TRANSPORTATION OF HAZARDOUS WASTES, AND 25 PA CODE SECTION 75.264 REQUIREMENTS FOR THE TREATMENT, STORAGE AND DISPOSAL OF HAZARDOUS WASTES.

(D) THE PENNSYLVANIA NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) REQUIREMENTS ESTABLISHED UNDER 25 PA CODE CHAPTER 92, THE PENNSYLVANIA WATER QUALITY CRITERIA ESTABLISHED UNDER 25 PA CODE CHAPTER 93, AND THE WASTEWATER TREATMENT REQUIREMENTS FOR ALL DISCHARGERS UNDER 25 PA CODE CHAPTER 95 ARE APPLICABLE FOR THE DISCHARGE OF TREATED GROUNDWATER TO INDIAN SPRING RUN (OR OTHER APPROPRIATE LOCAL STREAM.) INDIAN SPRING RUN IS CLASSIFIED BY PADER AS A COLD WATER FISHERY. IT IS NOT CERTAIN, AT THIS POINT, IF THE DISCHARGE WILL OCCUR "OFFSITE" OR "ONSITE";

(E) 25 PA CODE CHAPTER 102 REQUIREMENTS CONCERNING THE CONTROL OF SOIL EROSION AND SEDIMENTATION FROM EARTH-MOVING ACTIVITIES ARE APPLICABLE DURING THE CONSTRUCTION OF TREATMENT FACILITIES;

(F) THE FISH AND WILDLIFE COORDINATION ACT (16 USC SECTION 661, ET SEQ.)

SETS REQUIREMENTS TO PROTECT FISH AND WILDLIFE AS A RESULT OF CONTROL OR STRUCTURAL MODIFICATION OF A NATURAL STREAM OR WATER BODY. THIS LAW IS APPLICABLE TO THE PROPOSED DISCHARGE OF TREATED GROUNDWATER TO INDIAN SPRING RUN;

(G) THE FOLLOWING ARARS APPLY FOR AIR EMISSIONS FROM GROUNDWATER TREATMENT UNITS:

- * NATIONAL AMBIENT AIR QUALITY STANDARDS (NAAQS) UNDER THE CLEAN AIR ACT (40 CFR PART 50) FOR THE RELEASE OF VOLATILE ORGANIC EMISSIONS FROM THE AIR STRIPPERS (THE SITE LIES WITHIN AN OZONE NON-ATTAINMENT AREA);
- * RCRA SUBTITLE C 40 CFR SECTION 264 SUBPARTS AA AND BB FOR THE RELEASE OF EMISSIONS FROM TREATMENT UNITS;
- * 25 PA CODE SECTION 127.1 REQUIRES CONTROL OF THE EMISSIONS TO THE MAXIMUM EXTENT PRACTICABLE AND CONSISTENT WITH THE BEST AVAILABLE TECHNOLOGY, UNLESS FOUND TO BE EXEMPT UNDER 25 PA CODE SECTION 127.14. IN ADDITION, 25 PA CODE SECTION 127.11 REQUIRES PLAN APPROVAL BY THE DEPARTMENT OF ENVIRONMENTAL RESOURCES.
- * ALL AIR CONTAMINATION SOURCES MUST COMPLY WITH THE EMISSION LIMITATIONS, WORK PRACTICES, AND OTHER APPLICABLE REQUIREMENTS CONTAINED IN 25 PA CODE CHAPTERS 121, 122, 123, 124, 129, AND 135, SPECIFICALLY SECTION 123.31 WHICH PROHIBITS MALODORS FROM CROSSING THE PROPERTY LINE AND SECTION 123.41 WHICH PROHIBITS VISIBLE EMISSIONS BEYOND A PRESCRIBED LEVEL;

(H) OSHA STANDARDS FOR WORKER PROTECTION, 29 CFR PARTS 1904, 1910, AND 1926, AND THE REQUIREMENTS OF 40 CFR SECTION 300.150 ARE APPLICABLE.

3) LOCATION SPECIFIC

(A) 40 CFR SECTION 6.302 CALLS FOR ACTION TO AVOID ADVERSE AFFECTS, MINIMIZE POTENTIAL HARM, AND PRESERVE AND ENHANCE WETLANDS TO THE EXTENT POSSIBLE. 25 PA CODE CHAPTER 105 SETS FORTH PROVISIONS FOR THE REGULATION AND SUPERVISION OF DAMS, RESERVOIRS, WATER OBSTRUCTIONS, ENCROACHMENTS, AND WETLANDS. THESE ARARS ARE APPLICABLE TO THE DISCHARGE POINT FOR TREATED GROUNDWATER DUE TO THE PRESENCE OF FRINGE, FORESTED WETLANDS.

(B) SECTION 404 OF THE CLEAN WATER ACT (40 CFR PART 230) ESTABLISHES REQUIREMENTS REGARDING THE DISCHARGE OF DREDGE AND FILL MATERIAL INTO WETLANDS. IT IS RELEVANT AND APPROPRIATE TO THE CONSTRUCTION AND BEDDING OF A TREATED GROUNDWATER DISCHARGE PIPE IF IT TRAVERSES THE FRINGE WETLANDS TO THE RECEIVING STREAM.

