EPA/ROD/R09-91/056
1991

EPA Superfund
Record of Decision:

ATLAS ASBESTOS MINE
EPA ID: CAD980496863
OU 01
COALINGA, CA
02/14/1991

I) THE ATLAS MINE AREA (FIGURE 1); II) THE CLEAR CREEK MANAGEMENT AREA (FIGURE 2); III) THE PONDING BASIN OF THE CALIFORNIA AQUEDUCT (FIGURE 3); AND IV) THE CITY OF COALINGA, CALIFORNIA. ASBESTOS MINING AND MILLING WASTE FROM THE ATLAS MINE AREA HAS BEEN TRANSPORTED TO AND COME TO BE LOCATED IN THE OTHER THREE AREAS. THIS OU ADDRESSES THE ATLAS MINE AREA ("ATLAS MINE AREA OPERABLE UNIT OR ATLAS MINE OU").

THE ATLAS MINE OU IS ONE OF TWO DESIGNATED OPERABLE UNITS FOR THE ATLAS SITE. A ROD FOR THE CITY OF COALINGA OPERABLE UNIT WAS SIGNED ON JULY 19, 1989. IT PROVIDES FOR THE CLEAN UP OF ASBESTOS CONTAMINATED SOIL IN COALINGA, CALIFORNIA BY BURYING THE CONTAMINATED MATERIAL IN A WASTE MANAGEMENT UNIT WITH AN IMPERMEABLE CAP.

THE ATLAS MINE OU CONTAINS AN ESTIMATED 2.3 MILLION CUBIC METERS (3 MILLION CUBIC YARDS) OF HIGHLY CONCENTRATED ASBESTOS ORE AND ASBESTOS MINE AND MILL TAILINGS. ACTUAL OR THREATENED RELEASES OF HAZARDOUS SUBSTANCES FROM THE ATLAS MINE OU PRESENTS AN IMMINENT AND SUBSTANTIAL ENDANGERMENT TO PUBLIC HEALTH, WELFARE, OR THE ENVIRONMENT. THE RESPONSE ACTIONS SELECTED IN THIS ROD ADDRESS THIS IMMINENT AND SUBSTANTIAL ENDANGERMENT.

ASBESTOS IS A HAZARDOUS SUBSTANCE AS DEFINED IN 42 USC SECTION 9601(14) AND AS LISTED IN 40 CFR SECTION 302.4. ASBESTOS MINING AND MILLING WASTE IS NOT REGULATED BY THE RESOURCE CONSERVATION AND RECOVERY ACT ("RCRA"). ASBESTOS IS KNOWN TO CAUSE LUNG CANCER AND MESOTHELIOMA IN HUMANS. ASBESTOS ALSO CAUSES OTHER LUNG DISEASES SUCH AS ASBESTOSIS. IF ASBESTOS REMAINS UNCONTROLLED AT THE ATLAS MINE OU, THE POTENTIAL FOR HUMAN EXPOSURE TO ASBESTOS AND THE RESULTING INCREASED RISK TO HUMAN HEALTH, PRIMARILY THROUGH THE INHALATION PATHWAY, WILL REMAIN.

DESCRIPTION OF THE SELECTED REMEDY

ASBESTOS WASTE AT THE ATLAS MINE OU PRESENTS THREE MAJOR PROBLEMS: I) GENERATION OF AIRBORNE ASBESTOS ON-SITE BY VEHICULAR OR OTHER HUMAN DISTURBANCE; II) THE TRANSPORT OF ASBESTOS FROM THE ATLAS MINE AREA BY VEHICLES WHICH HAVE BEEN DRIVEN THROUGH THE MINE AREA; AND III) THE RELEASE OF CHRYSOTILE ASBESTOS FROM THE ATLAS MINE AREA INTO LOCAL CREEKS DURING HEAVY RAINS AND THE POTENTIAL FOR THIS ASBESTOS TO SUBSEQUENTLY BECOME AIRBORNE AT DOWNSTREAM LOCATIONS.

CLEAN UP OF THE ASBESTOS AT THE ATLAS MINE OU INCLUDES CONTROLLING THE RELEASE OF ASBESTOS FROM AND RESTRICTING ACCESS TO THE MINE AREA USING ENGINEERING AND INSTITUTIONAL CONTROLS. THE SELECTED REMEDY ENTAILS;

1. FENCING OR OTHER APPROPRIATE CONTROLS TO RESTRICT ACCESS TO THE ATLAS MINE OU;
2. PAVING THE ROAD THROUGH THE MINE AREA OR IMPLEMENTING AN APPROPRIATE ROAD MAINTENANCE ALTERNATIVE;
3. CONSTRUCTING STREAM DIVERSIONS AND SEDIMENT TRAPPING DAMS TO MINIMIZE THE RELEASE OF ASBESTOS INTO LOCAL CREEKS;
4. CONDUCTING A REVEGETATION PILOT PROJECT TO DETERMINE WHETHER REVEGETATION IS AN APPROPRIATE MEANS OF INCREASING STABILITY AND MINIMIZING EROSION OF THE DISTURBED AREAS AND IMPLEMENTING REVEGETATION IF IT IS FOUND TO BE APPROPRIATE;
5. DISMANTLING OF THE MILL BUILDING AND DISPOSING OF DEBRIS;
6. FILING DEED RESTRICTIONS; AND
7. IMPLEMENTING AN OPERATION AND MAINTENANCE PROGRAM

STABILIZATION AND CONTROL OF ASBESTOS WASTE WILL MINIMIZE THE RELEASE OF ASBESTOS, THUS PROVIDING LONG-TERM PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT. THE ESTIMATED COST OF THE SELECTED REMEDIAL ACTION IS $4.2 MILLION.

OPERATION AND MAINTENANCE ACTIVITIES WILL BE REQUIRED TO ENSURE THE EFFECTIVENESS OF THE RESPONSE ACTION. IN THE EVENT OF A NATURAL EVENT SUCH AS A FLOOD OR EARTHQUAKE, ALL REPAIRS NECESSARY TO CONTAIN THE HAZARDOUS SUBSTANCES WILL BE MADE. BECAUSE THE ASBESTOS WASTE WILL NOT

BE TREATED, LONG TERM MANAGEMENT OF THE WASTE WILL BE REQUIRED. EPA WILL PERFORM PERIODIC REVIEWS OF THE REMEDIAL ACTION PURSUANT TO CERCLA SECTION 121(C).

AT THIS TIME EPA IS NOT PROPOSING ANY ACTION IN THE CLEAR CREEK MANAGEMENT AREA ("CCMA"). THE UNITED STATES DEPARTMENT OF INTERIOR'S BUREAU OF LAND MANAGEMENT ("BLM") HAS INDICATED THAT IT WILL REVISE ITS LAND USE PLAN FOR THE CCMA IN ORDER TO MINIMIZE AIRBORNE ASBESTOS EMISSIONS AND THE THREAT TO PUBLIC HEALTH REPRESENTED BY THE ASBESTOS IN THE CCMA. IN 1992, EPA WILL EVALUATE WHETHER BLM'S PLAN IS ADEQUATE TO PROTECT HUMAN HEALTH AND THE ENVIRONMENT AND WILL PUBLISH A PUBLIC NOTICE OF ITS DETERMINATION. AT THAT TIME EPA WILL DECIDE WHETHER FURTHER ACTION UNDER CERCLA IN THE CCMA IS NECESSARY.

AT THIS TIME EPA IS NOT PROPOSING ANY ACTION IN THE PONDING BASIN OF THE CALIFORNIA AQUEDUCT NEAR GALE AVENUE ("PONDING BASIN") BECAUSE THE US BUREAU OF RECLAMATION ("USBR") AND THE CALIFORNIA DEPARTMENT OF WATER RESOURCES ("DWR") ARE CONSIDERING ACTIONS TO MINIMIZE THE GENERATION OF AIRBORNE ASBESTOS-LADEN DUST IN THIS AREA. IN 1992 EPA WILL EVALUATE WHETHER USBR/DWR ACTIONS ARE ADEQUATE TO PROTECT HUMAN HEALTH AND THE ENVIRONMENT AND WILL PUBLISH A PUBLIC NOTICE OF ITS DETERMINATION. AT THAT TIME EPA WILL DECIDE WHETHER FURTHER ACTION UNDER CERCLA IN THE PONDING BASIN IS NECESSARY.

STATUTORY DETERMINATIONS

PURSUANT TO CERCLA SECTION 121, 42 USC SECTION 9621, AND IN ACCORDANCE WITH THE NCP, THE SELECTED REMEDY FOR THE ATLAS MINE OU: (1) IS PROTECTIVE OF HUMAN HEALTH, WELFARE AND THE ENVIRONMENT; (2) COMPLIES WITH FEDERAL AND STATE REQUIREMENTS THAT ARE LEGALLY APPLICABLE OR RELEVANT AND APPROPRIATE TO THE REMEDIAL ACTION; AND (3) IS COST-EFFECTIVE. THE SELECTED REMEDY UTILIZES PERMANENT SOLUTIONS AND ALTERNATIVE TREATMENT (OR RESOURCE RECOVERY) TECHNOLOGIES, TO THE MAXIMUM EXTENT PRACTICABLE FOR THE ATLAS MINE OU. TREATMENT OF ASBESTOS CONTAMINATION AT THE ATLAS MINE OU WAS DETERMINED TO BE IMPRACTICABLE BASED ON LACK OF EFFECTIVENESS, TECHNICAL INFEASIBILITY, PROBLEMS WITH IMPLEMENTABILITY AND COST FACTORS.

THIS REMEDY WILL RESULT IN HAZARDOUS SUBSTANCES REMAINING ON SITE ABOVE HEALTH-BASED LEVELS. PURSUANT TO CERCLA SECTION 121, 42 USC SECTION 9621, EPA WILL CONDUCT A REVIEW WITHIN FIVE YEARS AFTER COMMENCEMENT OF REMEDIAL ACTION TO ENSURE THAT THE REMEDY CONTINUES TO PROVIDE ADEQUATE PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT.

DANIEL W. MCGOVERN
REGIONAL ADMINISTRATOR
EPA REGION IX

DATE: 02/14/91

#SNLD

1.0 SITE NAME, LOCATION, AND DESCRIPTION

THE ATLAS ASBESTOS MINE SITE ("ATLAS SITE") INCLUDES FOUR GEOGRAPHICALLY DISTINCT AREAS: I) THE ATLAS MINE AREA ("MINE AREA"); II) THE CLEAR CREEK MANAGEMENT AREA ("CCMA"); III) THE PONDING BASIN OF THE CALIFORNIA AQUEDUCT NEAR GALE AVENUE ("PONDING BASIN''); AND IV) THE CITY OF COALINGA, CALIFORNIA. THIS RECORD OF DECISION DESCRIBES THE REMEDY SELECTED FOR THE ATLAS MINE AREA.

THE ATLAS MINE AREA

THE ATLAS MINE AREA IS AN APPROXIMATELY 1.8 SQUARE KILOMETER (450 ACRE) TRACT OF LAND LOCATED IN THE SOUTHERN DIABLO MOUNTAINS IN WESTERN FRESNO COUNTY, CALIFORNIA, ON LAND OWNED BY THE FEDERAL GOVERNMENT AND PRIVATE PARTIES (SEE FIGURE 2). THE NEAREST POPULATION CENTER IS COALINGA (POPULATION 8250) LOCATED APPROXIMATELY 29 KILOMETERS (18 MILES) TO THE SOUTHEAST. THE MINE AREA INCLUDES THREE OPEN PIT ASBESTOS MINE SURFACES, STOCKPILES OF ASBESTOS WASTE MATERIAL, AN ABANDONED MILL BUILDING, A SETTLING POND AND DEBRIS. IT IS DRAINED BY A NUMBER OF INTERMITTENT STREAMS (SEE FIGURE 1). LANDS ADJACENT TO THE MINE AREA ARE RURAL. LAND USES INCLUDE MINING, RANCHING, FARMING AND RECREATION (CAMPING, HUNTING, HIKING, MINERAL COLLECTING AND RIDING OFF-HIGHWAY VEHICLES ("OHVS")).

THE CLEAR CREEK MANAGEMENT AREA

THE ATLAS MINE AREA LIES WITHIN APPROXIMATELY 124 SQUARE KILOMETERS (48 SQUARE MILES) OF SERPENTINE ROCK (THE NEW IDRIA FORMATION) CONTAINING LARGE AMOUNTS OF NATURALLY OCCURRING CHRYSOTILE ASBESTOS ("ASBESTOS") AS WELL AS OTHER MINERALS ASSOCIATED WITH SERPENTINE. APPROXIMATELY 93 SQUARE KILOMETERS (36 SQUARE MILES) OF THE NEW IDRIA FORMATION IS WITHIN THE UNITED STATES DEPARTMENT OF INTERIOR, BUREAU OF LAND MANAGEMENT’S ("BLM’S") CLEAR CREEK MANAGEMENT AREA AND HAS BEEN DESIGNATED A HAZARDOUS ASBESTOS AREA, BY THE BLM (SEE FIGURE 2). THIS HAZARDOUS ASBESTOS AREA HAS BEEN MINED FOR MERCURY, CHROMITE, ASBESTOS AND OTHER MINERALS SINCE THE MID-1800,S AND CONTAINS NUMEROUS MINES AND EXPLORATION CUTS AS WELL AS INNUMERABLE ROADS AND TRAILS. IT IS ALSO A POPULAR OHV RECREATION AREA. THE HAZARDOUS ASBESTOS AREA OF THE CCMA HAS BEEN INCLUDED AS PART OF THE ATLAS ASBESTOS MINE SITE BECAUSE ASBESTOS MINING AND MILLING WASTE FROM THE ATLAS MINE OU HAS BEEN TRANSPORTED THROUGHOUT THE CCMA BY WIND, WATER AND VEHICULAR TRAFFIC.

THE PONDING BASIN AT THE CALIFORNIA AQUEDUCT

THE PONDING BASIN IS AN AREA BETWEEN STATE HIGHWAY 198 AND GALE AVENUE TO THE WEST OF THE CALIFORNIA AQUEDUCT (SEE FIGURE 3). IT WAS DESIGNED TO HOLD FLOODWATERS FROM THE ARROYO PASAJERO ALLUVIAL FAN. DURING HEAVY RAINS, ASBESTOS-BEARING SEDIMENTS ARE WASHED DOWN THE CREEKS DRAINING THE ATLAS MINE OU AND OTHER PARTS OF THE WHITE CREEK WATERSHED INTO LOS GATOS CREEK AND ARE EVENTUALLY CARRIED THROUGH THE ARROYO PASAJERO DRAINAGE BASIN AND DEPOSITED IN THE PONDING BASIN AND IN THE SURROUNDING AREA. DURING VERY HEAVY FLOODING, ASBESTOS-LADEN WATER HAS FILLED THE PONDING BASIN AND BEEN RELEASED INTO THE CALIFORNIA AQUEDUCT.

