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APPENDIX B

Historic JAB Hydrologic Test Report
October, 1984

HYDROLOGY OF THE

JAB PROJECT AREA

PREPARED FOR:

UMETCO MINERALS CORPORATION

By:
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October, 1984

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1.0 INTRODUCTION

Hydro-Engineering was contracted by the Gas Hills, Wyoming operation of Umetco Minerals Corporation, formerly known as Union Carbide Corporation, to evaluate hydrology of the Jab 1 tract located in the Red Desert area of Sweetwater County, Wyoming. The proposed project area is shown in Exhibit D6-1.

This report addresses hydrologic analyses made and monitoring information collected between November, 1979, and November, 1982. Included are a brief geologic setting, well completion information, aquifer-test description and data, water-level data, and surface water and ground-water quality information.

D6.2.0 GROUND WATER

D6.2.1 GEOLOGIC SETTING

The Jab project area is located in the area where the Battle Springs Formation crops out. Exhibit D6-1 presents the surficial geology of Jab project and surrounding areas, as well as two faults in the area. The formation consists of mainly sandstone, being arkosic, fine to coarse grained, and green claystone. The Battle Springs Formation interfingers with the Wasatch and Green River Formation going from east to west in the Great Divide Basin.

To the north and south of the project area are deposits of gravel of Pleistocence that consist of sand and gravel, which is poorly consolidated to unconsolidated and some conglomerate. Continuing south of the gravel deposit the Laney shale and Tertiary rocks of the Green River Formation crop out. To the north and west of the Jab project area the Fort Union Formation crops out.

Two faults are presented in Exhibit D6-1. The fault to the south passes through the southwesterly corner of the project area. This fault has a vertical displacement of about 1000 ft. The fault to the north is outside of the project area. A localized fault has been defined by Umetco geologists to exist between wells OW 1301 and MW 1291. Well OW 1303 on the north side of the fault is on the uplifted side with a displacement of 39 ft. Exhibit D6-2 presents Geologic Cross-Section A-A' which runs in a north-south direction through the localized fault. The cross-section

presents the mudstone bed that is used to indicate the base of the ore zone and to show the generalized geologic structure. From well MW 1300 to the localized fault to the south the mudstone bed dips gently to the south. From said fault to well MW 1298 the mudstone bed dips steeply to the south.

Exhibit D6-3 presents a Geologic Cross-Section B-B' in the east-west direction. The cross-section shows the mudstone bed being very deep. The sloping of mudstone bed from well MW 1292 to MW 1298 to MW 1299 is caused from well MW 1298 being further south of the other two wells.

Exhibit D6-1 presents structure contours on the top of the mudstone bed south of the localized fault. The structure contours do not continue north of well OW 1303 due to lack of adequate data, but would be spaced much further apart.

D6.2.2 WELL CONSTRUCTION

Five monitoring wells were drilled and completed with five-inch PVC casing, and six observation wells were drilled and completed with two-inch PVC casing. These wells were drilled and completed in late summer 1980. Table D6-1 presents the basic well information. Exhibit D6-4 shows the location of the wells. Well Jab #1 was drilled and completed in late summer 1978 with six-inch PVC casing. It is not known when well AX 34 was drilled, but it is cased with six-inch steel casing. This well is outside the project area located in section 21 and has been used to define water levels (see Exhibit D6-1 for location).

Wells OW 1300, OW 1303, and OW 1307 were drilled, and perforated casing was installed below the mudstone bed. Well 1307 was completed below the mudstone to define the hydrologic conditions below the mudstone in this area. Wells OW 1301, OW 1302, and OW 1303 are observation wells for monitoring well MW 1291 and have radii of 62 ft, 30.5 ft, and 50 ft, respectively, from the monitoring well. Well OW 1304, OW 1305, and OW 1307 are observation wells for monitoring well MW 1292 and have radii of 60.4 ft, 30.4 ft and 32.4 ft, respectively, from the monitoring well (see Exhibit D6-4 for location).

D6.2.3 AQUIFER PROPERTIES

D6.2.3.1 Pump Test Theory

The theories used to analyze these pump tests are presented in Addendum A. The Theis confined aquifer theory is mainly used to obtain the aquifer properties. The straight line or Jacob modification of Theis' equation and the Theis recovery equation are also used. The Neuman-Witherspoon method (see Addendum A for a discussion) was used to estimate the vertical permeability that exists below the ore sand.

D6.2.3.2 Pump Test Results

Two multi-well (1291 and 1292) pump tests and four single well (1298, 1299, 1300, and Jab No. 1) tests were used to define the aquifer properties at the Jab project area. Addendum B presents the results of the Jab pump tests.

D6.2.3.3 Summary of Aquifer Properties

Table D6-2 presents a summary of aquifer properties for this area. A multi- well pump test was conducted in the western portion of the Jab area at well MW1292. The average transmissivity in this area is thought to be 4400 gal/day/ft while a storage coefficient of 2 x 10^-4 is representative of the aquifer in this area. The horizontal permeability of the ore sand is roughly 8 ft/day.

A vertical permeability of 0.43 ft/day (1.6 x 10^-4 cm/sec) was calculated for the mudstone below the ore sand at well OW 1307. This value seems verh high and is probably not representative of the mudstone unless it is highly fractured.

The transmissivity of the ore sand is much less in the area of the other multi-well test at well 1291. The transmissivity seems to increase with distance from the local fault in this area from 210 gal/day/ft at well 1291 to 840 gal/day/ft at well OW 1301. The storage coefficient is roughly 8 x 10^-4 in this area of the aquifer. Permeabilities vary from less than one to 2.5 ft/day in this area of the ore sand.

The transmissivity of the aquifer varied considerable over the remainder of the Jab project area from a low of 45 gal/day/ft in the south central portion at well 1298 to a high at Jab Well No. 1 with a transmissivity of 3400 gal/day/ft. The transmitting ability of the sand at well 1299 is very good, with a value of 1500 gal/day/ft. A transmissivity of 660 gal/day/ft was

determined for the sand at well 1300.

D6.2.4 WATER-LEVEL AND GROUND-WATER MOVEMENT

D6.2.4.1 Water-Level Elevation

Figure D6-1 presents the water-level elevation plots for wells MW 1291, OW 1301, OW 1302, and OW 1303. Tables D6-3 through D6-6 present the static water level data for said wells, respectively. Wells OW 1302 and OW 1301 present an increase in the static water level, and stabilization by mid 1981. This change in the water level is due to the development of these wells by air lifting and bailing. Wells MW 1291 and OW 1303 have stayed close to the same water-level elevation since installation.

Figure D6-2 presents the water-level elevation plots for wells MW 1292, OW 1304, OW 1305 and OW 1307. Tables D6-7 through D6-10 present the static water level data for these wells, respectively. Wells MW 1292 and OW 1307 have been stable since installation, but wells OW 1304 and OW 1305 required development with air before their water levels stabilized.

Wells MW 1298, MW 1299, MW 1300, Jab No. 1 and AX 34 static water level measurements are presented in Tables D6-11 through D6-15, respectively. Figure D6-3B presents the plot of the static water elevation for these wells. All five wells show stability, with the exception of a measurement made in January, 1981 for well MW 1298 and June, 1981 for well AX 34. These two measurements were probably in error. Well Jab No. 1 had a

submersible pump installed and the water was being used in the drilling of the other monitoring and observation wells and drill holes.

Exhibit D6-4 presents the water-level elevation map in the Jab project area. Ground water flows in the more permeable sand channels to the southeast at an average rate of 50 ft/yr, based on a gradient of 0.0018 ft/ft, average permeability of 8 ft/day, and an effective porosity of 0.1. The movement is much less (~ one ft/yr) in the low permeability zones near well 1298.

D6.2.4.2 Water Level Changes

Water levels have been monitored since the Fall of 1980 in thirteen wells in the area of the proposed Jab mine and are presented in Tables D6-3 through D6-15. The water levels in all wells have been very stable without seasonal fluctuation or a long-term trend. The initial water levels in observation wells OW 1301, OW 1302, OW 1304, and OW 1305 were too low during the first few months of monitoring because the wells were not adequately developed. Water levels responded to air development of these observation wells and recovered to representative values after development.

Figure D6-1 presents the water levels for the east pump test cluster of wells, pumping well MW 1291 and observation wells OW 1301, OW 1302 and OW 1303. Water levels in the east cluster of wells have been very stable since the observation wells were developed. The head of the water level in observation well OW

1303 is two ft higher than the other wells in this cluster. Observation well OW 1303 is completed north of the fault below the mudstone. The higher head indicates that the fault retards flow across the fault. Potential flow is from the north to the south side of the fault.

Figure D6-2 presents the water levels for the west pump test cluster of wells OW 1304, OW 1305 and OW 1307. Well OW 1307 is completed below the mudstone in the next lower sand below the ore sand. The head in well OW 1307 is approximately one ft lower than that in the ore sand above the mudstone. Potential flow across the mudstone is from the ore sand downward through the mudstone.

Water levels for the other five wells monitored are presented in Figure D6-3. Water levels in well MW 1300, which is upgradient and to the north of the mine area have been very stable, as have all of the other wells. The three southern wells, MW 1298, MW 1299, and AX 34 have lower heads than wells north of them, but also demonstrate a gradient from the west to the east.

Water levels near the proposed Jab mine were very stable for the two and one-half years that they were monitored and therefore are not expected to vary much with time. These water levels indicate that recharge and discharge to this aquifer are very close to being in equilibrium.

D6.2.5 RECHARGE AREAS

Recharge to the ground-water system in the Jab permit area is from recharge in areas where the sands outcrop and from surface infiltration. Recharge from surface infiltration probably occurs mostly in the sandy stream channels.

D6.2.6 GROUND-WATER QUALITY

Ground water in the Jab project area is predominantly the calcium sulfate- bicarbonate type (see Table D6-16). However, sodium makes up a relatively high percentage of total cation content in some of the more diluted ground- water samples (see specifically analyses for wells MW 1292 and MW 1300).

In terms of total dissolved solids (TDS) and specific major ion concentrations, the Jab project area ground-water quality is quite variable and ranges from excellent to unsuitable for use as a domestic water supply. TDS ranges from 230 mg/l (well MW 1300, 3/30/82) to 1700 mg/l (well MW 1291, 3/30/82). Wyoming Department of Environmental Quality, Water Quality Division (DEQ, WQD) ground-water standards indicate that 500 mg/l is the TDS limit, although higher TDS water is commonly used for domestic purposes where a better quality water supply is not available.

Sulfate is the ion most often observed in excessive concentrations. Measured concentrations of sulfate have ranged as high as 1100 mg/l (well MW 1291, 3/30/82), which is more than four times greater than DEQ, WQD's domestic ground-water supply

standard of 250 mg/l for sulfate.

Currently, the most common use of ground water near the Jab project area is livestock watering. This use is also the most likely predominant use in the future. With respect to TDS and major ion concentrations, all Jab project area ground water is suitable for livestock consumption.

With some exceptions, trace element and heavy metal concentrations are acceptably low in the Jab project area ground water for use as a domestic or livestock watering supply. One arsenic concentration was observed in well MW 1291 water (0.06 mg/l, 3/30/82) which is slightly in excess of the DEQ, WQD domestic ground-water supply standard of 0.05 mg/l. No arsenic concentrations exceeded the livestock consumption ground-water standard of 0.2 mg/l.

Boron concentration exceeded the DEQ, WQD domestic ground-water supply standard of 0.75 mg/l on one occasion each in three Jab project monitoring wells (Jab No. 1, 9/17/80; MW 1291, 10/08/80; and MW 1299, 9/17/80). In each case, the measured value was 1 mg/l, which also corresponded to the lower limit of detection at that time. Because of the relatively large lower detection limit in 1980, and because no excessive boron values have been observed in Jab ground water since late 1980, the three reported excessive values are not considered to be significant.

Two values of cadmium have exceeded DEQ, WQD's domestic ground-water standard of 0.01 mg/l. One was measured in water collected

from well MW 1298 (0.026 mg/l) and the other in water collected from well MW 1299 (0.018 mg/l). Both water samples were taken on 3/30/82. No cadmium concentrations which exceed the DEQ, WQD livestock watering standard of 0.05 mg/l have been measured in Jab project area ground water.

Maximum allowable chromium concentration in ground water to be used as a domestic or livestock water supply is 0.05 mg/l, according to DEQ, WQD standards. Two measurements of chromium in Jab project area ground water exceeded this standard. The values, both measured in water samples collected on 12/09/81, are 0.15 mg/l and 0.083 mg/l for wells MW 1291 and MW 1299, respectively.

One excessive fluoride value of 11 mg/l was measured in water collected from well MW 1299 on 12/09/81. Because other fluoride concentrations measured in well MW 1299 water do not exceed 1 mg/l, and the highest concentration observed in ground water in other Jab area wells is 2 mg/l, the one excessive value is believed to be erroneous.

Only one iron concentration in Jab area ground water exceeds DEQ, WQD's domestic standard of 0.3 mg/l (0.575 mg/l in well MW 1300 on 3/30/82). Iron, in this concentration, does not pose a health hazard, but is undesireable for aesthetic reasons.

Several mercury concentrations in Jab area ground water exceed DEQ, WQD's livestock water-supply standard (0.00005 mg/l). None exceed the domestic water-supply standard of 0.002 mg/l.

A standard for manganese concentration in ground water to be used as a domestic water supply has been set by DEQ, WQD at 0.05 mg/l. Like iron, manganese is undesireable at these concentrations because of aesthetic, not health-hazard, reasons. Several manganese measurements in water collected from two Jab project area monitoring wells exceed the standard of 0.05 mg/l. Maximum observed manganese concentration is 0.401 mg/l.

DEQ, WQD's selenium standard for domestically used ground water is 0.01 mg/l, and is 0.05 mg/l in ground water to be used as a source for livestock consumption. One excessive value (0.07 mg/l on 11/30/79) has been measured in water collected from well Jab No. 1. Other selenium measurements in water collected from this well are less than the detection limit. Similarly, one excessive selenium value (0.41 mg/l on 10/08/80) is reported for well MW 1291, whereas all other measurements are less than the lower limit of detection.

Radium-226 has been observed in excessive concentrations in ground water collected from three Jab project area wells. Except for values measured in well MW 1291 water, excessive concentrations do not greatly exceed DEQ, WQD's standard of 5 pCi/l. However, radium-226 concentration in well MW 1291 water is greater than 200 pCi/l. Although these values are unusually large when compared to typical ground-water radionuclide activities, they are not rare when dealing with ground water in contact with a uranium ore body. Uranium has not been observed in concentrations which exceed the State of Wyoming's ground-water standards for

domestic or livestock water supplies.

D6.2.6.1 Correlation of Water-Quality Constituents

Correlation and regression analyses were performed on measurements of Jab project area ground water, whereby the relationships between individual major constituent ions (including TDS) and conductivity were tested.

TDS vs. Conductivity

Figure D6-4 presents a plot of conductivity vs. TDS concentration for Jab project area ground water. A least-squares line of best fit and correlation and regression parameters are also presented on Figure D6-4. An excellent relationship has been defined, for which the correlation coefficient is 0.99 and the standard error of estimate is 72 mg/l. Therefore, conductivity is useful as a predictor of TDS concentration for the Jab area ground water.

Sulfate vs. Conductivity

Sulfate vs. conductivity data, along with a regression line and associated parameter values, are presented on Figure D6-5. A good relationship exists between sulfate and conductivity (correlation coefficient equals 0.99 and standard error of estimate equals 45 mg/l), indicating that conductivity is a good predictor of sulfate concentration for the Jab area ground water.

Calcium vs. Conductivity

Calcium, like sulfate and TDS, relates well to conductivity in Jab project area ground water (see Figure D6-6). The correlation coefficient for this relationship is 0.98 and the standard error of estimate is 27 mg/l. Therefore, conductivity can be considered to be a useful indicator of calcium concentration.

Magnesium vs. Conductivity

Figure D6-7 presents magnesium concentration vs. conductivity and associated correlation and regression analysis information. The relationship between magnesium and conductivity for Jab project area ground water is not as strong as those previously discussed for TDS, sulfate, and calcium. However, conductivity can still be considered an adequate predictor of magnesium concentration.

Other Major Ions

Conductivity was determined to be an inadequate predictor of potassium, chloride, sodium, and bicarbonate. Potassium and chloride are relatively minor constituents in Jab area ground water. Although changes in potassium and chloride concentrations do affect conductivity, the percent change in conductivity remains small and therefore is not sensitive to the changes in potassium or chloride.

Sodium concentration appears to remain relatively constant in Jab area groundwater, regardless of the water's conductivity. Availability of sodium in host geologic formations is probably

limiting input of sodium to the ground water, but is relatively uniform areally.

Bicarbonate concentration in Jab area ground water varies over a relatively wide range (less than 75 mg/l to greater than 150 mg/l) but does not exhibit a definable trend or pattern. Reactions involving the CO_2 - HCO_3 - CO_3 equilibria can cause volatilization and loss as CO_2. Therefore, representative bicarbonate measurements are more difficult to achieve than for other major constituents, and a wider range of observations is expected.

D6.2.7 GROUND-WATER MONITORING

Before submittal of a permit to DEQ, wells 1291, 1292, 1298, 1299, 1300, 1307, Jab No. 1 and AX-34 should be sampled once for water level and for the complete Wyoming Department of Environmental Quality (WDEQ) water quality list. This information should be sufficient as long as there are no marked changes from previous data in the new results.

During mining, quarterly water levels should be measured with semi-annual water quality measurements of temperature, conductivity, pH, chloride, uranium, and radium-226. Complete water quality sampling per WDEQ list should be performed annually. The post mining monitor program would be similar to the monitoring program during mining.

D6.3.0 SURFACE WATER

D6.3.1 DRAINAGE BASIN DESCRIPTION

The channels and drainage areas of relevance to the Jab project area are shown on Exhibit D6-1. The project area is drained primarily by two westerly-flowing ephemeral tributaries to Arapahoe Creek, both unnamed. For convenience, the channel draining Antelope Reservoir and the southern portion of the project area is hereafter referred to as Antelope Reservoir Creek. The other, which drains the north portion of the project area, is referred to simply as Unnamed Creek in this appendix. A third channel drains a small drainage basin which includes a minor portion of the southern Jab project area. This third small channel joins Antelope Reservoir Creek very close to the southwestern corner of the project area. Surface water monitoring site SW-1 (see Exhibit D6-1) is located downstream from the confluence and should allow detection of potential impacts to either basin.

Antelope Reservoir Creek joins Arapahoe Creek approximately one and one- half miles west of the Jab project area, in T.26N., R.94W., Sec. 17, and Unnamed Creek joins Arapahoe Creek in the southeast corner of Sec. 10, T.26N., R.94W., less than one-fourth mile north of the project boundary.

Arapahoe Creek flows into Lost Creek less than 2 1/2 miles due

west of the Jab project area boundary. Lost Creek flows into Lost Creek Lake, from which there is no surface outflow.

Arapahoe Creek drainage area is several times the size of the drainage area to Angelope Reservoir Creek. Arapahoe Creek tributaries Antelope Reservoir Creek and Unnamed Creek have respective drainage areas of 8.64 mi^2 and 1.50 mi^2. Upstream from surface-water monitoring site SW-1, Antelope Reservoir Creek's drainage area is 8.16 mi^2, its drainage area upstream from site SW-3 (see Exhibit D6-1) is 6.12 mi^2, and its drainage area upstream from the eastern Jab project area boundary is 5.89 mi^2. Surface- water monitoring site SW-2 is located on Unnamed Creek close to where it crosses the Jab project area boundary. At this site its drainage area is 1.32 mi^2.

From its confluence with Arapahoe Creek to surface-water monitoring site SW-1, the length of Antelope Reservoir Creek's channel is approximately 1.2 mi. The total channel length upstream from this site is 9.1 mi, of which approximately 6.0 mi is upstream and 0.6 mi is downstream of the project area boundary. The total length of Unnamed Creek's channel is approximately 2.9 mi, 2.6 miles of which are upstream from surface-water monitoring site SW-2 and about 0.5 mi is upstream of the project area.

Average basin gradients of Antelope Reservoir Creek and Unnamed Creek are 0.035 ft/ft and 0.017 ft/ft, respectively. Channel gradients within the Jab Project area are considerably flatter, being 0.007 ft/ft at surface- water sites SW-2 and SW-3 and 0.004

ft/ft at site SW-1. Basin characteristics for the two Arapahoe Creek tributaries are summarized on Table D6-17.

D6.3.2 SURFACE WATER RUNOFF ESTIMATES

The Jab project area lies within the Great Divide Basin, from which no surface water flows. All precipitation in this closed basin is lost to evapotranspiration, direct evaporation, or ground-water recharge. Annual precipitation is generally low, and surface-water annual yield per square mile is small.

Flood-flow characteristics for Antelope Reservoir Creek and Unnamed Creek at sites SW-1, SW-2, and SW-3 (see Table D6-18) have been computed using Craig and Rankl's (1977) technique and Lowham's (1976) technique. Lowham's equations are generally applicable for basins larger than 5 mi^2, but graphical interpretations can be made for basins as small as 0.5 mi^2. Lowham divided the state into separate regions, but used only drainage area in his basin characteristics method. Craig and Rankl's method is applicable to drainage basins smaller than 11 mi^2, is applicable to all Wyoming prairie stream channels, and utilizes basin parameters in addition to drainage area. For small, prairie drainage basins, Craig and Rankl's technique is probably preferable, but flood flows calculated using Lowham's method are presented on Table D6-18 for comparison purposes. Flood peaks and volumes shown on Table D6-18 using Craig and Rankl's technique were calculated utilizing basin parameters of drainage area, maximum basin relief, and average basin gradient.

D6.3.3 CHANNEL GEOMETRY

Channel cross sections have been prepared for Antelope Reservoir Creek and Unnamed Creek at surface-water monitoring sites SW-1, SW-2, and SW-3. These cross sections are presented, respectively, on Figures D6-8, D6-9, and D6-10. Channel conveyance characteristics, including slope, cross- sectional area, hydraulic radius, velocity, discharge, and flood volumes for the five-year and one hundred-year floods are also presented on these figures. Only water in Unnamed Creek should exceed five feet per second during the one hundred year flood.

D6.3.4 SURFACE-WATER QUALITY

Crest-stage gages and self-sampling water collectors were installed at surface-water sites SW-1, SW-2, and SW-3 in fall of 1980. Since that time, no runoff events have occurred on Antelope Reservoir and Unnamed Creeks. As a result, no surface-water runoff samples have been collected for laboratory analysis.

Several springs in the region have been visited and sampled. These analyses are presented on Table D6-19, and locations are shown on Exhibit D6-1. Quality of water collected from these springs is more typical of ground-water quality than surface-runoff quality. The spring shown in section 11 of T26N R94W on Exhibit D6-1 was dry each time it was visited.

D6.3.5 SURFACE WATER MONITORING

The three surface water sites SW-1, SW-2, and SW-3 should be

checked each quarter. At anytime that it is known that a storm of significant rain occurrs, the surface water sites should be checked for both stage and a sample.

D6.4.0 WATER RIGHTS

D6.4.1 GROUND-WATER RIGHTS

The State Engineer's files were also searched for active ground-water rights in and within 4 miles of the project area. These rights and other pertinent information are listed in Table D6-20. Exhibit D6-1 shows the locations of the active ground-water rights.

D6.4.2 SURFACE-WATER RIGHTS

A list of active surface-water rights can be found in Table D6-21. The list covers surface-water rights within and within a 3/4 mile perimeter of the project area. The surface water rights are also shown on Exhibit D6-1.

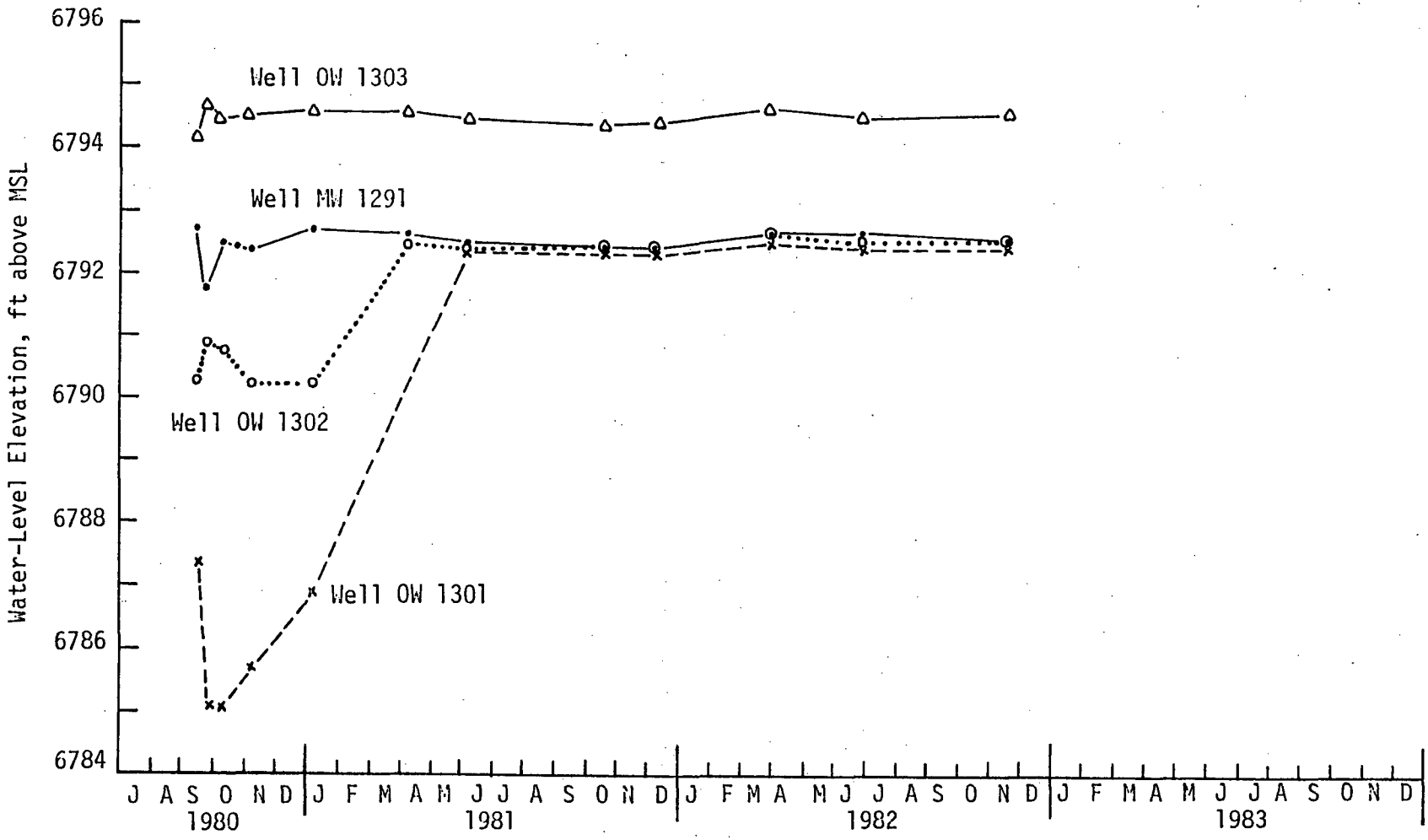

FIGURE D6-1 WATER-LEVEL HYDROGRAPHS FOR JAB PERMIT AREA WELLS MW 1291, OW 1301, OW 1302, AND OW 1303.