(C) EXECUTIVE ORDER 11990 (PROTECTION OF WETLANDS) WHICH CALLS FOR ACTION TO PROTECT AND PRESERVE WETLANDS TO THE EXTENT PRACTICABLE IS APPLICABLE.

4) TO-BE-CONSIDERED (TBC) MATERIAL:

(A) SUBSTANTIVE REQUIREMENTS FOR WELL DRILLING, GROUNDWATER PUMP TESTS AND DISCHARGES AS FOUND IN THE PENNSYLVANIA DER'S BUREAU OF WATER QUALITY MANAGEMENT ARARS DOCUMENT ARE EXPECTED TO BE COMPLIED WITH.

(B) EPA'S GROUNDWATER PROTECTION STRATEGY (AUGUST 1984) WAS CREATED TO PROTECT GROUNDWATERS FOR THEIR HIGHEST CURRENT OR POTENTIAL FORM OF USE. SINCE THE AQUIFER AT THE WILLIAM DICK LAGOONS SITE IS CLASSIFIED AS A CLASS II GROUNDWATER, THE STRATEGY RECOMMENDS CLEANUP TO BACKGROUND OR DRINKING WATER LEVELS. THIS TBC WILL NOT BE COMPLIED WITH UNDER THE

SCOPE OF THIS INTERIM REMEDY. HOWEVER, THE REMEDY IS DESIGNED TO ULTIMATELY DETERMINE THE TECHNICAL FEASIBILITY OF RETURNING THE GROUNDWATER TO ITS INTENDED USE.

(C) THE INTENT OF RECOMMENDATION 1 IN OSWER DIRECTIVE 9355.4-03, CONSIDERATIONS IN GROUNDWATER REMEDIATION AT SUPERFUND SITES, OCTOBER 18, 1989, HAS BEEN FOLLOWED VIA SELECTION OF THE INTERIM REMEDY FOR GROUNDWATER IN THIS ROD.

(D) THE "OFF-SITE POLICY", REVISED PROCEDURES FOR PLANNING AND IMPLEMENTING OFF-SITE RESPONSE ACTIONS, OSWER DIRECTIVE 9834.11, NOVEMBER 13, 1987, IS EXPECTED TO BE ADHERED TO WHEN DISPOSING OF WASTES GENERATED DURING THE REMEDIAL ACTION.

COST EFFECTIVENESS

EPA BELIEVES THAT THE TWO SELECTED REMEDIES ARE COST EFFECTIVE IN THAT THEY PROVIDE OVERALL EFFECTIVENESS IN PROPORTION TO THEIR COSTS. ALTHOUGH EACH REMEDY IS THE HIGHEST IN COST OF THE ASSOCIATED ALTERNATIVES EVALUATED, THE AGENCY BELIEVES THAT THE CHOSEN REMEDIES PROVIDE THE BEST BALANCE OF TRADEOFFS AMONG ALL NINE EVALUATION CRITERIA. THE PERMANENCY AND REGULATED STATUS OF THE SELECTED ALTERNATIVE FOR UNIT 1 WAS REGARDED AS AN IMPORTANT FACTOR IN ITS SELECTION OVER OTHER ALTERNATIVES. SELECTION OF THE UNIT 2 REMEDY WAS PRIMARILY BASED ON ITS STATED GOAL OF GATHERING DATA AND COMMENCING REMEDIAL OPERATIONS TO ULTIMATELY DETERMINE THE POTENTIAL FOR TOTAL CONTAMINANT PLUME REMEDIATION (PER THE INTENT OF SECTION 121 OF CERCLA).

THE ESTIMATED PRESENT WORTH COSTS ASSOCIATED WITH EPA'S WATER SUPPLY SELECTION ARE ROUGHLY \$1.3 TO \$2 MILLION IN EXCESS OF THE POINT-OF-ENTRY SYSTEM REMEDY STRONGLY RECOMMENDED BY A SITE RESPONSIBLE PARTY. THE AGENCY BELIEVES THESE ADDED COSTS ARE WARRANTED WHEN CONSIDERING THE EXTENSIVE OVERSIGHT AND MONITORING WHICH WOULD BE NEEDED FOR 30+ YEARS OF INDIVIDUAL POINT-OF-ENTRY SYSTEM USE. IN ADDITION, THE POTENTIAL FOR HUMAN ERROR AND NEGLIGENCE UNDER SUCH A SCENARIO IS AN UNQUANTIFIED COST WHICH THE AGENCY CHOOSES NOT TO IGNORE.