THE PONDING BASIN HAS BEEN DESIGNATED AS A PART OF THE ATLAS MINE SITE AND THE NEARBY COALINGA ASBESTOS MINE SITE ("COALINGA SITE") BECAUSE IT CONTAINS ASBESTOS WHICH HAS BEEN TRANSPORTED FROM THE ATLAS MINE OU, THE JOHNS-MANVILLE MILL AREA OPERABLE UNIT OF THE COALINGA SITE, AND OTHER NATURAL AND DISTURBED AREAS. THE PONDING BASIN IS ADMINISTERED BY THE UNITED STATES BUREAU OF RECLAMATION ("USBR") AND THE CALIFORNIA DEPARTMENT OF WATER RESOURCES ("DWR"). PONDING BASIN LAND IS USED MAINLY FOR AGRICULTURE. HURON, A COMMUNITY OF APPROXIMATELY 3000 PEOPLE, IS LOCATED ADJACENT TO THE PONDING BASIN. THE USBR AND DWR ARE CURRENTLY DEVELOPING PLANS TO ADDRESS THE ARROYO PASAJERO FLOODING AND THE IMPACT OF SUCH FLOODING ON THE CALIFORNIA AQUEDUCT.

THE CITY OF COALINGA

DURING THE INVESTIGATIONS OF THE ATLAS SITE, ASBESTOS WAS DISCOVERED IN COALINGA, CALIFORNIA. THIS ASBESTOS HAD BEEN BROUGHT FROM THE ATLAS MINE OU AND OTHER SOURCES TO A DEPOT IN COALINGA FOR EVENTUAL SHIPMENT OUT OF COALINGA BY RAIL AND TRUCK. THE ASBESTOS IS CONCENTRATED IN A 44 HECTARE (107 ACRE) PARCEL OF LAND IN THE SOUTHWESTERN CORNER OF COALINGA. THE CITY OF COALINGA IS AN OPERABLE UNIT OF THE ATLAS SITE AND THE COALINGA SITE. A ROD WAS SIGNED FOR THE CITY OF COALINGA OPERABLE UNIT ON JULY 19, 1989 AND CLEANUP OF THE ASBESTOS BEGAN IN JUNE 1990. THE CLEAN UP IS SCHEDULED TO BE COMPLETED BY JUNE 1991.

#SHEA

2.0 SITE HISTORY AND ENFORCEMENT ACTIVITIES

IN THE MID-1950'S, AN INVESTIGATION BY THE CALIFORNIA DIVISION OF MINES AND GEOLOGY INDICATED THAT THE SERPENTINE MATRIX OF THE NEW IDRIA FORMATION WAS MAINLY CHRYSOTILE ASBESTOS. SUBSEQUENT INVESTIGATION IN THE SOUTHEASTERN THIRD OF THE NEW IDRIA FORMATION DEMONSTRATED THAT THE ASBESTOS ORE COULD BE MINED AND MILLED TO PRODUCE A MARKETABLE SHORT-FIBER ASBESTOS PRODUCT. FROM 1959 THROUGH 1962, THE COALINGA AND LOS GATOS CREEK AREAS EXPERIENCED AN INTENSIVE LAND RUSH FOR ASBESTOS MINING CLAIMS. IN 1962 THE ATLAS MINERALS DIVISION OF THE ATLAS CORPORATION ACQUIRED TITLE TO A LARGE BLOCK OF CLAIMS AND BEGAN CONSTRUCTION OF AN ASBESTOS MILL AT THE ATLAS MINE OU. ASBESTOS MINING AND MILLING AT THE ATLAS MINE OU OCCURRED FROM 1967 TO 1979. THE VINNELL MINING AND MINERALS CORPORATION, IN A JOINT VENTURE WITH CALIFORNIA MINERALS CORPORATION, OWNED AND OPERATED THE MINING AND MILLING OPERATION FROM 1967 UNTIL 1974, WHEN THEY SOLD IT TO WHEELER PROPERTIES. WHEELER PROPERTIES OPERATED THE FACILITY UNTIL 1979 AND FILED FOR BANKRUPTCY SHORTLY THEREAFTER.

THE MINING ACTIVITY INCLUDED DIGGING THE ASBESTOS ORE OUT OF SURFACE PITS AND THEN MILLING THE ORE. THE BY-PRODUCTS OF THE MILLING PROCESS (THE MILL TAILINGS) WERE BULLDOZED INTO PILES NEAR THE MILL BUILDING. APPROXIMATELY 2.3 MILLION CUBIC METERS (3 MILLION CUBIC YARDS) OF ASBESTOS ORE AND ASBESTOS TAILINGS REMAIN AT THE ATLAS MINE OU.

ON DECEMBER 3, 1976 AND ON FEBRUARY 15, 1980, ATLAS ASBESTOS COMPANY AND WHEELER PROPERTIES WERE CITED FOR VIOLATING THE NATIONAL EMISSIONS STANDARDS FOR HAZARDOUS AIR POLLUTANTS ("NESHAPS") REGULATIONS REGARDING CONTROL OF ASBESTOS EMISSIONS.

IN EARLY 1980, THE METROPOLITAN WATER DISTRICT ("MWD") OF SOUTHERN CALIFORNIA DETECTED ELEVATED LEVELS OF ASBESTOS IN WATER SAMPLES FROM THE CALIFORNIA AQUEDUCT NEAR LOS ANGELES. AN EXTENSIVE SAMPLING PROGRAM ALONG THE AQUEDUCT, CONDUCTED BY THE MWD IN AUGUST THROUGH SEPTEMBER OF 1980, SUGGESTED THAT THE ATLAS MINE WAS ONE PROBABLE SOURCE OF ASBESTOS IN THE CALIFORNIA AQUEDUCT. ASBESTOS LEVELS OF UP TO 2500 MILLION FIBERS PER LITER ("MFL") WERE MEASURED.

ON OCTOBER 17, 1980, THE CENTRAL VALLEY REGIONAL WATER QUALITY CONTROL BOARD ("CVRWQCB") AND THE CALIFORNIA DEPARTMENT OF HEALTH SERVICES ("DHS") INSPECTED THE ATLAS MINE TO DETERMINE IF WASTE DISCHARGES FROM THESE FACILITIES WERE IN COMPLIANCE WITH STATE REGULATIONS. THE CVRWQCB CONCLUDED THAT ADDITIONAL CORRECTIVE MEASURES SHOULD BE TAKEN TO PREVENT MINE- AND MILL-GENERATED ASBESTOS FROM ENTERING THE DRAINAGE BASINS.

IN MARCH OF 1983, THE CVRWQCB COLLECTED FOUR SURFACE WATER SAMPLES DURING A PERIOD OF HIGH RUN-OFF IN THE ARROYO PASAJERO WATERSHED. ASBESTOS FIBER CONCENTRATIONS IN THESE SAMPLES RANGED FROM 80,000 TO 240,000 MFL.

ON JUNE 14, 1983, THE RISKS REPRESENTED BY THE ATLAS MINE AREA WERE RATED USING THE HAZARD RANKING SYSTEM. THE ATLAS SITE WAS APPROVED FOR LISTING ON THE NPL IN SEPTEMBER OF 1984. REMEDIAL INVESTIGATION/FEASIBILITY STUDY ("RI/FS") ACTIVITIES WERE INITIATED BY THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY ("EPA") IN 1985.

THE ATLAS MINERALS DIVISION OF THE ATLAS CORPORATION, VINNELL MINING AND MINERALS CORPORATION, WHEELER PROPERTIES INC., THE CALIFORNIA MINERAL CORPORATION AND THE US BUREAU OF LAND MANAGEMENT HAVE BEEN IDENTIFIED AS POTENTIALLY RESPONSIBLE PARTIES (PRPS) AT THE ATLAS MINE OU. ON OCTOBER 13, 1987 AND ON JUNE 23, 1988, GENERAL NOTICE LETTERS WERE SENT TO THESE PRPS, NOTIFYING THEM OF THEIR POTENTIAL LIABILITY.

ENFORCEMENT EFFORTS WITH RESPECT TO THE CITY OF COALINGA OPERABLE UNIT HAVE RESULTED IN A CONSENT DECREE WITH SOUTHERN PACIFIC TRANSPORTATION COMPANY UNDER WHICH A CLEAN UP IS BEING PERFORMED. NO PRPS HAVE BEEN SENT NOTICE LETTERS WITH RESPECT TO THE CCMA OR THE PONDING BASIN.

#HCP

3.0 HIGHLIGHTS OF COMMUNITY PARTICIPATION

THE RI/FS REPORT AND THE PROPOSED PLAN FOR THE ATLAS SITE WERE RELEASED FOR PUBLIC COMMENT ON APRIL 11, 1990. THESE DOCUMENTS, AS WELL AS THE ADMINISTRATIVE RECORD, WERE MADE AVAILABLE TO THE PUBLIC AT THE EPA SUPERFUND RECORDS CENTER, REGION IX OFFICE, SAN FRANCISCO, CALIFORNIA. THE COMPLETE ADMINISTRATIVE RECORD, WHICH EPA USED TO SELECT THE REMEDY, WAS AVAILABLE FOR PUBLIC REVIEW AT AN INFORMATION REPOSITORY AT THE COALINGA DISTRICT LIBRARY, COALINGA, CA. IN ADDITION, FOUR OTHER INFORMATION REPOSITORIES WERE ESTABLISHED IN THE FOLLOWING CALIFORNIA MUNICIPALITIES: AVENAL, HANFORD, HURON AND SAN JOSE. THESE FOUR REPOSITORIES CONTAIN THE MOST IMPORTANT DOCUMENTS RELATED TO THE SELECTION OF A REMEDY, INCLUDING THE RI/FS, THE PROPOSED PLAN AND THE ADMINISTRATIVE RECORD INDEX. NOTICE OF THE AVAILABILITY OF THESE DOCUMENTS WAS PUBLISHED IN THE FRESNO BEE AND THE HANFORD SENTINEL ON APRIL 9, 1990 AND IN THE COALINGA RECORD ON APRIL 11, 1990.

A 60 DAY PUBLIC COMMENT PERIOD ON THE PROPOSED PLAN WAS HELD FROM APRIL 11, 1990 TO JUNE 11, 1990. AFTER REQUESTS FOR AN EXTENSION WERE RECEIVED, THE PUBLIC COMMENT PERIOD WAS EXTENDED FOR AN ADDITIONAL 30 DAYS TO JULY 11, 1990. IN ADDITION, PUBLIC MEETINGS WERE HELD ON MAY 9, 1990 IN COALINGA, CALIFORNIA AND ON MAY 30, 1990 IN SUNNYVALE, CALIFORNIA. THE MEETING IN SUNNYVALE WAS ARRANGED TO ALLOW PEOPLE WHO LIVE IN THE SAN FRANCISCO BAY AREA A MORE CONVENIENT OPPORTUNITY TO COMMENT ON THE PROPOSED PLAN. MOST OF THE PEOPLE WHO ATTENDED THE MAY 30TH MEETING WERE CONCERNED ABOUT THE POTENTIAL IMPACT ON PUBLIC ACCESS TO THE CCMA. AT THESE MEETINGS, REPRESENTATIVES FROM EPA ANSWERED QUESTIONS ABOUT THE EVALUATION OF THE ATLAS SITE AND THE REMEDIAL ALTERNATIVES UNDER CONSIDERATION.

EPA HAS PREPARED THE ATTACHED RESPONSIVENESS SUMMARY, WHICH PROVIDES RESPONSES TO THE SIGNIFICANT COMMENTS SUBMITTED IN WRITING DURING THE PUBLIC COMMENT PERIOD, AS WELL AS RESPONSES TO SIGNIFICANT COMMENTS MADE BY ATTENDEES AT THE TWO PUBLIC MEETINGS.

#SRRA

4.0 SCOPE AND ROLE OF THE RESPONSE ACTION

THE ATLAS MINE OU: THE PRINCIPAL THREAT AT THE ATLAS MINE OU IS POSED BY UNCONTAINED ASBESTOS WHICH, IF NOT CONTROLLED, WOULD LEAD TO THE GENERATION OF AIRBORNE ASBESTOS EMISSIONS. THIS RESPONSE ACTION IS DESIGNED TO:

> I) MINIMIZE CURRENT AND FUTURE AIRBORNE ASBESTOS EMISSIONS FROM THE ATLAS MINE OU; AND II) LIMIT THE SURFACE WATER TRANSPORT OF ASBESTOS DOWNSTREAM FROM THE ATLAS MINE OU. IF ASBESTOS CARRIED DOWNSTREAM FROM THE ATLAS MINE OU IS DEPOSITED AND THEN RESUSPENDED, THE RESULTING AIRBORNE EMISSIONS WOULD BE A THREAT TO HUMAN HEALTH. THEREFORE, IT IS IMPORTANT TO MINIMIZE THE HYDRAULIC TRANSPORT OF ASBESTOS FROM THE ATLAS MINE OU INTO THE LOCAL CREEKS.

THE REMEDIAL ACTION SELECTED IN THIS ROD ADDRESSES THE PROBLEM OF UNCONTAINED ASBESTOS ORE AND ASBESTOS MILL TAILINGS IN THE CONTEXT OF A REMOTE AND LARGELY RURAL AREA WITH LARGE AMOUNTS OF NATURALLY OCCURRING ASBESTOS. THE ASBESTOS WASTE WILL BE STABILIZED TO MINIMIZE EROSION AND TO MINIMIZE THE RELEASE OF ASBESTOS INTO THE LOCAL DRAINAGE BASIN. IN ADDITION, ACCESS TO THE DISTURBED AREAS WITHIN THE ATLAS MINE OU WILL BE LIMITED TO PREVENT DISTURBANCE OF THE ASBESTOS WASTE AND THE RESULTING GENERATION OF AIRBORNE ASBESTOS. THE ABANDONED MILL BUILDING WILL BE DISMANTLED AND DISPOSED OF IN ORDER TO REDUCE THE ATTRACTION TO THE PUBLIC.