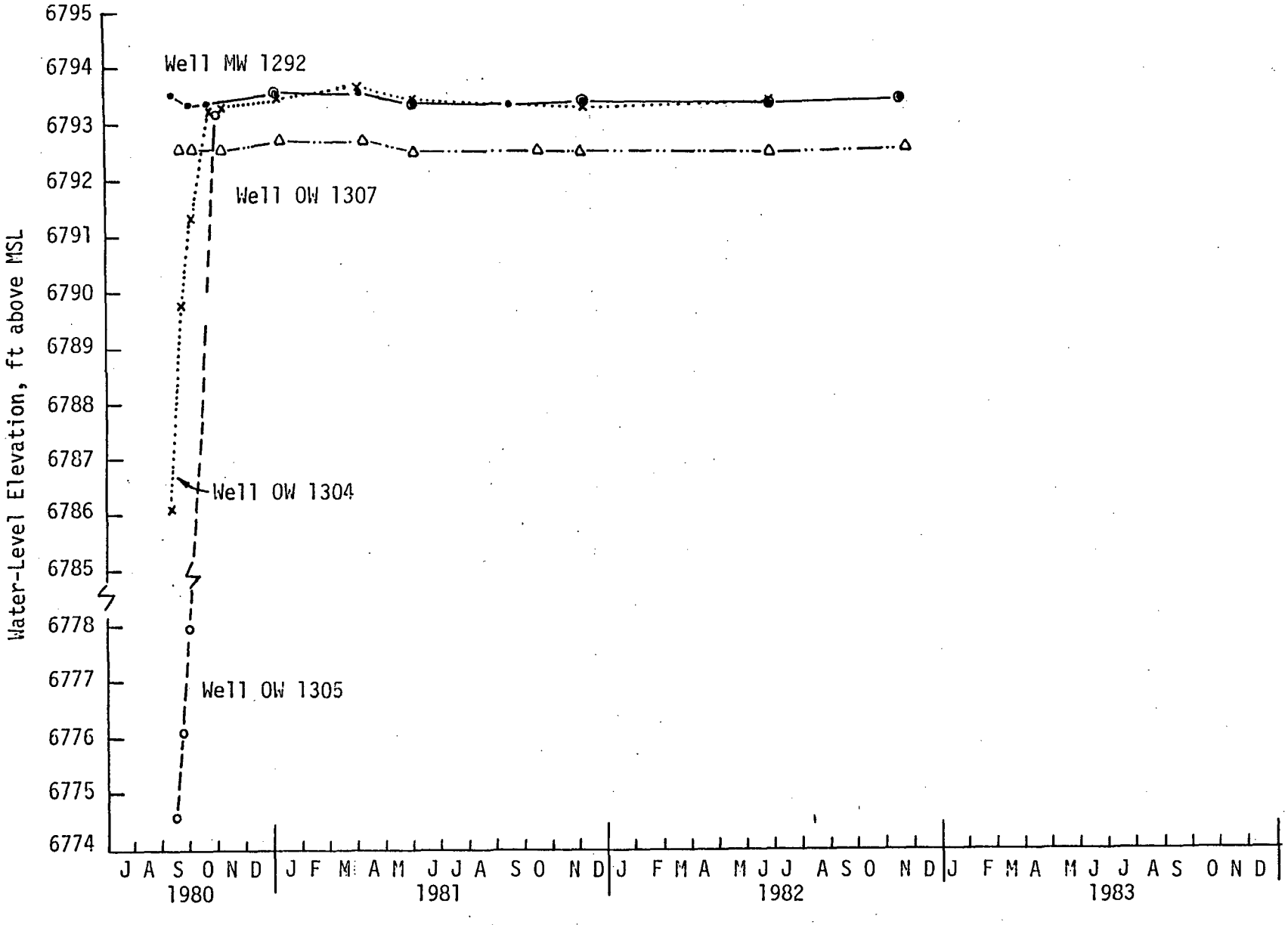

FIGURE D6-2 WATER-LEVEL HYDROGRAPHS FOR JAB PERMIT AREA WELLS MW 1292, OW 1304, OW 1305, AND OW 1307

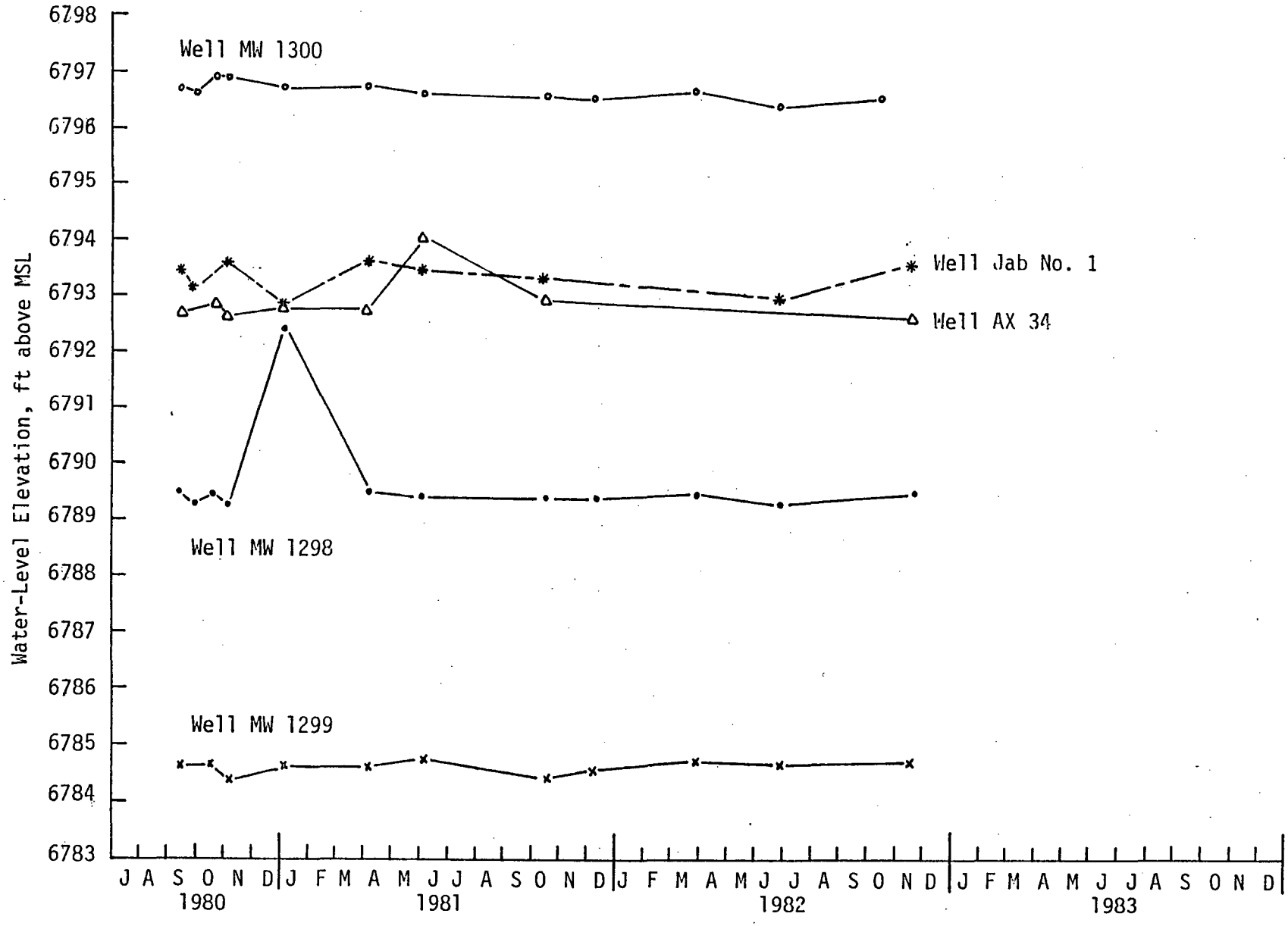

FIGURE D6-3 WATER-LEVEL HYDROGRAPHS FOR JAB PERMIT AREA WELLS MW 1298, MW 1299, MW 1300, AND AX 34.

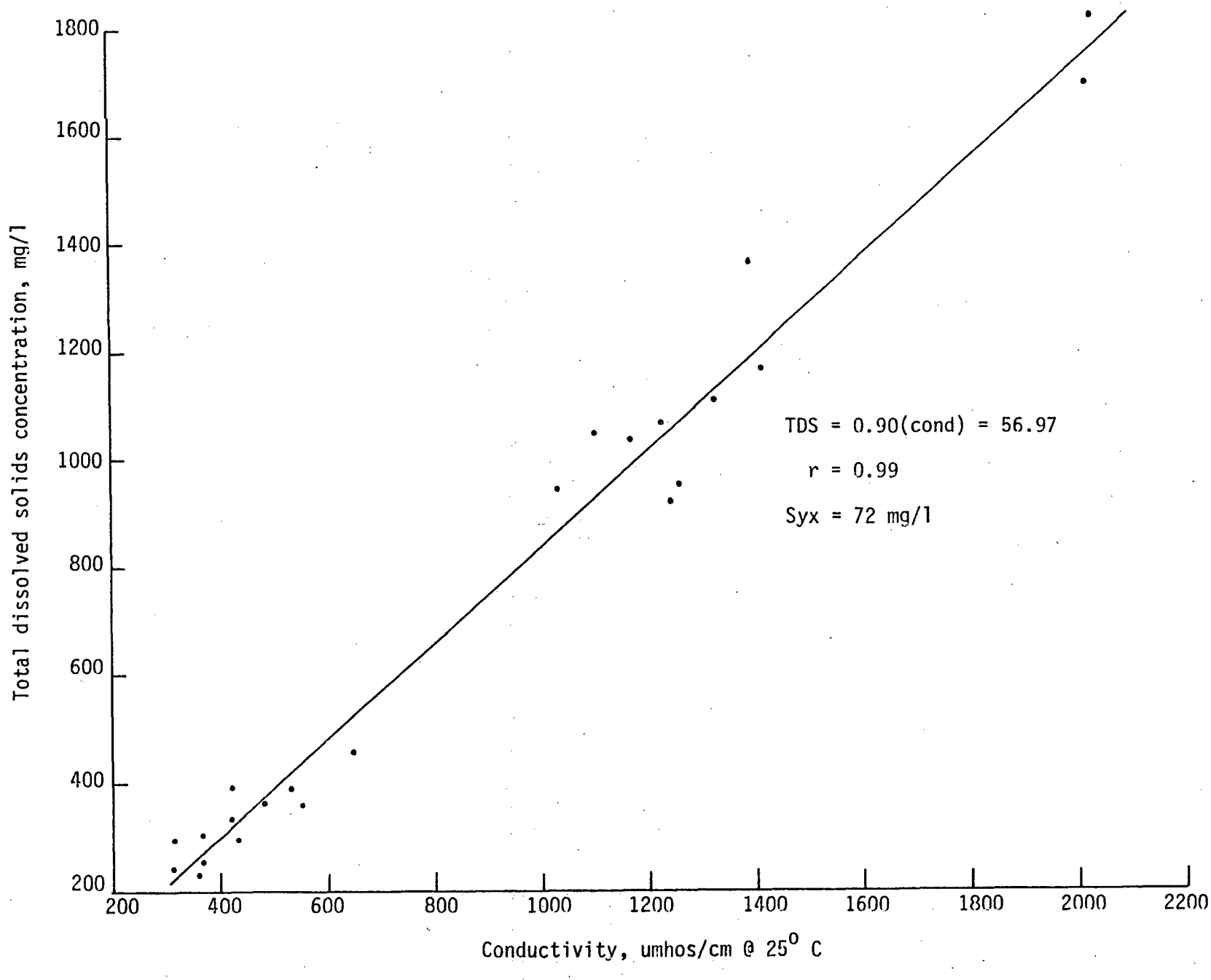

FIGURE D6-4. RELATIONSHIP BETWEEN TOTAL DISSOLVED SOLIDS AND CONDUCTIVITY IN JAB AREA GROUND WATER

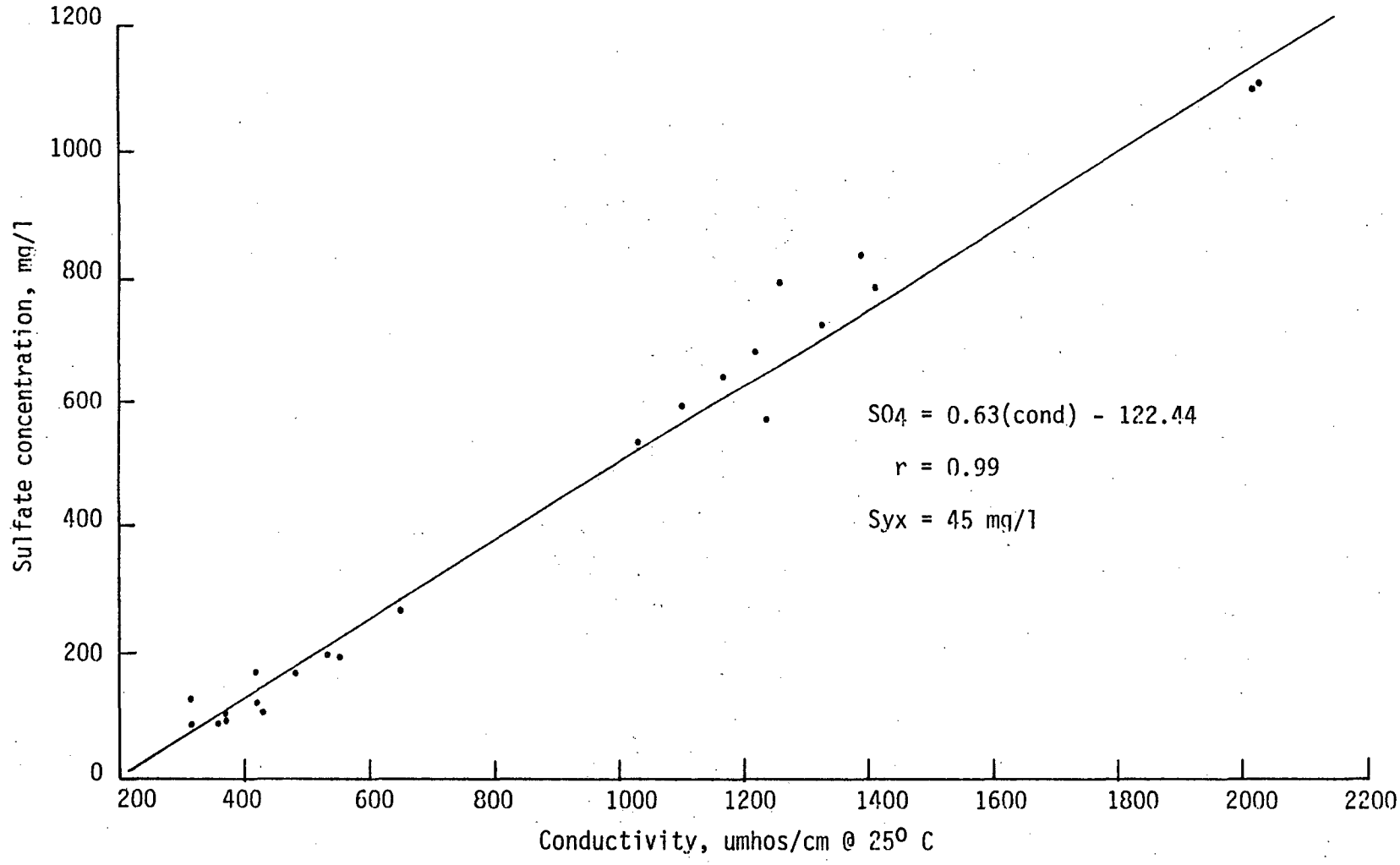

FIGURE D6-5. RELATIONSHIP BETWEEN SULFATE AND CONDUCTIVITY IN JAB AREA GROUND WATER

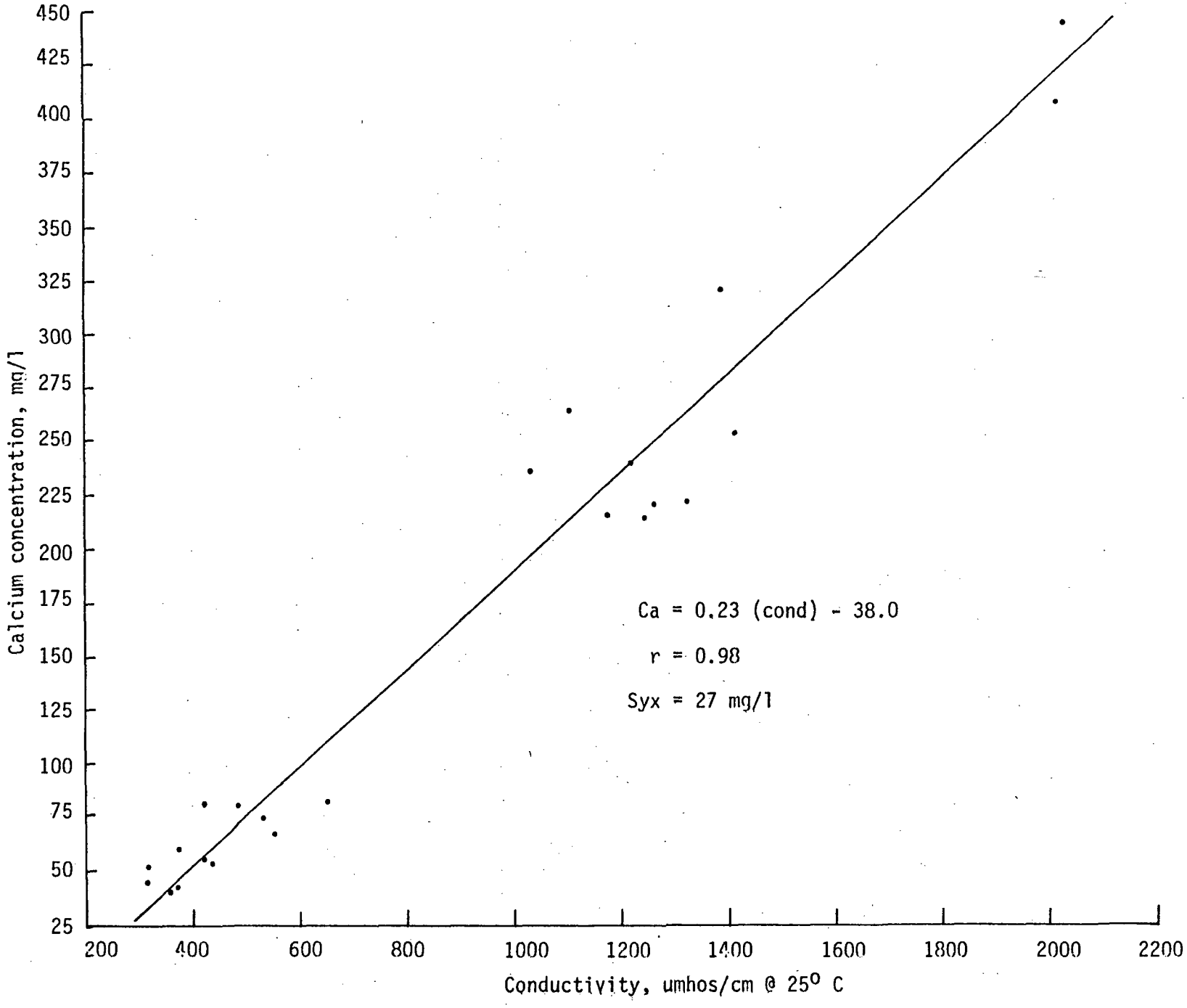

FIGURE D6-6. RELATIONSHIP BETWEEN CALCIUM AND CONDUCTIVITY IN JAB AREA GROUND WATER

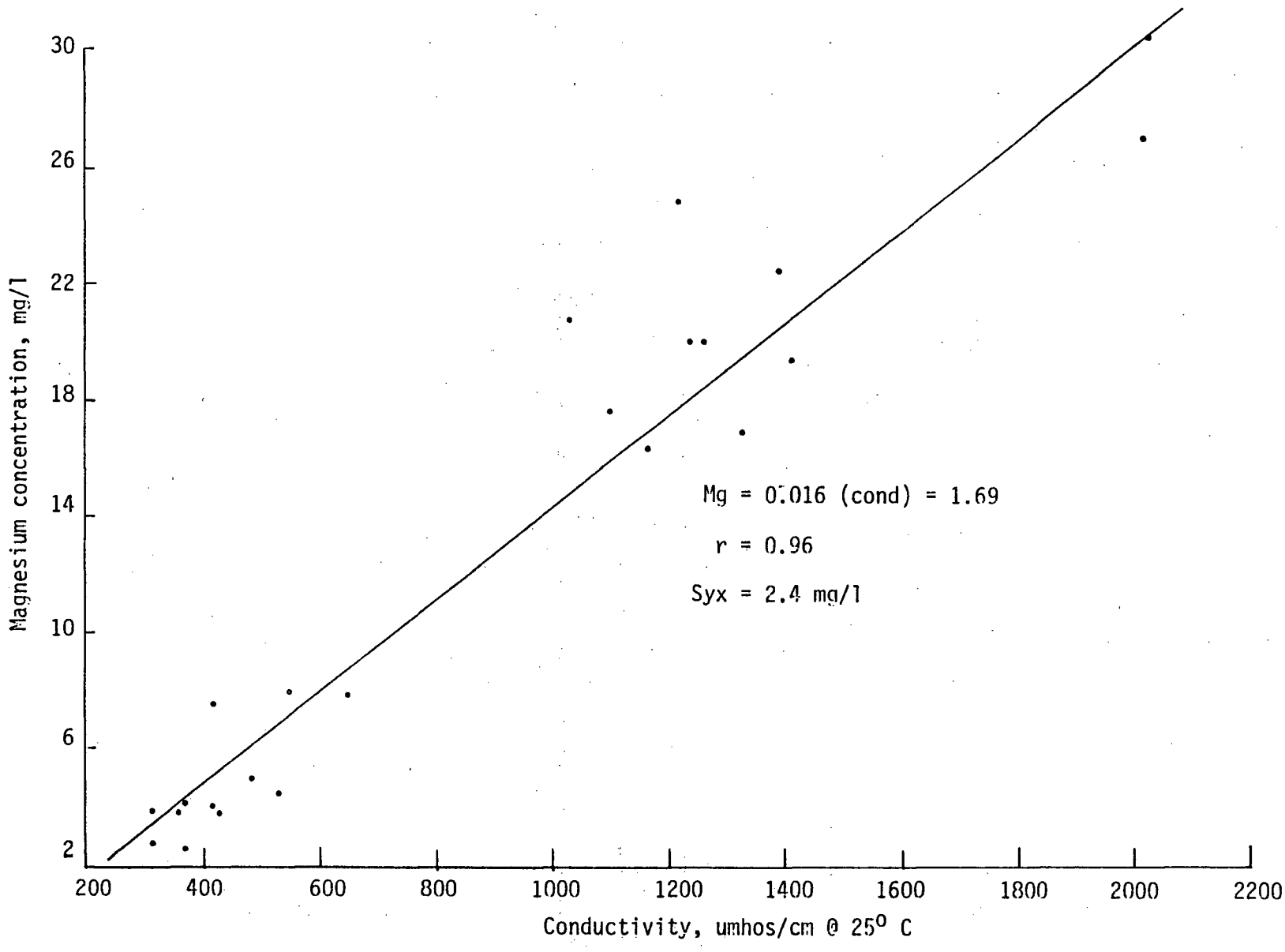

FIGURE D6-7. RELATIONSHIP BETWEEN MAGNESIUM AND CONDUCTIVITY IN JAB AREA GROUND WATER.

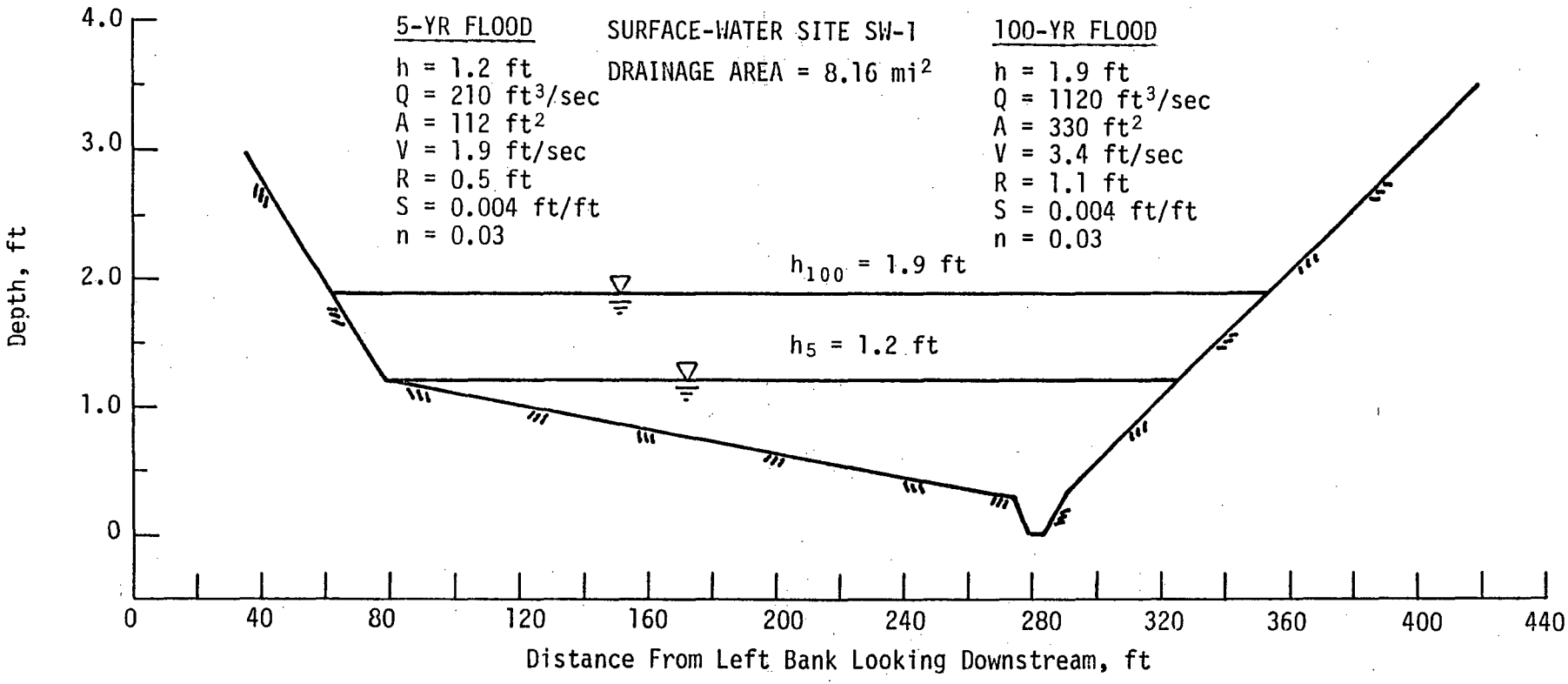

FIGURE D6-8 CHANNEL CROSS SECTION AND CONVEYANCE OF ANTELOPE RESERVOIR CREEK AT SURFACE-WATER MONITORING SITE SW-1.

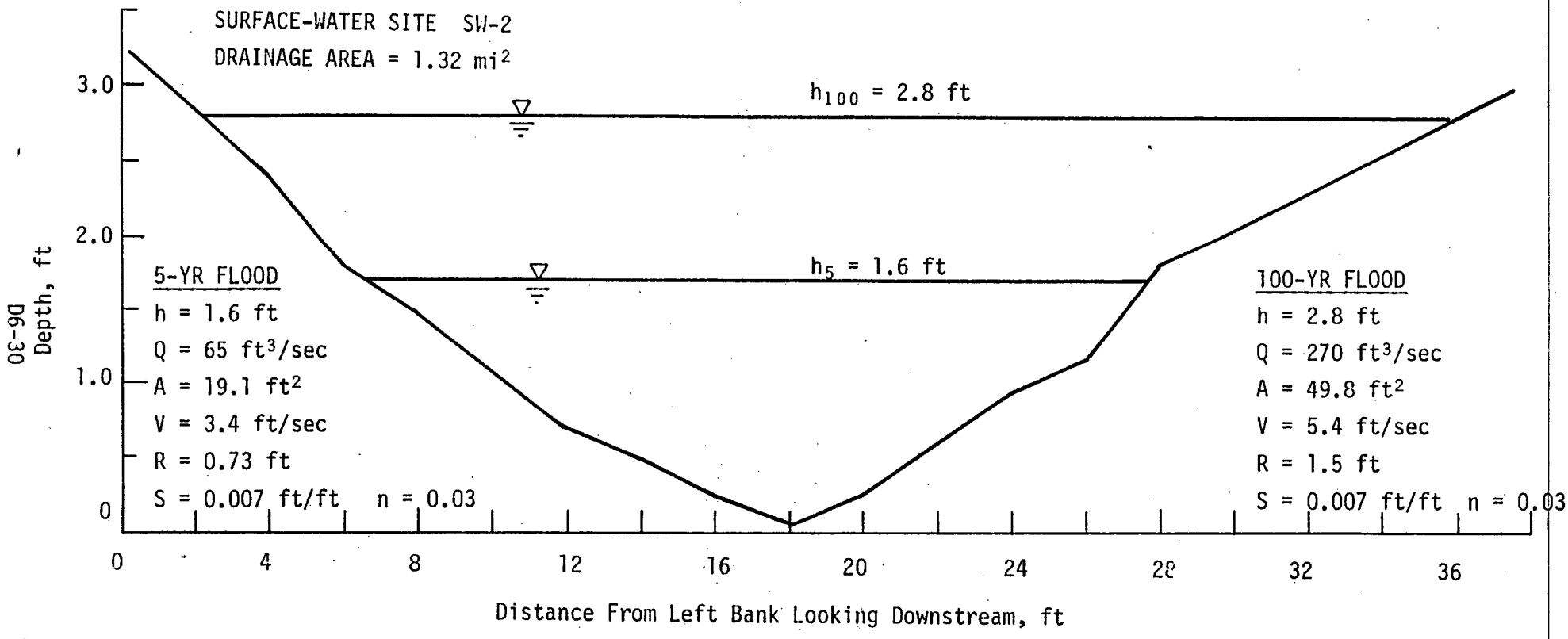

FIGURE D6-9 CHANNEL CROSS SECTION AND CONVEYANCE CHARACTERISTICS OF UNNAMED CREEK AT SURFACE-WATER MONITORING SITE SW-2.