REGARDING CONTAMINATED GROUNDWATER, THE RESPONSIBLE PARTY RECOMMENDED THE CONTINUATION OF FURTHER STUDY. ALTHOUGH THE AGENCY DECISION FOR UNIT 2 ALSO INCLUDES ADDITIONAL STUDY, IT PROVIDES FOR IMMEDIATE FOLLOW-UP BY AN ACTIVE PUMP AND TREAT SYSTEM WHICH WILL BEGIN PARTIAL GROUNDWATER CLEANUP AND PROVIDE ADEQUATE DATA TO DETERMINE THE BEST MEANS OF REMEDIATING THE ENTIRE CONTAMINANT PLUME. SUCH ACTION IS CONSISTENT WITH RECENT EPA GUIDANCE ON GROUNDWATER REMEDIATION EFFORTS (SEE CONSIDERATIONS IN GROUNDWATER REMEDIATION AT SUPERFUND SITES, OSWER DIRECTIVE 9355.4-03, OCTOBER 18, 1989) AS WELL AS THE GOAL OF CERCLA TO EXPEDITIOUSLY COMMENCE THE CLEANUP OF SUPERFUND SITES NATIONWIDE. THE DIFFERENCE IN COST BETWEEN THE RESPONSIBLE PARTY'S PROPOSAL TO CONTINUE FURTHER STUDY AND THE EPA DECISION IS ESTIMATED AT APPROXIMATELY \$3.3 MILLION. AS STATED ABOVE, THE AGENCY BELIEVES THIS ADDITIONAL COST IS JUSTIFIED.

AS A COMPARISON TO WHAT THE REMEDY MAY HAVE COST, THE AGENCY ORIGINALLY CONSIDERED MAKING A FINAL GROUNDWATER DECISION FOR THE SITE WHICH WAS ESTIMATED TO REQUIRE 55 PUMPING WELLS AT A PRESENT WORTH COST OF FROM \$6.8 TO \$8.2 MILLION. THIS DECISION WOULD HAVE ATTEMPTED TO REMEDIATE THE ENTIRE GROUNDWATER PLUME IN ACCORDANCE WITH THE INTENT OF CERCLA TO RESTORE GROUNDWATER TO ITS ORIGINAL USE. HOWEVER, EPA CHOSE NOT TO CONSIDER NOR SELECT THIS OPTION SINCE IT WAS DETERMINED THAT DATA GAPS REGARDING SITE HYDROGEOLOGY PRECLUDED CONSIDERATION OF SUCH AN APPROACH AT THIS TIME. THE COST ESTIMATE FOR SUCH A REMEDY AND THE TIME ESTIMATE FOR GROUNDWATER RESTORATION WOULD HAVE BEEN EXTREMELY SPECULATIVE.

PREFERENCE FOR TREATMENT AS A PRINCIPAL ELEMENT

THE SELECTED REMEDY FOR THE WATER SUPPLY ALTERNATIVE DOES NOT ENTAIL TREATMENT OF THE CONTAMINATED WATER; SUCH ACTION WILL BEST BE ADDRESSED VIA THE INTERIM AND FINAL REMEDIES FOR THE GROUNDWATER UNIT. THE REMEDY INCLUDES THE PROVISION OF A SOURCE OF WATER UNAFFECTED BY THE SITE, WHICH THE AGENCY BELIEVES IS A MORE EFFECTIVE REMEDY THAN INDIVIDUAL HOUSEHOLD TREATMENT. THE UNSELECTED ALTERNATIVE OF POINT-OF-ENTRY SYSTEMS AT EACH AFFECTED HOUSEHOLD WOULD ENTAIL TREATMENT, BUT AT A LOCATION AND MANNER WHICH POSES SIGNIFICANT QUESTIONS REGARDING LONG TERM OPERATION AND MANAGEMENT.

THE SELECTED REMEDY FOR THE GROUNDWATER UNIT SATISFIES THE PREFERENCE FOR TREATMENT IN THAT A PUMP AND TREAT OPERATION WILL COMMENCE IN THE MID- TO LATER PHASE OF THIS REMEDY. THE INTERIM NATURE OF THE REMEDY DOES NOT ENSURE THAT TREATMENT OF THE ENTIRE GROUNDWATER PLUME WILL BE PERFORMED, BUT IT WILL ASSIST IN ACHIEVING THIS GOAL IN A FINAL ROD, IF DETERMINED TO BE TECHNICALLY FEASIBLE.

UTILIZATION OF PERMANENT SOLUTIONS AND ALTERNATIVE TREATMENT TECHNOLOGIES TO THE MAXIMUM EXTENT PRACTICABLE

EPA HAS DETERMINED THAT THE SELECTED REMEDIES REPRESENT THE MAXIMUM EXTENT TO WHICH PERMANENT SOLUTIONS AND ALTERNATIVE TREATMENT TECHNOLOGIES CAN BE UTILIZED WHILE PROVIDING THE BEST BALANCE AMONG THE EVALUATION CRITERIA. THE NATURE OF THE ENVIRONMENTAL PROBLEMS TO BE ADDRESSED SERVE TO LIMIT THE ABILITY TO SELECT FROM NUMEROUS ALTERNATIVE TREATMENT TECHNOLOGIES IN THIS CASE. HOWEVER, IT IS POSSIBLE THAT THE TREATMENT SCHEME CHOSEN DURING DESIGN TO CLEANSE GROUNDWATER MAY INCLUDE THE USE OF AN ALTERNATIVE TREATMENT TECHNOLOGY.