THE CCMA: THE HAZARDOUS ASBESTOS AREA OF THE CCMA CONTAINS NUMEROUS DISTURBED AREAS (MINES AND EXPLORATION CUTS) AS WELL AS INNUMERABLE UNPAVED ROADS AND JEEP TRAILS. SOILS AND ROADS IN THIS AREA ARE VERY RICH IN ASBESTOS. THE AREA IS POPULAR WITH OHV USERS BECAUSE THE RUGGED TERRAIN AND SPARSE VEGETATION PROVIDE A CHALLENGING AND UNRESTRICTED RIDING EXPERIENCE. EPA'S RISK ASSESSMENT INDICATES THAT A VERY SIGNIFICANT CANCER RISK EXISTS FOR OHV USERS IN AREAS WITH HIGH LEVELS OF ASBESTOS IN THE SOIL. THIS IS DISCUSSED IN GREATER DETAIL IN SECTION 6.0 BELOW. AT THIS TIME EPA IS NOT TAKING ANY ACTION IN THE CCMA. THE BLM HAS INDICATED TO EPA THAT IT WILL REVISE ITS LAND USE PLAN FOR THE CCMA SO THAT AIRBORNE ASBESTOS EMISSIONS AND THE THREAT TO PUBLIC HEALTH ARE MINIMIZED. IN 1992, EPA WILL EVALUATE WHETHER THE BLM'S PLAN PROTECTS HUMAN HEALTH AND THE ENVIRONMENT AND WILL PUBLISH A PUBLIC NOTICE OF ITS DETERMINATION. AT THAT TIME EPA WILL DECIDE WHETHER FURTHER ACTION UNDER CERCLA IN THE CCMA IS NECESSARY.

THE PONDING BASIN: THE PONDING BASIN CONTAINS ASBESTOS WHICH HAS BEEN TRANSPORTED FROM THE ATLAS MINE AREA AND OTHER NATURAL AND DISTURBED AREAS IN THE NEW IDRIA FORMATION. EPA'S RISK ASSESSMENT (SUMMARIZED IN SECTION 6.0 BELOW) SUGGESTS THAT A SIGNIFICANT CANCER RISK MAY EXIST FOR PEOPLE WHO LIVE AND WORK ADJACENT TO ASBESTOS-CONTAINING AREAS WHERE AGRICULTURAL PRACTICES PUT ASBESTOS-LADEN DUST INTO THE AIR. AT THIS TIME EPA IS NOT TAKING ANY ACTION IN THE PONDING BASIN BECAUSE THE USBR AND THE DWR ARE CONSIDERING ACTIONS TO MINIMIZE THE GENERATION OF ASBESTOS-LADEN DUST IN THIS AREA. IN 1992 EPA WILL EVALUATE WHETHER USBR/DWR ACTIONS ARE ADEQUATE TO PROTECT HUMAN HEALTH AND THE ENVIRONMENT AND WILL PUBLISH A PUBLIC NOTICE OF ITS DETERMINATION. AT THAT TIME EPA WILL DECIDE WHETHER FURTHER EPA ACTION UNDER CERCLA IN THE PONDING BASIN IS NECESSARY.

WATER IN THE CALIFORNIA AQUEDUCT CONTAINS HIGH LEVELS OF DISPERSED ASBESTOS FIBERS. THIS WATER IS USED TO SUPPLY MUNICIPALITIES WITH DRINKING WATER AND FARMERS WITH WATER FOR AGRICULTURAL PURPOSES SUCH AS IRRIGATION. MUNICIPALITIES ARE REQUIRED TO TREAT DRINKING WATER TO REMOVE ASBESTOS UNDER THE SAFE DRINKING WATER ACT. EPA RECOMMENDS THAT THE CALIFORNIA DEPARTMENT OF HEALTH SERVICES ("DHS") AND THE DWR EVALUATE THE POTENTIAL, LONG-TERM PUBLIC HEALTH EFFECT OF DELIVERING ASBESTOS-LADEN IRRIGATION WATER TO AGRICULTURAL AREAS OF THE CENTRAL VALLEY.

THE REGION: THE PROBLEM OF ASBESTOS CONTAMINATION AT THE ATLAS SITE IS PART OF A LARGER, REGIONAL PROBLEM IN THE NEW IDRIA FORMATION, WHERE MANY OTHER MINES AND DISTURBANCES RELATED TO MINERAL EXPLORATION EXIST. EPA CONDUCTED A REGIONAL ASSESSMENT, TITLED CHARACTERIZATION OF DISTURBANCES RELATED TO MINING AND EXPLORATION IN THE NEW IDRIA/COALINGA/TABLE MOUNTAIN STUDY REGION. EPA INTENDS TO ADDRESS THIS REGIONAL PROBLEM IN THE FUTURE.

#SC

5.0 SITE CHARACTERISTICS

FIGURE 3 SHOWS THE LOCATION OF THE ATLAS MINE AREA WITHIN THE LOS GATOS CREEK WATERSHED. THE ATLAS MINE AREA IS SITUATED ON APPROXIMATELY 200 HECTARES (450 ACRES) IN THE SOUTHERN DIABLO MOUNTAINS, AT ELEVATIONS OF 1220 TO 1340 METERS (4000 TO 4400 FEET). THE TERRAIN IS RUGGED WITH SLOPES RANGING FROM FIVE TO 65 PERCENT AND AVERAGING 10 TO 15 PERCENT. THE TAILINGS AND ORE PILES AT THE ATLAS MINE OU CONTAIN AN ESTIMATED 2.3 MILLION CUBIC METERS (3 MILLION CUBIC YARDS) OF HIGHLY CONCENTRATED ASBESTOS. THE REMEDIAL INVESTIGATION INCLUDED ANALYSES OF SOIL, AIR AND WATER AT THE ATLAS MINE AREA AND IN THE SURROUNDING AREA:

SOIL:

THE DETAILED SOIL SAMPLING IN THE MINE AREA FOUND LARGE AMOUNTS OF HIGHLY CONCENTRATED ASBESTOS. POLARIZED LIGHT MICROSCOPY ("PLM") ANALYSES (SEE INTERIM METHOD FOR THE DETERMINATION OF ASBESTOS IN BULK INSULATION SAMOLES. EPA-600/M4-82-020) DETECTED ASBESTOS CONCENTRATIONS UP TO FOUR AREA PERCENT. WHEN THE MORE SENSITIVE TRANSMISSION ELECTRON MICROSCOPY ("TEM") METHOD WAS USED, THE ASBESTOS LEVELS RANGED FROM THREE PERCENT TO 100 PERCENT. (SEE APPENDIX 1 FOR A DISCUSSION OF ASBESTOS ANALYTICAL TECHNIQUES).

WATER:

WATER SAMPLES TAKEN NEAR THE ATLAS MINE AREA WERE MEASURED FOR ASBESTOS USING TEM. ASBESTOS CONCENTRATIONS WERE EXTREMELY HIGH, RANGING FROM 3 X (10-6) TO 2 X (10-8) MFL (3 MILLION TO 200 MILLION MFL). SURFACE WATER TRANSPORT MODELING SHOWED THAT DURING HEAVY RAINS, BETWEEN FIVE PERCENT AND 36 PERCENT OF THE TOTAL ASBESTOS YIELD FROM THE LOS GATOS CREEK WATERSHED IS CONTRIBUTED BY THE ATLAS MINE OU.

AIR:

REGIONAL AIR MONITORING WAS CONDUCTED IN THE WINTER AND SUMMER OF 1986 AND 1987. AIR MONITORING STATIONS WERE LOCATED UPWIND AND DOWNWIND OF THE ATLAS MINE OU AS WELL AS IN COALINGA AND THIRTEEN OTHER LOCATIONS IN THE GREATER COALINGA AREA. AIR MONITORING SAMPLES WERE ANALYZED USING TEM. THE DATA SHOWED THAT AIRBORNE ASBESTOS CONCENTRATIONS WERE ELEVATED IN THE ATLAS MINE OU AND THROUGHOUT THE LOS GATOS DRAINAGE BASIN AND PARTS OF THE ARROYO PASAJERO ALLUVIAL FAN COMPARED TO OTHER AREAS OF CALIFORNIA.

WINDS:

WINDS THAT EXCEED THE THRESHOLD VELOCITY AND ACTIVITIES THAT DISTURB THE MINE SURFACES AND TAILINGS PILES, SUCH AS DRIVING A VEHICLE ON THE TAILINGS PILES, CAN CAUSE AIRBORNE ASBESTOS EMISSIONS. OVER TIME, A PROTECTIVE CRUST HAS FORMED ON THE TAILINGS PILES THAT APPEARS TO REDUCE WIND EROSION IF LEFT UNDISTURBED.

#SSR

6.0 SUMMARY OF SITE RISKS

THE PUBLIC HEALTH EVALUATION:

THE FOLLOWING DISCUSSION OF SITE RISK SUMMARIZES RESULTS OF A RISK ASSESSMENT CONDUCTED AS PART OF THE REMEDIAL INVESTIGATION. THE COMPLETE RISK ASSESSMENT OR PUBLIC HEALTH EVALUATION ("PHE") IS INCLUDED AS CHAPTER 6 OF THE RI. BECAUSE OF CERTAIN SIMILARITIES BETWEEN THE ATLAS MINE OU AND THE JM MILL OU WITH RESPECT TO THE CONTAMINANT AND THE MEDIA OF CONCERN, EPA PREPARED ONE PHE FOR BOTH SITES. HOWEVER, WHERE POSSIBLE, THE EXCESS CANCER RISK DUE TO EACH OPERABLE UNITS, INDIVIDUAL CONTRIBUTION OF ASBESTOS WAS CALCULATED SEPARATELY.

ASBESTOS - PRIMARY CONTAMINANT:

ASBESTOS IS THE PRIMARY CONTAMINANT OF CONCERN AT THE ATLAS MINE OU, IN THE CCMA, IN THE PONDING BASIN AND AT THE CITY OF COALINGA OU. ASBESTOS IS A GENERIC TERM REFERRING TO TWO GROUPS OF NATURALLY-OCCURRING HYDRATED SILICATE MINERALS HAVING A FIBROUS CRYSTALLINE STRUCTURE, THE AMPHIBOLES AND THE SERPENTINES. THE ASBESTOS FOUND IN THE NEW IDRIA FORMATION IS THE SERPENTINE MINERAL CHRYSOTILE. ASBESTOS FIBERS HAVE BEEN WIDELY USED FOR THEIR HIGH TENSILE STRENGTH AND FLEXIBILITY AND FOR THEIR NONCOMBUSTIBLE, NONCONDUCTING, AND CHEMICAL-RESISTANT PROPERTIES. THE FIBERS HAVE BEEN USED IN INSULATION, BRAKE LININGS, FLOOR TILE, PLASTICS, CEMENT PIPE, PAPER

PRODUCTS, TEXTILES, AND BUILDING PRODUCTS.

ASBESTOS - HEALTH EFFECTS:

ASBESTOS IS A HUMAN CARCINOGEN FOR WHICH NO LEVEL OF EXPOSURE IS BELIEVED TO BE SAFE. ASBESTOS HAS BEEN THE SUBJECT OF NUMEROUS EPIDEMIOLOGY STUDIES AND EXPOSURE TO ASBESTOS HAS BEEN POSITIVELY LINKED TO LUNG CANCER, MESOTHELIOMA AND ASBESTOSIS. ALSO ASSOCIATED WITH ASBESTOS EXPOSURE IN SOME STUDIES ARE CANCERS OF THE LARYNX, PHARYNX, GASTROINTESTINAL TRACT, KIDNEY, AND OVARY, AS WELL AS RESPIRATORY DISEASES SUCH AS PNEUMONIA.

THE ADVERSE HUMAN HEALTH EFFECTS FROM EXPOSURE TO ASBESTOS ARE EXTREMELY SERIOUS. A FULL DISCUSSION OF THE HEALTH EFFECTS OF ASBESTOS IS FOUND IN THE EPA DOCUMENT AIRBORNE ASBESTOS HEALTH ASSESSMENT UPDATE. JUNE 1986. REMEDIAL ACTION IS WARRANTED TO MITIGATE THE EXPOSURE TO A CARCINOGEN THAT IS PRESENT AS A RESULT OF HUMAN ACTIVITY. ACTUAL OR THREATENED RELEASES OF HAZARDOUS SUBSTANCES FROM THIS OU MAY PRESENT AN IMMINENT AND SUBSTANTIAL ENDANGERMENT TO PUBLIC HEALTH, WELFARE, OR THE ENVIRONMENT.

ASBESTOS - SOURCES AT THE OU:

MAJOR SOURCES OF ASBESTOS AT THE ATLAS MINE OU ARE CONTAMINATED SOILS, RAW ASBESTOS ORE, ASBESTOS MINE AND MILL TAILINGS AND UNPAVED ROADS AND TRAILS. THE THREE MEDIA OF CONCERN AT THE ATLAS MINE SITE ARE AIR, SURFACE WATER AND SOIL. ASBESTOS IS NOT SOLUBLE IN WATER AND IS NOT TRANSMITTED TO GROUND WATER.

ROUTES OF EXPOSURE:

THERE ARE TWO GENERAL ROUTES OF EXPOSURE TO ASBESTOS AT THE ATLAS MINE OU: INHALATION AND INGESTION. INHALATION IS THE EXPOSURE PATHWAY OF GREATEST CONCERN TO HUMAN HEALTH BECAUSE THIS PATHWAY HAS BEEN POSITIVELY LINKED TO CANCER IN HUMANS. WHILE NOT CONFIRMED, THERE HAS BEEN ONE ANIMAL STUDY WHICH SUGGESTED THAT INGESTION EXPOSURE TO ASBESTOS MAY ALSO BE ASSOCIATED WITH AN INCREASED RISK OF CANCER.

POPULATIONS AT RISK:

POTENTIALLY EXPOSED POPULATIONS INCLUDE THE FOLLOWING GROUPS: I) INDIVIDUALS WHO USE THE ATLAS MINE AREA AND OTHER AREAS IN THE CCMA FOR RECREATIONAL OHV DRIVING, HIKING, CAMPING, HUNTING, RANCHING AND OTHER PUBLIC USES; II) INDIVIDUALS WHO LIVE IN CLOSE PROXIMITY TO THE ATLAS MINE AREA AND THE CCMA; AND III) THE POPULATIONS OF COMMUNITIES IN FRESNO AND SAN BENITO COUNTIES SUCH AS HURON, COALINGA, IDRIA, FIVE POINTS, STRATFORD, KETTLEMAN CITY, PRIEST VALLEY, LONOAK, PANOCHE AND AVENAL.

REGIONAL SOURCES OF ASBESTOS:

IN THE GREATER NEW IDRIA-COALINGA STUDY REGION, A WIDE VARIETY OF POTENTIAL REGIONAL SOURCES OF ASBESTOS MAY CONTRIBUTE TO ASBESTOS CONCENTRATIONS IN THE AIR. THESE REGIONAL SOURCES INCLUDE OTHER MINES AND DISTURBED AREAS IN THE CCMA, UNPAVED ROADS AND TRAILS IN THE CCMA AND NATURALLY OCCURRING SERPENTINITE SOILS IN THE NEW IDRIA FORMATION. THE RISK ASSESSMENT EVALUATED EXPOSURE TO AMBIENT LEVELS OF ASBESTOS DUE TO ALL POTENTIAL REGIONAL SOURCES AND ALSO TO ASBESTOS PRESENT IN THE AIR DUE TO THE ATLAS MINE OU ALONE.