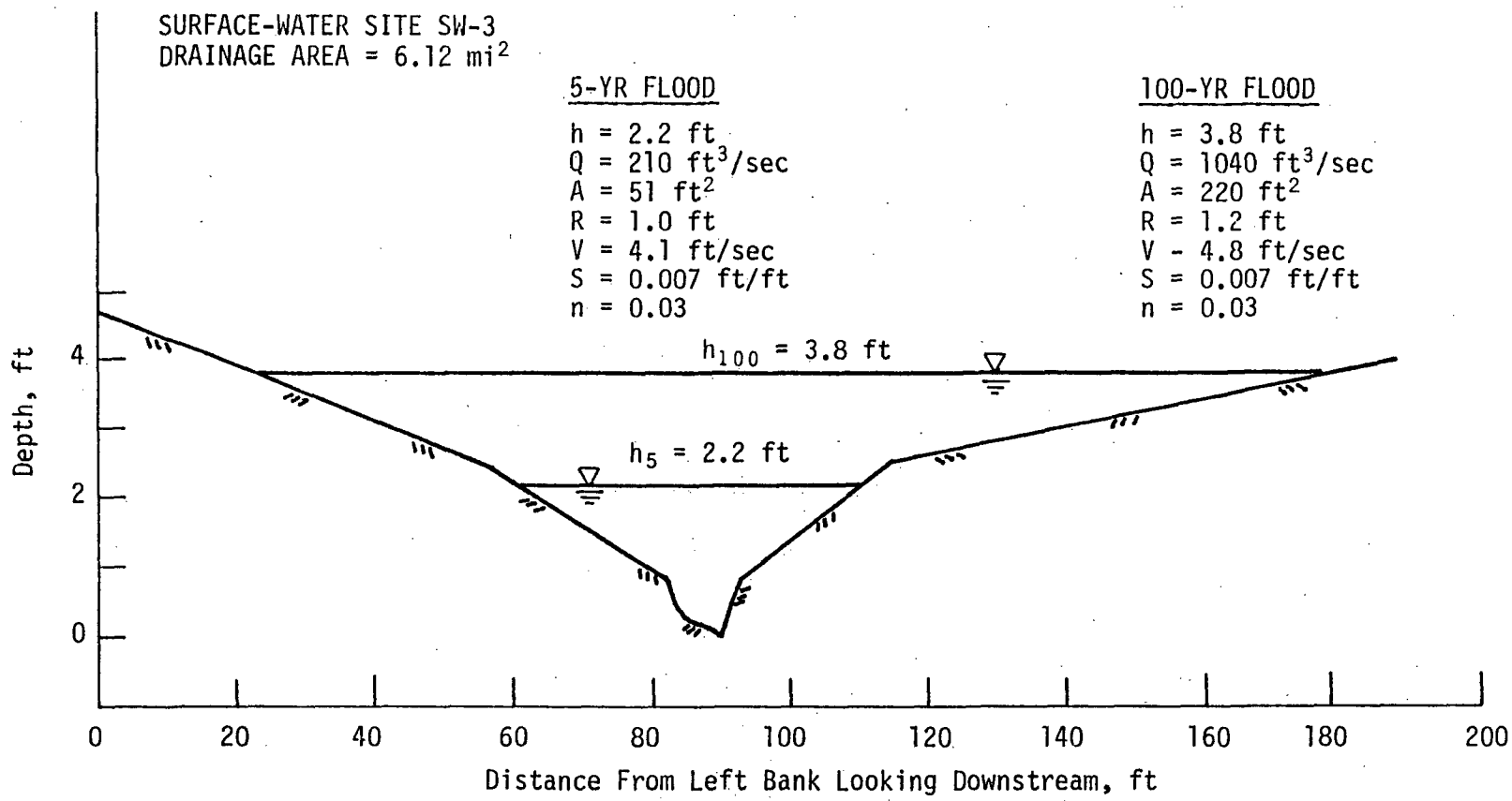

FIGURE D6-10 CHANNEL CROSS SECTION AND CONVEYANCE CHARACTERISTICS OF ANTELOPE RESERVOIR CREEK AT SURFACE-WATER MONITORING SITE SW-3.

TABLE D6-1 BASIC WELL INFORMATION FOR JAB PERMIT AREA MONITORING AND OBSERVATION WELLS

WELL	LOCATION COORDINATES North	LOCATION COORDINATES East	DATE DRILLED	MEASURED TOTAL DEPTH (ft below MP)	MEASURING POINT (ft above LSD)	MEASURING POINT (ft above MSL)	PERFORATED INTERVAL (ft below LSD)	CASING DIAMETER (in)
MW 1291	567,794	696,154	08/19/80	192	2.3	6903.61	150-190	5
OW 1301	567,732	696,155	09/03/80	180	1.4	6899.98	177-197	2
OW 1302	567,763	696,154	09/04/80	189	1.8	6902.06	172-192	2
OW 1303	567,843	696,159	09/08/80	216	3.0	6906.40	215-235	2
MW 1292	566,848	693,371	08/20/80	272	2.0	6869.08	230-270	5
OW 1304	566,849	693,431	09/09/80	242	1.4	6868.78	243-263	2
OW 1305	566,850	693,340	09/10/80	188	1.4	6868.13	245-265	2
OW 1307	566,816	693,374	09/23/80	300	2.0	6868.37	278-298	2
MW 1298	565,847	695,838	08/21/80	287	2.2	6872.67	246-286	5
MW 1299	565,694	701,674	08/25/80	263	2.1	6914.26	227-267	5
MW 1300	570,709	696,495	08/22/80	236	1.6	6870.04	200-240	5
JAB No. 1	568,336	699,807	09/12/78	220	2.5	6910.67	180-220	6
AX 34	563,984	688,801	-	106	1.3	6887.08	-	6

TABLE D6-2. SUMMARY OF AQUIFER PROPERTIES IN JAB PERMIT AREA

WELL	DATE TESTED	TRANSMISSIVITY, GAL/DAY/FT			STORAGE COEFFICIENT		AQUIFER THICKNESS (FT)	PERMEABILITY (FT/DAY)
		THEIS' METHOD	JACOB'S METHOD	THEIS' RECOVERY METHOD	THEIS' METHOD	JACOB'S METHOD		
MW 1300	10/01/80	-	670	650	-	-	30	2.90
MW 1292	10/21/80	-	2800	2900	-	-	70	5.40
OW 1304	10/21/80	4700	4700	-	2.4 ± 10^{-4}	2.4 ± 10^{-4}	70	8.90
OW 1305	10/21/80	3900	4200	-	1.7 ± 10^{-4}	1.4 ± 10^{-4}	70	7.90
JAB WELL NO. 1	09/16/80	-	-	3400	-	-	40	11.00
MW 1299	09/16/80	-	1400	1700	-	-	53	3.90
MW 1298	09/17/80	-	50	40	-	-	35	0.17
MW 1291	12/09/81	-	200	220	-	-	45	0.62
OW 1301	12/09/81	790	880	-	1.9×10^{-4}	5.4×10^{-4}	45	2.50
OW 1302	12/09/81	510	580	-	1.2×10^{-3}	9.1×10^{-4}	45	1.60

TABLE D6-3 STATIC WATER-LEVEL DATA FOR WELL MW 1291

DATE	TIME	WATER LEVEL (FT-MP)	WATER LEVEL ELEVATION (FT-MSL)
09/16/80	1727	110.88	6792.73
09/17/80	1148	110.90	6792.71
09/24/80	1230	111.86	6791.75
	1255	111.73	6791.88
10/06/80	1643	111.12	6792.49
	1705	111.15	6792.46
10/21/80	1228	111.06	6792.55
	1442	111.01	6792.60
10/22/80	0826	111.07	6792.54
	1007	111.08	6792.53
10/23/80	1151	111.40	6792.21
	1459	111.46	6792.15
11/04/80	1055	111.18	6792.43
01/07/81	1055	111.01	6792.60
04/09/81	0940	110.96	6792.65
06/05/81	1103	111.15	6792.46
10/19/81	1510	111.17	6792.44
12/09/81	0830	111.20	6792.41
03/30/82	1514	110.94	6792.67
06/29/82	1235	110.92	6792.69
11/18/82	1036	111.05	6792.56

TABLE D6-4 STATIC WATER-LEVEL DATA FOR WELL OW 1301

DATE	TIME	WATER LEVEL (FT-MP)	WATER LEVEL ELEVATION (FT-MSL)
09/16/80	1546	112.62	6787.36
09/17/80	1142	113.57	6786.41
09/24/80	0924	114.84	6785.14
	1002	114.84	6785.14
	1226	114.84	6785.14
	1254	114.84	6785.14
10/02/80	1314	114.92	6785.06
10/06/80	1154	114.89	6785.09
	1411	114.88	6785.10
	1703	114.88	6785.10
11/04/80	1046	114.25	6785.73
01/07/81	1047	113.09	6786.89
06/05/81	1050	107.62	6792.36
10/18/81	1517	107.62	6792.36
12/09/81	0840	107.66	6792.32
03/30/82	1545	107.44	6792.54
06/29/82	1227	107.58	6792.40
11/18/82	-	107.50	6792.48

TABLE D6-5 STATIC WATER-LEVEL DATA FOR WELL OW 1302

DATE	TIME	WATER LEVEL (FT-MP)	WATER LEVEL ELEVATION (FT-MSL)
09/16/80	1756	111.82	6790.24
09/17/80	1139	111.76	6790.30
09/24/80	0926	111.13	6790.93
	0959	111.12	6790.94
	1223	111.13	6790.93
	1256	111.13	6790.93
	1258	111.16	6790.90
10/01/80	1013	110.58	6791.48
10/02/80	1252	110.59	6791.47
10/06/80	1202	111.38	6790.68
	1402	111.24	6790.82
	1701	111.38	6790.68
11/04/80	1050	111.86	6790.20
01/07/81	1051	111.88	6790.18
04/09/81	0935	109.58	6792.48
06/05/81	1055	109.64	6792.42
10/18/81	1515	109.65	6792.41
12/09/81	0844	109.70	6792.36
03/30/82	1525	109.48	6792.58
06/29/82	1230	109.52	6792.54
11/18/82	1049	109.52	6792.54

TABLE D6-6 STATIC WATER-LEVEL DATA FOR WELL OW 1303

DATE	TIME	WATER LEVEL (FT-MP)	WATER LEVEL ELEVATION (FT-MSL)
09/16/80	1740	112.21	6794.19
09/17/80	1146	112.19	6794.21
	1502	112.06	6794.34
09/24/80	0935	111.69	6794.71
	1000	111.69	6794.71
10/01/80	1021	111.75	6794.65
10/02/80	1226	111.86	6794.54
10/06/80	1154	111.92	6794.48
	1359	111.92	6794.48
	1657	111.95	6794.45
10/22/80	0830	111.87	6794.53
	1010	111.87	6794.53
10/23/80	1154	111.93	6794.47
11/04/80	1057	111.90	6794.50
01/07/81	1057	111.80	6794.60
04/09/81	0945	111.81	6794.59
06/05/81	1106	111.95	6794.45
10/19/81	1513	111.96	6794.44
12/09/81	0830	111.95	6794.45
	0944	111.94	6794.46
03/30/82	1435	111.70	6794.70
06/29/82	1240	111.86	6794.54
11/18/82	1046	111.79	6794.61

TABLE D6-7 STATIC WATER-LEVEL DATA FOR WELL MW 1292

DATE	TIME	WATER LEVEL (FT-MP)	WATER LEVEL ELEVATION (FT-MSL)
09/17/80	1533	75.55	6793.53
09/24/80	1040	75.63	6793.45
09/25/80	1709	75.53	6793.55
10/01/80	1052	75.73	6793.35
10/21/80	1022	75.70	6793.38
01/07/81	1226	75.54	6793.54
04/09/81	1040	75.54	6793.54
06/05/71	1210	75.73	6793.35
10/19/81	1450	75.70	6793.38
12/09/81	1500	75.69	6793.39
06/29/82	1130	75.66	6793.42
11/18/82	1115	75.60	6793.48

TABLE D6-8. STATIC WATER-LEVEL DATA FOR WELL OW 1304

DATE	TIME	WATER LEVEL (FT-MP)	WATER LEVEL ELEVATION (FT-MSL)
09/17/80	1540	82.64	6786.14
09/24/80	1040	78.95	6789.83
	1138	78.99	6789.79
	1151	79.01	6789.77
09/25/80	1716	79.91	6789.87
10/01/80	1108	79.09	6789.69
10/02/80	1143	79.02	6789.76
10/06/80	1237	77.43	6791.35
	1432	77.29	6791.49
10/07/80	1203	77.15	6791.63
10/08/80	1357	76.79	6791.99
10/21/80	1010	75.38	6793.4
	1038	75.38	6793.4
11/04/80	1153	75.48	6793.3
01/07/81	1224	75.19	6793.59
04/09/81	1025	75.20	6793.58
06/05/81	1208	75.38	6793.40
12/09/81	1518	75.44	6793.34
06/29/82	1139	75.33	6793.45

TABLE D6-9. STATIC WATER-LEVEL DATA FOR WELL OW 1305

DATE	TIME	WATER LEVEL (FT-MP)	WATER LEVEL ELEVATION (FT-MSL)
09/17/80	1531	93.52	6774.61
09/24/80	1030	92.01	6776.12
	1108	92.00	6776.13
	1113	92.02	6776.11
	1118	92.02	6776.11
	1129	92.03	6776.10
	1134	92.04	6779.09
	1153	92.04	6779.09
09/25/80	1041	91.82	6776.31
10/01/80	1103	90.23	6777.90
10/02/80	1040	90.00	6779.13
10/06/80	1248	89.63	6778.50
	1442	89.62	6778.51
10/07/80	1227	89.35	6778.78
10/08/80	1500	89.33	6778.80
10/21/80	0950	74.70	6793.43
	1029	74.70	6793.43
	1038	74.70	6793.43
11/04/80	1202	74.93	6793.20
01/07/81	1230	74.64	6793.49
04/09/81	1035	74.62	6793.51
10/05/81	1200	74.79	6793.34
12/09/81	1515	74.64	6793.49
06/29/82	1140	74.74	6793.39
11/18/82	1127	74.61	6793.52

TABLE D6-10 STATIC WATER-LEVEL DATA FOR WELL OW 1307

DATE	TIME	WATER LEVEL (FT-MP)	WATER LEVEL ELEVATION (FT-MSL)
09/24/80	1033	75.71	6792.66
10/01/80	1050	75.68	6792.69
10/02/80	1104	75.73	6792.64
10/06/80	1246	75.74	6792.63
	1439	75.72	6792.65
10/07/80	1206	75.75	6792.62
10/08/80	1046	75.74	6792.63
10/21/80	1005	75.66	6792.71
	1024	75.66	6792.71
	1026	75.66	6792.71
11/04/80	1200	75.82	6792.55
01/07/81	1220	75.65	6792.72
04/09/81	1030	75.65	6792.72
06/05/81	1203	75.80	6792.57
10/19/81	1455	75.83	6792.54
12/09/81	1505	75.88	6792.49
06/29/82	1242	75.89	6792.50
11/18/82	1130	75.81	6792.56

TABLE D6-11 STATIC WATER-LEVEL DATA FOR WELL MW 1298

DATE	TIME	WATER LEVEL (FT-MP)	WATER LEVEL ELEVATION (FT-MSL)
09/16/80	1728	83.16	6789.51
09/17/80	0938	83.19	6789.48
09/24/80	0910	83.30	6789.37
	1422	83.30	6789.37
	1455	83.31	6789.36
	1900	83.31	6789.36
09/25/80	0810	83.33	6789.34
	1745	83.32	6789.35
09/26/80	0200	83.32	6789.35
09/28/80	1600	83.32	6789.35
09/29/80	0400	83.31	6789.36
10/01/80	1645	83.36	6789.31
10/02/80	0800	83.40	6789.27
10/02/80	1800	83.39	6789.28
10/03/80	1600	83.37	6789.30
10/04/80	0400	83.36	6789.31
	1600	83.35	6789.32
10/05/80	0600	83.35	6789.32
	1200	83.34	6789.28
	2000	83.38	6789.29
10/06/80	1831	83.36	6789.31
10/07/80	0900	83.40	6789.27
	1800	83.39	6789.29

TABLE D6-11. STATIC WATER-LEVEL DATA FOR WELL MW 1298 (CONT.)

DATE	TIME	WATER LEVEL (FT-MP)	WATER LEVEL ELEVATION (FT-MSL)
10/08/80	1630	83.37	6789.30
10/21/80	1235	83.21	6789.46
	2400	83.22	6789.45
10/22/80	1050	83.28	6789.39
	1800	83.33	6789.34
	2000	83.36	6789.31
	2200	83.40	6789.27
10/23/80	0600	83.46	6789.21
	1000	83.50	6789.17
	1200	83.55	6789.12
	1600	83.58	6789.09
	1800	83.59	6789.08
	2000	83.61	6789.06
10/24/80	0100	83.65	6789.02
	1200	83.65	6789.02
	2400	83.65	6789.02
10/25/80	1200	83.62	6789.05
	2000	83.55	6789.12
10/26/80	1000	83.48	6789.19
10/27/80	1800	83.46	6789.21
10/28/80	0200	83.49	6789.18
11/04/80	1245	83.43	6789.24
01/07/81	1235	80.25	6792.42

TABLE D6-11 STATIC WATER LEVEL DATA FOR WELL MW 1298 (CONT.)

DATE	TIME	WATER LEVEL (FT-MP)	WATER LEVEL ELEVATION (FT-MSL)
04/09/81	1015	83.17	6789.50
06/05/81	1150	83.29	6789.38
10/19/81	1505	83.28	6789.39
12/09/81	1100	83.30	6789.37
03/30/82	1640	83.20	6789.47
06/29/82	1152	83.38	6789.29
11/18/82	-	83.21	6789.46

TABLE D6-12 STATIC WATER-LEVEL DATA FOR WELL MW 1299

DATE	TIME	WATER LEVEL (FT-MP)	WATER LEVEL ELEVATION (FT-MSL)
09/16/80	1435	129.64	6784.62
	1445	129.50	6784.76
10/22/80	0847	129.62	6784.64
11/04/80	1020	129.87	6784.39
01/07/81	1035	129.64	6784.62
04/09/81	1055	129.64	6784.62
06/05/81	1000	129.49	6784.77
10/19/81	1540	129.86	6784.40
12/09/81	1610	129.73	6784.53
03/30/82	1728	129.53	6784.73
06/29/82	1614	129.60	6784.66
11/18/82	0927	129.55	6784.71

TABLE D6-13. STATIC WATER-LEVEL DATA FOR WELL MW 1300

DATE	TIME	WATER LEVEL (FT-MP)	WATER LEVEL ELEVATION (FT-MSL)
09/16/80	1709	73.33	6796.71
09/24/80	-	73.40	6796.64
09/25/80	0959	73.48	6796.56
10/01/80	0940	73.40	6796.64
10/07/80	1034	73.46	6796.58
10/21/80	1424	73.10	6796.94
10/22/80	0838	73.28	6796.76
11/04/80	1117	73.13	6796.91
01/07/81	1150	73.32	6796.72
04/09/81	1030	73.30	6796.74
06/05/81	1120	73.44	6796.60
10/19/81	1525	73.50	6796.54
12/09/81	1352	73.52	6796.52
03/30/82	1125	73.34	6796.70
06/29/82	1535	73.63	6796.41
11/18/82	1015	73.52	6796.52

TABLE D6-14 STATIC WATER-LEVEL DATA FOR WELL JAB NO. 1

DATE	TIME	WATER LEVEL (FT-MP)	WATER LEVEL ELEVATION (FT-MSL)
09/16/80	1622	117.24	6793.43
	1624	117.24	6793.43
09/24/80	0913	117.54	6793.13
09/25/80	1529	117.41	6793.26
11/04/80	1106	117.11	6793.56
01/07/81	1206	117.85	6792.82
04/09/81	1020	117.10	6793.57
	1600	117.06	6793.61
06/05/81	1145	117.22	6793.45
10/19/81	1535	117.37	6793.30
06/29/82	1515	117.67	6793.00
11/18/82	0955	117.05	6793.62

TABLE D6-15 STATIC WATER-LEVEL DATA FOR WELL AX 34

DATE	TIME	WATER LEVEL (FT-MP)	WATER LEVEL ELEVATION (FT-MSL)
09/24/80	-	94.38	6792.7
10/22/80	0943	94.21	6792.87
11/04/80	1216	94.44	6792.64
01/07/81	1255	94.24	6792.84
04/09/81	1110	94.39	6792.69
06/05/81	1220	92.99	6794.09
10/19/81	1440	94.10	6792.98
11/18/82	1149	94.40	6792.68

TABLE D6-16. WATER-QUALITY DATA FOR JAB PROJECT AREA WELLS

WELL	DATE	pH FIELD	pH LAB	TEMPERATURE (°C)	CONDUCTIVITY FIELD	CONDUCTIVITY LAB	TDS LAB	TDS SUM	Ca	Mg	K	Na	HCO_3 FIELD	HCO_3 LAB	CO_3	Cl	SO_4
JAB NO. 1	11/30/79	-	8.15	-	-	1166	1041	-	216	16.4	7.0	67	-	-	0	11	642
	08/05/80	-	-	-	-	1416	1171	-	253	19.4	8.0	71	-	-	-	18	789
	09/17/80	7.1	6.6	7.8	-	1326	1106	1091	221	16.9	6.8	65	-	63	0	24	726
	06/29/82	6.95	7.3	10.9	1100	-	1050	1009	264	17.5	12	59.8	91	-	0	16	594
MW 1291	10/08/80	7.2	7.7	12.0	1390	1554	1368	1338	320	22.5	7.7	39.2	112	-	0	56	837
	12/09/81	-	-	-	-	-	-	-	370	25	7.2	40	-	-	-	19	1000
	03/30/82	7.5	7.2	5.5	2020	-	1700	1695	409	27.1	49.2	46.8	88	-	0	19	1100
	06/29/82	6.61	6.6	11.6	2030	-	1820	1732	477	30.4	12.8	45.6	76	-	0	18	1110
	11/18/82	-	-	10.1	2230	-	-	-	-	-	-	-	-	-	-	-	-
MW 1292	10/22/80	7.4	8.3	8.0	315	384	294	305	52	3.8	4	37	159	-	0	65	124
	12/09/81	7.6	7.5	7.8	430	-	-	295	53	3.8	3.2	34	159	92		14	107
	06/29/82	6.98	7.2	17.2	370	-	300	291	61	4.0	7.7	39	147	-	0	12	94
	11/18/82	-	-	8.0	460	-	-	-	-	-	-	-	-	-	-	-	-

TABLE D6-16. WATER-QUALITY DATA FOR JAB PROJECT AREA WELLS (CONT.)

WELL	DATE	pH		TEMPER-ATURE (°C)	CONDUCTIVITY		TDS		Ca	Mg	K	Na	HCO_3		CO_3	Cl	SO_4
		FIELD	LAB		FIELD	LAB	LAB	SUM					FIELD	LAB			
MW 1298	09/17/80	7.0	7.2	8.9	-	653	454	488	82	7.8	3.5	49	-	117		22	265
	12/09/81	-	7.6	7.4	530	984	387	395	74	4.5	3.3	38	115	110		20	198
	03/30/82	7.75	7.4	6.5	550	-	360	431	66.8	7.9	49.4	35.3	125	124	0	19	190
	06/29/82	6.87	7.5	9.0	480	-	360	447	80.2	4.8	7.5	42.8	119	-	0	15	170
	11/18/82	-	-	8.0	550	-	-	-	-	-	-	-	-	-	-	-	-
MW 1299	09/17/80	6.6	7.0	8.0	-	1224	1074	1108	240	24.8	5.3	47	-	123		47	682
	12/09/81	7.33	7.0	4.1	1260	1170	952	1159	220	20	5.0	35	130	120		18	796
	03/30/82	7.54	7.2	5.5	1240	-	920	975	215	20.2	54.9	33.1	125	-	0	20	570
	06/29/82	6.87	7.3	9.9	1030	-	943	918	237	20.7	9.8	37.6	127	-	0	15	534
	11/18/82	-	-	9.0	1410	-	-	-	-	-	-	-	-	-	-	-	-
MW 1300	10/01/80	7.7	8.0	9.0	420	448	331	418	55	4.0	4	44	127	-	0	78	170
	12/09/81	8.03	7.6	8.2	370	286	-	256	41	2.6	3.2	32	135	130	0	12	104
	03/30/82	7.52	7.8	6.5	360	-	230	295	40.2	3.8	47.5	31.6	127	-	0	15	93
	06/29/82	7.36	7.6	9.5	310	-	246	251	44.6	2.7	9.4	35.1	132	-	0	11	82

TABLE D6-16. WATER-QUALITY DATA FOR JAB PROJECT AREA WELLS (CONT.)

WELL	DATE	pH		TEMPER-ATURE (°C)	CONDUCTIVITY		TDS		Ca	Mg	K	Na	HCO_3		CO_3	Cl	SO_4
		FIELD	LAB		FIELD	LAB	LAB	SUM					FIELD	LAB			
OW 1303	06/29/82	7.12	6.9	17.2	420	-	389	349	81.4	7.4	10.2	34.8	169	-	0	12	119

TABLE D6-16. WATER-QUALITY DATA FOR JAB PROJECT AREA WELLS (CONT.)

WELL	DATE	ALKALINITY ($CaCO_3$)	F	NH_3 (N)	NO_3 (N)	PO_4	SiO_2	TOTAL CATIONS (meq/l)	TOTAL ANIONS (meq/l)	CHARGE BALANCE (%)
JAB NO. 1	11/30/79	74	* 1.0	*1.0	*1.0	*1.0	27	15.221	-	-
	08/05/80	50	* 1.0	*1.0	-	-	66	17.513	-	-
	09/17/80	53	* 1.0	*1.0	*1.0	*1.0	18	15.419	16.825	- 4.4
	06/29/82	70	< 1.0	< .5	< 1.0	-	-	17.521	14.310	10.0
MW 1291	10/08/80	81	* 1.0	*1.0	*1.0	*1.0	163	19.721	20.841	- 2.8
	12/09/81	-	1.0	* .5	*1.0	-	-	22.443	-	-
	03/30/82	-	* 1.0	* .5	*1.0	-	-	25.932	24.880	2.1
	06/29/82	70	5.0	< .5	< 1.0	-	-	28.613	24.863	7.0
	11/18/82	-	-	-	-	-	-	-	-	-
MW 1292	10/22/80	107	* 1.0	*1.0	*1.0	*1.0	10	4.619	7.021	-20.6
	12/09/81	-	1.0	* .5	*1	-	-	4.518	5.229	- 7.3
	06/29/82	115	2.0	< .5	< 1.0	-	-	5.266	4.705	5.6
	11/18/82	-	-	-	-	-	-	-	-	-

TABLE D6-16. WATER-QUALITY DATA FOR JAB PROJECT AREA WELLS (CONT.)

WELL	DATE	ALKALINITY ($CaCO_3$)	F	NH_3 (N)	NO_3 (N)	PO_4	SiO_2	TOTAL CATIONS (meq/l)	TOTAL ANIONS (meq/l)	CHARGE BALANCE (%)
MW 1298	09/17/80	96	* 1.0	*1.0	*1.0	*1.0	33	6.954	8.055	- 7.3
	12/09/81	-	2.0	* .5	*1.0	-	-	5.800	6.571	- 6.2
	03/30/82	-	* 1.0	* .5	*1.0	-	-	6.782	6.540	1.8
	06/29/82	85	2.0	< .5	<1.0	-	-	8.177	5.913	16.1
	11/18/82	-	-	-	-	-	-	-	-	-
MW 1299	09/17/80	101	* 1.0	*1.0	*1.0	*1.0	13	16.196	17.541	- 4.0
	12/09/81	-	11	* .5	*1.0	-	-	14.273	19.211	-14.7
	03/30/82	-	* 1.0	* .5	*1.0	-	-	15.234	14.480	2.5
	06/29/82	100	< 1.0	< .5	<1.0	-	-	15.415	13.622	6.2
	11/18/82	-	-	-	-	-	-	-	-	-
MW 1300	10/01/80	102	* 1.0	*1.0	*1.0	*1.0	11	5.090	7.821	-21.2
	12/09/81	-	2.0	* .5	*1.0	-	-	3.734	4.778	-12.3
	03/30/82	-	* 1.0	* .5	*1.0	-	-	4.908	4.441	5.0
	06/29/82	100	<1.0	<.5	<1.0	-	-	4.215	4.181	0.4

TABLE D6-16. WATER-QUALITY DATA FOR JAB PROJECT AREA WELLS (CONT.)