A MAJOR REASON FOR EPA'S SELECTION OF THE COATESVILLE WATER LINE AS THE CHOSEN ALTERNATE WATER SUPPLY IS ITS STATUS AS A REGULATED, PERMANENT WATER SOURCE. EXTENSION OF PUBLIC WATER WILL ELIMINATE THE NEED, UNDER THE POINT-OF-ENTRY SCENARIO, FOR EXTENSIVE AND RIGOROUS MONITORING (I.E., SAMPLING AND ANALYSES) OF QUESTIONABLE EFFECTIVENESS FOR MORE THAN 100 RESIDENTIAL WELLS OVER AN UNKNOWN PERIOD OF TIME. (THE 100 RESIDENCES INCLUDES BOTH THOSE PROVIDED WITH POINT-OF-ENTRY SYSTEMS AND THOSE RESIDING IN THE PLUME WHO MUST CONTINUALLY HAVE THE WELL MONITORED.) CONCERNS REGARDING THE IDENTITY OF THE COMPANY OR REGULATORY AUTHORITY TO OPERATE AND MAINTAIN THE SYSTEMS, AS WELL AS MANAGE THE MONITORING PROGRAM, ALSO WILL BE ELIMINATED. THE LINE EXTENSION WOULD ELIMINATE THE NEED TO REPLACE HOME TREATMENT UNITS EVERY ONE TO THREE YEARS. IT IS PREFERRED OVER THE PRIVATE WATER COMPANY SINCE ALL FUTURE OPERATION AND MAINTENANCE CAN BE ADDRESSED BY AN EXISTING OPERATOR, ITS PERMANENCY IS PRACTICALLY ASSURED, AND THE MINIMAL ADDITIONAL RESIDUAL WASTE GENERATED AS A RESULT OF PROCESSING A SLIGHTLY LARGER QUANTITY OF WATER CAN EASILY BE ASSIMILATED BY THE EXISTING TREATMENT PLANT.

AS PREVIOUSLY DISCUSSED, ALTHOUGH THE WATER LINE OPTION WILL EXCLUDE THE RISK PRESENTED BY THE POTENTIAL MIGRATION OF SITE-RELATED GROUNDWATER CONTAMINANTS TO RESIDENTIAL WELLS, IT PRESENTS AN EXPECTED SHORT PERIOD OF CARCINOGENIC RISK ASSOCIATED WITH TRIHALOMETHANES IN THE CITY WATER SUPPLY. THIS OPTION CONTINUES TO BE PREFERRED, HOWEVER, BASED ON:

(1) THE PERMANENCE OF THE WATER SUPPLY AND ITS COMPLIANCE WITH STATE AND FEDERAL STANDARDS;

(2) THE GENERALLY LOWER CARCINOGENIC RISK POSED BY THE USE OF CITY WATER WHEN COMPARED TO THE POTENTIAL FUTURE RISK POSED BY MIGRATION OF SITE CONTAMINATED GROUNDWATER TO RESIDENTIAL WELLS (SEE THE DISCUSSION UNDER SECTION X. STATUTORY DETERMINATIONS - PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT);

(3) CONCERNS REGARDING THE UNKNOWN MATERIALS DISPOSED OF AT THE SITE AS IT INVOLVES THE POTENTIAL LEACHING OF THESE CHEMICALS TO GROUNDWATER. SAMPLING OF HOME WELLS UNDER THE POINT-OF-ENTRY SCENARIO CANNOT ADEQUATELY ADDRESS UNKNOWN CHEMICALS;

(4) EPA'S INTENT TO OFFICIALLY REVISE THE DRINKING WATER STANDARD FOR TRIHALOMETHANES IN 1995. CURRENT INDICATIONS ARE THAT THE AGENCY WILL REDUCE THE PERMISSIBLE CONCENTRATION OF TRIHALOMETHANES IN PUBLIC WATER SUPPLIES;

(5) SEVERAL ISSUES RAISED REGARDING THE EFFECTIVENESS OF POINT-OF-ENTRY SYSTEMS, INCLUDING:

(A) PUBLISHED REPORTS THAT BACTERIA BUILDUP IN GAC SYSTEMS ARE A POTENTIAL HEALTH PROBLEM. THESE REPORTS SUGGEST ADDITIONAL MONITORING OF THE SYSTEMS FOR BACTERIA OR, IF NECESSARY, THE PLACEMENT OF UV LIGHTS AFTER THE INSTALLED SYSTEM. IF ENACTED, SUCH ACTION WOULD ADD TO BOTH THE OVERSIGHT AND OPERATION AND MAINTENANCE BURDEN;

(B) CONCERNS RAISED BY AN EPA RESEARCHER THAT BACKWASH WATER ASSOCIATED WITH SYSTEM OPERATION MAY CONTAIN CONTAMINANTS. BACKWASH WATER IS ROUTINELY DISCHARGED TO SEPTIC SYSTEMS AND CAN ULTIMATELY LEACH DOWN TO GROUNDWATER. AGAIN, MONITORING OF THIS WATER MAY BE NECESSARY AS A MINIMUM MEASURE. THE SAME RESEARCHER EXPRESSED CONCERNS THAT SYSTEMS UNDERGOING BACKWASH MAY RESULT IN RECONFIGURATION OF UNIT CARBON, THUS MAKING CONTAMINANT BREAKTHROUGH TO WATER CONSUMERS MORE LIKELY AND RATHER UNPREDICTABLE FOR MONITORING TO DETECT.