IT IS EXTREMELY DIFFICULT TO DIRECTLY MEASURE THE INDIVIDUAL CONTRIBUTION OF ASBESTOS EMISSIONS FROM THE ATLAS MINE OU TO AMBIENT AIR MONITORING RESULTS BECAUSE OF THE OTHER NEARBY SOURCES IN THE NEW IDRIA FORMATION. THEREFORE, MODELS WERE USED TO ESTIMATE THE CONCENTRATION OF ASBESTOS IN AIR WHICH WOULD EXIST IF THE ONLY SOURCES OF ASBESTOS IN THE REGION WERE WIND EROSION OF

TAILINGS PILES AND MINE SURFACES AND VEHICLE TRAFFIC ON UNPAVED ROADS RUNNING THROUGH THE ATLAS MINE AREA. THE AIR MONITORING DATA WERE USED IN CONJUNCTION WITH HISTORICAL TOTAL SUSPENDED PARTICULATE ("TSP") DATA TO OBTAIN ANNUAL AVERAGE AIR CONCENTRATIONS IN VARIOUS LOCATIONS WITH ALL SOURCES CONSIDERED. THE TSP DATA ACCOUNT FOR TIME PERIODS WHEN THE THRESHOLD WIND VELOCITY FOR ENTRAINMENT WAS EXCEEDED. SECTION 5.2.1 OF THE RI PROVIDES A MORE DETAILED DISCUSSION OF THE AIR MODELING METHODS.

RISK ASSESSMENT METHODOLOGY:

EXCESS LIFETIME CANCER RISKS ARE DETERMINED BY MULTIPLYING THE INTAKE LEVEL WITH THE CANCER POTENCY FACTOR. THESE RISKS ARE PROBABILITIES THAT ARE GENERALLY EXPRESSED IN SCIENTIFIC NOTATION (E.G., 1 X (10-6)). IN THIS RISK ASSESSMENT, AN EXCESS LIFETIME CANCER RISK OF 1 X (10-6) INDICATES THAT, AS A PLAUSIBLE UPPER BOUND, AN INDIVIDUAL HAS A ONE IN ONE MILLION CHANCE OF DYING FROM CANCER AS A RESULT OF SITE-RELATED EXPOSURE TO A CARCINOGEN OVER A 70-YEAR LIFETIME UNDER SPECIFIC EXPOSURE CONDITIONS.

INHALATION RISK:

THE HIGHEST RISK POSED BY THE ATLAS MINE OU IS CORRELATED WITH ACTIVITY-RELATED EXPOSURE, SUCH AS EXPOSURE DUE TO DISTURBANCE BY MOTORIZED VEHICLES OF ASBESTOS-BEARING SURFACES. THIS EXPOSURE COULD EITHER OCCUR AT THE ATLAS MINE OU OR IN AREAS TO WHICH ASBESTOS FROM THE MINE AREA HAS BEEN TRANSPORTED. EXPOSURE POINT CONCENTRATIONS WERE CALCULATED USING CONCENTRATIONS OF ASBESTOS IN SOILS, MINE SURFACES AND MINE TAILINGS IN CONJUNCTION WITH ESTIMATED EMISSION RATES AND AN AIR DISPERSION MODEL. EMISSIONS OF ASBESTOS-CONTAMINATED DUST GENERATED BY OFF-ROAD VEHICLE ACTIVITIES AND BY AGRICULTURAL TILLING WERE ESTIMATED USING EQUATIONS PRESENTED IN EPA'S COMPILATION OF AIR POLLUTANT EMISSION FACTORS FOR STATIONARY POINT AND AREA SOURCES (EPA, 1985C).

THE AIR DISPERSION MODEL WAS A SIMPLE BOX MODEL WHICH DEFINES A CERTAIN VOLUME OF AIR (THE BOX) IN WHICH EMISSIONS FROM THE AREA SOURCES ARE PRESENT. THE BOX MODEL ASSUMES THAT WIND SPEED AND DIRECTION ARE CONSTANT WITHIN THE BOX AND THAT THE AIR IS UNIFORMLY MIXED. FOR EXPOSURE TO AMBIENT AIR AT THE ATLAS MINE AREA, IT WAS ASSUMED THAT A 20-YEAR-OLD-MALE WILL BE PRESENT FOR 8 HOURS PER DAY, 52 DAYS PER YEAR, FOR 10 YEARS, TO YIELD AN AVERAGE CONTINUOUS EXPOSURE DURATION OF 0.47 YEARS (THE AVERAGE CASE). FOR EXPOSURE TO AIR DURING OFF-ROAD VEHICLE ACTIVITY, IT WAS ASSUMED THAT A 20-YEAR OLD MALE DRIVES FOR THREE HOURS PER DAY, 16 DAYS PER YEAR FOR FIVE YEARS (THE AVERAGE CASE). TABLE 1 SUMMARIZES THE AVERAGE AND REASONABLE MAXIMUM ("MAXIMUM") EXPOSURE ASSUMPTIONS USE FOR THE VARIOUS ACTIVITY RELATED EXPOSURES. FOR BOTH TYPES OF ACTIVITY, THE EPA UNIT RISK FACTOR OF .21386 (PCM FIBERS/CUBIC CENTIMETER)1.OE-1 WAS USED. THERE ARE DATA FROM MEASUREMENTS MADE IN THE CCMA BY INVESTIGATORS INDEPENDENT OF EPA, THAT CONFIRM EPA'S ESTIMATES OF AIRBORNE ASBESTOS CONCENTRATION MADE USING THE AIR DISPERSION MODEL. SEE ADMINISTRATIVE RECORD DOCUMENT NO. 1612. USERS OF OHVS ON SERPENTINITE SOILS MAY EXPERIENCE EXPOSURE LEVELS THAT ARE ASSOCIATED WITH AN EXTREMELY HIGH CANCER RISK.

EXPERIMENTS CONDUCTED BY THE CALIFORNIA DEPARTMENT OF HEALTH SERVICES ("DHS") IN 1985 CLEARLY SHOW THAT A PICKUP TRUCK DRIVING ON UNPAVED ASBESTOS CONTAMINATED SOIL CAN PRODUCE ASBESTOS DUST CONCENTRATIONS IN THE AIR THAT POSE A POTENTIAL HEALTH RISK TO INDIVIDUALS CLOSE TO THE ACTIVITY. A DISCUSSION OF THIS EXPERIMENT HAS BEEN INCORPORATED INTO THE ADMINISTRATIVE RECORD FOR THE ATLAS MINE OU.

THE ESTIMATED EXCESS LIFETIME CANCER RISK FOR INDIVIDUALS HIKING, CAMPING OR HUNTING AT OR NEARBY THE ATLAS MINE OU VARIED FROM 1 X (10-6) TO 3 X (10-5) UNDER AVERAGE AND REASONABLE MAXIMUM EXPOSURE CONDITIONS, RESPECTIVELY. THE ESTIMATED EXCESS LIFETIME CANCER RISK FOR INDIVIDUALS DRIVING A FOUR-WHEEL-DRIVE TRUCK ON THE ATLAS MINE OU VARIED FROM 5 X (10-4) TO 4 X (10-1) UNDER AVERAGE AND REASONABLE MAXIMUM EXPOSURE CONDITIONS, RESPECTIVELY.

INGESTION RISK: THE EXCESS LIFETIME CANCER RISK FROM DRINKING ASBESTOS CONTRIBUTED TO THE WATER FROM THE CALIFORNIA AQUEDUCT BY THE ATLAS MINE OU WAS NOT FOUND TO BE SIGNIFICANT. THE RISK ESTIMATES WERE CALCULATED ASSUMING INGESTION OF TWO LITERS OF WATER PER DAY FOR A 70 YEAR PERIOD BY AN ADULT WEIGHING 70 KILOGRAMS (154 POUNDS). EPA'S UNIT RISK FACTOR OF 1.4 X (10-13) (FIBERS/LITER-1 WAS USED (EPA, 1985B).

THE ESTIMATED EXCESS LIFETIME CANCER RISK FOR INDIVIDUALS INGESTING UNTREATED CALIFORNIA AQUEDUCT WATER, CONTAMINATED WITH ASBESTOS FROM ALL SOURCES IN THE LOS GATOS CREEK DRAINAGE BASIN (NOT JUST THE ATLAS MINE OU), VARIED FROM 2 X (10-6) TO 4 X (10-5) UNDER AVERAGE AND REASONABLE MAXIMUM EXPOSURE CONDITIONS, RESPECTIVELY. HOWEVER, IT SHOULD BE NOTED THAT MUNICIPALITIES ARE REQUIRED TO FILTER DRINKING WATER UNDER THE SAFE DRINKING WATER ACT, THEREBY REDUCING EXPOSURE TO ASBESTOS.

ASBESTOS MEASUREMENT - UNCERTAINTY CONCERNING RISK LEVELS: WHEN EVALUATING RISK FROM ASBESTOS IN THE ENVIRONMENT, THERE ARE SOURCES OF UNCERTAINTY ASSOCIATED WITH ASBESTOS MEASUREMENT THAT MAKE QUANTIFYING THE RISK DIFFICULT.

COMPLEXITIES OF PARTICLE MEASUREMENT: ONE OF THESE SOURCES OF UNCERTAINTY IS THE DIFFICULTY OF OBTAINING ACCURATE AND PRECISE MEASUREMENTS OF ASBESTOS CONCENTRATIONS IN SOIL, AIR, AND WATER. FOR EXAMPLE, ALL RISK ASSESSMENTS REQUIRE AN ACCURATE AND PRECISE MEASUREMENT OF CONTAMINANT CONCENTRATION. WHEN A GASEOUS OR SOLUBLE CHEMICAL IS THE CONTAMINANT OF CONCERN, THE MEASUREMENT OF ONLY ONE PARAMETER, CONCENTRATION, IS SUFFICIENT TO ESTABLISH HOW MUCH OF THAT CONTAMINANT IS PRESENT IN A GIVEN SAMPLE. HOWEVER IT IS SIGNIFICANTLY MORE COMPLEX TO MEASURE THE CONCENTRATION OF PARTICULATES ACCURATELY AND PRECISELY, ESPECIALLY FIBROUS PARTICULATES, BECAUSE MANY MORE PARAMETERS MUST BE ACCOUNTED FOR. WHEN MEASURING SPHERICAL PARTICLES THE FOLLOWING PARAMETERS MUST BE MEASURED: I) THE OVERALL PARTICLE SIZE DISTRIBUTION; II) THE CONCENTRATION OF EACH INDIVIDUAL SIZE CATEGORY; AND III) THE CHANGE IN CONCENTRATION OF EACH SIZE CATEGORY IN DIFFERENT PARTS OF A DUST CLOUD. WHEN MEASURING FIBROUS PARTICULATES SUCH AS ASBESTOS, THE PARAMETERS BECOME EVEN MORE COMPLEX. THE LENGTH AND DIAMETER OF EACH PARTICLE MUST BE MEASURED ALONG WITH THE DISTRIBUTION OF COMPLEX SHAPES (SUCH AS BUNDLES, CLUSTERS AND MATRICES). THE CONCENTRATION OF EACH PARTICLE SHAPE MUST BE ESTABLISHED, ALONG WITH THE SETTLING VELOCITY OF DIFFERENT FIBER SHAPES. FINALLY, BECAUSE ASBESTOS ANALYSIS INVOLVES USE OF AN OPTICAL OR ELECTRON MICROSCOPE, THE RELATIVE EXPERIENCE AND FATIGUE OF THE ANALYST CAN INFLUENCE THE ULTIMATE ACCURACY AND PRECISION OF A GIVEN ANALYSIS.

CHANGES IN ASBESTOS MEASUREMENT METHODOLOGY: MANY OF THE EPIDEMIOLOGY STUDIES WHICH ESTABLISHED THE LINK BETWEEN THE INHALATION OF ASBESTOS AND CANCER USED PHASE CONTRAST MICROSCOPY ("PCM") TECHNIQUES TO MEASURE ASBESTOS CONCENTRATION. HOWEVER, PCM IS CONSIDERED INADEQUATE FOR THE ANALYSIS OF A SHORT FIBER MINERAL SUCH AS CHRYSOTILE AND FOR THE ANALYSIS OF NONOCCUPATIONAL LEVELS OF ASBESTOS. MANY OF THESE STUDIES WERE DONE BEFORE TEM TECHNIQUES WERE AVAILABLE. MOST STUDIES TODAY USE TEM AS THE "STATE OF THE ART" ANALYTICAL TECHNIQUE FOR MEASURING AIRBORNE ASBESTOS CONCENTRATIONS (SEE SUPERFUND METHOD FOR THE DETERMINATION OF ASBESTOS IN AMBIENT AIR, EPA 540/2-90/005A AND 005B, MAY 1990). IN THE RI, THE AMBIENT AIR SAMPLES AND SURFACE WATER SAMPLES WERE MEASURED USING TEM WHILE THE SOIL SAMPLES WERE MEASURED USING PLM. LIMITED TEM ANALYSES OF THE SOILS SAMPLES WERE USED FOR CONFIRMATION. TO USE TEM DATA IN QUANTITATIVE RISK ASSESSMENTS, ONE MUST CONVERT TEM DATA TO PCM EQUIVALENT ("PCME") DATA USING A CONVERSION FACTOR. THERE ARE A VARIETY OF WAYS TO PERFORM THIS CONVERSION. WHENEVER CONVERSIONS OF THIS TYPE ARE DONE, THE ABILITY TO QUANTIFY RISKS IS DECREASED.

ENVIRONMENTAL ASSESSMENT: SECTION 6.6 OF THE RISK ASSESSMENT PROVIDES AN ENVIRONMENTAL ASSESSMENT OF THE ATLAS MINE OU. FROM AN ECOLOGICAL STANDPOINT, THE MOST SIGNIFICANT IMPACTS OF THE MINING APPEAR TO BE ASSOCIATED WITH THE DESTRUCTION OF HABITATS IN THE ATLAS MINE AREA AS OPPOSED TO THE DIRECT EFFECTS OF ASBESTOS ON WILDLIFE. THESE IMPACTS WILL BE PARTIALLY MITIGATED IF THE PILOT REVEGETATION PROJECT IS SUCCESSFUL AND RECLAMATION OF THE DISTURBED AREAS

USING NATIVE VEGETATION IS IMPLEMENTED.

#DA

7.0 DESCRIPTION OF ALTERNATIVES

EPA EVALUATED POTENTIAL REMEDIAL ACTION ALTERNATIVES FOR THE ATLAS MINE OU IN ACCORDANCE WITH CERCLA SECTION 121, THE NATIONAL CONTINGENCY PLAN ("NCP") AND THE INTERIM-FINAL GUIDANCE ON PREPARING SUPERFUND DECISION DOCUMENTS. JUNE 1989, (OSWER DIRECTIVE NO. 9355.3-02). THE RESOURCE CONSERVATION AND RECOVERY ACT ("RCRA") DOES NOT APPLY TO ASBESTOS AND ITS LAND DISPOSAL RESTRICTIONS DO NOT APPLY TO ASBESTOS MINING AND MILLING WASTE.