WELL	DATE	ALKALINITY ($CaCO_3$)	F	NH_3 (N)	NO_3 (N)	PO_4	SiO_2	TOTAL CATIONS (meq/l)	TOTAL ANIONS (meq/l)	CHARGE BALANCE (%)
OW 1303	06/29/82	180	< 1.0	< .5	< 1.0	-	-	6.445	5.586	7.1

TABLE D6-16. WATER-QUALITY DATA FOR JAB PROJECT AREA WELLS (CONT.)

WELL	DATE	Ag	Al	As	B	Ba	Cd	CN	Cr	Cu	Fe	Hg	Mn	Mo
JAB NO. 1	11/30/79	*.01	*.1	*.004	-	*.13	*.01	*1.0	*.01	*.01	*.01	*.00061	*.01	-
	08/05/80	*.01	*.01	0.002	-	*.12	*.01	*1.0	*.01	*.01	0.03	*.001	0.01	-
	09/17/80	*.01	*.1	0.012	1	*.01	*.01	*1.0	*.01	0.02	0.04	.0005	0.04	*.01
	06/29/82	-	<.125	<.005	<.02	0.014	0.0006	-	<.005	<.01	<.025	<.001	0.011	<.025
MW 1291	10/08/80	*.02	*.1	*.004	1.0	*.13	*.01	*1.0	*.01	*.01	*.01	*.001	0.12	*.02
	12/09/81	-	*.025	*.05	0.032	0.017	*.002	-	0.15	*.002	0.10	*.001	0.28	*.005
	03/30/82	-	*.125	0.006	*.02	0.025	.0024	-	0.007	*.01	0.147	0.001	0.401	0.618
	06/29/82	-	<.125	<.005	<.02	0.03	.009	-	<.005	<.01	<.025	<.001	0.433	<.025
	11/18/82	-	-	-	-	-	-	-	-	-	-	-	-	-
MW 1292	10/22/80	*.01	*.1	*.004	*1	*.13	*.01	*1.0	*.01	*.01	*.01	*.001	*.01	*.02
	12/09/81	-	*.025	*.06	0.019	0.019	*.002	-	0.048	*.002	*.01	*.001	0.029	*.005
	06/29/82		<.125	<.011	<.02	0.02	<.0005	-	<.005	<.01	<.025	<.001	0.026	<.025
	11/18/82	-	-	-	-	-	-	-	-	-	-	-	-	-

TABLE D6-16. WATER-QUALITY DATA FOR JAB PROJECT AREA WELLS (CONT.)

WELL	DATE	AG	Al	As	B	Ba	Cd	CN	Cr	Cu	Fe	Hg	Mn	Mo
MW 1298	09/17/80	*.01	* .1	0.006	*1	* .01	* .01	*1.0	* .01	0.01	0.06	* .0005	0.13	* .01
	12/09/81	-	* .025	* .05	.024	.022	* .002	-	0.039	* .002	* .01	* .001	.042	* .005
	03/30/82	-	0.762	0.009	* .02	.021	0.026	-	* .005	* .01	0.13	0.001	.084	* .025
	06/29/82	-	< .125	0.009	< .02	.034	< .0005	-	< .005	< .01	< .025	< .001	0.03	< .025
	11/18/82	-	-	-	-	-	-	-	-	-	-	-	-	-
MW 1299	09/17/80	*.01	* .1	0.008	1.0	* .01	* .01	*1.0	* .01	0.02	0.05	* .0005	0.01	* .01
	12/09/81	-	* .025	* .05	0.018	0.023	* .002	-	0.083	* .002	* .01	* .001	0.039	0.010
	03/30/82	-	0.256	0.006	* .02	0.016	0.018	-	* .005	* .01	0.169	0.001	0.049	0.032
	06/29/82		< .125	< .005	< .02	0.027	0.001	-	< .005	< .01	< .025	< .001	0.044	< .025
	11/18/82	-	-	-	-	-	-	-	-	-	-	-	-	-
MW 1300	10/01/80	*.01	* .1	* .004	*1.0	* .13	* .01	*1.0	* .01	* .01	* .01	* .001	* .01	* .02
	12/09/81	-	* .025	* .05	0.014	0.017	* .002	-	0.035	* .002	* .01	* .001	0.033	* .005
	03/30/82	-	0.196	* .005	* .02	0.016	* .0005	-	* .005	* .01	0.575	0.001	0.04	* .025
	06/29/82		< .125	< .005	< .02	0.02	0.0005	-	< .005	< .01	< .025	< .001	0.032	< .025

TABLE D6-16. WATER-QUALITY DATA FOR JAB PROJECT AREA WELLS (CONT.)

WELL	DATE	Ag	Al	As	B	Ba	Cd	CN	Cr	Cu	Fe	Hg	Mn	Mo
OW 1303	06/29/82	-	< .125	0.007	< .02	0.037	0.0011	-	< .005	< .01	< .025	< .001	< .08	< .025

TABLE D6-16. WATER-QUALITY DATA FOR JAB PROJECT AREA WELLS (CONT.)

WELL	DATE	Ni	Pb	Se	V	Zn	U	Ra-226	Th-230	Pb-210	Po-210
JAB NO. 1	11/30/79	-	* .01	0.07	-	* .01	-	-	-	-	-
	08/05/80	-	* .02	* .01	-	0.21	-	4.85 ± .65	.002 ± .002	15.45 ± 15.45	0.5 ± 1.1
	09/17/80	*.01	* .01	* .01	* .01	0.04	* .001	3.15 ± .53	.003 ± .003	15.45 ± 15.45	0.0 ± 1.0
	06/29/82	< .05	< .005	0.012	< .01	0.563	0.236	4.3 ± .6	4.4 ± 5.0	10.0 ± 7.0	0.0 ± 4.5
MW 1291	10/08/80	*.01	* .02	0.41	* .06	* .01	0.374	299 ± 7.79	.008 ± .004	31.02 ± 7.64	4.4 ± 1.2
	12/09/81	*.01	* .025	* .05	0.012	0.038	0.258	205 ± 2	-	-	-
	03/30/82	*.05	* .005	* .01	* .01	0.254	0.31	49.5 ± 0.9			
	06/29/82	< .05	< .005	< .01	< .01	< .02	0.222	30 ± 2	8.6 ± 4.2	20 ± 8	16 ± 8
	11/18/82	-	-	-	-	-	-	-	-	-	-
MW 1292	10/22/80	*.01	* .02	* .01	* .06	* .01	0.135	21.3 ± 1.82	.002 ± .002	41.06 ± 41.06	3.4 ± 1.1
	12/09/81	*.01	* .025	* .05	0.016	0.006	0.029	6.8 ± 0.14	-	-	-
	06/29/82	< .05	< .0005	< .01	< .01	< .02	0.197	2.2 ± 0.4	7.0 ± 3.8	14 ± 7	0.0 ± 3.8
	11/18/82	-	-	-	-	-	-	-	-	-	-

TABLE D6-16. WATER-QUALITY DATA FOR JAB PROJECT AREA WELLS (CONT.)

WELL	DATE	Ni	Pb	Se	V	Zn	U	Ra-226	Th-230	Pb-210	Po-210
MW 1298	09/17/80	*.01	* .01	* .01	* .01	0.08	* .001	2.46 ± .48	.003 ± .003	15.45 ± 15.45	0.0 ± 1.0
	12/09/81	*.01	* .025	* .05	0.014	0.007	* .001	1.1 ± .2	-	-	-
	03/30/82	*.05	* .005	* .01	.012	* .02	< .01	1.9 ± 0.3	-	-	-
	06/29/82	< .05	< .005	< .01	< .01	< .02	< .015	1.4 ± 0.9	5.7 ± 3.6	6.4 ± 7.0	1.3 ± 4.7
	11/18/82	-	-	-	-	-	-	-	-	-	-
MW 1299	09/17/80	*.01	* .01	* .02	* .01	* .01	.0698	4.77 ± .76	.003 ± .003	21.89 ± 15.78	2.0 ± 0.9
	12/09/81	*.01	* .025	* .05	0.008	* .004	.1758	6.2 ± 0.4	-	-	-
	03/30/82	*.05	0.009	0.01	* .01	* .02	.27	1.7 ± 0.2	-	-	-
	06/29/82	< .05	< .005	0.011	< .01	0.059	.355	1.0 ± 0.4	370 ± 20	7.0 ± 7.0	0.0 ± 4.2
	11/18/82	-	-	-	-	-	-	-	-	-	-
MW 1300	10/01/80	*.01	* .02	* .01	* .06	* .01	* .001	1.94 ± .65	.005 ± .003	41.06 ± 41.06	0.0 ± 1.0
	12/09/81	*.01	* .025	* .05	.009	* .004	* .001	0.4 ± .1	-	-	-
	03/30/82	*.05	* .005	* .01	* .01	* .02	< .015	4.0 ± 0.1	-	-	-
	06/29/82	< .05	0.008	< .01	< .01	0.032	< .015	0.6 ± 0.2	7.2 ± 0.92	91.8 ± 12.7	0.0 ± 3.8

TABLE D6-16. WATER-QUALITY DATA FOR JAB PROJECT AREA WELLS (CONT.)

WELL	DATE	Ni	Pb	Se	V	Zn	U	Ra-226	Th-230	Pb-210	Po-210
OW 1303	06/29/82	< .05	< .005	< .01	< .01	0.034	0.325	0.8 ± 0.7	0.0 ± 4.0	8.7 ± 7.1	1.6 ± 5.9

TABLE D6-17. CHARACTERISTICS OF THE BASINS DRAINING THE JAB PROJECT AREA

BASIN	DRAINAGE AREA (mi^2)	MAXIMUM ELEVATION (FT)	CHANNEL LENGTH (mi)	AVERAGE BASIN (FT/FT)
Antelope Reservoir Creek				
Total	8.64	530	10.3	0.035
Upstream of SW-1	8.16	500	9.1	0.035
Upstream of SW-3	6.12	430	6.6	0.038
Upstream of permit area	5.89	400	6.0	0.038
Unnamed Creek				
Total	1.50	150	2.9	0.017
Upstream of SW-2	1.32	150	2.6	0.017
Upstream of permit area	0.21	55	0.5	-

TABLE D6-18. FLOOD PEAKS AND VOLUMES FOR JAB PROJECT AREA STREAMS

STREAM	DRAINAGE AREA (mi^2)	LOWHAM'S TECHNIQUE DISCHARGE, FT^3/SEC						CRAIG AND RANKL'S TECHNIQUE DISCHARGE, FT^3/SEC						CRAIG AND RANKL'S TECHNIQUE VOLUME, AC-FT					
		P_2	P_5	P_{10}	P_{25}	P_{50}	P_{100}	P_2	P_5	P_{10}	P_{25}	P_{50}	P_{100}	V_2	V_5	V_{10}	V_{25}	V_{50}	V_{100}
Antelope Res. Ck @ SW-1	8.16	125	305	490	810	1120	1490	91	210	340	570	810	1130	20	41	61	92	120	150
Antelope Res. Ck. @ SW-3	6.12	115	275	440	740	1020	1365	93	210	330	540	760	1040	19	39	57	85	110	140
Unnamed Ck @ SW-2	1.32	55	140	220	360	750	850	32	65	96	150	205	270	8.8	16	23	33	42	51

NOTES: P_2, P_5, P_{10}, etc. = peak flow expected once every 2 years, 5 years, 10 years, etc.

V_2, V_5, V_{10}, etc. = volume of flood event expected once every 2 years, 5 years, 10 years, etc.

TABLE D6-19. WATER-QUALITY DATA FOR JAB PROJECT AREA SPRINGS

LOCATION	DATE	FLOW RATE (GPM)	pH		TEMPER-ATURE (°C)	CONDUCTIVITY		TDS		Ca	Mg	K	Na	HCO_3		CO_3	Cl	SO_4
			FIELD	LAB		FIELD	LAB	LAB	SUM					FIELD	LAB			
Middle Lost Creek																		
26N-95W-24	11/18/82	13.5	6.95	7.5	1.3	880	-	620	566	90.1	15.7	19.6	104.1	230	-	0	33	188
Upper Lost Creek	04/09/81	3.82	8.52	-	9.0	1850	-	-	1310	39	11.5	7	340	343.8	-	9.6	81	645
26N-94N-04	11/18/82	9.43	7.36	7.3	3.1	910	-	550	500	16.1	2.4	12.6	175.8	200	-	0	15	178
Hadsell	10/01/63	-	-	7.3	20.0	-	859	578	534	46	5.1	4.0	142	-	262	0	13	193
26N-94W-30 ccd	11/18/82	3.14	6.76	7.9	6.0	920	-	640	620	118.7	5.2	15.4	109.2	200	-	0	42	229

TABLE D6-19. WATER-QUALITY DATA FOR JAB PROJECT AREA SPRINGS (CONT.)

LOCATION	DATE	FLOW RATE (GPM)	pH		TEMPER-ATURE (°C)	CONDUCTIVITY		TDS		Ca	Mg	K	Na	HCO_3		CO_3	Cl	SO_4
			FIELD	LAB		FIELD	LAB	LAB	SUM					FIELD	LAB			
26N-93W-05	04/09/81	5.84	7.75	-	10.5	1370	-	-	895	147	16.4	14	64	119.6	-	0	44	550

TABLE D6-19. WATER-QUALITY DATA FOR JAB PROJECT AREA SPRINGS (CONT.)

LOCATION	DATE	ALKALINITY ($CaCO_3$)	F	NH_3 (N)	NO_3 (N)	PO_4	SiO_2	TOTAL CATIONS (meq/l)	TOTAL ANIONS (meq/l)	CHARGE BALANCE (%)
Middle Lost Creek										
26N-95W-24	11/18/82	175	3.1	< 1.0	< .04	-	-	10.8	8.61	11.3
Upper Lost Creek	04/09/81	-	6.0	< .5	< 1	< 1	-	17.9	21.8	-10.0
26N-94W-04	11/18/82	165	3.1	< 1.0	< .04	-	-	8.97	7.41	9.55
Hadsell	10/01/63	-	0.4	-	0.7	-	-	8.99	8.68	1.79
26N-93W-30ccd	11/18/82	140	31	< 1.0	< .04	-	-	11.5	9.23	10.9

TABLE D6-19. WATER-QUALITY DATA FOR JAB PROJECT AREA SPRINGS (CONT.)

LOCATION	DATE	ALKALINITY ($CaCO_3$)	F	NH_3 (N)	NO_3 (N)	PO_4	SiO_2	TOTAL CATIONS (meq/l)	TOTAL ANIONS (meq/l)	CHARGE BALANCE (%)
26N-93W-05	04/09/81	-	5.0	< .5	< 1	< 1	-	11.8	14.7	-10.7

TABLE D6-19. WATER-QUALITY DATA FOR JAB PROJECT AREA SPRINGS (CONT.)

LOCATION	DATE	Ag	Al	As	B	Ba	Cd	CN	Cr	Cu	Fe	Hg	Mn	Mo
Middle Lost Creek														
26N-29N-24	11/18/82	-	< .125	0.005	0.051	0.043	0.0011	-	0.094	< .010	< .025	< .001	0.059	< .025
Upper Lost Creek	04/09/81	-	< .1	< .001	< 1	< .12	< .01	< .1	< .01	< .01	0.08	< .001	< .01	< .03
26N-94W-04	11/18/82	-	0.328	0.005	0.027	0.020	< .0005	-	0.048	< .010	0.227	< .001	0.016	< .025
Hadsell	10/01/63	-	-	-	0.06	-	-	-	-	-	-	-	-	-
26N-93W-30ccd	11/18/82	-	< .125	0.005	0.025	0.041	0.016	-	0.069	< .010	< .025	< .001	0.098	< .025

TABLE D6-19. WATER-QUALITY DATA FOR JAB PROJECT AREA SPRINGS (CONT.)

LOCATION	DATE	Ag	Al	As	B	Ba	Cd	CN	Cr	Cu	Fe	Hg	Mn	Mo
	04/09/81	-	< .1	< .001	< 1	< .12	< .01	< .1	< .01	< .01	0.04	< .001	0.05	.03
26N-93W-05														

TABLE D6-19. WATER-QUALITY DATA FOR JAB PROJECT AREA SPRINGS (CONT.)

LOCATION	DATE	Ni	Pb	Se	V	Zn	U	Ra-226	Th-230	Pb-210	Po-210
Middle Lost Creek											
26N-94W-24	11/18/82	< .05	< .005	< .01	< .01	< .02					
Upper Lost Creek	04/09/81	< 1.0	0.02	< .04	< .06	< .01	0.0045	0.14 ± .08	2.20 ± 2.20	20.55 ± 20.55	0.2 ± 1.5
26N-94W-04	11/18/82	< .05	< .005	< .01	< .01	< .02					
Hadsell	10/01/63	-	-	-	-	-					
26N-93W-30 ccd	11/18/82	< .05	< .005	< .01	< .01	< .02					

TABLE D6-19. WATER-QUALITY DATA FOR JAB PROJECT AREA SPRINGS (CONT.)

LOCATION	DATE	Ni	Pb	Se	V	Zn	U	Ra-226	Th-230	Pb-210	Po-210
	04/09/81	< 1.0	< .02	< .04	< .06	< .01	0.0035	1.96 ± 0.22	2.16 ± 2.16	20.55 ± 20.55	5.1 ± 2.6
26N-93W-05											

NOTE: All parameters are in mg/l except Flow Rate in gpm; pH in standard units; Temperature in ^{o}C; Conductivity in µmhos/cm @ $25^{o}C$; Total cations and Total Anions in meq/l; Charge Balance in %; Ra-226, Th-230, Pb-210 and Po-210 are in pCi/l.

TABLE D6-20. GROUND-WATER RIGHTS FOR JAB PROJECT AREA

LOCATION ¼ ¼ Sec.	PERMIT NUMBER	USE	USER	OTHER INFOR-MATION[1]	PROB-ABLE AQUI-FER	DIS-TANCE FROM PITS-'	WELL DEPTH (ft)	DATE WELL MEAS-URED	WATER LEVEL (' below LSD)	L.S. ELEV. (' above MSL)	W. S. ELEV. (' above MSL)
T26N R93W											
SW/NW 12	P46333W	MIS	Newpark Re-Sources, Inc. USDI-BLM				400	08/17/78	266	7255	6989
T26N R94W											
NE/SE 05	P23977W	IND	Jack Grynberg & Assoc.	ABA			-		-	6880	-
NE/SE 05	P26861W	STO	USDI-BLM				300	07/24/73	5.0	6860	6855
NE/SE 14	P43133W	IND MIS	Union Carbide Corp., Metals Division				-		-	6922	-
NW/NW 17	P433G	IND	Carter Oil Co.				260	02/09/56	65.0	6840	6775
NW/NW 17	P446G	IND	Carter Oil Co.				285	03/21/56	60	6840	6780
SE/NE 31	P37188W	MIS TEM	Wold Nuclear Co., USDI-BLM	ABA			42	04/15/77	16	6800	6784
SE/NE 31	P37189W	MIS TEM	Wold Nuclear Co., USDI-BLM	ABA			37	04/15/77	16	6785	6769
SE/NE 31	P37190W	MIS TEM	Wold Nuclear Co., USDI-BLM	ABA			37	04/15/77	16	6780	6764

TABLE D6-20. GROUND-WATER RIGHTS FOR JAB PROJECT AREA (CONT.)

LOCATION ¼ ¼ SEC.	PERMIT NUMBER	USE	USER	OTHER INFORMATION[1]	PROBABLE AQUIFER	DISTANCE FROM PITS-'	WELL DEPTH (ft)	DATE WELL MEASURED	WATER LEVEL (' below LSD)	L.S. ELEV. (' above MSL)	W.S. ELEV. (' above MSL)
T26N R95W											
SW/NW 01	P14833W	IND	Nuclear Exploration & Development				365	08/07/72	310	6990	6680
NW/NW 01	P49869W	MIS	Pioneer Nuclear, Inc.				421	07/16/79	35	7000	6965
NW/SE 24	P14W	IND	Sinclair Oil Co.	CAN			-	-	-	6800	-
T27N R93W											
SW/SW 28	P12426P	STO	USDI-BLM				250	02/10/66	3.0	6960	6957
SE/NW 33	P30165W	DRI IND MIS TEM	May Petroleum, Inc.	CAN			420	06/18/75	300	6980	6680
T27N R94W											
SW/NE 35	P40075W	DRI MIS TEM	J.C. Williamson, USDI-BLM	CAN			-		-	6900	-
SW/NE 35	P53841W	MIS	Black Hawk Resources Corp.; USDI-BLM	(Refile of Permit P40075W)							

TABLE D6-27. SURFACE-WATER RIGHTS OF JAB PROJECT AREA

LOCATION *¼ ¼ SEC.	PERMIT NUMBER	USE	USER
T26N R94W			
SW/NW 23	P223S	STOCK	Bessie A. McIntosh
SW/SW 30	P25646D	DRI IND TEM	Union Oil Company
T26N R95W			
NE/SE 24	P25645D	DRI IND TEM	Union Oil Co. of California
T27N R93W			
SE/SW 28	P26056D	DRI IND MIS TEM	Minerals Exploration Co.
NE/SW 33	P7336R	STOCK WILDLIFE	USDI-BLM
T27N R94W			
NW/SE 26	P7331R	STOCK WILDLIFE	USDI-BLM

*NOTE: ¼-¼ of sections are in order of smallest to largest

ADDENDUM D6A:

AQUIFER-TEST THEORY

AQUIFER-TEST THEORY

Transmissivity is a definition of the ability of an aquifer to transmit water. Common units of transmissivity are gallons per day per foot (gal/day/ft). A transmissivity expressed in these units is the amount of water, in gallons per day, that can flow through a vertical strip of aquifer one-foot wide extending the full saturated height of the aquifer normal to the flow direction under a unit hydraulic gradient.

Transmissivity must be adjusted by the actual aquifer width and hydraulic gradient to determine actual aquifer flow rates.

THEIS EQUATION

Theis, in 1935, introduced his equation which describes a non-leaky, confined aquifer. The following is a general definition of the Theis equation:

$$T = 114.6\ Q\ W(u)/s$$
$$u = 2693\ r^2\ S/T\ t$$

where: s = drawdown, in feet
Q = discharge, in gallons per minute (gpm)
W(u) = well function
= the integral from u to infinity of $(e^{-u})/u\ du$
T = transmissivity, in gal/day/ft
u = well function variable
r = observation well radius from pumping well, in feet
S = storage coefficient,
and t = time since pumping started, in min.

NOTE: "^" denotes exponentiation.

Pump test data are analyzed by matching the log-log plot of drawdown versus time to Theis' type curve (W(u) vs. 1/u) and applying the above equations to the match. Pages 92-98 of Ferris and others (1962) present a more thorough discussion of the Theis equation.

The value of the integral expression for W(u) is given by the following series:

$$W(u) = -0.577216 - \ln u + u - u^2/2.2! + u^3/3.3! \ldots$$

where all terms are as previously defined.

STRAIGHT LINE EQUATION

Jacob developed a simplified form of Theis' drawdown equation by truncating the well function series after the first two terms.

Assuming the trunction, the following equations were developed to analyze drawdown versus time data on semi-log plots and is called the straight-line or Jacob equation:

$$T = 264\ Q\ [\log\ (t2/t1)]/(s2 - s1)$$
$$T = 264\ Q/DELTA\ s$$
$$S = T\ to/4800\ r^2$$

s1 = drawdown, in feet, at time since pumping started, t1, in min.
s2 = drawdown, in feet, at time since pumping started, t2, in min.
and t2 > t1
DELTA s = change in drawdown over one log cycle of time on a semi-log plot, in feet
S = storage coefficient
to = straight-line intercept of zero drawdown, in min.
r = radius of well, in ft

A straight line is fitted to the semi-log plot of drawdown versus time (log scale) to obtain transmissivity. Jacob suggested that u values less than 0.01 are needed before his straight-line method is useful. However, a plot of W(u) versus 1/u on semi-log paper indicates that this method should be applicable for values of u as large as 0.1. Pages 98-100 of Ferris and others (1962) should be consulted for additional information on Jacob's method.

THEIS RECOVERY EQUATION

Theis' equation can be modified to handle recharge of a well or multiple pumping periods by summation of the well functions. The following equation is the solution of Theis' equation for one pumping and recharge cycle (Recovery equation) using a log-log match format:

$$T = 114.6\ Q\ [w(u) - W(u')]\ /\ s'$$
$$u' = 2693\ r^2\ S\ /\ Tt'$$
$$T = 114.6\ Q\ [W(u) - W(u) + W(u')]\ /\ sr$$
$$= 114.6\ Q\ W(u')\ /\ sr$$
$$sr = s - s'$$

where: sr = recovery, in feet
s' = residual drawdown (static water level - water level @ t'), in feet
W(u') = recovery well function
u' = recovery well function variable
t' = time since pumping stopped, min.

The recovery data are analyzed by matching the log-log plot of the recovery versus time since pumping stopped to Theis' type curve. The type curve variables are W(u') and 1/u' for the recovery match. The recovery is computed by estimating the drawdown which would have occurred if pumping had continued, and subtracting this predicted drawdown from the residual drawdown. For example, the recovery at 100 minutes after pumping has stopped

is computed by estimating the drawdown at that time if the pumping had continued uninterrupted, and subtracting this drawdown from the residual drawdown. The straight-line fit of the drawdown is normally extended to obtain these estimates of drawdown.

The well functions of the residual-drawdown form of Theis' equation were approximated by using only the first two terms in the well function series. The following equations present the semi-log form of the Theis recovery equation:

$$T = 264\ Q\ [\log (t/t')]/s'$$

or $$T = 264\ Q/\Delta s'$$

where: t = time since pumping started, in min.
t' = time since pumping stopped, in min.
s' = residual drawdown, in feet

and
$\Delta s'$ = change in residual drawdown over one log cycle of t/t' on a semi-log plot, in feet

Therefore, when residual drawdown is plotted on an arithmetic scale versus t/t' on a logarithmic scale, the above equation can be used for the straight line fit. Pages 100-102 of Ferris and others (1962) should be consulted for a discussion of Theis' recovery method. Theis' recovery equation is for a non-leaky confined aquifer also.

NEUMAN-WITHERSPOON METHOD

A method for determining aquitard vertical permeability has been described by Neuman and Witherspoon (1971) and Neuman and Witherspoon (1972). In this technique, referred to as the Ratio Method, the ratio of drawdown in the aquitard to the drawdown in the pumped aquifer at the same time distance is related to a dimensionless time parameter, $t'D$:

$$t'D = K't / Ss'\ z^2$$

where K' = aquitard vertical permeability
t = time for which drawdown ratio was determined
Ss' = specific storage of the aquitard
= $K'/ALPHA'$
$ALPHA'$ = aquitard diffusivity,
and z = vertical distance from the center of the screened section of the well completed in the aquitard to the aquifer.

$t'D$ is determined graphically. Therefore, aquitard diffusivity ($ALPHA'$) can be calculated from $ALPHA' = K' / Ss' = t'D\ Z^2 / t$.

In order to determine aquitard vertical permeability, K', aquitard specific storage, Ss', must be ascertained.

$$Ss' = avWw / 1 + e$$

where av = coefficient of compressibility

Ww = weight of water,
and e = void ratio.

The values of av and e must be determined on samples of the aquitard in the laboratory or Ss' may be estimated based on published reports on similar sediments.

ADDENDUM A REFERENCES

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ADDENDUM D6B:

PUMP TEST RESULTS

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D6B.1 PUMP TEST 1292

Well 1292 was pumped at 32 gpm for two days while wells 1304, 1305, and 1307 were observed for drawdown. Table D6B-1 presents the drawdown and field water quality data for pumping well MW 1292. The semi-log plot of the drawdown for pumping well 1292 is presented in Figure D6B-1. The straight line fit of this data yields a transmissivity of 2800 gal/day/ft for this aquifer. The specific capacity of well 1292 at the end of the pump test was one gpm per foot of drawdown. This data and the potential drawdown in this well indicates that the well should yield at least 100 gpm of water. The recovery of the water level in pumping well 1292 (see Fig. D6B-2) produced a similar transmissivity as the value from the drawdown data.

D6B.1.1 OBSERVATION WELL OW 1304

Drawdowns in observation well 1304, which is 60.4 feet from pumping well 1292 were greater than six feet after two days of pumping. Table D6B-2 presents the drawdown data for this observation well while Figure D6B-3 presents the semi-log plot of the drawdown data. The straight line fit to this drawdown produced a transmissivity of 4700 gal/day/ft and a storage coefficient of 2.4×10^{-4}. The log-log plot of the drawdown data in observation well 1304 yields the same aquifer properties from our match to the Theis type curve (see Fig. D6B-4).

D6B.1.2 OBSERVATION WELL OW 1305

Figure D6B-5 presents the drawdown data (see Table D6B-3) for observation well 1305, which is located 30.4 feet from pumping well 1292. The straight line fit of this data produced a transmissivity and storage coefficient of 4200 gal/day/ft and 1.4 x 10^-4, respectively. The log-log match of the drawdown (see Fig. D6B-6) to the Theis type curve produced similar aquifer properties on the straight line fit.