(C) CONCERNS REGARDING THE PERMANENCY AND RELIABILITY OF THE

ENTITY RESPONSIBLE FOR OPERATION AND MAINTENANCE OF THE UNITS OVER A POTENTIAL 30+ YEAR TIME FRAME.

(7) SINCE A PUMP AND TREAT REMEDY HAS BEEN PROPOSED FOR OPERABLE UNIT 2, THE POTENTIAL EXISTS FOR MIGRATION OF CONTAMINANTS TO HOME WELLS AS A RESULT OF THE CONCOMITANT PUMPING OF REMEDIAL ACTION RECOVERY WELLS AND RESIDENTIAL WELLS IN A RATHER COMPLEX AND SOMEWHAT POORLY UNDERSTOOD HYDROGEOLOGIC SYSTEM.

(8) THE FOLLOWING INCIDENTAL BENEFITS: (A) THE SIGNIFICANT CARCINOGENIC RISK ASSOCIATED WITH THE PRESENCE OF NATURALLY OCCURRING RADIOACTIVE SUBSTANCES IN PRIVATE WELL WATER WILL BE ELIMINATED AND, (B) THE WATER SUPPLY OF CONNECTED RESIDENCES WILL BE MONITORED FOR OVER 100 CONTAMINANTS, SOME UNRELATED TO THE SITE. THIS RELATIVELY LARGE SCALE PROTECTIVE MEASURE WILL NOT OCCUR UNDER THE POINT-OF-ENTRY MONITORING PROGRAM.

REGARDING GROUNDWATER REMEDIATION, THE TWO ACTION-ORIENTED ALTERNATIVES MERELY DIFFER IN THE SCOPE OF THE ACTION TO BE IMPLEMENTED. WHERE ALTERNATIVE GW2 MERELY ATTEMPTS TO DETERMINE IF THE MOST CONTAMINATED PORTION OF THE AQUIFER NEAREST THE FORMER LAGOONS CAN BE REMEDIATED, THE INTENT OF THE CHOSEN INTERIM REMEDY IS TO COLLECT DATA AND BEGIN ACTIONS NEEDED TO RESTORE THE ENTIRE CONTAMINATED GROUNDWATER AREA. AS STATED, THE PROSPECTS FOR THE PRACTICABILITY OF THIS GOAL ARE UNKNOWN AT THIS TIME AND A FINAL DECISION ON THE SCOPE OF GROUNDWATER REMEDIATION WILL BE MADE AT THE LATTER STAGES OF THIS INTERIM ACTION.

EPA CONSIDERED PROPOSING TOTAL GROUNDWATER REMEDIATION AS A FINAL REMEDY IN THIS DECISION DOCUMENT. ALTHOUGH SUCH A REMEDY IS GENERALLY THE GOAL OF GROUNDWATER CLEANUPS UNDER CERCLA, THE AGENCY REALIZED THAT CURRENT DATA WAS INSUFFICIENT TO PURSUE SUCH AN OPTION AND THAT SUCH A DECISION WOULD BE PREMATURE AT THIS POINT.

AT THE PUBLIC MEETING ON FEBRUARY 14, 1991 ANNOUNCING EPA'S PROPOSED DECISION ON THE SITE, A LARGE MAJORITY OF RESIDENTS EXPRESSED DISSATISFACTION WITH EPA'S PROPOSAL TO EXTEND THE CCA WATER LINE. SEVERAL RESIDENTS INDICATED THAT "THE WATER TASTES BAD" AND EXPRESSED THE OPINION THAT THEY DID NOT MOVE OUT TO THE AREA TO DRINK "CITY" WATER. MOST OF THESE RESIDENTS, HOWEVER, APPEARED TO BE UNHAPPY WITH THE THOUGHT OF PAYING A RELATIVELY HIGH MONTHLY WATER BILL SINCE EPA COULD NOT GUARANTEE THAT AFFECTED RESIDENTS WOULD BE REIMBURSED FOR THE COST OF THEIR WELL INSTALLATION OR HAVE ALL OR A PORTION OF THEIR MONTHLY WATER BILL PAID FOR BY A SITE RESPONSIBLE PARTY.

SINCE EPA WAS UNSURE OF THE OVERALL PUBLIC SENTIMENT AS A RESULT OF THIS MEETING AND AN EARLIER PUBLIC INFORMATIONAL MEETING IN AUGUST 1990, THE AGENCY DECIDED TO CONDUCT A TELEPHONE SURVEY OF RESIDENTS WHOSE WELL WATER WAS KNOWN TO BE IMPACTED BY SITE GROUNDWATER CONTAMINATION. THE TELEPHONE SURVEY WAS CONDUCTED DURING THE WEEK OF FEBRUARY 25 AND REACHED 27 OF 50 RESIDENCES IDENTIFIED FOR CONTACT. SURVEY RESULTS INDICATED THAT 20 OF THE 27 RESIDENCES DID NOT APPROVE OF THE WATER LINE EVEN IF ALL COSTS OF INSTALLATION WERE PAID BY EPA (OR A RESPONSIBLE PARTY) BUT MONTHLY WATER BILL COSTS WERE INCURRED BY THE RESIDENT. HOWEVER, 10 OF THE 20 NON-APPROVING RESIDENTS WOULD ACCEPT THE WATER LINE IF SOME CO-PAYMENT OF MONTHLY WATER BILL COSTS WERE MADE OR IF THE COSTS ASSOCIATED WITH EARLIER PRIVATE WELL INSTALLATION WERE REIMBURSED TO THE RESIDENT.