MINOR CHANGES FROM ALTERNATIVE 3, THE PROPOSED PLAN: AS A RESULT OF PUBLIC COMMENTS AND EPA'S REVIEW PROCESS, THE SELECTED REMEDY FOR THE ATLAS MINE OU DIFFERS IN SOME MINOR RESPECTS FROM ALTERNATIVE 3, THE ALTERNATIVE SELECTED BY EPA AS THE PROPOSED PLAN. AS A RESULT OF IDENTIFICATION OF STATE ARARS BY THE CALIFORNIA DEPARTMENT OF HEALTH SERVICES, CERTAIN REQUIREMENTS OF CALIFORNIA,S PORTER-COLOGNE ACT HAVE BEEN ADDED TO THE SELECTED REMEDY. THE PROPOSED PLAN DID NOT SPECIFICALLY MENTION DISMANTLING AND DISPOSAL OF THE MILL BUILDING AT THE ATLAS MINE. A REQUIREMENT FOR DISMANTLING AND DISPOSAL OF THE MILL BUILDING HAS BEEN INCORPORATED INTO THE SELECTED REMEDY. THE PROPOSED PLAN ALSO SPECIFIED THAT THE ROAD THROUGH THE MINE AREA WOULD BE PAVED. THE ROD ALLOWS APPROPRIATE ENGINEERING ALTERNATIVES TO ROAD PAVING, SUCH AS ANNUAL ROAD MAINTENANCE. THE PROPOSED PLAN DID NOT SPECIFICALLY MENTION DEED RESTRICTIONS. A REQUIREMENT FOR FILING DEED RESTRICTIONS ON PRIVATE LANDS AT THE ATLAS MINE OU TO RESTRICT USE HAS BEEN ADDED TO THE SELECTED REMEDY. THE PROPOSED PLAN REQUIRED ADDITIONAL FENCING TO RESTRICT ACCESS TO THE MINE AREA. THE SELECTED REMEDY ALLOWS OTHER APPROPRIATE CONTROLS TO RESTRICT ACCESS. THESE CHANGES ARE INCLUDED IN SECTION 10.0, WHICH DESCRIBES THE SELECTED REMEDY.

SELECTION OF ALTERNATIVES: THE FIRST STEP IN EVALUATING POTENTIAL REMEDIAL ACTION ALTERNATIVES WAS TO DETERMINE, BASED UPON ATLAS MINE OU CHARACTERISTICS, WHAT SET OF RESPONSE ACTIONS AND ASSOCIATED TECHNOLOGIES WOULD BE CONSIDERED FROM AMONG ALL POSSIBLE ALTERNATIVES. AN EXAMPLE OF THIS PRELIMINARY DETERMINATION (OR "SCOPING") WAS THE ELIMINATION OF BIOLOGICAL TREATMENT FROM FURTHER CONSIDERATION BECAUSE BIOLOGICAL PROCESSES CAPABLE OF DETOXIFYING ASBESTOS CONTAMINATED SOIL DO NOT EXIST. SECTION 2.4 OF THE FS DISCUSSES THE SCOPING PROCESS IN MORE DETAIL.

THE NEXT STEP IN THE SELECTION OF REMEDY PROCESS WAS ASSEMBLING THE REMAINING TECHNOLOGIES AND/OR DISPOSAL OPTIONS INTO GENERAL REMEDIAL ACTION ALTERNATIVES. PURSUANT TO OSWER DIRECTIVE NO. 9355.3-02, REMEDIAL ACTION ALTERNATIVES ARE TO BE DEVELOPED INCLUDING THOSE THAT WOULD ELIMINATE THE NEED FOR LONG-TERM MANAGEMENT (INCLUDING MONITORING) AND ALTERNATIVES INVOLVING TREATMENT THAT WOULD PERMANENTLY REDUCE THE MOBILITY, TOXICITY OR VOLUME OF THE HAZARDOUS SUBSTANCES(S) AS THEIR PRINCIPAL ELEMENT. IN ADDITION, CONTAINMENT OPTIONS INVOLVING LITTLE OR NO TREATMENT AND A NO ACTION ALTERNATIVE ARE TO BE DEVELOPED. THE REMEDIAL ACTION ALTERNATIVES DEVELOPED IN THE FS WERE:

ALTERNATIVE 1:	NO ACTION
ALTERNATIVE 2:	ACCESS RESTRICTION
ALTERNATIVE 3:	STREAM DIVERSION/SEDIMENT TRAPPING DAMS, ACCESS RESTRICTION AND REVEGETATION
ALTERNATIVE 4:	STABILIZATION OF WASTE PILES, STREAM DIVERSION/SEDIMENT TRAPPING DAM, ACCESS RESTRICTION AND REVEGETATION
ALTERNATIVE 5:	CAPPING, ACCESS RESTRICTION AND STREAM DIVERSION
ALTERNATIVE 6:	CHEMICAL FIXATION, ACCESS RESTRICTION AND STREAM DIVERSION
ALTERNATIVE 7:	OFF-SITE DISPOSAL
ALTERNATIVE 8:	CONSTRUCTION OF A DAM AT WHITE CREEK

ALL OF THE COSTS AND IMPLEMENTATION TIMES PRESENTED BELOW ARE ESTIMATES. THE COST OF MONITORING IS NOT INCLUDED IN THE COST ESTIMATES FOR ALTERNATIVES 2 THROUGH 6. OPERATION AND MAINTENANCE ESTIMATES ARE FOR A 30 YEAR PERIOD. DETAILS OF HOW THE COST ESTIMATES WERE CALCULATED ARE INCLUDED IN THE FS.

ALTERNATIVE 1: NO ACTION

THE SUPERFUND PROGRAM REQUIRES THAT THE "NO ACTION" ALTERNATIVE BE EVALUATED AT EVERY SITE TO ESTABLISH A BASELINE FOR COMPARISON. UNDER THIS ALTERNATIVE, NO REMEDIAL ACTION WOULD BE TAKEN BUT A REGULAR PROGRAM OF SITE MONITORING WOULD BE STARTED. THIS MONITORING PROGRAM WOULD INCLUDE PERIODIC SAMPLING OF SURFACE WATER AND AIRBORNE ASBESTOS LEVELS IN THE ATLAS MINE AREA, AS WELL AS AERIAL MONITORING. CAPITAL, O&M (OPERATION AND MAINTENANCE) AND PRESENT WORTH COSTS ARE, RESPECTIVELY, NO COST, $830,000 AND $830,000. ALTERNATIVE 1 IS ESTIMATED TO REQUIRE THREE MONTHS TO IMPLEMENT.

ALTERNATIVE 2: ACCESS RESTRICTION

UNDER THIS ALTERNATIVE, THE MINES AND STOCKPILE AREAS WOULD BE FENCED TO RESTRICT ACCESS AND PREVENT DISTURBANCE BY OFF-ROAD VEHICLES. SIGNS WARNING OF ASBESTOS HAZARDS WOULD BE POSTED THROUGHOUT THE MINE AREA. CRITERIA WOULD BE ESTABLISHED FOR ALL OTHER ACTIVITY TO MINIMIZE THE AMOUNT OF AIRBORNE ASBESTOS EMISSIONS. CAPITAL, O&M AND PRESENT WORTH COSTS ARE, RESPECTIVELY, $470,000, $88,000 AND $558,000. ALTERNATIVE 2 IS ESTIMATED TO REQUIRE TWO MONTHS TO IMPLEMENT.

ALTERNATIVE 3: STREAM DIVERSION/SEDIMENT RETENTION DAMS; ACCESS RESTRICTION; REVEGETATION; MILL DISMANTLING AND DISPOSAL; SLOPE STABILIZATION

IN ADDITION TO ACCESS RESTRICTION, SURFACE WATERS WOULD BE DIVERTED AROUND MINE SURFACES AND STOCKPILE AREAS WITH PERIMETER DIKES AND DIVERSION DITCHES. THESE STREAM DIVERSIONS WOULD MINIMIZE EROSION OF THE MINE SURFACES AND TAILINGS PILES. SEDIMENT RETENTION DAMS WOULD BE BUILT TO REDUCE THE TRANSPORT OF SEDIMENTS. MINOR REGRADING AND/OR OTHER APPROPRIATE ENGINEERING CONTROLS, SUCH AS BOX CULVERTS, WOULD IMPROVE THE SURFACE DRAINAGE AND STABILITY OF THE MINES AND STOCKPILE AREAS. A PILOT STUDY WOULD EVALUATE WHETHER NATIVE VEGETATION COULD BE ESTABLISHED ON THE DISTURBED AREAS. A REVEGETATION PROJECT WILL BE IMPLEMENTED IF IT IS FOUND TO BE TECHNICALLY FEASIBLE AND COST EFFECTIVE. CAPITAL, O&M AND PRESENT WORTH COSTS ARE, RESPECTIVELY, $4,000,000, $286,000 AND $4,286,000. ALTERNATIVE 3 IS ESTIMATED TO REQUIRE FOUR MONTHS TO IMPLEMENT.

ALTERNATIVE 4: REGRADING OF WASTE PILES PLUS ALTERNATIVE 3

IN ADDITION TO ALL ELEMENTS OF ALTERNATIVE 3, ALTERNATIVE 4 ADDS MAJOR IMPROVEMENTS TO THE STABILITY AND DRAINAGE OF MINES AND STOCKPILE AREAS. FULLY ENGINEERED, COMPREHENSIVE IMPROVEMENTS WOULD BE PERFORMED TO MINIMIZE SLUMPING AND EROSION DUE TO RUNOFF. CAPITAL, O&M AND PRESENT WORTH COSTS ARE, RESPECTIVELY, $9,100,000, $286,000 AND $9,386,000. ALTERNATIVE 4 IS ESTIMATED TO REQUIRE SIX MONTHS TO IMPLEMENT.

ALTERNATIVE 5: VEGETATED SOIL CAP; ACCESS RESTRICTION; STREAM DIVERSION

IN ADDITION TO THE STREAM DIVERSION ELEMENT OF ALTERNATIVE 3, ALTERNATIVE 5 INCLUDES THE CONSTRUCTION OF A VEGETATED SOIL COVER ON MINE SURFACES AND STOCKPILES. THIS VEGETATED SOIL CAP WOULD BE CONSTRUCTED BY FIRST RESHAPING THE STOCKPILES AND THEN COVERING THE MINES AND STOCKPILES WITH 6 TO 12 INCHES OF FERTILE SOIL COVER. VEGETATION WOULD THEN BE ESTABLISHED ON THE SOIL COVER. CAPITAL, O&M AND PRESENT WORTH COSTS ARE, RESPECTIVELY, $14,300,000, $286,000 AND $14,586,000. ALTERNATIVE 5 IS ESTIMATED TO REQUIRE SIX MONTHS TO IMPLEMENT.

ALTERNATIVE 6: CHEMICAL FIXATION; ACCESS RESTRICTION; STREAM DIVERSION

2.3 MILLION CUBIC METERS (3 MILLION CUBIC YARDS) OF ASBESTOS WASTE MATERIALS WOULD BE CHEMICALLY FIXED WITH CEMENTING AGENTS. THE ASBESTOS MATERIAL WOULD BE EXCAVATED FROM THE MINES AND STOCKPILES AND TRANSPORTED TO AN ON-SITE BATCH MIXING PLANT. AT THE PLANT THE ASBESTOS WOULD BE MIXED WITH CEMENTING AGENTS AND WATER TO FORM A SLURRY. THIS SLURRY WOULD THEN BE TRANSPORTED

TO THE OPEN PIT MINES AND PREVIOUSLY EXCAVATED AREAS. AFTER CURING, THE SLURRY WOULD HARDEN INTO A FIXED MASS SIMILAR TO CONCRETE. STREAM RUN-ON WOULD BE DIVERTED AROUND AREAS CONTAINING FIXED MATERIAL, THEREBY REDUCING EROSION. CAPITAL, O&M AND PRESENT WORTH COSTS ARE, RESPECTIVELY, $103,336,000, $137,000 AND $103,473,000. ALTERNATIVE 6 IS ESTIMATED TO REQUIRE 48 MONTHS TO IMPLEMENT.

ALTERNATIVE 7: OFF-SITE DISPOSAL
2.3 MILLION METERS (3 MILLION CUBIC YARDS) OF ASBESTOS CONTAMINATED MATERIAL WOULD BE EXCAVATED AND TRANSPORTED TO AN OFFSITE LANDFILL PERMITTED TO RECEIVE ASBESTOS WASTE. NEARLY ALL OF THE ASBESTOS WASTE WOULD BE EXCAVATED AND THE NEED FOR LONG-TERM MONITORING AND MAINTENANCE OF THE MINES AND STOCKPILE AREAS WOULD BE ELIMINATED. CAPITAL, O&M AND PRESENT WORTH COSTS ARE, RESPECTIVELY, $ 243,000,000, NO COST AND $243,000,000. ALTERNATIVE 7 IS ESTIMATED TO REQUIRE 120 MONTHS TO IMPLEMENT.

ALTERNATIVE 8: CONSTRUCTION OF A DAM ON WHITE CREEK
A DAM WITH AN APPROXIMATE RESERVOIR CAPACITY OF 7500 ACRE-FEET AND AN AREAL EXTENT OF ABOUT 91 HECTARES (200 ACRES) WOULD BE CONSTRUCTED. THE PROBABLE LOCATION WOULD BE JUST BELOW THE INTERSECTION OF WHITE CREEK AND DIAZ CANYON, APPROXIMATELY 7 MILES DOWNSLOPE FROM THE ATLAS MINE OU. THIS DAM WOULD ADDRESS THE TRANSPORT OF WATERBORNE ASBESTOS FROM THE ENTIRE WHITE CREEK WATERSHED. HOWEVER, THIS ALTERNATIVE WOULD NOT ADDRESS SPECIFIC CONDITIONS AND HEALTH THREATS AT THE ATLAS MINE OU (EXCEPT FOR TRANSPORT OF ASBESTOS BEARING SEDIMENTS FROM THE ATLAS MINE AREA TO THE PONDING BASIN BY SURFACE STREAMS). THE PRESENT WORTH COST IS ESTIMATED AT $16,500,000. THE TIME REQUIRED TO IMPLEMENT ALTERNATIVE 8 IS GREATER THAN TWO (2) YEARS.

#SCAA
8.0 SUMMARY OF THE COMPARATIVE ANALYSIS OF ALTERNATIVES

THIS SECTION PROVIDES AN EXPLANATION OF THE NINE (9) CRITERIA USED TO SELECT THE REMEDY, AND AN ANALYSIS OF THE EIGHT REMEDIAL ACTION ALTERNATIVES IN LIGHT OF THOSE CRITERIA, HIGHLIGHTING THE ADVANTAGES AND DISADVANTAGES OF EACH OF THE ALTERNATIVES.