D6B.1.3 OBSERVATION WELL OW 1307

Observation well 1307 is completed in the sand below the mudstone which forms the base to the ore sand (see Figure D6B-7 and Table D6B-4 for drawdowns). This mudstone is 12 feet thick at well 1307. Neuman- Witherspoon's (1971) method (see Addendum D6A for a discussion of this technique) can be used to estimate the vertical permeability of the mudstone. Their method is designed to use drawdowns in the mudstone (aquitard) but use of an observation well just below the mudstone can be used to obtain an approximate permeability. A dimensionless time, tD, for the ore aquifer of 22 was computed from a transmissivity, storage coefficient and well radius, of 4400 gal/day/ft, 2 x 10^-4 and 30.4 feet, respectively. Drawdowns at ten minutes from wells 1307 and 1304 of 0.12 and 4.24 feet, respectively were used to calculate the drawdown ratio of 0.028. The dimensionless time for the aquitard, tD', was obtained from Figure IV-16 of Neuman and Witherspoon (1971). Specific storage of the aquitard was not

determined for this site, but a value determined for a similar mudstone in the Red Desert of 7.4 x 10^-5/ft was used to estimate the vertical permeability. These values produce a vertical permeability of 0.45 ft/day (1.6 x 10^-4 cm/sec). This value should be reduced some because observation well 1307 is also sampling the vertical movement through a few feet of sand. This adjustment was not made because the vertical permeability of the sand is unknown and the reduction would not be large. The drawdown in well 1307 indicates that the mudstone is very permeable, which would not be expected. Secondary permeability through fracturing would be needed for this mudstone to obtain a vertical permeability this large. It seems likely that the mudstone would have the ability to seal fractures and therefore not contain a high permeability. A poor bentonite seal in the annulus or pinching out of the mudstone near this area could cause the drawdowns observed in well 1307. This test indicates a ready connection between the sands above and below the mudstone.

D6.2 PUMP TEST 1291

Well 1291 was pumped at an average rate of 3.1 gpm for 405 minutes, while observation wells 1301, 1302, and 1303 were observed for drawdown. Table D6B-5 presents drawdown and recovery data and field water quality information for pumping well 1291. Figures D6B-8 and D6B-9 present the drawdown and recovery semi-log plots for pumping well 1291. The straight line fits to this data indicates the transmissivity near well 1291 is 200 gal/day/ft.

D6B.2.1 OBSERVATION WELL 1301

Observation well 1301 is located 62 feet south of pumping well 1291. The drawdown observed in this observation well is tabulated in Table D6B-6 and presented in Figures D6B-10 and D6B-11. The analysis of this drawdown data produced a transmissivity of roughly 800 gal/day/ft and a storage coefficient of 6 x 10^-4. These results indicate that the ore aquifer is more permeable at well 1301 than at the pumping well. The leveling off of drawdowns after 200 minutes of pumping is probably caused by the unconfined properties of the aquifer in this area. The length of the pump test needed to be several days long to develop an adequate drawdown curve to warrant using unconfined aquifer theory to analyze the test.

D6B.2.2 OBSERVATION WELL 1302

Observation well 1302 is spaced approximately one-half the distance between wells MW 1291 and OW 1301. Drawdown (see Table D6B-7) in this observation well produced a transmissivity between the values obtained from wells 1291 and 1301. Transmissivities of 580 gal/day/ft from the semi-log plot (see Fig. D6B-12) and 510 gal/day/ft from the Theis match (see Fig. D6B-13) were obtained from the well 1302 data. These results indicate that the transmissivity increases with distance away from the local fault.

D6B.2.3 OBSERVATION WELL 1303

Observation well 1303 is completed on the north side of the

localized fault and below the mudstone (see Exhibit D6-2) while all of the other wells in the 1291 test are south of the fault. Table D6B-8 presents the water level data collected from well 1303 during the 1291 test. Very little change in water level was observed in well 1303 during the test. Barometric pressure adjustments were made to the observed drawdown from well 1303 because these adjustments were significant for the small change in water level. The barometric pressure during this test gradually decreased from 29.66 to 29.57 inches of Hg at the end of the test. A barometric efficiency of 0.63 ft of water/inches of Hg was determined from static water level data. Drawdowns corrected for the barometric pressure changes indicates that a maximum drawdown of 0.08 ft was observed in well 1303. This data shows that the aquifer north of the fault below the mudstone is not readily connected to the ore sand aquifer in this area.

D6B.3 PUMP TEST 1298

Well 1298 was pumped at an average rate of 5.9 gpm for 55 minutes. Field water quality and drawdown data is presented in Table D6B-9. The plot of the drawdown and recovery data produced transmissivities of 50 and 40 gal/day/ft, respectively (see Figs. D6B-14 and 15). This shows that the sand just above the mudstone in the south central portion of the project area contains a much lower permeability.

D6B.4 PUMP TEST 1299

Well 1299, which is located in the southeast corner of the

project area, was pumped at an average rate of 23.7 gpm for 916 minutes (see Table D6B- 10). The drawdown and recovery plots for well 1299 indicate transmissivities of 1400 and 1700 gal/day/ft, respectively (see Figs. D6B- 16 and D6B-17). This data shows that the aquifer is very permeable in this area.

D6B.5 PUMP TEST 1300

Monitoring well 1300, which is in the northern portion of the Jab project area was pumped at an average rate of 6.9 gpm. Table D6B-11 presents the pumping and field water quality data for this test. The semi-log drawdown plot for well 1300 is presented in Figure D6B-18 and the straight line fit indicates a transmissivity of 670 gal/day/ft. The recovery plot of this test yields a similar transmissivity of 650 gal/day/ft.

D6B.6 PUMP TEST JAB WELL NO. 1

The Jab No. 1 well was used for a drilling water supply, and is completed in the ore sand below the mudstone. The recovery data for this well (see Fig. D6B-20 and Table D6B-12) produced a transmissivity of 3400 gal/day/ft. This test shows that the sands below the mudstone are very permeable in this area.

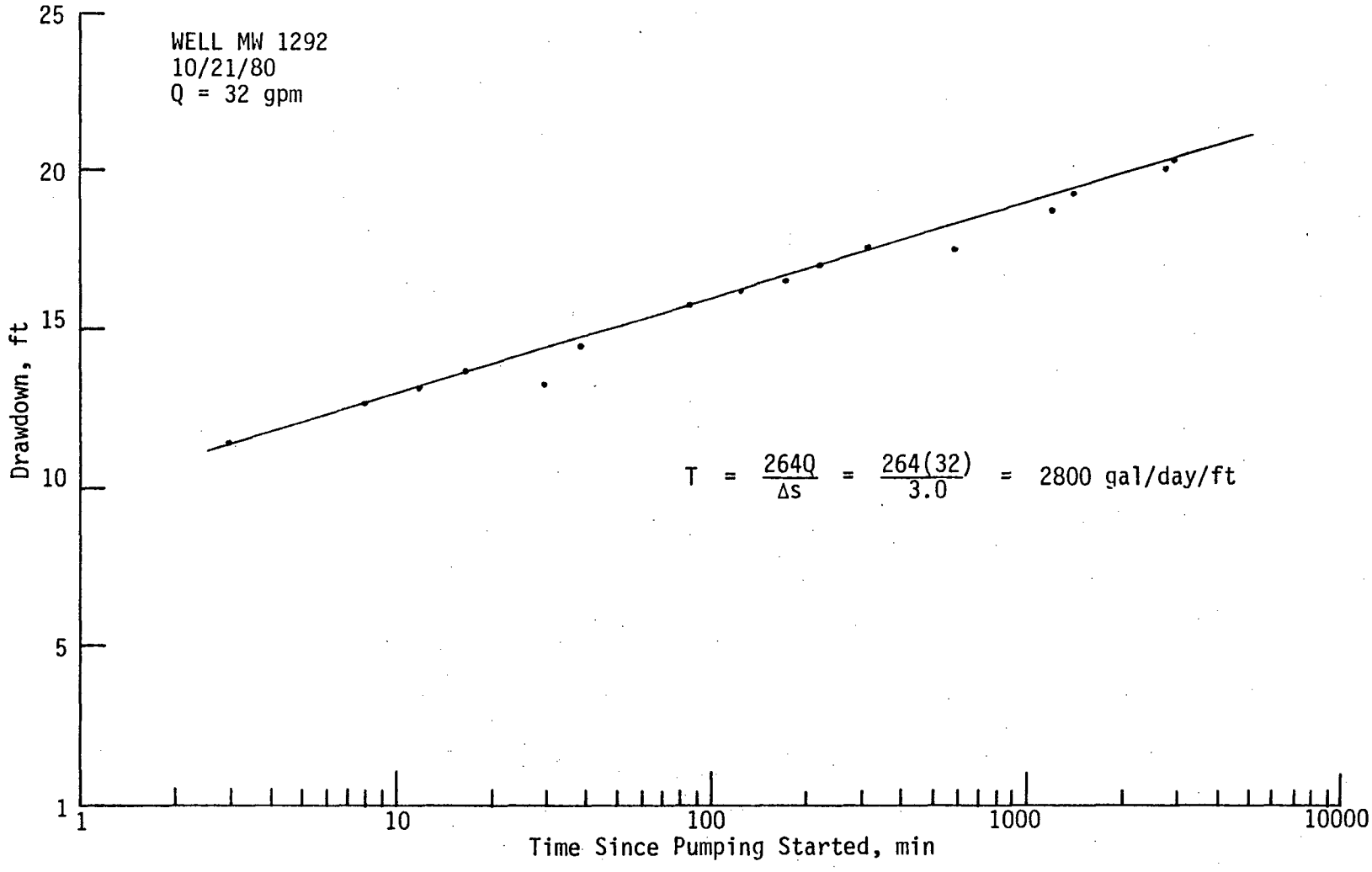


FIGURE D6B-1. DRAWDOWN FOR PUMPING WELL MW 1292

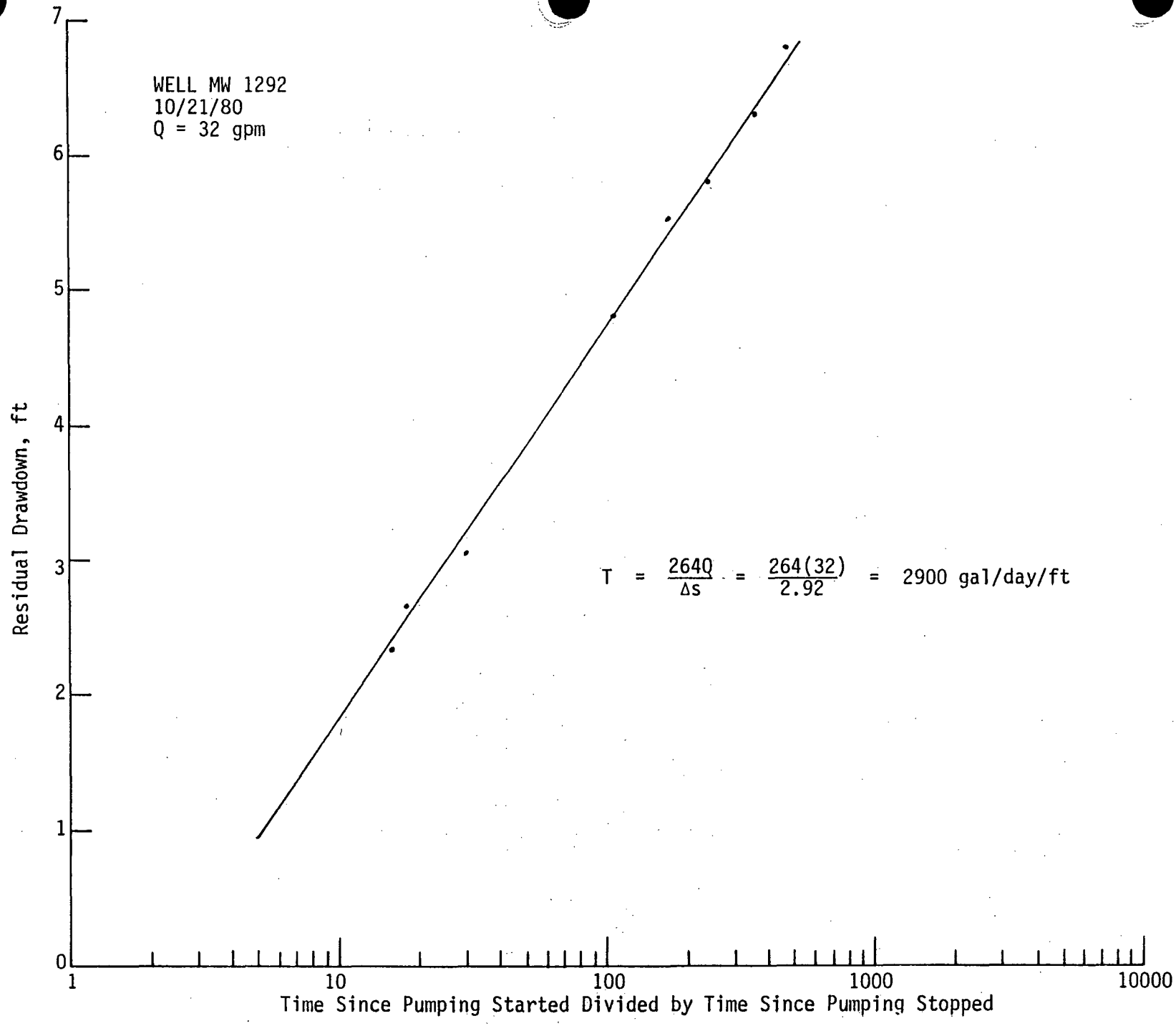


FIGURE D6B-2. RECOVERY DATA FOR PUMPING WELL MW 1292

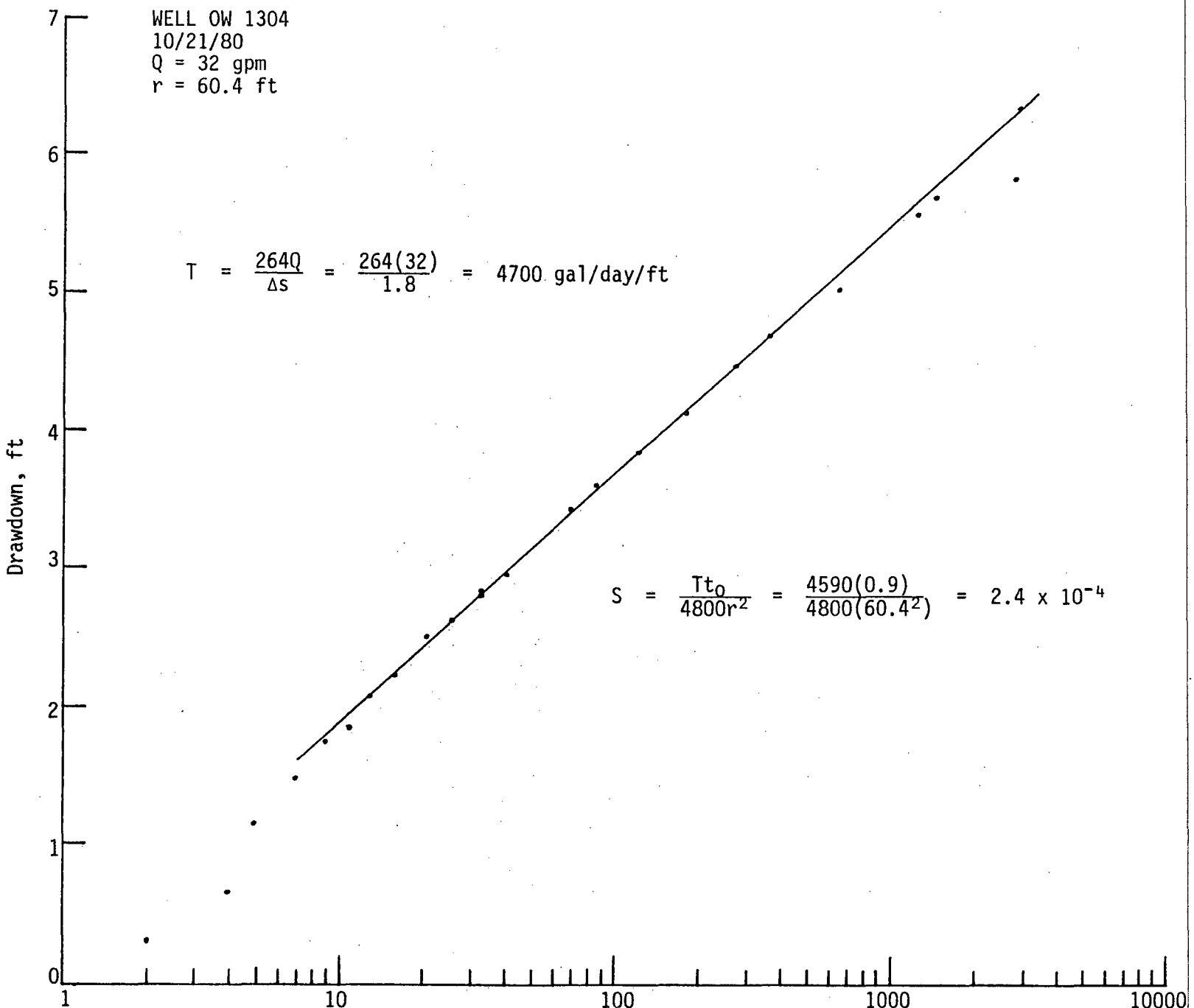


FIGURE D6B-3. DRAWDOWN FOR WELL OW 1304 FROM PUMPING WELL MW 1292

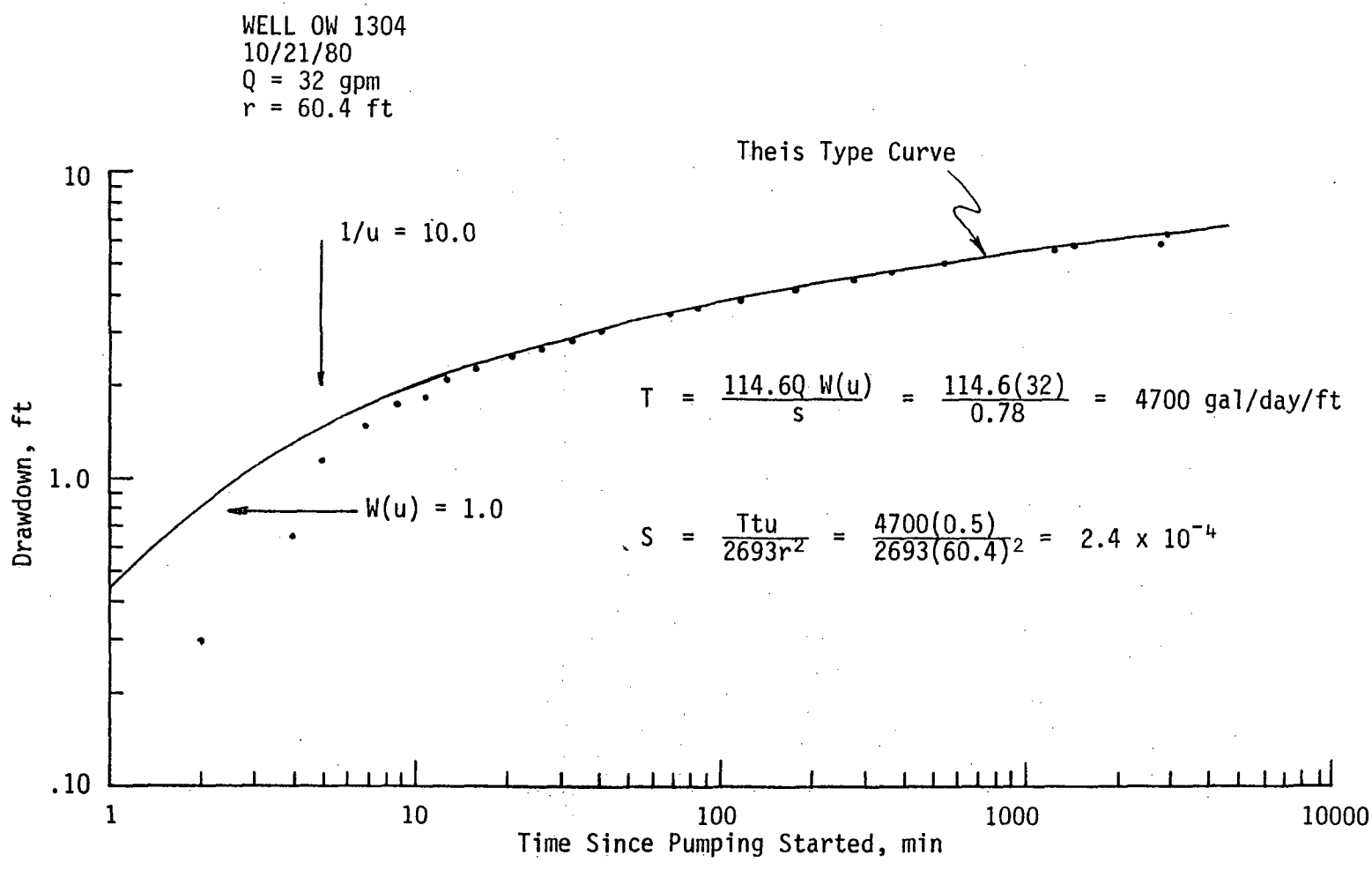


FIGURE D6B-4. DRAWDOWN FOR WELL OW 1304 (LOG-LOG)

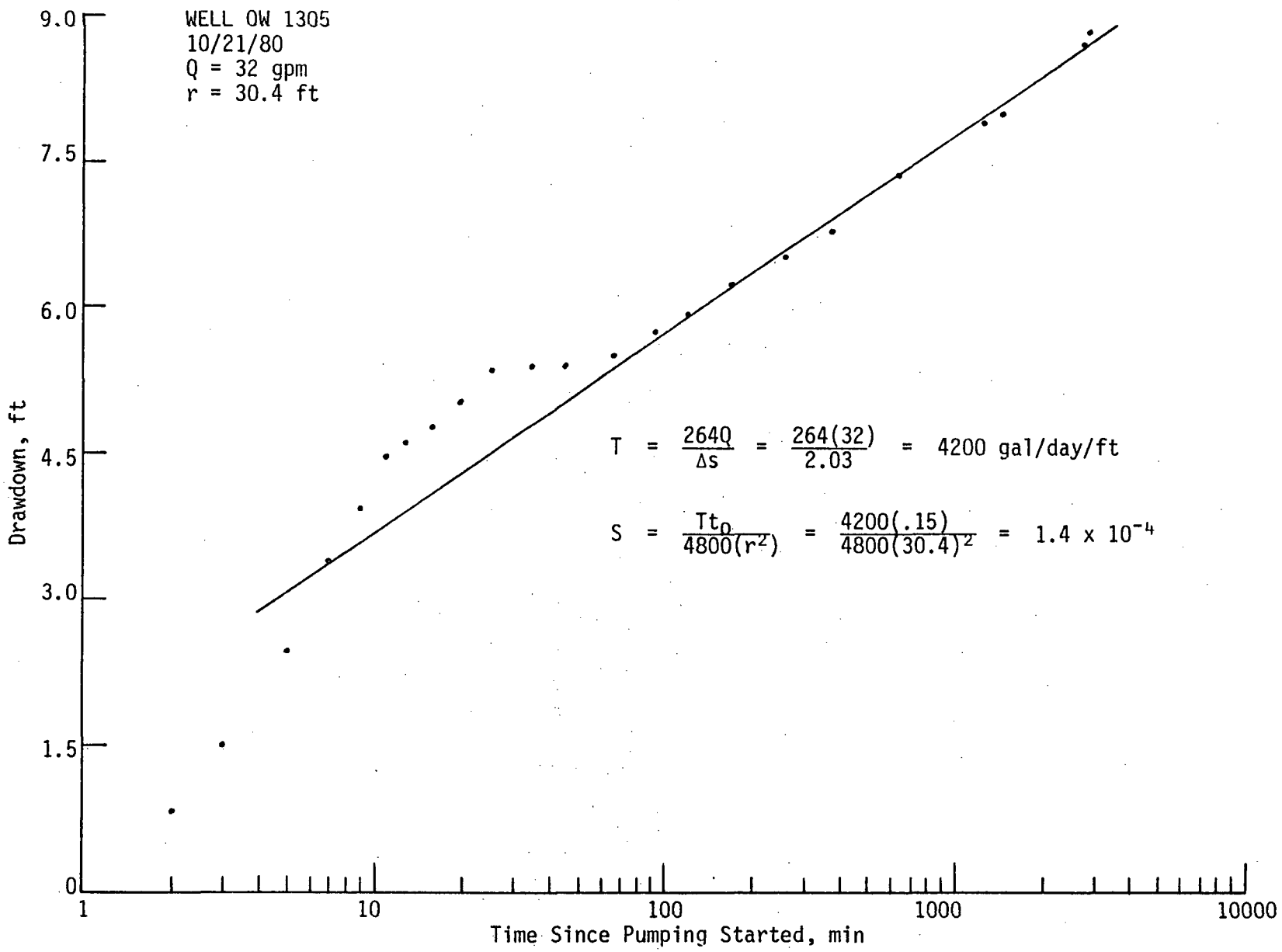


FIGURE D6B-5. DRAWDOWN FOR WELL OW 1305 FROM PUMPING WELL MW 1292

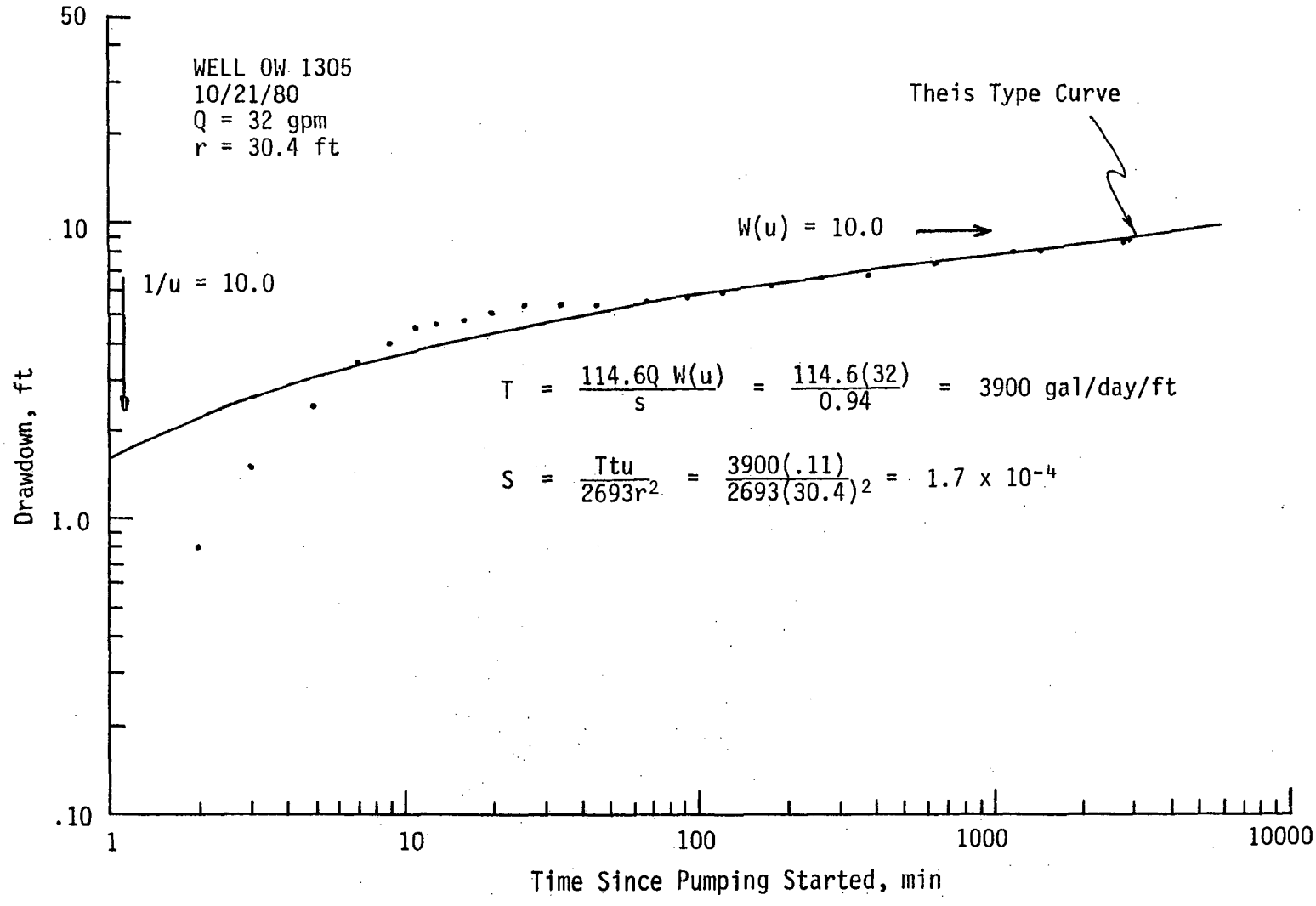


FIGURE D6B-6. DRAWDOWN FOR WELL OW 1305 (LOG-LOG)

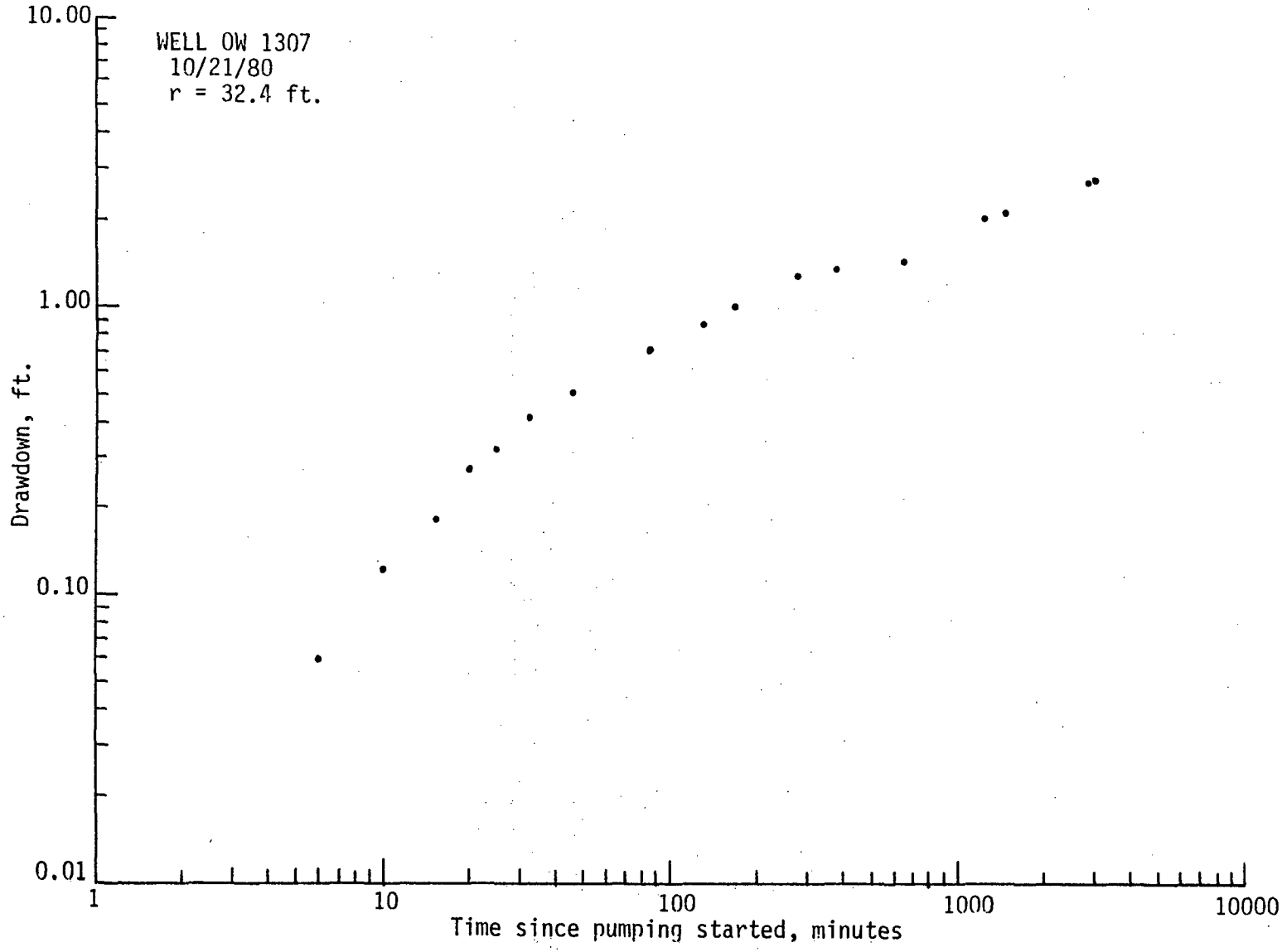


FIGURE D6B-7. DRAWDOWN DATA FOR WELL OW 1307 FROM PUMPING WELL MW 1292.