ONLY 3 OF 27 RESIDENTS APPROVED OF INSTALLATION OF A COMMUNITY WATER WELL TO BE OPERATED BY A PRIVATE COMPANY. APPARENTLY, THE MAJOR CONCERN WITH THIS OPTION (AGAIN ASSUMING THAT ALL HOOK-UPS COSTS TO THE DISTRIBUTION SYSTEM WERE NOT PAID BY THE HOMEOWNER) INVOLVED THE UNKNOWN COSTS OF MONTHLY WATER BILLS AND THE IDENTITY OF THE LONG TERM WELL AND TREATMENT PLANT OPERATOR.

CONCERNING CONTINUATION OF THE CURRENT POINT-OF-ENTRY SYSTEM PROCEDURES (WITH MORE FREQUENT MONITORING), 12 OF 27 RESIDENTS APPROVED AND 15 OF 27 RESIDENTS DISAPPROVED. THE RATIONALE FOR EACH INDIVIDUAL RESPONSE ON THIS ISSUE WAS NOT DETERMINED AS PART OF THE SURVEY.

DURING THE PUBLIC COMMENT PERIOD ON THE PROPOSED PLAN, AN ALLIED GROUP OF HOMEOWNERS INDICATED THAT THEY DID APPROVE OF THE WATER LINE ALTERNATIVE IF THE SITE RESPONSIBLE PARTY IS ORDERED TO PAY MONTHLY RESIDENTIAL WATER BILLS. A LOCAL CHAPTER OF THE SIERRA CLUB SUGGESTED THE INSTALLATION OF WATER CONSERVATION DEVICES IN HOMES CONNECTED TO THE LINE TO HELP DEFRAY WATER BILL COSTS AND CONSERVE WATER. THE PRINCIPAL SITE RESPONSIBLE PARTY STRONGLY OBJECTS TO EPA'S REASONING FOR THE WATER LINE AND RECOMMENDS CONTINUATION OF POINT-OF-ENTRY SYSTEMS. THE COMMONWEALTH OF PENNSYLVANIA AGREES WITH THE WATER LINE ALTERNATIVE.

THE GROUNDWATER PROPOSAL FOR THE SITE DID NOT GENERATE AS MUCH COMMENT AS THE REMEDY FOR ALTERNATE WATER. AT THE PUBLIC MEETING, MOST QUESTIONS WERE CONCERNED WITH DESCRIPTIVE INFORMATION ON SITE HYDROGEOLOGY. DURING THE COMMENT PERIOD, ONE RESIDENT SUGGESTED RECOMMENDATIONS FOR IMPLEMENTING A PUMPING STRATEGY AT THE SITE

WHICH THE AGENCY WILL TAKE INTO CONSIDERATION. THE PRINCIPAL SITE RESPONSIBLE PARTY SUGGESTED FOREGOING THE PUMP AND TREAT PORTION OF THE INTERIM REMEDY UNTIL FURTHER HYDROGEOLOGIC STUDY IS COMPLETE. A LOCAL CHAPTER OF THE SIERRA CLUB QUESTIONED EPA'S PROPOSAL TO DISCHARGE TREATED GROUNDWATER TO A NEARBY STREAM. THE COMMONWEALTH OF PENNSYLVANIA ACCEPTS THE INTERIM GROUNDWATER REMEDY BUT IS WATCHFUL REGARDING THE FUTURE DECISION ON A FINAL GROUNDWATER CLEANUP AS IT RELATES TO COMPLIANCE WITH STATE GROUNDWATER CLEANUP GOALS. ALL OF THE ABOVE PUBLIC COMMENTS HAVE BEEN EVALUATED BY EPA BEFORE CHOOSING THE SELECTED REMEDIES. AS INDICATED ABOVE, AND IN SECTION III COMMUNITY RELATIONS HISTORY, THE PUBLIC OPINION ON THE ALTERNATE WATER SUPPLY REMEDY WAS CAREFULLY EVALUATED AND SOUGHT OUT. A RESPONSE TO EACH PUBLIC COMMENT OR RECOMMENDATION DURING THE PUBLIC MEETING AND COMMENT PERIOD APPEARS IN THE RESPONSIVENESS SUMMARY AT THE END OF THIS ROD.