CRITERIA
THE ALTERNATIVES WERE EVALUATED BASED ON THE NINE KEY CRITERIA WHICH DIRECTLY RELATE TO THE FACTORS THAT CERCLA AND THE NCP, 40 CFR SECTION 300.430, MANDATE THAT THE AGENCY ASSESS IN SELECTING A REMEDY. THESE CRITERIA ARE:

1. OVERALL PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT, WHICH ADDRESSES WHETHER A REMEDY PROVIDES ADEQUATE PROTECTION AND DESCRIBES HOW RISKS POSED THROUGH EACH PATHWAY ARE ELIMINATED, REDUCED OR CONTROLLED THROUGH TREATMENT, ENGINEERING CONTROLS OR INSTITUTIONAL CONTROLS;

2. COMPLIANCE WITH APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARS), WHICH ADDRESSES WHETHER A REMEDY WILL MEET THE STANDARDS OF ALL OF THE ARARS OF OTHER FEDERAL AND STATE ENVIRONMENTAL LAWS AND/OR JUSTIFIES A WAIVER;

3. LONG-TERM EFFECTIVENESS AND PERMANENCE, WHICH REFERS TO EXPECTED RESIDUAL RISK AND THE ABILITY OF A REMEDY TO MAINTAIN RELIABLE PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT OVER TIME, ONCE CLEAN-UP GOALS HAVE BEEN MET;

4. REDUCTION OF TOXICITY, MOBILITY OR VOLUME THROUGH TREATMENT, WHICH ADDRESSES THE ANTICIPATED PERFORMANCE OF THE TREATMENT TECHNOLOGIES A REMEDY MAY EMPLOY;

5. SHORT TERM EFFECTIVENESS, WHICH ADDRESSES THE PERIOD OF TIME NEEDED TO ACHIEVE PROTECTION AND ANY ADVERSE IMPACTS ON HUMAN AND THE ENVIRONMENT THAT MAY BE POSED

DURING THE CONSTRUCTION AND IMPLEMENTATION PERIOD, UNTIL CLEAN-UP GOALS ARE ACHIEVED;

6. IMPLEMENTABILITY, WHICH IS THE TECHNICAL AND ADMINISTRATIVE FEASIBILITY OF A REMEDY;

7. COST, WHICH INCLUDES ESTIMATED CAPITAL AND O&M COSTS, AS WELL AS PRESENT-WORTH COSTS;

8. STATE ACCEPTANCE, WHICH INDICATES THE SUPPORT OF THE STATE AGENCY FOR THE SELECTED REMEDY; AND

9. COMMUNITY ACCEPTANCE, WHICH SUMMARIZES THE PUBLIC'S GENERAL RESPONSE TO THE RI/FS AND PROPOSED PLAN.

ANALYSIS OF THE ALTERNATIVES OVERALL PROTECTION.
BECAUSE ALTERNATIVE 1, THE "NO ACTION" ALTERNATIVE, IS NOT PROTECTIVE OF HUMAN HEALTH AND THE ENVIRONMENT, IT IS NOT CONSIDERED FURTHER IN THIS ANALYSIS AS AN OPTION FOR THE ATLAS MINE OU. ALTERNATIVE 2 WOULD BE PROTECTIVE OF HUMAN HEALTH ONLY FOR PERSONS ATTEMPTING TO ENTER THE ATLAS MINE AREA. ALTERNATIVES 3 THROUGH 7 WOULD ALL PROVIDE ADEQUATE PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT BY CONTROLLING RISK THROUGH ENGINEERING CONTROLS, INSTITUTIONAL CONTROLS OR TREATMENT. ALTERNATIVE 6 IS THE ONLY OPTION THAT UTILIZES TREATMENT. ALTERNATIVE 3 WOULD CONTROL THE SIGNIFICANT RISK FROM INHALATION OF ASBESTOS-CONTAMINATED AIR AT THE ATLAS MINE OU AND NEARBY AREAS BY RESTRICTING ACCESS TO THE ATLAS MINE AREA. THE STREAM DIVERSIONS AND SEDIMENT RETENTION DAMS WOULD MINIMIZE THE RELEASE OF ASBESTOS FROM THE ATLAS MINE OU INTO LOCAL CREEKS. ALTERNATIVE 3 WOULD NOT DISTURB THE PROTECTIVE CRUST ON THE STOCKPILES TO A GREAT EXTENT. THE REVEGETATION ELEMENT OF ALTERNATIVES 3 AND 4 COULD, IF SUCCESSFUL, HELP STABILIZE DISTURBED AREAS, MINIMIZE EROSION AND REDUCE FUTURE RELEASES OF CONTAMINANTS. ALTHOUGH ALTERNATIVE 4 WOULD PROVIDE GREATER SLOPE STABILITY OF TAILINGS PILES THAN ALTERNATIVE 3, ALTERNATIVE 4 WOULD DISTURB THE PROTECTIVE CRUST TO A GREATER EXTENT THAN ALTERNATIVE 3. ALTERNATIVE 8 WOULD NOT ADDRESS CONDITIONS AND HEALTH THREATS AT THE ATLAS MINE OU.

COMPLIANCE WITH ARARS.
ALTERNATIVES 3 THROUGH 7 WOULD MEET THEIR RESPECTIVE APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS OF FEDERAL AND STATE ENVIRONMENTAL LAWS. ALTERNATIVE 2 WOULD COMPLY WITH THE SPECIFICATIONS IN 40 CFR SECTION 61.153(B) AND SECTION 61.156(B) BUT WOULD NOT COMPLY WITH THE REMAINING IDENTIFIED ARARS. ALTERNATIVES 1 AND 8 WOULD NOT COMPLY WITH ARARS.

LONG-TERM EFFECTIVENESS AND PERMANENCE.
ALTERNATIVE 3 WOULD REDUCE THE AMOUNT OF ASBESTOS-CONTAMINATED MATERIAL RELEASED INTO THE AIR AND THE SURFACE WATER IN THE ATLAS MINE OU. BY RESTRICTING ACCESS TO AREAS WHERE ASBESTOS HAS BEEN TRANSPORTED, ALTERNATIVE 3 WOULD ALSO REDUCE THE LONG-TERM RISK OF EXPOSURE TO ASBESTOS-CONTAMINATED AIR. FOR THIS CRITERION, ALTERNATIVES 4 AND 5 ARE COMPARABLE TO ALTERNATIVE 3. ALTERNATIVE 2 WOULD PROVIDE LONG-TERM PROTECTION ONLY TO EXPOSURE AT THE ATLAS MINE AREA AS OPPOSED TO DOWNSTREAM EXPOSURES. LONG TERM EFFECTIVENESS WILL DEPEND ON PROPER MAINTENANCE OF DIVERSION STRUCTURES AND OTHER ENGINEERED ELEMENTS. THE ENGINEERED ELEMENTS OF THE PREFERRED ALTERNATIVE WILL BE DESIGNED TO TAKE MAXIMUM ADVANTAGE OF THE NATURAL SYSTEMS AND TO MINIMIZE OPERATION AND MAINTENANCE NEEDS.

ALTERNATIVE 6 PROVIDES THE GREATEST AMOUNT OF LONG-TERM EFFECTIVENESS AND PERMANENCE. ALTERNATIVE 7 WOULD REMOVE ALL WASTE TO A LANDFILL PERMITTED TO ACCEPT ASBESTOS, THEREBY ELIMINATING THE LONG-TERM RISK OF EXPOSURE AT THE ATLAS MINE OU. AS WITH ALL LANDFILLS, THE LONG-TERM EFFECTIVENESS OF THE CONTAINMENT SYSTEM MAY NEED TO BE RETROFITTED OR REPLACED. THEREFORE, A RISK WILL REMAIN AT THE LANDFILL SITE AND LONG-TERM EFFECTIVENESS WILL BE DEPENDENT ON OPERATION AND MAINTENANCE AT THAT LOCATION. ALTERNATIVES 1 AND 8 DO NOT PROVIDE LONG-TERM EFFECTIVENESS AND PERMANENCE.

REDUCTION OF TOXICITY, MOBILITY OR VOLUME OF THE CONTAMINANTS THROUGH TREATMENT. BECAUSE THERE IS NO COST-EFFECTIVE TREATMENT TECHNOLOGY FOR ASBESTOS-CONTAINING MINING MATERIALS AT THIS OU, THIS CRITERION IS NOT DIRECTLY RELEVANT TO A CHOICE AMONG ALTERNATIVES. HOWEVER, THE ALTERNATIVES WERE COMPARED WITH RESPECT TO THEIR ABILITY TO MINIMIZE THE MOBILITY (THROUGH THE AIR OR SURFACE WATER PATHWAYS) OF THE ASBESTOS-CONTAINING MATERIAL. ONLY ALTERNATIVE 6 WOULD TREAT THE WASTE TO REDUCE THE MOBILITY OF THE ASBESTOS. ALTERNATIVES 2 THROUGH 5 AND ALTERNATIVE 7 RELY ON INSTITUTIONAL CONTROLS OR ENGINEERING CONTROLS TO REDUCE THE MOBILITY OF THE ASBESTOS TO VARYING DEGREES. TECHNOLOGY IS NOT CURRENTLY AVAILABLE THAT WOULD REDUCE THE VOLUME OF ASBESTOS CONTAMINATED SOILS.

SHORT TERM EFFECTIVENESS.
ALTERNATIVE 2 WOULD QUICKLY REDUCE DIRECT HUMAN CONTACT WITH ASBESTOS AT THE ATLAS MINE OU. ALTERNATIVES 3, 4 AND 5 WOULD HAVE A MINOR, SHORT TERM RISK OF EXPOSURE FOR WORKERS AT THE ATLAS MINE OU. ALTERNATIVES 6 AND 7, BECAUSE OF THEIR GREATER IMPLEMENTATION TIMES, WOULD INCLUDE A MORE SERIOUS SHORT TERM RISK OF EXPOSURE FOR ON-SITE WORKERS. IN ADDITION, ALTERNATIVE 7 WOULD SUBJECT THE SURROUNDING COMMUNITY TO THE POSSIBILITY OF ACCIDENTAL SPILLAGE DURING TRANSPORT OF THE CONTAMINANT FROM THE ATLAS MINE OU. ALTERNATIVE 8 WOULD NOT BE EFFECTIVE IN THE SHORT TERM BECAUSE IT DOES NOT ADDRESS EXPOSURE AT THE ATLAS MINE AREA.

IMPLEMENTABILITY.
ALTERNATIVES 2 AND 7 WOULD HAVE NO UNUSUAL TECHNICAL DIFFICULTIES THAT COULD DELAY IMPLEMENTATION. FOR ALTERNATIVES 3 AND 4, THE IMPLEMENTABILITY OF THE REVEGETATION COMPONENT WILL BE TESTED IN A PILOT PROJECT. THE OTHER ELEMENTS OF ALTERNATIVES 3 AND 4 SHOULD NOT PRESENT AN IMPLEMENTABILITY PROBLEM. ALTERNATIVE 5 WOULD FACE A TECHNICAL DIFFICULTY IN FINDING ADEQUATE BORROW SOURCES (I.E., AREAS WHERE CLEAN SOIL IS REMOVED FOR USE AS A CAP ON THE CONTAMINATED AREAS) AND COULD FACE ADMINISTRATIVE DIFFICULTIES IN GETTING PERMITS FROM LOCAL AND COUNTY DEVELOPMENT AGENCIES TO EXPLOIT NEARBY BORROW SOURCES WITHOUT ADVERSELY IMPACTING THE MINE AREA HABITAT VALUE. ALTERNATIVE 6 COULD FACE TECHNICAL DIFFICULTIES WITH THE PROCESS SYSTEM DESIGNED TO FIX THE WASTE MATERIAL AND WOULD ALSO REQUIRE A PILOT STUDY PRIOR TO IMPLEMENTATION. THESE DIFFICULTIES COULD INCLUDE LOGISTICAL PROBLEMS RELATED TO OPERATING A COMPLEX FIXATION PLANT IN A REMOTE AREA AND THE PROVIDING POWER SOURCES TO RUN SUCH A PLANT. ALTERNATIVE 7 COULD FACE ADMINISTRATIVE DIFFICULTIES IN GETTING PERMITS FROM STATE AND FEDERAL AGENCIES FOR TRANSPORTING THE ASBESTOS MATERIAL ON PUBLIC ROADS. ALTERNATIVE 8 WOULD HAVE NO TECHNICAL DIFFICULTIES IN TERMS OF DAM CONSTRUCTION BUT WOULD FACE FORMIDABLE ADMINISTRATIVE DIFFICULTIES IN TERMS OF PERMITTING AND ENVIRONMENTAL IMPACTS, AT THE STATE AND FEDERAL LEVEL. IN ADDITION, THE FEASIBILITY OF DAM CONSTRUCTION IN AN AREA OF KNOWN SEISMIC ACTIVITY IS UNKNOWN.

COST.
ALL OF THE FOLLOWING COST FIGURES ARE ESTIMATES OF PRESENT WORTH COST AND INCLUDE OPERATION AND MAINTENANCE COSTS BASED ON A 30-YEAR PERIOD. FOR ALTERNATIVES 2 THROUGH 6, THE COSTS OUTLINED BELOW DO NOT INCLUDE THE COST OF CONTINUED MONITORING. HOWEVER, MONITORING WILL BE REQUIRED AS PART OF THE SELECTED REMEDY. THE COST OF ALTERNATIVE 1 IS $830,000 (FOR CONTINUED MONITORING). ALTERNATIVE 2 HAS A COST OF $558,000. THE COST OF ALTERNATIVE 3 IS $4,286,000. ALTERNATIVE 4 HAS A COST OF $9,386,000. ALTERNATIVE 5 HAS A COST OF $14,586,000. ALTERNATIVE 6 HAS A COST OF $103,473,000. THE HIGHEST COST ALTERNATIVE IS ALTERNATIVE 7 AT $243,000,000. THE COST OF ALTERNATIVE 8 IS 16,500,000.

STATE ACCEPTANCE.
THE STATE OF CALIFORNIA HAS CONCURRED IN EPA'S SELECTED REMEDY. HOWEVER, THE STATE HAS INDICATED THAT IT WOULD PREFER A MORE FULLY ENGINEERED REMEDY THAT INCLUDES LARGE-SCALE REGRADING OF THE TAILINGS PILES.

COMMUNITY ACCEPTANCE.