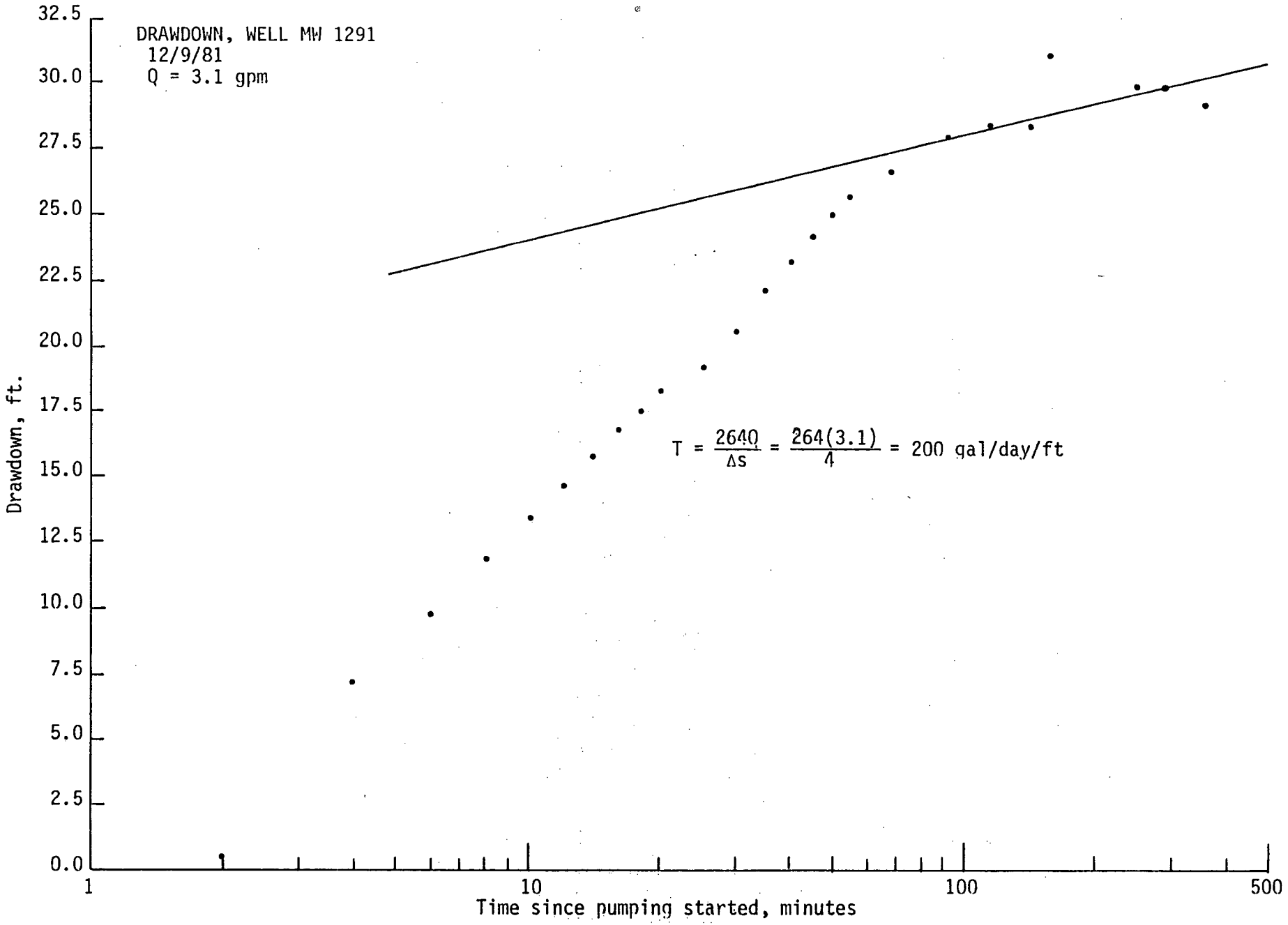


FIGURE D6B-8. DRAWDOWN DATA FOR PUMPING WELL MW 1291

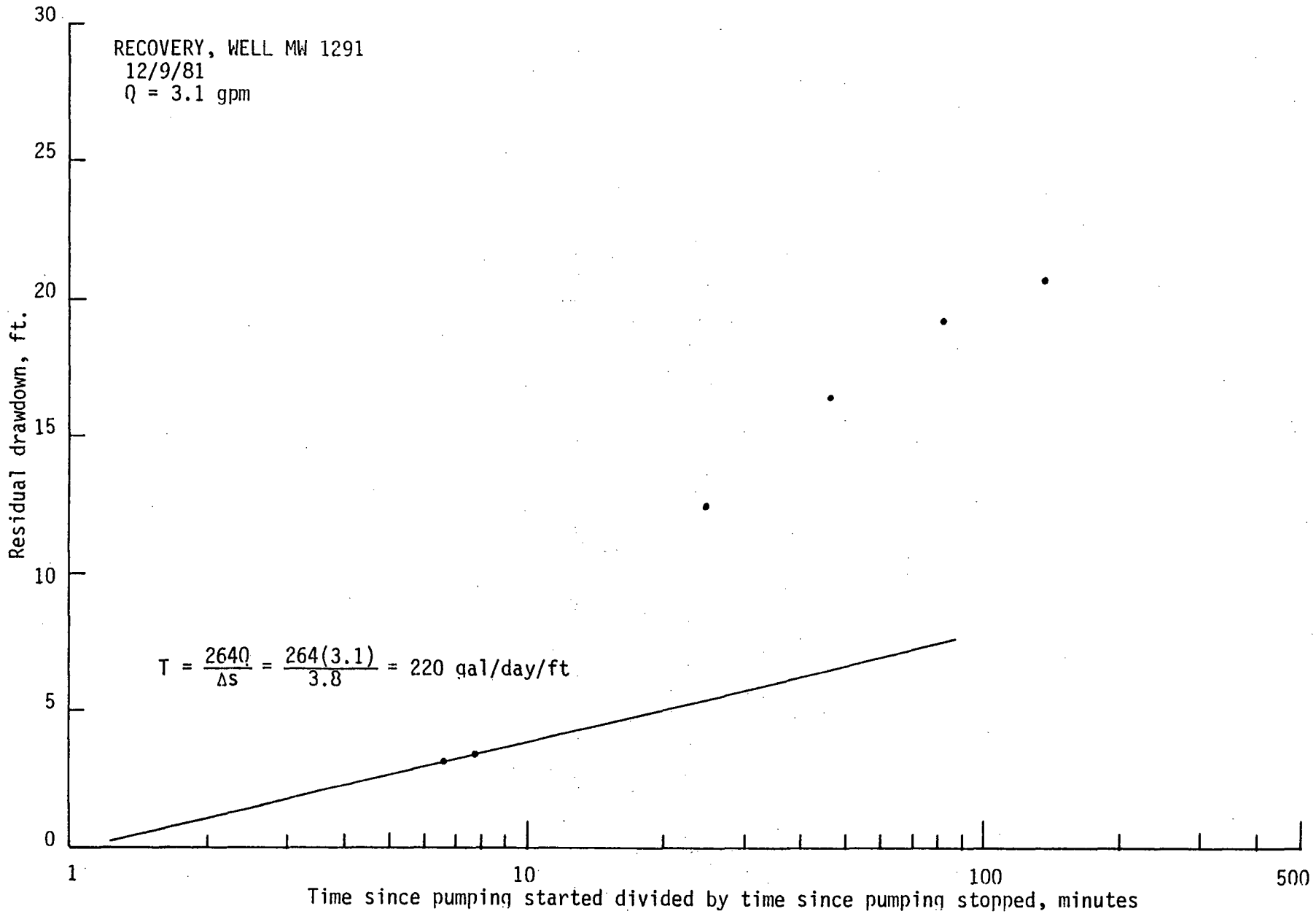


FIGURE D6B-9. RECOVERY DATA FOR PUMPING WELL MW 1291

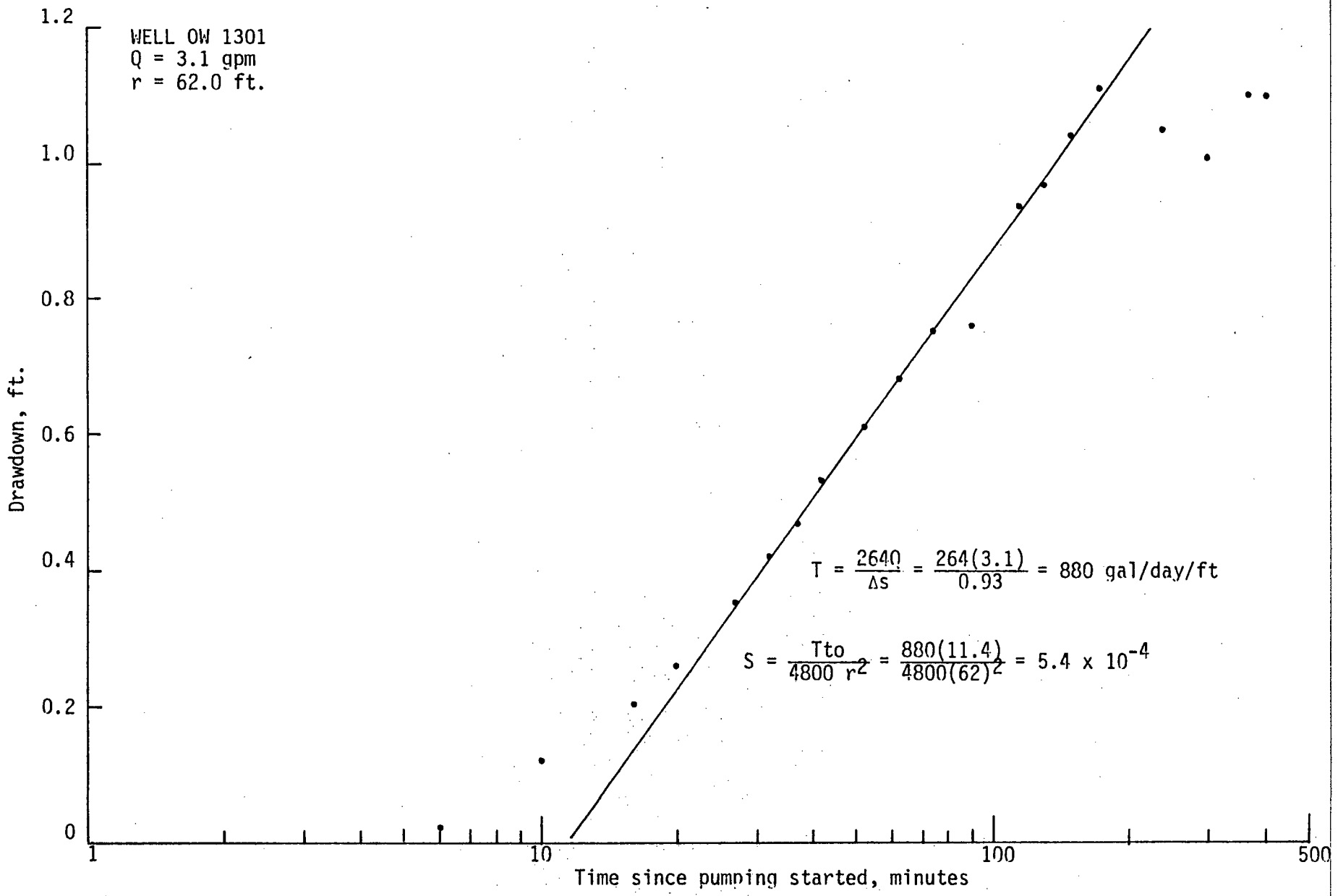


FIGURE D6B-10. DRAWDOWN FOR WELL OW 1301 FROM PUMPING WELL 1291.

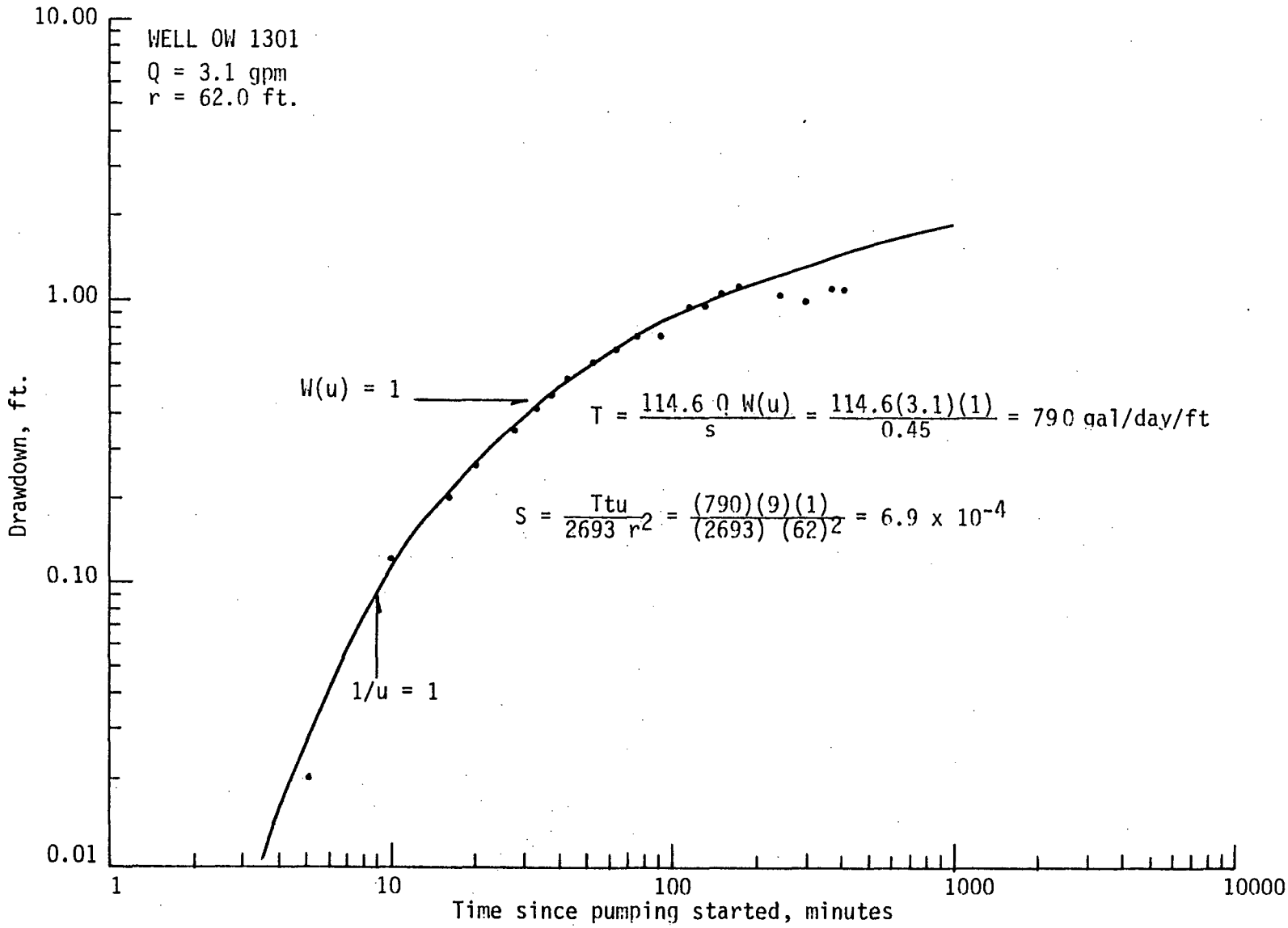


FIGURE D6B-11. DRAWDOWN FOR WELL OW 1301 (LOG-LOG)

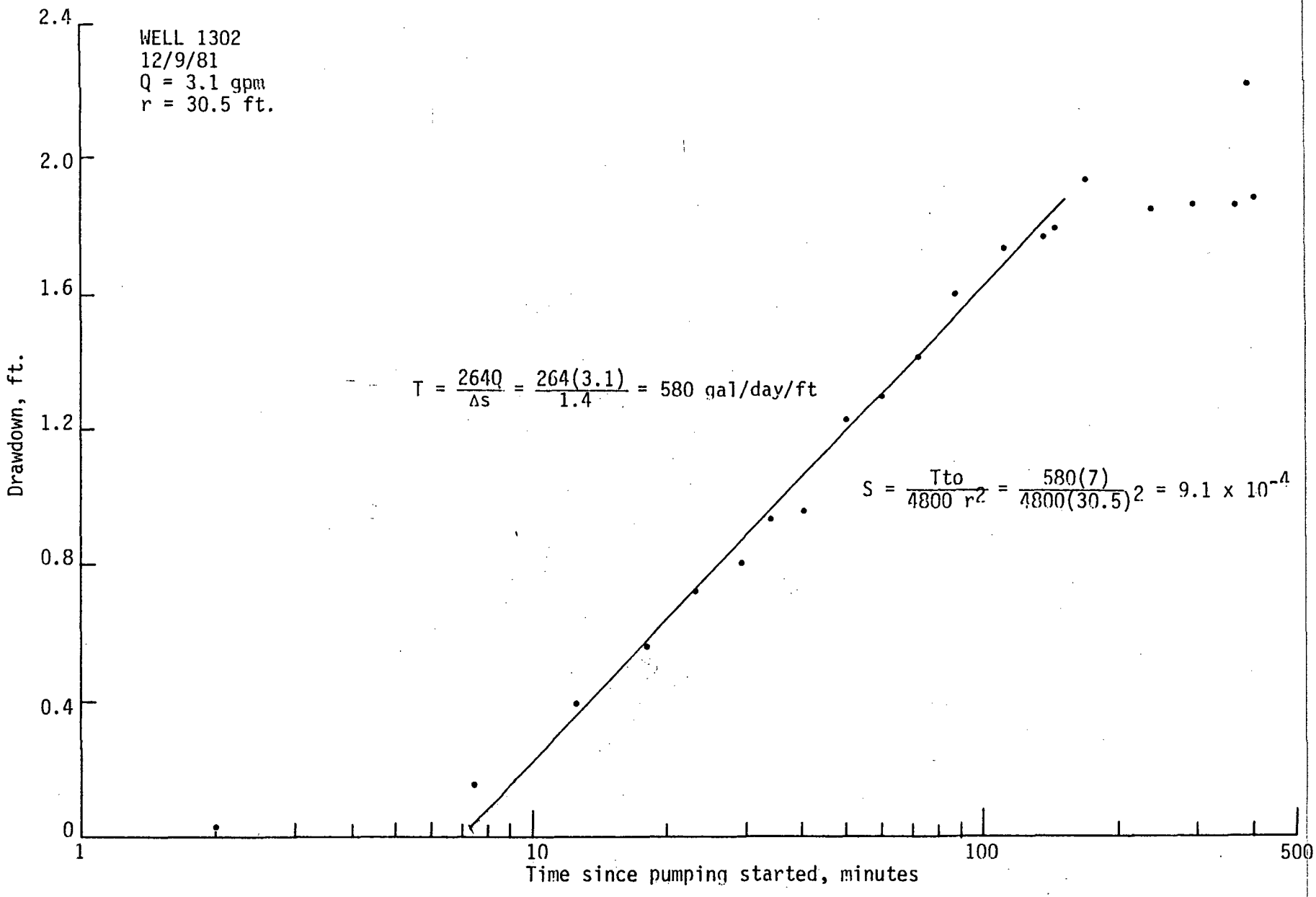


FIGURE D6B-12. DRAWDOWN FOR WELL OW 1302 FROM PUMPING WELL MW 1291

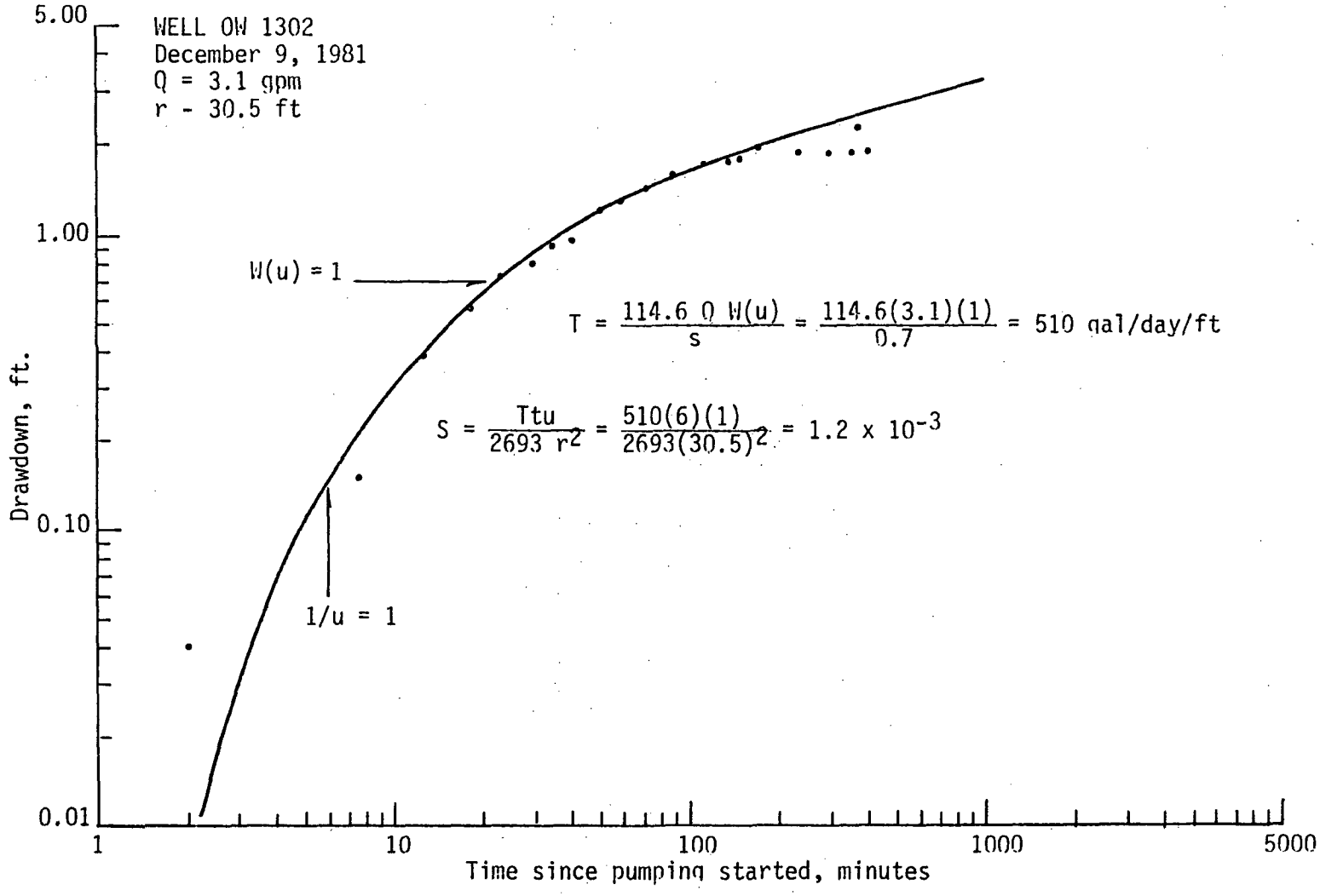


FIGURE D6B-13. DRAWDOWN DATA FOR OBSERVATION WELL OW 1302 (LOG-LOG)