THE PROPOSED PLAN FOR THE SITE ALSO INCLUDED A REMEDY FOR CLEANUP OF SITE SOILS. THIS REMEDY WAS IDENTIFIED AS UNIT 3 - SOURCE CONTROL IN THE PROPOSED PLAN. SEVERAL COMMENTS WERE MADE ON EPA'S PROPOSED ALTERNATIVE OF THERMAL DESORPTION WITH A PROTECTIVE COVER. THE ALLIED GROUP OF HOMEOWNERS SUGGESTED INCINERATION OF SITE SOILS AS THE MOST APPROPRIATE REMEDY. A COMPANY INVOLVED IN UNRELATED CLEANUP NEGOTIATIONS WITH THE PRINCIPAL SITE RESPONSIBLE PARTY ALSO BELIEVES THAT INCINERATION IS THE BEST REMEDY. AT THIS POINT IN TIME, SUBJECT TO FURTHER EVALUATION AND STUDY, THE COMMONWEALTH OF PENNSYLVANIA BELIEVES THAT INCINERATION OF SITE SOILS IS THE BEST APPROACH. THE RATIONALE FOR THE ABOVE RECOMMENDATIONS CENTER ON SEVERAL ISSUES, NAMELY: CONCERN THAT THERMAL DESORPTION WILL CREATE MORE TOXIC AND MOBILE CHEMICALS AS A RESULT OF OXIDATION REACTIONS, CONCERN THAT THE THERMAL DESORPTION/PROTECTIVE COVER REMEDY WILL NOT RESTORE THE PROPERTY TO ITS FORMER PRECONTAMINATED BENEFICIAL USE AS WELL AS INCINERATION MIGHT, AND CONCERN THAT THE THERMAL DESORPTION/PROTECTIVE COVER REMEDY WILL NOT ADEQUATELY MITIGATE CONTAMINANT LEACHING TO COMPLY WITH STATE GROUNDWATER ARARS. THE PRINCIPAL SITE RESPONSIBLE PARTY BELIEVES THAT THE ALTERNATIVE VACUUM EXTRACTION WITH PROTECTIVE COVER, AS DISCUSSED IN THE PROPOSED PLAN, SHOULD BE FURTHER EVALUATED VIA A PILOT STUDY AS AN APPROPRIATE ALTERNATIVE FOR THE SITE.

BECAUSE OF THE ABOVE PUBLIC COMMENTS, AS WELL AS THE RATIONALE PRESENTED IN SECTION IV. SCOPE AND ROLE OF RESPONSE ACTION, EPA HAS DECIDED TO DEFER ITS DECISION ON THE SOURCE CONTROL REMEDY.

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DOCUMENTATION OF SIGNIFICANT CHANGES

THE MAJOR REVISION TO THE SELECTED REMEDY SINCE THE ISSUANCE OF THE PROPOSED PLAN IS THAT OF DEFERRING SELECTION OF A REMEDY FOR UNIT 3 - SOURCE CONTROL. AS MENTIONED, EPA PROPOSED A REMEDY OF THERMAL DESORPTION WITH PROTECTIVE COVER. THE REASONS FOR DEFERRING SELECTION OF A REMEDY FOR UNIT 3 ARE DISCUSSED IN SECTION IV. SCOPE AND ROLE OF RESPONSE ACTION OF THIS ROD. EPA EXPECTS TO SELECT A FINAL REMEDY FOR UNIT 3 WITHIN TWELVE MONTHS OF THIS ROD.

MINOR REVISIONS SINCE PROPOSED PLAN ISSUANCE INCLUDE THE FOLLOWING:

- * THE DESCRIPTION OF ALTERNATIVES AWS1 AND AWS2 HAS BEEN REVISED TO REFLECT THE CONTINUATION OF THE 1988 REMOVAL ORDER AND ITS REQUIREMENTS;
- * A COMPONENT HAS BEEN ADDED TO THE GROUNDWATER REMEDY WHICH REQUIRES ECOLOGICAL MONITORING OF SELECTED LOCATIONS OF NEARBY STREAMS TO DETERMINE ANY CHANGES IN STREAM QUALITY OR MACROINVERTEBRATE DIVERSITY;
- * ESTIMATIONS OF TIME NEEDED TO COMPLETE EACH REMEDIAL ALTERNATIVE FOR EACH UNIT HAVE BEEN REVISED SLIGHTLY IN SOME CASES PER ADDITIONAL EVALUATION;
- * THE TITLES OF GROUNDWATER REMEDIES GWS2 AND GWS3 HAVE BEEN REVISED TO MORE ACCURATELY INDICATE THE IMPORTANCE OF THE INITIAL HYDROGEOLOGIC STUDY WORK;
- * MINOR CHANGES HAVE BEEN MADE TO THE TABLES DISCUSSING THE NINE EVALUATION CRITERIA TO MORE ACCURATELY REFLECT EPA'S ANALYSIS.

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TABLE 4
FORMER SPRAY IRRIGATION AREA SOIL QUALITY
WILLIAM DICK LAGOONS SITE

COMPOUND	AVERAGE CONCENTRATION	MAXIMUM CONCENTRATION	FREQUENCY OF DETECTION
VOLATILES			ND
SEMIVOLATILES (MICROGRAM/KG)			
BENZOIC ACID	45	360J	1 OF 8
4-CHLORO-3-METHYLPHENOL	6	50J	1 OF 8
PYRENE	23	180J	1 OF 8
BIS(2-ETHYLHEXYL)PHTHALATE	20	160J	ND
PESTICIDES/PCBS			
METALS (MG/KG)			
ALLUMINUM	10.645	14,500	8 OF 8
ARSENIC	2.2	3.5	8 OF 8
BARIUM	39	46	8 OF 8
BERYLLIUM	0.32	0.58	6 OF 6
CHROMIUM	10	20	8 OF 8
COBALT	2.7	4.3	7 OF 8
IRON	7,856	11,700	8 OF 8
LEAD	8.6	15	8 OF 8
MAGNESIUM	730	1,260	8 OF 8
MANGANESE	121	291	8 OF 8
MERCURY	0.1	0.65	1 OF 8
POTASSIUM	748	2,170	4 OF 8
SODIUM	254	1,070	2 OF 8
VANADIUM	15.5	21	8 OF 8
ZINC	31	38	8 OF 8