THE MAJORITY OF THE COMMENTERS FROM THE COALINGA AREA PREFERRED ALTERNATIVE 8. THEY BELIEVE THAT A DAM WOULD PROVIDE THE MOST PROTECTION TO COALINGA AND HURON FROM ASBESTOS BEARING SEDIMENTS AND WOULD ALSO HELP RECHARGE LOCAL GROUNDWATER. EPA ALSO RECEIVED COMMENTS FROM MEMBERS OF THE OHV USER COMMUNITY AND OTHER RECREATIONAL USERS OF THE CCMA. THE OHV USER COMMUNITY EXPRESSED CONCERN THAT, ALTHOUGH THIS ROD DOES NOT SELECT ANY REMEDIAL ACTION IN THE CCMA, REVISION OF BLM'S LAND USE PLAN FOR THE CCMA TO CONSIDER POSSIBLE HUMAN HEALTH EFFECTS OF ASBESTOS EXPOSURE COULD RESULT IN ACCESS RESTRICTION OR CLOSURE OF THE CCMA TO RECREATIONAL AND OTHER PUBLIC USE. SEVERAL PRPS QUESTIONED EPA'S RESULTS AND CONCLUSIONS AS TO THE HEALTH RISK THAT THE ATLAS SITE REPRESENTS, GIVEN THE NATURAL OCCURRENCE OF ASBESTOS IN THE NEW IDRIA FORMATION. THESE PRPS CONCLUDED THAT A "NO ACTION" DECISION IS APPROPRIATE.

#ARARS

9.0 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARS)

UNDER SECTION 121(D)(1) OF CERCLA, 42 USC S 9621(D)(1), REMEDIAL ACTIONS MUST AT A MINIMUM ATTAIN A DEGREE OF CLEAN-UP WHICH ASSURES PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT. ADDITIONALLY, REMEDIAL ACTIONS THAT LEAVE ANY HAZARDOUS SUBSTANCE, POLLUTANT, OR CONTAMINANT ON-SITE MUST MEET A LEVEL OR STANDARD OF CONTROL THAT ATTAINS STANDARDS, REQUIREMENTS, LIMITATIONS, OR CRITERIA THAT ARE "APPLICABLE" OR "RELEVANT AND APPROPRIATE UNDER THE CIRCUMSTANCES OF THE RELEASE." SEE SECTION 121(D)(2) OF CERCLA, 42 USC S 9621(D)(2). THESE REQUIREMENTS OF SECTION 121(D)(2), KNOWN AS "ARARS", MAY BE WAIVED IN CERTAIN INSTANCES, AS STATED IN SECTION 121(D)(4) OF CERCLA, 42 USC S 9621(D)(4).

"APPLICABLE" REQUIREMENTS ARE THOSE CLEAN-UP STANDARDS, STANDARDS OF CONTROL AND OTHER SUBSTANTIVE ENVIRONMENTAL PROTECTION REQUIREMENTS, CRITERIA, OR LIMITATIONS PROMULGATED UNDER FEDERAL OR STATE LAW THAT SPECIFICALLY ADDRESS A HAZARDOUS SUBSTANCE, POLLUTANT OR CONTAMINANT, REMEDIAL ACTION, LOCATION, OR OTHER CIRCUMSTANCE AT A CERCLA SITE.

"RELEVANT AND APPROPRIATE" REQUIREMENTS ARE CLEAN-UP STANDARDS, STANDARDS OF CONTROL AND OTHER SUBSTANTIVE ENVIRONMENTAL PROTECTION REQUIREMENTS, CRITERIA, OR LIMITATIONS PROMULGATED UNDER FEDERAL OR STATE LAW THAT, WHILE NOT "APPLICABLE" TO A HAZARDOUS SUBSTANCE, POLLUTANT, CONTAMINANT, REMEDIAL ACTION, LOCATION, OR OTHER CIRCUMSTANCE AT A CERCLA SITE, ADDRESS PROBLEMS OR SITUATIONS SUFFICIENTLY SIMILAR TO THOSE ENCOUNTERED AT THE CERCLA SITE THAT THEIR USE IS WELL-SUITED TO THE PARTICULAR SITE. FOR EXAMPLE, REQUIREMENTS MAY BE RELEVANT AND APPROPRIATE IF THEY WOULD BE "APPLICABLE" BUT FOR JURISDICTIONAL RESTRICTIONS ASSOCIATED WITH THE REQUIREMENT. THE DETERMINATION OF WHICH REQUIREMENTS ARE "RELEVANT AND APPROPRIATE" IS LEFT TO EPA'S DISCRETION. EPA MAY LOOK TO THE TYPE OF REMEDIAL ACTIONS CONTEMPLATED, THE HAZARDOUS SUBSTANCES PRESENT, THE WASTE CHARACTERISTICS, THE PHYSICAL CHARACTERISTICS OF THE SITE, AND OTHER APPROPRIATE FACTORS. IT IS POSSIBLE FOR ONLY PART OF A REQUIREMENT TO BE CONSIDERED RELEVANT AND APPROPRIATE.

ADDITIONALLY, ONLY SUBSTANTIVE REQUIREMENTS NEED BE FOLLOWED. IF NO ARAR COVERS A PARTICULAR SITUATION, OR IF AN ARAR IS NOT SUFFICIENT TO PROTECT HUMAN HEALTH OR THE ENVIRONMENT, THEN NONPROMULGATED STANDARDS, CRITERIA, GUIDANCE, AND ADVISORIES MAY BE USED TO PROVIDE A PROTECTIVE REMEDY.

TYPES OF ARARS

THERE ARE THREE TYPES OF ARARS. THE FIRST TYPE IS A "CONTAMINANT SPECIFIC" REQUIREMENT. THIS ARAR TYPE SETS LIMITS ON CONCENTRATIONS OF SPECIFIC HAZARDOUS SUBSTANCE, POLLUTANTS, AND CONTAMINANTS IN THE ENVIRONMENT. EXAMPLES OF THIS TYPE OF ARAR ARE AMBIENT WATER QUALITY CRITERIA AND DRINKING WATER STANDARDS. THE SECOND TYPE OF ARAR IS A LOCATION-SPECIFIC REQUIREMENT THAT SETS RESTRICTIONS ON CERTAIN TYPES OF ACTIVITIES BASED ON SITE CHARACTERISTICS.

THESE INCLUDE RESTRICTION ON ACTIVITIES IN WETLANDS, FLOODPLAINS, AND HISTORIC SITES. THE THIRD TYPE OF ARAR IS AN ACTION-SPECIFIC REQUIREMENT. THIS ARAR TYPE IS A TECHNOLOGY-BASED RESTRICTION WHICH IS TRIGGERED BY THE TYPE OF ACTION UNDER CONSIDERATION. AN EXAMPLE OF AN ACTION-SPECIFIC ARAR IS THE OCCUPATIONAL SAFETY AND HEALTH ACT ("OSHA") WHICH SETS PERMISSIBLE LEVELS OF EXPOSURE TO ASBESTOS FOR WORKERS.

ARAR IDENTIFICATION PROCESS

ARARS MUST BE IDENTIFIED ON A SITE-SPECIFIC BASIS FROM INFORMATION ABOUT SPECIFIC CHEMICALS AT THE SITE, SPECIFIC FEATURES OF THE SITE LOCATION, AND ACTIONS THAT ARE BEING CONSIDERED AS REMEDIES.

ARARS IDENTIFIED FOR THE ATLAS MINE OU ADDRESS EMISSION OF ASBESTOS FIBERS FROM CONTAMINATED SOILS, INHALATION OF ASBESTOS FIBERS, DISPOSAL OF ASBESTOS CONTAMINATED SOILS, PROTECTION OF ENDANGERED SPECIES, REGULATION OF MINING WASTE, FUGITIVE DUST EMISSIONS AND PROTECTION OF WETLANDS.

CONTAMINANT-SPECIFIC ARARS FOR ASBESTOS:

1. CLEAN AIR ACT, NATIONAL EMISSION STANDARD FOR HAZARDOUS AIR POLLUTANTS (NESHAPS) ASBESTOS WAS FIRST DESIGNATED AS A HAZARDOUS AIR POLLUTANT UNDER THE CLEAN AIR ACT IN 1971. THE NATIONAL EMISSION STANDARD FOR HAZARDOUS AIR POLLUTANTS ("NESHAPS") FOR ASBESTOS FOUND AT 40 CFR SECTION 61.152 AND 40 CFR SECTION 61.156 ARE ARARS FOR THE IMPLEMENTATION OF THE REMEDY AT THIS SITE. 40 CFR SECTION 61.153 IS AN ARAR FOR THE COMPLETION OF THE REMEDY AT THIS OPERABLE UNIT.

2. CALIFORNIA AIR RESOURCES ACT, HEALTH AND SAFETY CODE, DIVISION 26, SECTION 39000 ET SEQ, 17 CCR, PART 3, CHARTER 1, SPECIFICALLY THE FRESNO COUNTY AIR POLLUTION CONTROL DISTRICT PM 10 STANDARD

THE FRESNO COUNTY AIR POLLUTION CONTROL DISTRICT HAS ADOPTED PM 10 AS A PARTICULATE MATTER STANDARD. THIS PM 10 STANDARD MEANS THAT AMBIENT LEVELS OF PARTICULATE MATTER GREATER THAN 10 MICRONS IN LENGTH SHALL NOT EXCEED 30 MICROGRAMS PER CUBIC METER (ANNUAL AVERAGE) OR 50 MICROGRAMS PER CUBIC METER OVER A 24 HOUR PERIOD.

LOCATION-SPECIFIC ARARS:

1. THE ENDANGERED SPECIES ACT OF 1973, 16 USC SECTION 1536(A-D)

THE ATLAS MINE OU IS LOCATED IN AN AREA THAT CONTAINS ENDANGERED SPECIES (THE SAN JOAQUIN KIT FOX AND THE BLUNT-NOSED LEOPARD LIZARD). GENERALLY, WHEN A PROJECT POTENTIALLY IMPACTS AN ENDANGERED SPECIES OR CRITICAL HABITAT, ACTIVITIES CARRIED OUT BY FEDERAL AGENCIES SHOULD NOT JEOPARDIZE THE CONTINUED EXISTENCE OF AN ENDANGERED SPECIES OR CAUSE ADVERSE MODIFICATIONS OF CRITICAL HABITAT.

2. USFWS MITIGATION POLICY (46 FED.REG. 7644-7663. JANUARY 1981).

THIS POLICY IS TRIGGERED IN ACCORDANCE WITH THE FISH AND WILDLIFE ACT OF 1956, FISH AND WILDLIFE COORDINATION ACT, WATERSHED PROTECTION AND FLOOD PREVENTION ACT AND THE NATIONAL ENVIRONMENTAL POLICY ACT. THE MITIGATION POLICY DEFINES RESOURCE CATEGORIES AND ESTABLISHES MITIGATION GOALS AND GUIDELINES FOR EACH. GUIDELINES TO ACHIEVE THE GOAL INCLUDE AVOIDING OR MINIMIZING HABITAT LOSS, IMMEDIATE RECTIFICATION OR REDUCTION OF HABITAT LOSS OR REPLACEMENT OF HABITAT IN KIND.

3. FEDERAL WATER POLLUTION CONTROL ACT, SECTION 404(B)(1), 33 USC SECTION 1344(B)(1).

THIS STATUTE IS DESIGNED TO ENSURE THAT IF NO PRACTICABLE ALTERNATIVE TO IMPACTING WATERS OF THE UNITED STATES INCLUDING WETLANDS EXISTS, ANY UNAVOIDABLE, ADVERSE IMPACT ON THE WETLANDS MUST BE MITIGATED.

4. CALIFORNIA HAZARDOUS WASTE CONTROL LAWS, HEALTH AND SAFETY CODE, DIV. 20, CHAPTER 6.5. SECTION 25220-25241 ET SEQ. AND 22 CCR, DIV. 4, CHAPTER 30, SECTION 66001 ET SEQ

THE ACTUAL SUBSTANTIVE RESTRICTIONS CONTAINED IN SECTION 25232(A)(1) AND (2) ARE AN ARAR FOR THE PRIVATELY OWNED LANDS AT THE ATLAS MINE OU. HOWEVER, THE PROCEDURAL REQUIREMENTS RELATED TO NOTICE, HEARING AND THE MECHANISMS FOR IMPLEMENTING DEED RESTRICTIONS DO NOT FALL WITHIN THE DEFINITION OF AN ARAR. CERCLA SECTION 121, 42 USC 9621.

ACTION SPECIFIC ARARS:

1. OCCUPATIONAL SAFETY AND HEALTH ACT ("OSHA")

OSHA HAS SET A PERMISSIBLE EXPOSURE LIMIT ("PEL") FOR ALL ASBESTOS FIBERS AT 0.2 FIBER PER CC ("F/CC") FOR OCCUPATIONAL EXPOSURE AND AN "ACTION LEVEL" (THE LEVEL ABOVE WHICH EMPLOYERS MUST INITIATE COMPLIANCE ACTIVITIES) OF 0.1 F/CC AS AN 8-HOUR TIME WEIGHTED AVERAGE (51 CFR SECTION 22612 (1986)). WHILE THIS STANDARD WAS MEANT FOR OCCUPATIONAL EXPOSURE (8 HOURS PER DAY, 40 HOURS PER WEEK, 52 WEEKS PER YEAR) AND NOT FOR CONTINUOUS AMBIENT EXPOSURE, IT PROVIDES AN UPPER THRESHOLD FOR EVALUATING PERMISSIBLE AMBIENT EXPOSURE LIMITS. IN OTHER WORDS, A CONCENTRATION OF .2 PCM FIBERS PER CC OR LESS IS NOT PERMISSIBLE FOR AMBIENT EXPOSURE, SINCE THIS REQUIREMENT IS APPLICABLE OR RELEVANT AND APPROPRIATE FOR EXPOSURE DURING THE CLEANUP OF THIS OPERABLE UNIT.

2. CALIFORNIA PORTER COLOGNE WATER QUALITY ACT, 23 CCR, CHAPTER 3: SUBCHAPTER 15, ARTICLE 7 - MINING WASTE MANAGEMENT, SECTIONS 2570-2574, SPECIFICALLY 23 CCR SECTION 2572(B), 23 CCR SECTION 2572(H)(1)(A), 23 CCR SECTION 2572(H)(3), 23 CCR SECTION 2546(D) AND 23 CCR SECTION 2546(E)

THIS STATE ACT CONTAINS REGULATIONS ESTABLISHING WASTE MANAGEMENT REQUIREMENTS FOR ALL MINING WASTE. THE ACT,S CONSTRUCTION STANDARDS REQUIRE ACCOMMODATION OF 25-YEAR, 24-HOUR STORM RUN-OFF CONTROLS IN DESIGN CRITERIA FOR THE DRAINAGE AND DIVERSION STRUCTURES AT THE ATLAS MINE OU AS WELL AS 100 YEAR PEAK STREAM FLOW PROTECTION FOR ALL WASTE PILES AT THIS OPERABLE UNIT. THESE REQUIREMENTS ARE APPLICABLE AND RELEVANT AND APPROPRIATE FOR REMEDIAL ACTION AT THIS OPERABLE UNIT.