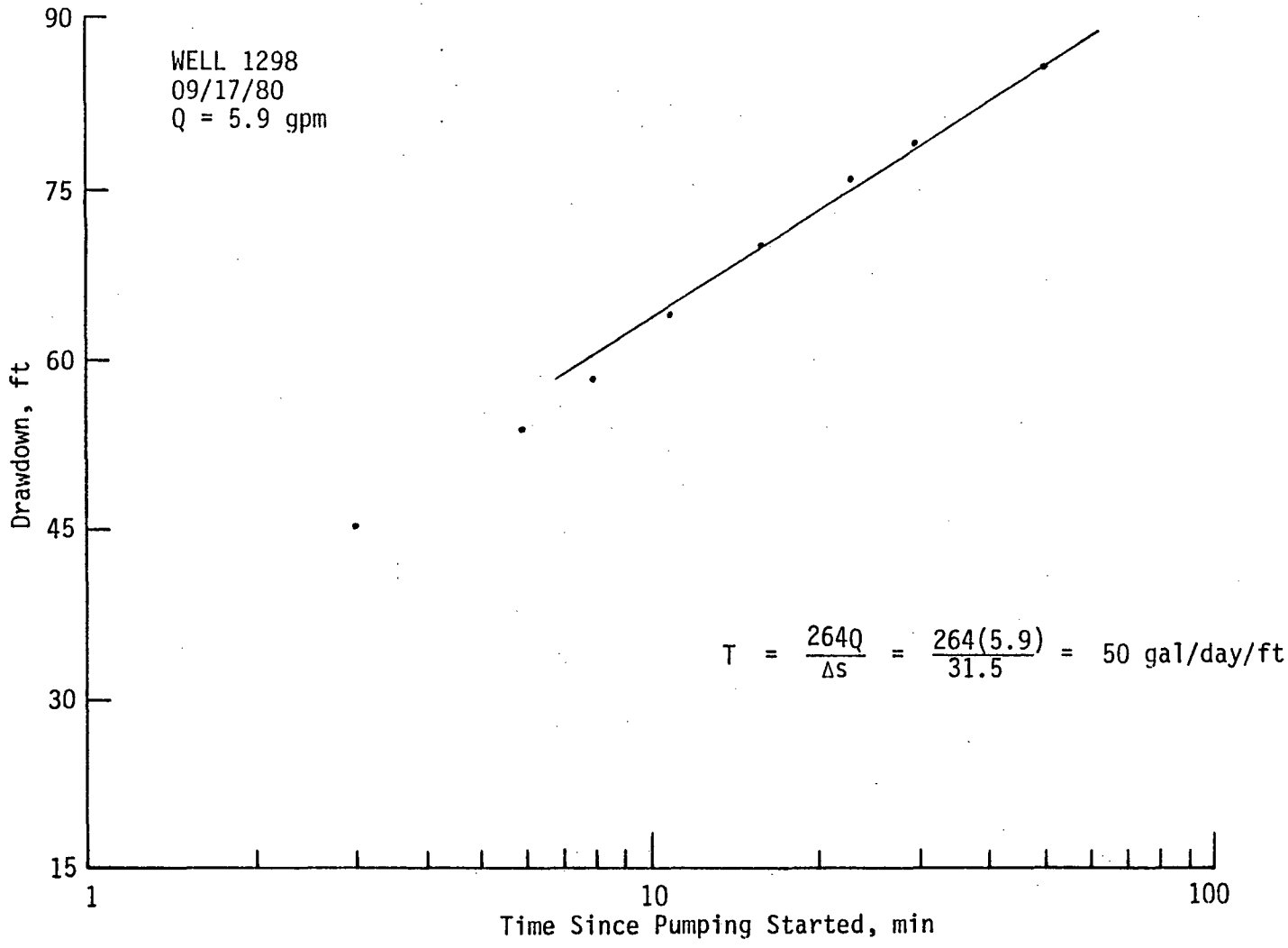


FIGURE D6B-14. DRAWDOWN FOR WELL 1298

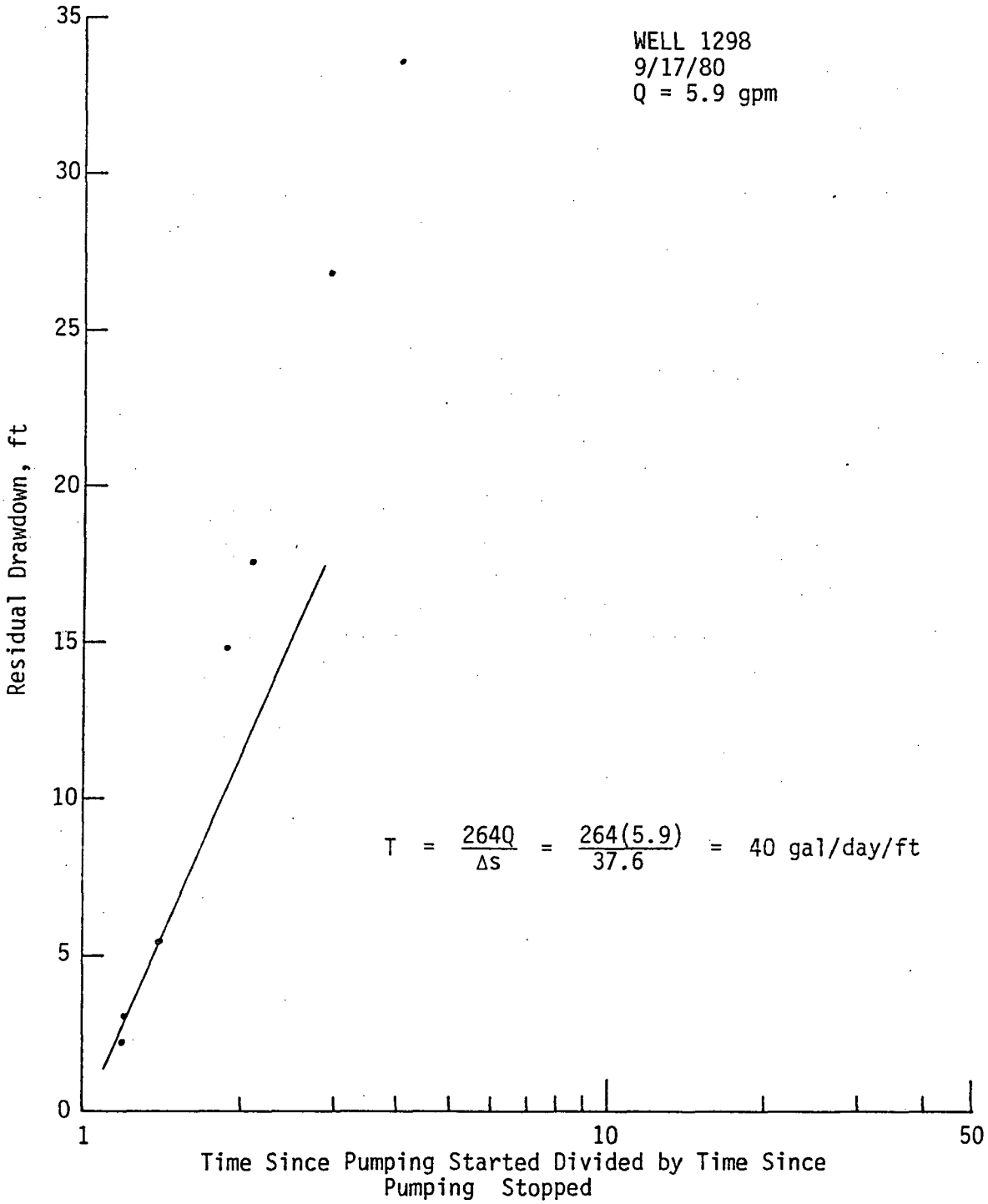


FIGURE D6B-15. RECOVERY OF WELL 1298

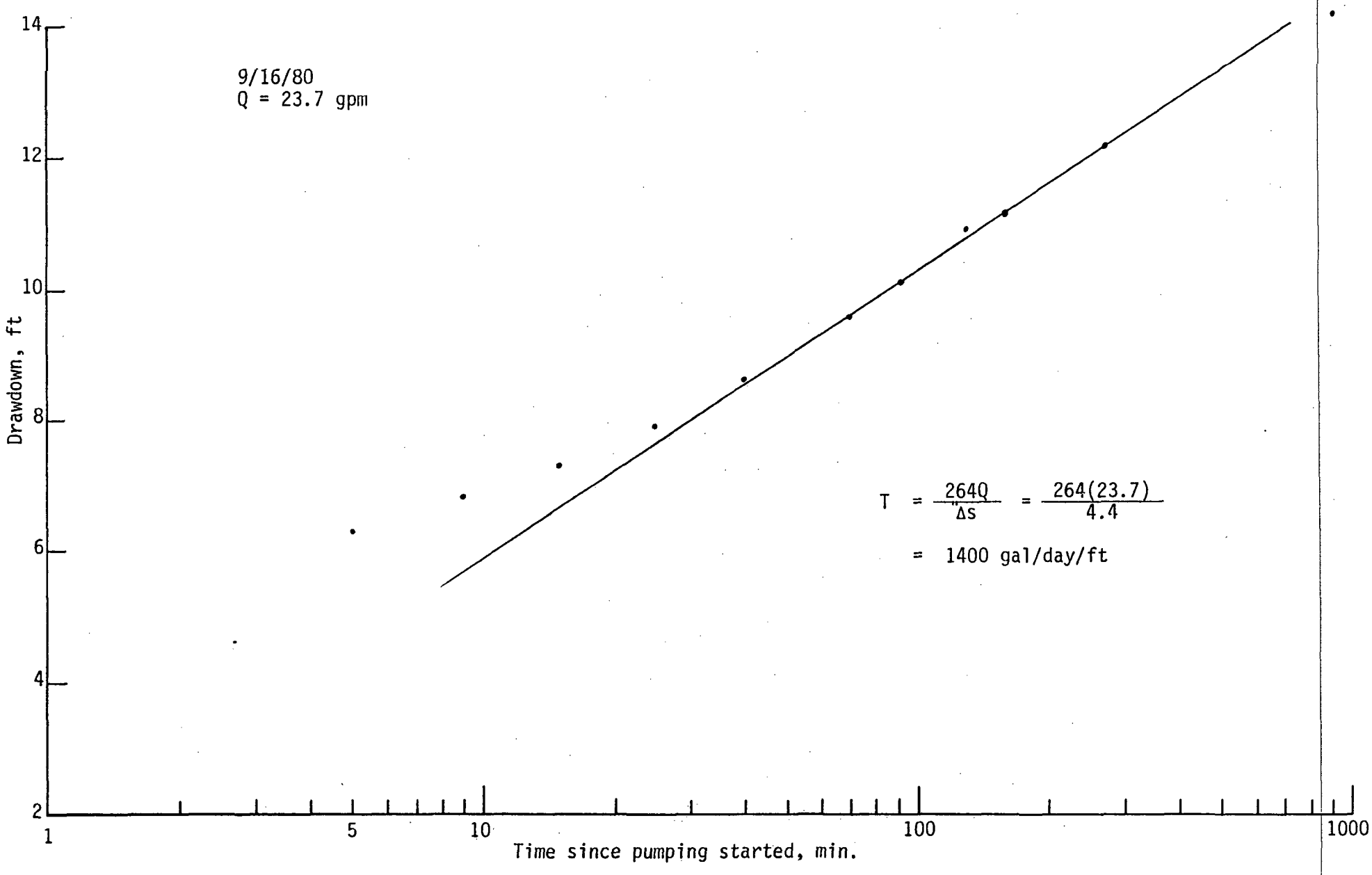


FIGURE D6B-16. DRAWDOWN DATA FOR WELL MW 1299

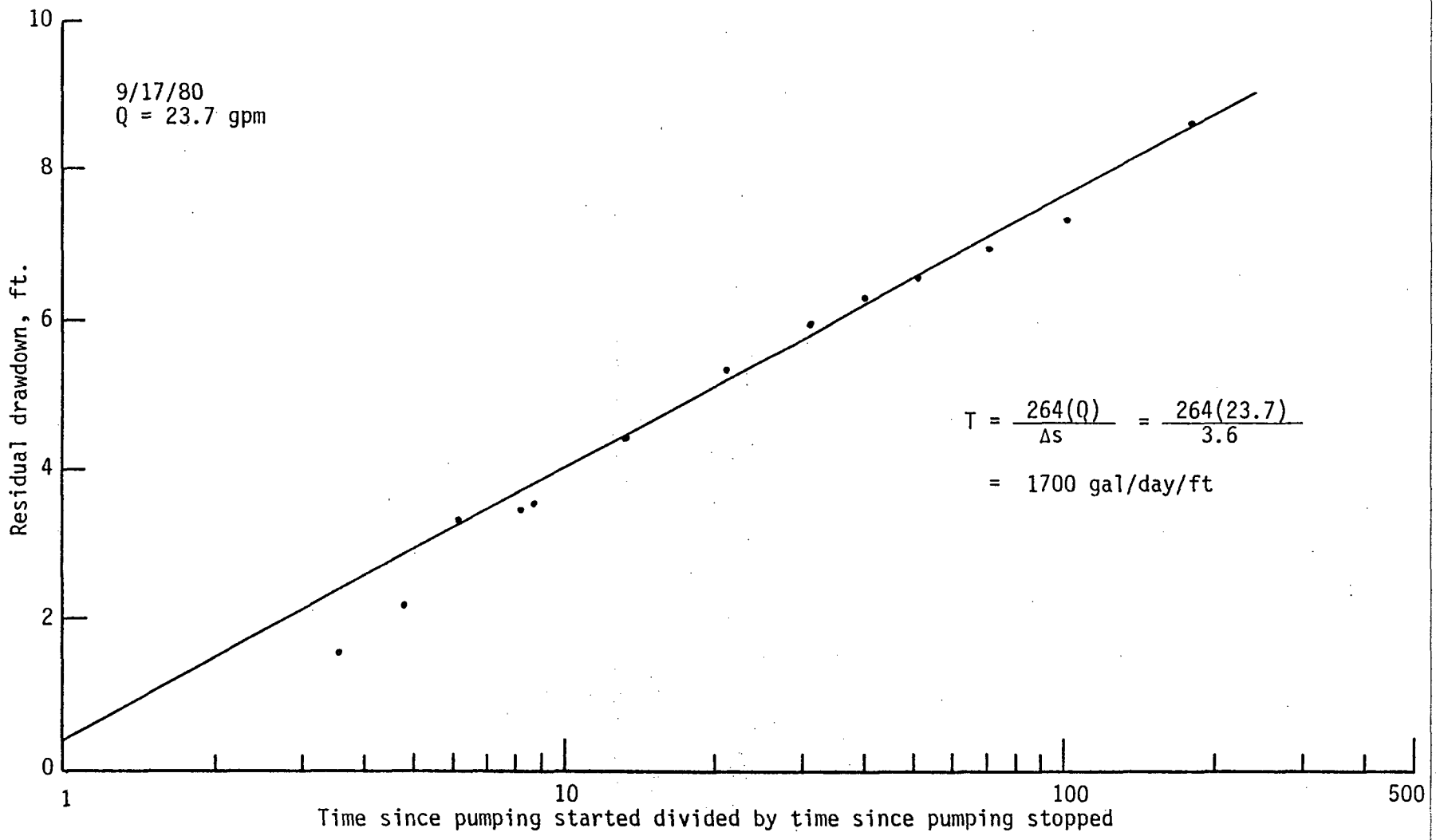


FIGURE D6B-17. RECOVERY DATA FOR WELL MW 1299

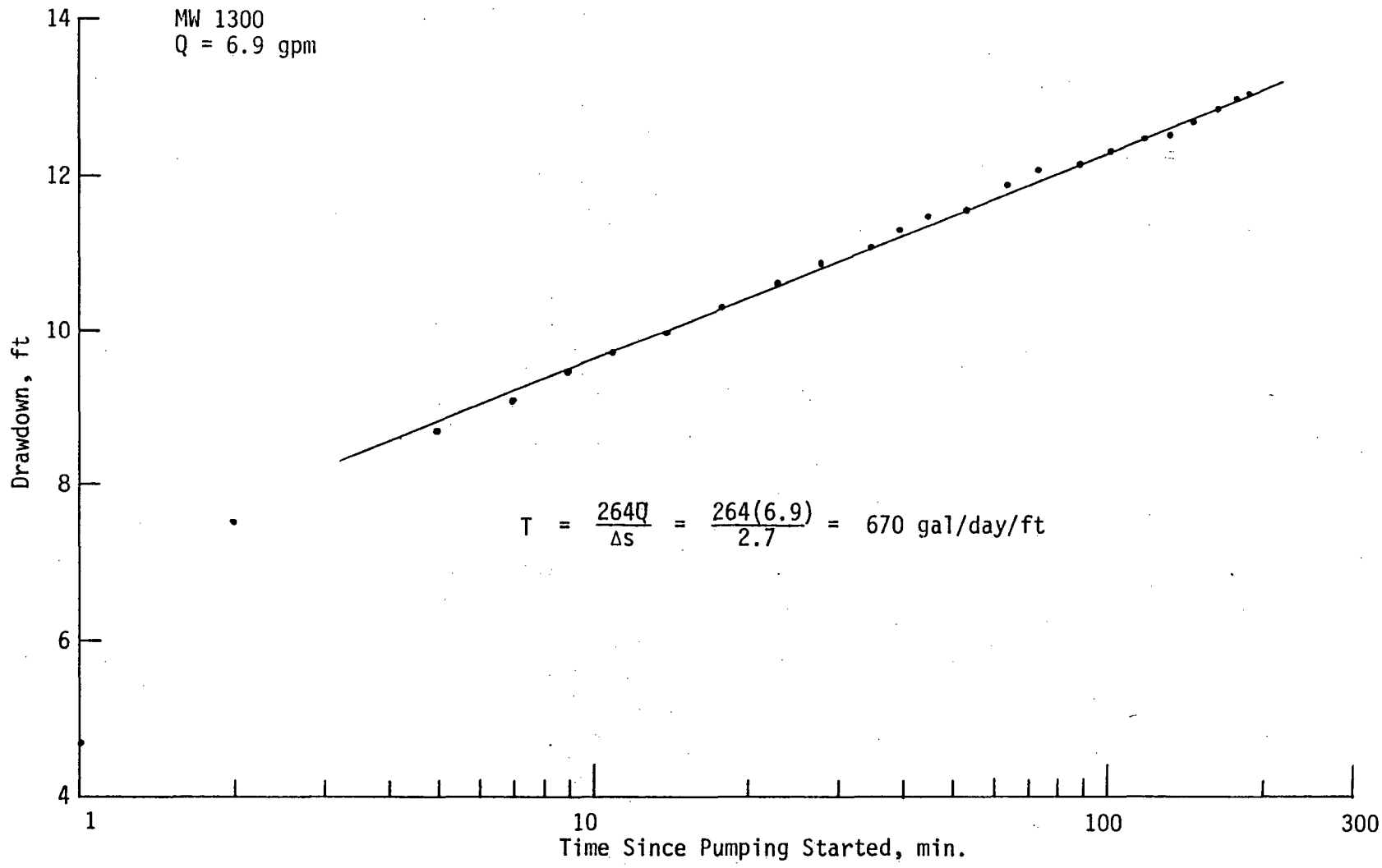


FIGURE D6B-18. DRAWDOWN FOR WELL MW1300

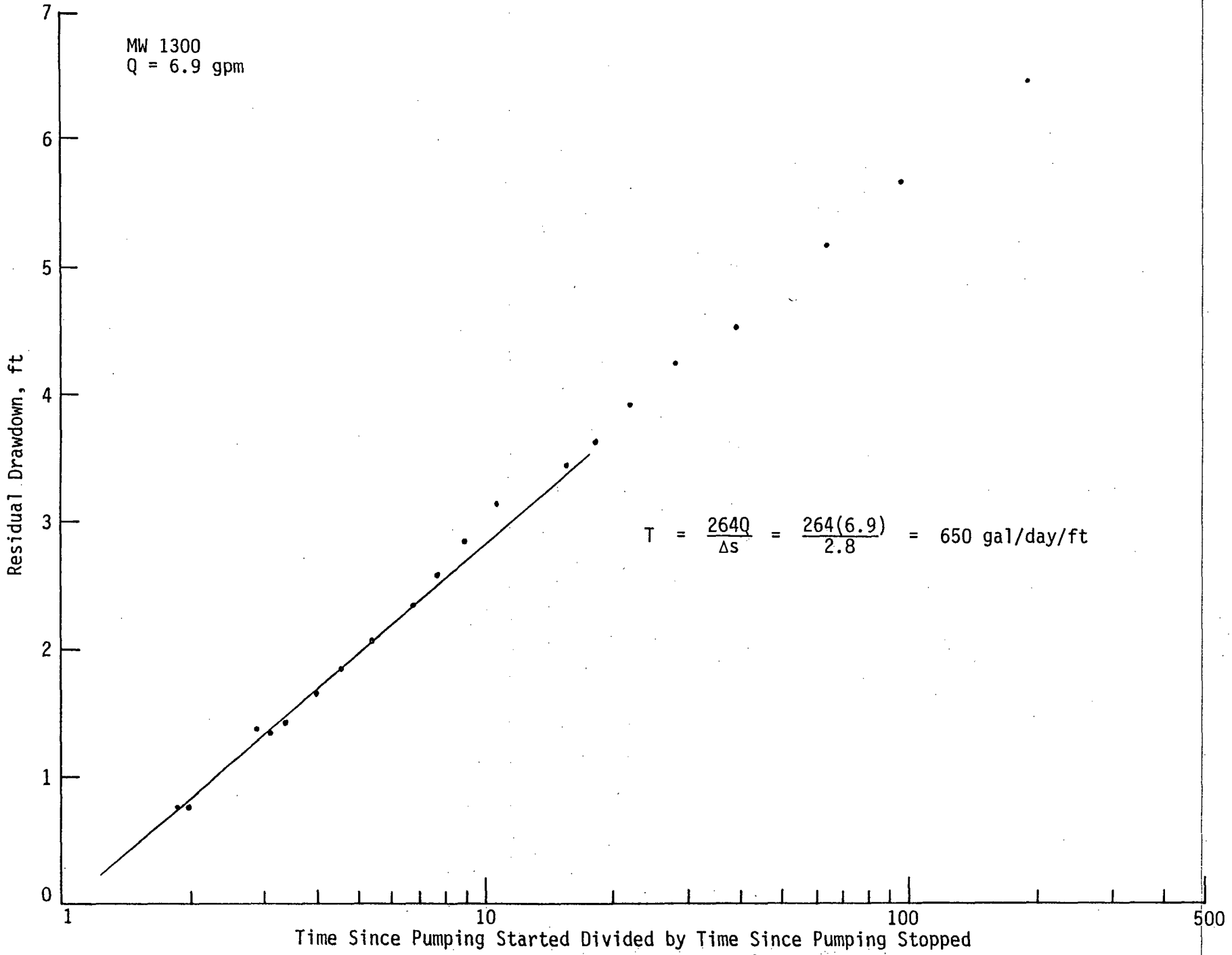


FIGURE D6B-19. RECOVERY FOR WELL MW 1300

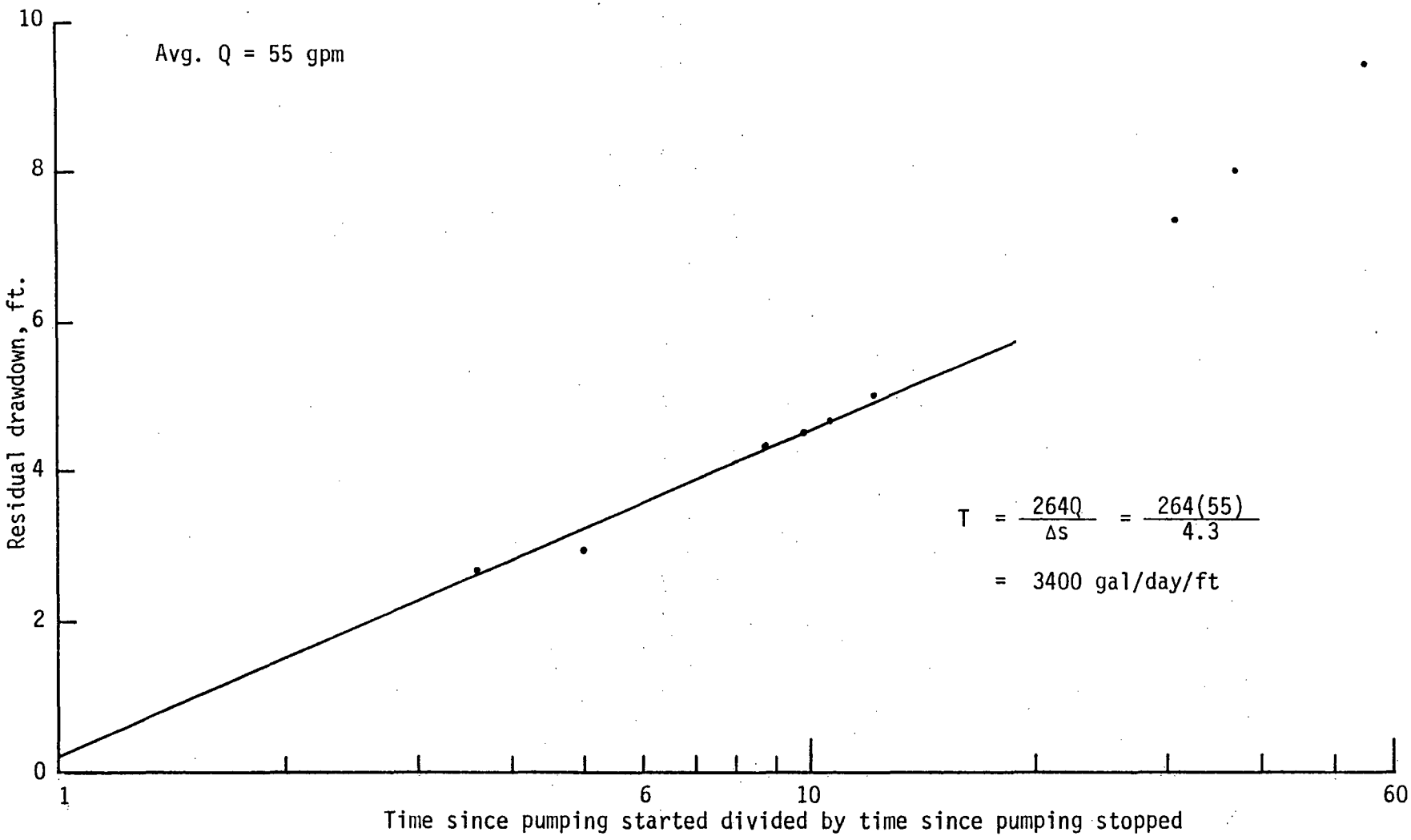


FIGURE D6B-20. RECOVERY OF JAB WELL NO. 1

TABLE D6B-1. DRAWDOWN AND RECOVERY DATA FOR WELL MW 1292

DATE	TIME	TIME SINCE PUMPING STARTED (t, in min.)	TIME SINCE PUMPING STOPPED (t', in min)	t/t'	WATER LEVEL (ft below MP)	DRAW-DOWN (ft)	DIS-CHARGE (gpm)	TOTAL DISCHARGE (gal)
09/25/80	1709				75.53			
10/01/80	1052				75.73			
10/21/80	1022				75.70			
	1045	PUMP ON						
	1048	3			87.18	11.48		
	1049	4					31.1	
	1050	5						241,272.0
	1053	8			88.35	12.65		
	1057	12			88.87	13.17		
	1058	13	T = 8.0°C, COND = 380 μmhos/cm @ 25°C				31.4	
	1102	17			89.30	13.60		
	1112	27	T = 8.0°C, COND = 365				31.4	
	1115	30			89.03	13.33		
	1124	39			90.20	14.50		
	1125	40					30.9	242,371.6
	1126	41	T = 8.5°C, COND = 360					
	1211	86			91.48	15.78		
	1212	87	T = 8.8°C, COND = 365				31.9	
	1251	126			92.04	16.34		
	1339	174			92.26	16.56		
	1344	179	T = 9.5°C, COND = 350				31.3	
	1346	181						246,810.3
	1527	222	T = 8.3°C, COND = 350		92.75	17.05	30.9	249,998.7
	1700	315	T = 8.0°C, COND = 340		93.26	17.56		
	1711	326	pH = 7.6				31.6	253,289.5
	2146	601			93.22	17.52	30.3	
10/22/80	0753	1208	T = 7.0°C, COND = 330		94.51	18.81	31.6	
	0808	1223						281,548.7
	1125	1420	T = 8.0°C, COND = 315, pH = 7.4, HCO_3 = 158.6, SAMPLES TAKEN		95.00	19.30		

TABLE D6B-1. DRAWDOWN AND RECOVERY DATA FOR WELL MW 1292 (cont'd)

DATE	TIME	TIME SINCE PUMPING STARTED (t, in min.)	TIME SINCE PUMPING STOPPED (t', in min.)	t/t'	WATER LEVEL (ft below MP)	DRAW-DOWN (ft)	DIS-CHARGE (gpm)	TOTAL DISCHARGE (gal)
10/23/80	1035	2810	T = 6.5°C, COND = 350 μmhos/cm @ 25°C		95.83	20.13	31.6	
	1040	2815						332,247.1
	1206	2901	T = 7.5°C, COND = 355		96.08	20.38	31.9	
	1211	2906						335,183.7
	1216	2911	PUMP OFF					
	1222	2917	6	486	82.52	6.82		
	1224	2919	8	365	82.01	6.31		
	1228	2923	12	244	81.53	5.83		
	1233	2928	17	172	81.24	5.54		
	1243	2938	27	109	80.51	4.81		
	1357	3012	101	30	78.75	3.05		
	1504	3079	168	18	78.36	2.66		
	1532	3107	196	16	78.04	2.34		

TABLE D6B-2. DRAWDOWN AND RECOVERY DATA FOR WELL OW 1304 FROM PUMPING WELL MW 1292

DATE	TIME	TIME SINCE PUMPING STARTED (t, in min.)	TIME SINCE PUMPING STOPPED (t', in min)	t/t'	WATER LEVEL (ft below MP)	DRAWDOWN (ft)
10/21/80	1010				75.29	
	1038				75.29	
	1045	PUMP ON IN WELL MW 1292				
	1047	2			75.59	0.30
	1049	4			75.95	0.66
	1050	5			76.45	1.16
	1052	7			76.78	1.49
	1054	9			77.04	1.75
	1056	11			77.14	1.85
	1058	13			77.39	2.10
	1101	16			77.53	2.24
	1106	21			77.80	2.51
	1111	26			77.91	2.62
	1118	33			78.09	2.80
	1126	41			78.27	2.98
	1155	70			78.71	3.42
	1211	86			78.89	3.60
	1249	124			79.13	3.84
	1347	182			79.42	4.13
	1523	278			79.78	4.49
	1655	370			79.99	4.70
	2140	655			80.32	5.03
10/22/80	0800	1275			80.88	5.59
	1123	1478			80.99	5.70
10/23/80	1022	2857			81.12	5.83
	1200	2955			81.66	6.37
	1216		PUMP OFF IN WELL MW 1292			

TABLD D6B-3. DRAWDOWN AND RECOVERY DATA FOR WELL OW 1305 FROM PUMPING WELL MW 1292

DATE	TIME	TIME SINCE PUMPING STARTED (t, in min.)	TIME SINCE PUMPING STOPPED (t', in min)	t/t'	WATER LEVEL (ft below MP)	DRAWDOWN (ft)
10/21/80	0950				74.70	
	1029				74.70	
	1038				74.70	
	1045	PUMP ON IN WELL MW 1292				
	1047	2			75.50	0.80
	1048	3			76.20	1.50
	1050	5			77.16	2.46
	1052	7			78.10	3.40
	1054	9			78.69	3.99
	1056	11			79.19	4.49
	1058	13			79.32	4.62
	1101	16			79.49	4.79
	1105	20			79.75	5.05
	1111	26			80.09	5.39
	1120	35			80.10	5.40
	1131	46			80.10	5.40
	1153	68			80.22	5.52
	1219	94			80.43	5.73
	1246	121			80.62	5.92
	1342	177			80.93	6.23
	1513	268			81.29	6.59
	1708	383			81.58	6.78
	2143	658			82.07	7.37
10/22/80	0805	1280			82.64	7.94
	1135	1490			82.72	8.02
10/23/80	1018	2853			83.49	8.79
	1203	2958			83.55	8.85
	1216		PUMP OFF IN WELL MW 1292			

TABLE D6B-4. DRAWDOWN AND RECOVERY DATA FOR WELL OW 1307 FROM PUMPING WELL MW 1292.