J - ESTIMATED CONCENTRATION

ND - NOT DETECTED

TABLE 5
 SURFACE WATER QUALITY
 WILLIAM DICK LAGOONS SITE

	MAXIMUM CONCENTRATION	AVERAGE CONCENTRATION	FREQUENCY OF DETECTION
VOLATILES			ND
SEMIVOLATILES			ND
PESTICIDES/PCBS			ND
METALS (DISSOLVED) (MICROGRAM/L)			
ALUMINUM	119	32	8 OF 15
BARIUM	58	31	15 OF 15
CALCIUM	18200	7515	15 OF 15
IRON	117	46	14 OF 14
LEAD	2	0.5	7 OF 15
MAGNESIUM	7730	5400	8 OF 8
MANGANESE	37	14	13 OF 15
NICKEL	82	5	1 OF 15
ZINC	37	37	2 OF 2

* TOTAL NUMBER OF SAMPLES EXCLUDES SAMPLES IN WHICH THE
 ANALYTE WAS DETECTED IN THE BLANK.

ND - NOT DETECTED

TABLE 6
 STREAM SEDIMENT QUALITY
 WILLIAM DICK LAGOONS SITE

COMPOUND	MAXIMUM CONCENTRATION	AVERAGE CONCENTRATION	FREQUENCY OF DETECTION*
VOLATILES (MICROGRAM/KG)			
CHLOROFORM	2J	1	10 OF 15
TOLUENE	5J	0.3	1 OF 15
SEMIVOLATILES (MICROGRAM/KG)			
BENZOIC ACID	82J	5	1 OF 15
PHENANTHRENE	73J	5	1 OF 15
FLUORANTHENE	67J	5	1 OF 15
PYRENE	65J	4	1 OF 15
BIS(2-ETHYLHEXYL) PHTHALATE	95J	13	3 OF 15
PESTICIDES/PCBS			ND
METALS (MG/KG)			
ALUMINUM	8,630J	3.374	15 OF 15
ARSENIC	5.8J	1.4	10 OF 15
BARIUM	107	32	15 OF 15
BERYLLIUM	0.69	0.21	6 OF 15
CALCIUM	3,320	884	15 OF 15
CHROMIUM	29	11	13 OF 15
COPPER	36	12	1 OF 3
IRON	15,900J	7,034	15 OF 15
LEAD	21	8	15 OF 15
MAGNESIUM	1,990	618	13 OF 15
MANGANESE	1,300J	273	15 OF 15
POTASSIUM	2,380	273	2 OF 15
SELENIUM	0.79J	0.08	2 OF 15
VANADIUM	119	19	14 OF 15
ZINC	119J	34	15 OF 15

* TOTAL NUMBER OF SAMPLES EXCLUDES SAMPLES IN WHICH THE ANALYTE WAS DETECTED IN THE BLANK.

J - ESTIMATED VALUE

TABLE 7
SUMMARY OF CHEMICALS CONCERN IN EACH MEDIUM

OFF-SITE GROUND WATER	SOIL	ON-SITE GROUND WATER
1.2-DICHLOROETHENE (TOTAL)	CHLOROFORM	CHLOROFORM
1.2-DICHLOROETHANE	TRICHLOROETHENE	1.2-DICHLOROETHANE
CHLOROFORM	TETRACHLOROETHENE	TRICHLOROETHENE
1.1.1-TRICHLOROETHANE	CHLOROBENZENE	BENZENE
TRICHLOROETHENE	1.2.4-TRICHLOROBENZENE	TETRACHLOROETHENE
TETRACHLOROETHENE	NAPHTHALENE	BIS(2-CHLOROETHYL)ETHER
CHLOROBENZENE	PHENANTHRENE	BARIUM
DICHLOROBENZENE (1.2)	FLUORANTHENE	BERYLLIUM
DICHLOROBENZENE (1.4)	BIS(2-ETHYLHEXYL)PHTHALATE	MANGANESE
1.1-DICHLOROETHENE	4.4-DDE	BIS(2-ETHYLHEXYL)PHTHALATE
1.1-DICHLOROETHANE	ACENAPTHENE	PHENOL
	FLUORENE	1.2-DICHLOROETHENE (TOTAL)
	BENZO(A)PYRENE EQUIVALENT	CHLOROBENZENE
	ANTHRACENE	4-METHYLPHENOL(P-CRESOL)
	HEPTACHLOR EPOXIDE	2,4-DICHLOROPHENOL
	2.4-DICHLOROPHENOL	
	ARSENIC	
	BARIUM	
	CHROMIUM	
	MANGANESE	
	VANADIUM	
	ZINC	