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10.0 THE SELECTED REMEDY

THE SELECTED REMEDY CONSISTS OF ALTERNATIVE 3 WITH SOME MODIFICATIONS. IT INCLUDES ACCESS RESTRICTIONS, CONSTRUCTION OF STREAM DIVERSIONS AND SEDIMENT TRAPPING DAMS, GRADING AND/OR OTHER SLOPE STABILIZATION ELEMENTS, A REVEGETATION PILOT STUDY (WITH IMPLEMENTATION IF FOUND TO BE APPROPRIATE), ROAD PAVING OR AN ENGINEERED ALTERNATIVE, MILL DISMANTLING, DISPOSAL OF DEBRIS, DEED RESTRICTIONS AND IMPLEMENTING AN OPERATION AND MAINTENANCE PROGRAM.

ACCESS RESTRICTION: THE PERIMETER OF THE ATLAS MINE OU HAS BEEN FENCED AND BERMS ALONG WHITE CREEK ROAD HAVE BEEN CONSTRUCTED BY THE BLM TO DISCOURAGE ACCESS OF THE MINE AREA. IN ADDITION, ACCESS TO DISTURBED AREAS WILL BE FURTHER LIMITED, IF NECESSARY, BY ADDITIONAL FENCING OR OTHER APPROPRIATE MEANS. BY RESTRICTING ACCESS TO THE ATLAS MINE OU, THE GENERATION OF AIRBORNE ASBESTOS EMISSIONS WILL BE MINIMIZED, REDUCING THE RISK FROM INHALING ASBESTOS FIBERS FOR PERSONS IN THE IMMEDIATE AREA.

CONSTRUCTION OF STREAM DIVERSIONS AND SEDIMENT TRAINING DAMS, GRADING AND/OR OTHER SLOPE STABILIZATION ELEMENTS: SURFACE WATER WOULD BE DIVERTED AROUND MINE SURFACES, ORE STOCKPILES AND MINE TAILINGS PILES WITH PERIMETER DIKES AND DIVERSION DITCHES. THESE STREAM DIVERSIONS WOULD REDUCE EROSION AND TRANSPORT OF ASBESTOS WASTE MATERIAL FROM THE ATLAS MINE OU INTO LOCAL DRAINAGES. SEDIMENT RETENTION DAMS WOULD BE BUILT DOWNSLOPE FROM THE MINE SURFACES AND MINING WASTE TO CONTROL THE RELEASE OF ASBESTOS INTO THE LOCAL DRAINAGE. MINOR REGRADING OF ORE STOCKPILES AND TAILINGS PILES WOULD IMPROVE SURFACE DRAINAGE AND STABILITY OF THESE AREAS. OTHER ENGINEERING CONTROLS, SUCH AS BOX CULVERTS, WILL BE CONSTRUCTED TO FURTHER STABILIZE THE TAILINGS PILES.

EACH OF THESE ENGINEERING CONTROLS CONSIST OF THE FOLLOWING COMPONENTS:

STREAM DIVERSION (RUN-ON CONTROL) SYSTEM:

- INTERCEPTOR DITCHES
- DIVERSION DIKES
- PRIMARY CHANNEL

SEDIMENT TRAPPING (RUN-OFF CONTROL) SYSTEM:

- FLOOD RETENTION DIKES
- SEDIMENT RETENTION DAMS
- REVEGETATION PILOT PROJECT

TAILINGS PILE STABILIZATION AND CONTROL:

- GRADING
- ROCK FILLED GABIONS, BOX CULVERTS OR OTHER APPROPRIATE SLOPE STABILIZATION STRUCTURES.

ALL DIVERSION AND DRAINAGE FACILITIES SHALL BE DESIGNED AND CONSTRUCTED TO ACCOMMODATE THE ANTICIPATED VOLUME OF PRECIPITATION AND PEAK FLOWS FROM SURFACE RUN-OFF IN A 25-YEAR, 24 HOUR STORM. ALL TAILINGS PILES SHALL BE PROTECTED FROM 100-YEAR PEAK STREAM FLOWS. ALL STRUCTURES SHALL BE DESIGNED AND CONSTRUCTED WITH SAFETY FACTORS THAT ENSURE THE INTEGRITY OF THESE STRUCTURES IN THE EVENT OF SEISMIC ACTIVITY OF MAGNITUDES KNOWN TO OCCUR IN THE COALINGA AREA.

ALL CONTAINMENT STRUCTURES SHALL BE DESIGNED BY A REGISTERED CIVIL ENGINEER AND CONSTRUCTION SHALL BE SUPERVISED AND CERTIFIED BY A REGISTERED CIVIL ENGINEER OR CERTIFIED ENGINEERING GEOLOGIST. ALL CONTAINMENT STRUCTURES WILL BE DESIGNED TO INCLUDE FACTORS OF SAFETY THAT WILL PROTECT THESE STRUCTURES FROM SEISMIC EVENTS OF A SIZE KNOWN TO OCCUR IN THIS AREA.

BECAUSE ASBESTOS FROM NATURAL AND DISTURBED. AREAS IS ALREADY PRESENT IN AND WILL CONTINUE TO ENTER THE SURFACE WATER PATHWAY, IT IS EXTREMELY DIFFICULT TO QUANTIFY THE REDUCTION IN RISK THAT THIS PORTION OF THE REMEDY WILL ACHIEVE. HOWEVER, IT IS BELIEVED THAT SIGNIFICANT REMOVAL OF THE ATLAS MINE OU CONTRIBUTION TO ASBESTOS ENTERING THE LOCAL DRAINAGE WOULD PRODUCE A REDUCTION IN DOWNSTREAM RISK DUE TO INHALATION OF RESUSPENDED ASBESTOS FIBERS. A VERIFICATION SAMPLING PLAN ("VSP") WILL BE INSTITUTED TO CONFIRM THAT AN APPROPRIATE REDUCTION IN HYDRAULIC TRANSPORT RATE OF ASBESTOS IS ACHIEVED. THE VSP WILL INCLUDE SURFACE WATER MODELING AND SURFACE WATER AND STREAM BED SAMPLING, AS NECESSARY.

REVEGETATION PILOT PROTECT: A PILOT STUDY WILL EVALUATE IF NATIVE VEGETATION COULD BE ESTABLISHED ON THE DISTURBED AREAS. IF REVEGETATION IS FOUND TO BE TECHNICALLY FEASIBLE AND COST EFFECTIVE, THE DISTURBED AREAS WILL BE RECLAIMED WITH VEGETATION TO THE EXTENT FOUND TO BE APPROPRIATE.

ROAD PAVING OR AN ENGINEERED ALTERNATIVE, MILL DISMANTLING, DISPOSAL OF DEBRIS AND DEED RESTRICTIONS: THE ROAD THROUGH THE MINE AREA WILL BE PAVED OR AN ALTERNATIVE WILL BE ADOPTED TO SUPPRESS DUST. THE MILL BUILDING WILL BE DISMANTLED AND DISPOSED OF ALONG WITH OTHER DEBRIS IN THE MINE AREA. A DEED RESTRICTION WILL LIMIT USE OF THE PRIVATELY HELD LAND AND PREVENT DISTURBANCE OF THE CONTAMINATED MATERIAL LEFT AT THE MINE AREA OU.

OPERATION AND MAINTENANCE: VISUAL INSPECTIONS, BOTH ON THE GROUND AND FROM THE AIR, WILL BE REQUIRED TO ENSURE THE INTEGRITY OF THE ENGINEERING AND INSTITUTIONAL CONTROLS. OPERATION AND MAINTENANCE ACTIVITIES WILL BE REQUIRED TO ENSURE THE EFFECTIVENESS OF THE ENGINEERING CONTROLS. THESE ACTIVITIES WILL INCLUDE: (1) INSPECTION OF ENGINEERING SYSTEMS TO ENSURE INTEGRITY AND PERFORMANCE, (2) REMOVAL OF SEDIMENTS FROM RETENTION DAMS, (3) ANY REPAIR WORK NECESSARY TO MAINTAIN THE INTEGRITY OF THE REMEDIAL SYSTEMS, (4) MAINTENANCE OF THE VEGETATION, AND (5) REGULAR POLICING OF THE ATLAS MINE AREA BY BLM RANGERS.

FIVE YEAR REVIEW: EPA WILL REVIEW THE EFFECTIVENESS OF THE REMEDIAL ACTIONS PURSUANT TO CERCLA SECTION 121(C), 42 USC SECTION 9621(C). COST: USING A CONSERVATIVE ESTIMATE, THE TOTAL CAPITAL COST FOR THE SELECTED ALTERNATIVE IS $4 MILLION. ANNUAL OPERATION AND MAINTENANCE ACTIVITIES ARE ESTIMATED AT $19,000. THE TOTAL PRESENT WORTH COST FOR THE SELECTED REMEDY IS ESTIMATED TO BE $4,286,000. TABLE 2 SUMMARIZES COSTS FOR THE SELECTED ALTERNATIVE.

DURING THE REMEDIAL DESIGN AND CONSTRUCTION PROCESS, THAT FOLLOWS THIS ROD, SOME CHANGES TO THE SELECTED REMEDY MAY BE REQUIRED AND WILL BE MADE IN ACCORDANCE WITH THE NCP. CERCLA SECTION 117, 42 USC SECTION 9617 AND 40 CFR SECTION 300.435(C)(2).

#DSC

11.0 DOCUMENTATION OF SIGNIFICANT CHANGES

THE SELECTED ALTERNATIVE FOR THE ATLAS MINE OU IS CONSTRUCTION OF ENGINEERING SYSTEMS TO CONTROL THE RELEASE OF AIRBORNE AND WATERBORNE ASBESTOS FROM THE ATLAS MINE AREA AND ACCOMPANYING MEASURES, AS DETAILED IN SECTION 10, ABOVE. AT THIS TIME NO SIGNIFICANT CHANGES FROM THE PROPOSED PLAN HAVE OCCURRED. MINOR CHANGES ARE DESCRIBED IN SECTION 7.0.

#SD

12.0 STATUTORY DETERMINATIONS

OVERALL PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT

THE SELECTED REMEDY PROTECTS HUMAN HEALTH AND THE ENVIRONMENT BY MINIMIZING EXPOSURE TO ASBESTOS-CONTAMINATED MATERIALS. PROPER OPERATION AND MAINTENANCE PRACTICES WILL ENSURE THE INTEGRITY OF THE STREAM DIVERSIONS, SEDIMENT TRAPPING DAMS, VEGETATION AND FENCING. STRICT DUST CONTROL PROCEDURES WILL BE FOLLOWED DURING CONSTRUCTION. PROPER HEALTH AND SAFETY MEASURES, INCLUDING AMBIENT AIR MONITORING AND PERSONNEL MONITORING DURING IMPLEMENTATION, WILL ENSURE THAT THE HEALTH OF ON-SITE WORKERS AND THE LOCAL POPULATION IS PROTECTED.

COST-EFFECTIVENESS

THE SELECTED REMEDY IS COST-EFFECTIVE IN THAT IT PROVIDES OVERALL EFFECTIVENESS COMMENSURATE TO ITS COSTS. THE ESTIMATED COST OF THE SELECTED REMEDY IS LESS THAN ONE HALF THE COST ASSOCIATED WITH ALTERNATIVE 4 AND LESS THAN ONE THIRD THE COST ASSOCIATED WITH ALTERNATIVE 5, AND YET THE SELECTED REMEDY AND ALTERNATIVES 4 AND 5 ARE SIMILAR IN TERMS OF THE LEVEL OF PUBLIC HEALTH AND ENVIRONMENTAL PROTECTION PROVIDED.

COMPLIANCE WITH ARARS

THE SELECTED REMEDY WILL COMPLY WITH ALL APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS THAT HAVE NOT BEEN WAIVED.

UTILIZATION OF PERMANENT SOLUTIONS TO THE MAXIMUM EXTENT PRACTICABLE CURRENTLY THERE IS NO KNOWN PERMANENT TREATMENT OR RESOURCE TECHNOLOGY WHICH WOULD CONTROL RELEASE OF ASBESTOS FROM THE SOIL AT THE ATLAS MINE OU. A CHEMICAL FIXATION ALTERNATIVE WAS IDENTIFIED, BUT IT WAS ELIMINATED FROM FURTHER CONSIDERATION DUE TO DIFFICULTIES ASSOCIATED WITH IMPLEMENTATION AND VERY HIGH COST. OF THOSE ALTERNATIVES THAT ARE PROTECTIVE OF HUMAN HEALTH AND THE ENVIRONMENT, COMPLY WITH ARARS AND ARE COST EFFECTIVE, EPA HAS DETERMINED, THAT THE SELECTED REMEDY PROVIDES THE BEST BALANCE OF THE VARIOUS FACTORS THAT CERCLA REQUIRES BE CONSIDERED IN REMEDY SELECTION.

THE ATLAS MINE OU IS LOCATED IN A LARGELY RURAL AREA, REMOTE FROM ANY POPULATION CENTERS AND WITHIN A LARGE AREA OF SERPENTINE WHICH IS A SOURCE OF NATURALLY OCCURRING ASBESTOS. OFF-SITE DISPOSAL OF THE MINING WASTE WOULD BE PROHIBITIVELY EXPENSIVE AND WOULD HAVE A SIGNIFICANT SHORT-TERM RISK ASSOCIATED WITH TRANSPORT OF THE ASBESTOS TO A LANDFILL LICENSED TO ACCEPT ASBESTOS WASTE.

PREFERENCE FOR TREATMENT AS A PRINCIPAL ELEMENT

CURRENTLY THERE IS NO PROVEN, COST-EFFECTIVE TREATMENT TECHNOLOGY THAT WOULD PERMANENTLY AND SIGNIFICANTLY REDUCE THE MOBILITY, TOXICITY OR VOLUME OF ASBESTOS AT THE ATLAS MINE OU. SINCE NO COST-EFFECTIVE TREATMENT ALTERNATIVE EXISTS FOR THIS OU, TREATMENT WAS NOT SELECTED AS A REMEDY. ALTHOUGH SEVERAL TREATMENT TECHNOLOGIES WERE INVESTIGATED DURING THE FEASIBILITY STUDY, IT WAS DETERMINED THAT NO TECHNOLOGY PRESENTLY EXISTS THAT WOULD RESULT IN A PERMANENT AND SIGNIFICANT DECREASE IN THE TOXICITY, MOBILITY OR VOLUME OF ASBESTOS AT THE ATLAS MINE OU IN A COST EFFECTIVE MANNER. ALTERNATIVE 3 WAS FOUND TO BE THE BEST METHOD FOR ADDRESSING THE THREATS POSED BY THE ATLAS MINE OU, TAKING INTO ACCOUNT ALL OF THE STATUTORY REQUIREMENTS AND PREFERENCES.