DATE	TIME	TIME SINCE PUMPING STARTED (t, in min)	TIME SINCE PUMPING STOPPED (t', in min)	t/t'	WATER LEVEL (ft below MP)	DRAWDOWN (ft)
10/21/80	1005				75.66	
	1026				75.66	
	1045	0	PUMP ON IN WELL MW 1292			
	1047	2			75.66	0
	1051	6			75.72	0.06
	1055	10			75.78	0.12
	1100	15			75.84	0.18
	1105	20			75.93	0.27
	1110	25			75.98	0.32
	1117	32			76.07	0.41
	1130	45			76.17	0.51
	1210	85			76.37	0.71
	1254	129			76.53	0.87
	1338	173			76.66	1.00
	1518	273			76.94	1.28
	1658	373			77.13	1.37
	2149	624			77.50	1.44
10/22/80	0803	1238			77.82	2.16
	1128	1463			77.91	2.25
10/23/80	1016	2831			78.42	2.76
	1205	2940			78.45	2.79
	1216		PUMP OFF IN WELL MW 1292			

TABLE D6B-5. PUMPING AND RECOVERY DATA FOR WELL MW 1291

DATE	TIME	TIME SINCE PUMPING STARTED (t, in min)	TIME SINCE PUMPING STOPPED (t'in min)	t/t'	WATER LEVEL (ft. below MP)	DRAWDOWN (ft)	DISCHARGE (gpm)	TOTAL DISCHARGE (gal.)
10/21/80	1434				111.00			
	1442				111.01			
11/22/80	0826				111.07			
	1007				111.08			
10/23/80	1151				111.40			
	1459				111.46			
11/04/80	1055				111.18			
01/07/81	1055				111.01			
04/09/81	0940				110.96			
06/05/81	1103				111.13			
10/19/81	1510				111.17			
12/09/81	0830				111.20			
	0915				109.85 (Measured after pump installation)			
	0945				110.59			
	0950	PUMP ON						
	0952	2			111.68	0.48		
	0954	4			118.39	7.19	3.2	
	0956	6			121.09	9.89	3.3	403373.6
	0958	8			123.03	11.83		
	1000	10			124.65	13.45	3.2	403386.7
	1002	12			125.82	14.62		
	1004	14			126.99	15.79		
	1006	16			127.98	16.78	3.1	403405.8
	008	18			128.74	17.54		
	1010	20			129.50	18.30		
	1015	25			130.54	19.34		
	1016	26	T = 8.1° C., Cond = 2040, umhos/cm @ 25° C.					
	1018	28					2.9	403440.3
	1020	30			131.73	20.53		
	1021	31					3.0	
	1023	33	INCREASED DISCHARGE				3.2	

TABLE D6B-5. PUMPING AND RECOVERY DATA FOR WELL MW 1291

DATE	TIME	TIME SINCE PUMPING STARTED (t, in min)	TIME SINCE PUMPING STOPPED (t', in min)	t/t'	WATER LEVEL (ft below MP)	DRAWDOWN (ft)	DISCHARGE (gpm)	TOTAL DISCHARGE (gal.)
12/09/81	1025	35			133.40	22.20	3.1	
	1029	39					3.1	403474.0
	1030	40			134.48	23.28	INCREASED DISCHARGE	
	1035	45			135.36	24.16	3.3	
	1040	50			136.26	25.06	3.2	403509.1
		T = 8.2° C., COND = 1390 umhos/cm @ 25° C.						
	1045	55			136.88	25.68	3.2	403525.2
	1058	68			137.97	26.77	3.2	403567.2
	1122	92			139.19	27.99	3.2	403642.3
	1146	116			139.63	28.43	3.2	403717.2
	1212	142			139.58	28.38	3.2	403799.8
	1228	158			142.36	31.16	3.7	403855.8
	1235	165	DECREASED DISCHARGE				3.3	
	1237	167					3.4	
	1239	169	T = 8.5° C., Cond = 1310 umhos/cm @ 25° C.					
	1250	180					3.4	
	1257	187	DECREASED DISCHARGE				3.2	
	1307	197					3.2	
	1327	217					3.2	404051.1
	1400	250			141.13	29.93	3.2	404157.1
	1436	286			141.17	29.97	3.3	404272.3
	1442	292	DECREASED DISCHARGE					
	1549	359			140.36	29.16	3.2	404452.9
	1600	370	SAMPLE COLLECTED					
	1605	375	pH = 7.42, HCO_3 = 87 mg/l					
	1625	395	T = 8.2° C., Cond = 1240 umhos/cm @ 25° C.					
	1635	405	0	PUMP OFF				
	1638	408	3	136.00	131.96	20.76		
	1640	410	5	82.00	130.43	19.23		
	1644	414	9	46.00	127.65	16.45		
	1652	422	17	24.80	123.54	12.34		
	1736	466	61	7.64	114.61	3.41		
	1748	478	73	6.55	113.83	2.63		

TABLE D6B-6. DRAWDOWN DATA FOR OBSERVATION WELL OW 1301 FROM PUMPING WELL MW 1291

DATE	TIME	TIME SINCE PUMPING STARTED	TIME SINCE PUMPING STOPPED	t/t'	DRAWDOWN (ft)	WATER LEVEL
10/18/81	1517					107.62
12/09/81	0840					107.66
	0932					
	0950	0	PUMP ON IN WELL MW 1291			107.64
	0955	5			0.02	107.66
	1000	10			0.12	107.76
	1006	16			0.20	107.84
	1010	20			0.26	107.90
	1017	27			0.35	107.99
	1022	32			0.42	108.06
	1027	37			0.47	108.11
	1032	42			0.53	108.17
	1042	52			0.61	108.25
	1052	62			0.68	108.32
	1104	74			0.75	108.39
	1120	90			0.76	108.40
	1144	114			0.94	108.58
	1200	130			0.97	108.61
	1219	149			1.04	108.68
	1242	172			1.11	108.75
	1349	239			1.05	108.69
	1449	299			1.01	108.65
	1558	368			1.10	108.74
	1633	403			1.10	108.74
	1635	405	PUMP OFF IN WELL MW 1291			

TABLE D6B-7. DRAWDOWN DATA FOR OBSERVATION WELL OW 1302 FROM PUMPING WELL 1291

DATE	TIME	TIME SINCE PUMPING STARTED (t, in min)	DRAWDOWN (ft)	WATER LEVEL (ft below MP)
06/06/81	1055			109.77
10/18/81	1555			109.65
12/09/81	0844			109.70
	0926			109.68
	0950	0	PUMP ON IN WELL MW 1291	
	0952	2	0.04	109.72
	0957.5	7.5	0.15	109.83
	1002.5	12.5	0.39	110.07
	1008	18	0.56	110.24
	1013	23	0.72	110.40
	1019	29	0.80	110.48
	1024	34	0.93	110.61
	1030	40	0.95	110.63
	1040	50	1.22	110.90
	1050	60	1.30	110.99
	1102	72	1.42	111.11
	1117	87	1.60	111.29
	1141	111	1.73	111.42
	1158	138	1.77	111.46
	1216	146	1.79	111.48
	1240	170	1.94	111.62
	1345	235	1.85	111.53
	1442	292	1.86	111.54
	1554	364	1.86	111.54
	1615	385	2.23	111.91
	1631	401	1.88	111.56
	1635	405	PUMP OFF IN WELL MW 1291	

TABLE D6B-8. DRAWDOWN DATA FOR OBSERVATION WELL OW 1301 FROM PUMPING WELL 1291

DATE	TIME	TIME SINCE PUMPING STARTED (t, min)	WATER LEVEL (ft below MP)	DRAW-DOWN (ft)	BAROMETRIC PRESSURE CORRECTION FACTOR (ft)	DRAWDOWN CORRECTED FOR BAROMETRIC PRESSURE (ft)
10/19/81	1513		111.96			
12/09/81	0830		111.95			
	0944		111.94			
	0950	0	PUMP ON IN WELL MW 1291			
	0958	8	111.96	0.02	0	0.02
	1003	13	111.96	0.02	0	0.02
	1010	20	111.96	0.02	0	0.02
	1028	38	111.97	0.03	0	0.03
	1052	62	111.98	0.04	0.01	0.05
	1110	80	112.01	0.07	0.01	0.08
	1136	106	111.98	0.04	0.02	0.06
	1156	126	111.98	0.04	0.02	0.06
	1217	147	111.98	0.04	0.03	0.07
	1313	203	111.98	0.04	0.04	0.08
	1317	207	111.98	0.04	0.04	0.08
	1358	248	111.94	0	0.05	0.05
	1457	307	111.95	0.01	0.05	0.06
	1635	405	PUMP OFF IN WELL MW 1291			

TABLE D6B-9. DRAWDOWN AND RECOVERY DATA FOR WELL MW 1298

DATE	TIME	TIME SINCE PUMPING STARTED (t, in min.)	TIME SINCE PUMPING STOPPED (t', in min)	t/t'	WATER LEVEL (ft below MP)	DRAW-DOWN (ft)	DIS-CHARGE (gpm)	TOTAL DISCHARGE (gal)
09/17/80	0938				83.19			
	1040	PUMP ON						
	1042	2					6.7	
	1043	3			128.29	45.10		
	1045	5					6.2	222,047.2
	1046	6			137.18	53.99		
	1048	8			141.66	58.47		
	1050	10					6.2	222,078.6
	1051	11			147.02	63.83		
	1054	14	T = 8.3°C, COND = 382 μmhos/cm @ 25°C					
	1056	16			153.41	70.22		
	1103	23			159.10	75.91		
	1105	25						222,165.1
	1110	30			162.59	79.40		
	1117	37					5.4	
	1118	38	T = 8.9°C, COND = 357, pH = 6.7					
	1125	45					5.5	222,272.9
	1128	48					5.3	
	1131	51			168.8	85.61		
	1133	53	SAMPLE COLLECTED, T = 8.9°C, COND = 370, pH = 7.0					
	1135	55	PUMP OFF					
	1147	67	12	5.6	122.91	39.72		
	1153	73	18	4.1	116.73	33.54		
	1202	82	27	3.0	109.93	26.74		
	1226	106	51	2.1	100.75	17.56		
	1231	111	56	1.9	98.07	14.88		
	1403	203	148	1.4	88.62	5.43		
	1527	287	232	1.2	86.30	3.11		
	1619	339	284	1.19	85.54	2.35		

TABLD D6B-10. PUMPING AND RECOVERY DATA FOR WELL MW 1299

DATE	TIME	TIME SINCE PUMPING STARTED (t, in min.)	TIME SINCE PUMPING STOPPED (t', in min)	t/t'	WATER LEVEL (ft below MP)	DRAWDOWN (ft)	DISCHARGE (gpm)	TOTAL DISCHARGE (gal)
09/16/80	1435	--	--	--	129.64	--	--	--
	1535	0	PUMP ON	--	--	--	--	--
	1539	4	--	--	--	--	23.4	--
	1540	5	--	--	135.98	6.34	--	200585.4
	1544	9	--	--	136.48	6.84	--	--
	1547	12	--	--	--	--	23.5	--
	1549	14	--	--	--	--	24.9	--
	1550	15	--	--	136.94	7.30	--	--
	1600	25	--	--	137.56	7.92	--	--
	1615	40	--	--	138.27	8.63	--	--
	1616	41	COND. = 1110 µmhos/cm @25°C pH = 6.9		--	--	23.5	--
	1617	42	--	--	--	--	--	201451.3
	1645	70	--	--	139.24	9.60	--	--
	1709	94	--	--	139.79	10.15	--	--
	1742	127	--	--	--	--	23.6	203433.8
	1745	130	--	--	140.57	10.93	--	--
	1822	167	--	--	140.83	11.19	--	--
	2005	270	TEMP= 6.1°C COND= 1230 pH= 7.1		--	--	--	--
	2006	271	--	--	--		23.3	206736.5
	2007	272	--	--	141.86	12.22	--	--

TABLE D6B-10. PUMPING AND RECOVERY DATA FOR WELL MW 1299 (cont'd)

DATE	TIME	TIME SINCE PUMPING STARTED (t, in min.)	TIME SINCE PUMPING STOPPED (t', in min)	t/t'	WATER LEVEL (ft below MP)	DRAWDOWN (ft)	DISCHARGE (gpm)	TOTAL DISCHARGE (gal)
09/17/80	0636	901	--	--	143.89	14.25	24.0	--
	0638	903	--	--	--	--	--	221692.5
	0645	910	Sample collected	--	--	--	--	--
		TEMP = 8°C COND= 860 µmhos/cm @25°C pH= 6.6						
	0651	916	0	PUMP OFF	--	--	--	--
	0656	921	5	184.0	138.25	8.61	--	--
	0700	925	9	103.0	136.94	7.30	--	--
	0704	929	13	71.5	136.59	6.95	--	--
	0709	934	18	51.9	136.22	6.58	--	--
	0714	939	23	40.8	135.92	6.28	--	--
	0721	946	30	31.5	135.59	5.95	--	--
	0736	961	45	21.4	134.97	5.33	--	--
	0805	990	74	13.4	134.08	4.44	--	--
	0848	1033	117	8.83	133.18	3.54		
	0856	1041	125	8.33	133.08	3.44	--	--
	0947	1092	176	6.20	132.94	3.30	--	--
	1047	1152	236	4.88	131.82	2.18	--	--
	1239	1264	348	3.63	131.19	1.55	--	--

TABLD D6B-11. DRAWDOWN AND RECOVERY DATA FOR WELL MW 1300

DATE	TIME	TIME SINCE PUMPING STARTED (t, in min.)	TIME SINCE PUMPING STOPPED (t, in min.)	t/t'	WATER LEVEL (ft below MP)	DRAWDOWN (ft)	DISCHARGE (gpm)
10/01/80	0940				73.42		
	0946	PUMP ON					
	0947	1			78.06	4.64	
	0949	3			80.95	7.53	
	0951	5			82.10	8.68	
	0952	6	T = 8.0°C, COND = 460 μmhos/cm @ 25°C				
	0953	7			82.50	9.08	
	0954	8					6.8
	0955	9			82.91	9.49	
	0957	11			83.11	9.69	
	1000	14			83.41	9.99	
	1002	16	T = 8.5°C, COND = 370				
	1004	18			83.72	10.30	
	1006	20					7.0
	1009	23			84.03	10.61	
	1014	28			84.28	10.86	
	1021	35			84.59	11.17	
	1022	36	T = 8.0°C, COND = 390				6.9
	1026	40			84.76	11.34	
	1031	45			84.86	11.44	
	1040	54			85.01	11.59	
	1050	64			85.30	11.88	
	1051	65	T = 7.5°C, COND = 410				7.0
	1100	74			85.51	12.09	
	1115	89			85.61	12.19	
	1130	104			85.77	12.35	
	1132	106	T = 9.0°C, COND = 440				6.9
	1145	119			85.90	12.48	
	1200	134			85.98	12.56	
	1215	149			86.12	12.70	
	1216	150	T = 8.0°C, COND = 440				6.9
	1231	165			86.29	12.87	
	1246	180			86.42	13.00	
	1248	182	T = 9.0°C, COND = 420, pH = 7.7, HCO_3 = 127 mg/l				
	1249	183	SAMPLES TAKEN				7.0

TABLE D6B-11. DRAWDOWN AND RECOVERY DATA FOR WELL MW 1300 (cont'd)

DATE	TIME	TIME SINCE PUMPING STARTED (t, in min.)	TIME SINCE PUMPING STOPPED (t', in min)	t/t'	WATER LEVEL (ft below MP)	DRAWDOWN (ft)	DISCHARGE (gpm)
10/01/80	1256	190			86.49	13.07	
(cont'd)	1257	191	PUMP OFF				
	1258	192	1	192	79.91	6.49	
	1259	193	2	96.5	79.11	5.69	
	1300	194	3	64.7	78.60	5.18	
	1302	196	5	39.2	77.96	4.54	
	1304	198	7	28.3	77.67	4.25	
	1306	200	9	22.2	77.33	3.91	
	1308	202	11	18.4	77.04	3.62	
	1310	204	13	15.7	76.84	3.42	
	1315	209	18	11.6	76.55	3.13	
	1321	215	24	9.0	76.26	2.84	
	1325	219	28	7.8	76.01	2.59	
	1330	224	33	6.8	75.75	2.33	
	1340	234	43	5.4	75.48	2.06	
	1350	244	53	4.6	75.26	1.84	
	1400	254	63	4.0	75.09	1.67	
	1417	271	80	3.4	74.84	1.42	
	1427	281	90	3.1	74.75	1.33	
	1437	291	100	2.9	74.79	1.37	
	1438	292	101	2.9	74.79	1.37	
	1618	392	201	2.0	74.19	0.77	
	1628	402	211	1.9	74.19	0.77	

TABLE D6B-12. PUMPING AND RECOVERY DATA FOR JAB WELL NO. 1

DATE	TIME	TIME SINCE PUMPING STARTED (t, in min.)	TIME SINCE PUMPING STOPPED (t', in min)	t/t'	WATER LEVEL (ft/MP)	DRAWDOWN (ft)	DISCHARGE (gpm)
09/16/80	1622	--	--	--	117.24(m)	--	--
	1624	--	--	--	117.33(e)	--	--
	1625	0	PUMP ON	--	--	--	--
	1627	2	--	--	144.65	27.32	--
	1632	7	--	--	148.08	30.84	70
	1636	11	--	--	--	--	61
	1644	19	--	--	148.98	31.74	59
	1814	109	TEMP.= 7.8°C COND = 860 µmhos/cm @ 25°C pH = 7.1		149.94	32.70	59
	2025	240	TEMP.= 7.8°C COND = 860	pH = 7.2	149.85	32.61	55
09/17/80	0655	870	PUMP OFF	pH= 6.6			
	0702	877	7	125.0	137.40(m)	20.16	--
	0711	886	16	55.4	126.66	9.42	--
	0719	894	24	37.2	125.22	7.98	--
	0724	899	29	31.0	124.57	7.33	--
	0813	948	78	12.2	122.20	4.96	--
	0825	960	90	10.7	121.89	4.65	--
	0833	968	98	9.88	121.76	4.52	--
	0847	982	112	8.77	121.53	4.29	--
	1034	1089	219	4.97	120.17	2.93	--
	1229	1204	334	3.60	119.90	2.66	--

(e) Electric Tape used

(m) Metal Tape used

APPENDIX C-1

RESRAD Data Input Basis Parameters

RESRAD Data Input Basis
Parameters

This document summarizes the data input and modeling scenario that was used to determine the radium benchmark dose for the Antelope-JAB Project Project. The modeling was performed using RESRAD for Windows Version 6.3 developed by the Environmental Assessment Division at Argonne National Laboratory (ANL).

The resident farmer scenario was used since this is the most likely land use near the site. The following sections describe the data parameters that were used to model site-specific conditions.

The data input was based upon four principal sources:

1. The RESRAD Data Collection Handbook (ANL, 1993)
2. The RESRAD Users' Manual (ANL, 2003)
3. NUREG-1569
4. Site-specific information to be included in the Antelope-JAB Project license application

Soil Concentration

1. Lead 210: 5.0 pCi/g per the NUREG-1569.
2. Radium 226: 5.0 pCi/g regulatory limit as basis for determining benchmark.

Distribution Coefficient (K_d) (values based upon data in RESRAD Handbook)

1. Lead 210: Used a distribution coefficient of 270 cm^3/g for sandy soil based on the predominant soil type at the Antelope-JAB Project site. The RESRAD User's Manual specifies the following values:

    - Sand = 270
    - Loam = 16,000

A sensitivity analysis indicated (with a multiple of 100) no appreciable impact on maximum dose for the external dose pathway using a higher or lower K_d. For the Plant (water independent) pathway, the lower K_d resulted in a slightly lower maximum dose for this pathway. In this case, using the mid-range value of 270 would result in a conservative maximum dose estimate. Values of 2.7, 270 (mid range), and 27,000 were adopted, covering the range of potential values at the site based upon sandy and loamy soil types. See graph (attached).

2. Radium 226: Used a distribution coefficient of 500 cm^3/g for sandy soil based on the predominant soil type at the Antelope-JAB Project site. The RESRAD User's Manual specifies the following values:

    - Sand = 500
    - Loam = 36,000

A sensitivity analysis indicated (with a multiple of 100) no appreciable impact on maximum dose using the higher K_d. Values of 5, 500 (mid range) and 50,000 were adopted, covering the range of potential values at the site based on sandy and loamy soil types. See graph (attached).

Contaminated Zone

1. Area: Used default value of 10,000 square meters.

A sensitivity analysis was performed with a multiple of 2 (5,000, 10,000 and 20,000 square meters). There was no impact on maximum dose for the external dose component. See graph (attached).

2. Thickness: 15 cm (6 inches) based on regulatory requirement (minimum in RESRAD Handbook)

3. Length parallel to aquifer flow: Default of 100 meters was used and is based upon the square root of a 10,000 square meter contaminated zone.

No sensitivity analysis was performed since water dependent pathways were not significant contributors to dose.

Cover and Contaminated Zone

1. Cover depth: 0 inches (in accordance with NUREG-1569).

2. Density of contaminated zone: Used the value of 1.36 g/cm^3, which corresponds to the average of the value for sandy loam soil (1.44 g/cm^3) and clay loam soil (1.28 g/cm^3) in the RESRAD Handbook. This corresponds to the soil types at the Antelope-JAB Project and data in the Antelope-JAB Project license application.

   Because the RESRAD Data Collection Handbook considers this default value representative of the soil type, no sensitivity analysis was performed.

3. Contaminated zone erosion rate: Used the default value of 0.001 meters/year. NUREG-1569 states that the erosion rate should be lower at uranium recovery sites due to the semi-arid environment. The RESRAD Handbook states that this value should be adequate for screening purposes. It also states that, while water erosion is the primary factor, wind erosion can also be significant.

A sensitivity analysis was run using a multiple of 2 (0.0002, 0.001 and 0.005). The lower erosion rate resulted in the total dose remaining at a higher level over a longer period of time for both the external and vegetation (water independent) pathways. However, there was no impact on the maximum dose.

4. Contaminated zone total porosity: Default value of 0.4 is based on the soil types at Antelope-JAB Project.

No sensitivity analysis was performed since water dependent pathways were not significant contributors to dose.

5. Contaminated zone field capacity: Default value of 0.2 was used. This value was used because it is at the midpoint of the range for the soil types at Antelope-JAB Project.

No sensitivity analysis was performed since water dependent pathways were not significant contributors to dose.

6. Contaminated zone hydraulic conductivity: Used 199 m/yr based on site specific information on soil types.

No sensitivity analysis was performed since water dependent pathways were not significant contributors to dose and site specific information was used.

7. Contaminated zone b parameter: Default parameter is 5.3 for silty loam. The RESRAD Handbook and RESRAD Manual specify the range from sand to loam is 4.05 to 5.39. Used default value.

No sensitivity analysis was performed since water dependent pathways were not significant contributors to dose.

8. Evapotranspiration Coefficient: The RESRAD default value is 0.5. NUREG-1569 suggests that a value of 0.6 to 0.99 for uranium recovery sites is appropriate because they are located in a semiarid environment. For screening purposes, a mid-value (0.75) was used.

No sensitivity analysis was performed since water dependent pathways were not significant contributors to dose.

9. Wind Speed: The RESRAD default is 2 m/s. The average for the Antelope-JAB Project is 6.6 m/s based on meteorological data obtained at the site.

   No sensitivity analysis was performed since this is actual site data.

10. Precipitation: The RESRAD default is 1 m/yr. The average for the Antelope-JAB site is 0.24 m/yr. Site data was used.

    No sensitivity analysis was performed since this is actual site data as recommended in NUREG-1569.

11. Irrigation Rate: The RESRAD default is 0.2 m/yr. This default value is high for western states where irrigation may not be an option for some areas.

    No sensitivity analysis was performed since water dependent pathways were not significant contributors to dose.

12. Runoff Coefficient: The RESRAD default value is 0.2. This is the value for open rolling land in the RESRAD Handbook and was used for the Antelope-JAB Project. The potential range in the RESRAD handbook for the site would be 0.1 to 0.4.

    No sensitivity analysis was performed since water dependent pathways were not significant contributors to dose.

13. Watershed Area for nearby stream or pond: The RESRAD default value is 1×10^6 m^2. Used site-specific datum of 7×10^7 m^2.

No sensitivity analysis was performed since water dependent pathways were not significant contributors to dose and site specific data was used.

14. Accuracy: Used the default value of 0.001.

Saturated Zone

1. Density of saturated zone: Used the default value of 1.5 g/cm^3, which corresponds to sandy soil in the RESRAD Handbook. This compares with the first saturated zone at the Antelope-JAB Project.

   No sensitivity analysis was performed since water dependent pathways were not significant contributors to dose.

2. Saturated zone total porosity: Used value of 0.25 is based upon site specific information.

   No sensitivity analysis was performed since water dependent pathways were not significant contributors to dose and site specific information was used.

3. Saturated zone effective porosity: Used value of 0.1 based upon site specific information.

   No sensitivity analysis was performed since water dependent pathways were not significant contributors to dose and site specific information was used.

4. Contaminated zone field capacity: Default value of 0.2 was used. This value was used because it is at the midpoint of the range for the soil types at Antelope-JAB Project.

   No sensitivity analysis was performed since water dependent pathways were not significant contributors to dose.

5. Saturated zone hydraulic conductivity: A value of 1090 m/y was used based upon site specific information.

   No sensitivity analysis was performed since water dependent pathways were not significant contributors to dose and site specific information was used.

6. Saturated zone hydraulic gradient: The default value of 0.02 was used for screening purposes.

   No sensitivity analysis was performed since water dependent pathways were not significant contributors to dose.

7. Saturated zone b parameter: This parameter was not used since the water table drop rate was zero.

   No sensitivity analysis was performed since water dependent pathways were not significant contributors to dose.

8. Water Table Drop Rate: The default value of 0.0 m/yr. was used for screening purposes. The site specific drop rate should be similar because there is little consumptive use of groundwater in the immediate area other than ranches that use local wells for domestic and livestock.

No sensitivity analysis was performed since water dependent pathways were not significant contributors to dose.

9. Well Pump Intake Depth: The RESRAD default is 10 m. Since the depth to saturated zone is approximately 150 meters, a value of 152 meters was chosen.

   No sensitivity analysis was performed since water dependent pathways were not significant contributors to dose.

10. Model for Water Transport Parameters: Used non-dispersion per NUREG-1569.

11. Well Pumping Rate: Used default of 250 m^3/yr. (66,000 gal/yr.).

    No sensitivity analysis was performed since water dependent pathways were not significant contributors to dose.

Unsaturated Zone

1. Unsaturated zone thickness: Used 108 meters based on site specific data to top of first saturated zone.

2. Density of unsaturated zone: Used site specific information of 1.44 g/cc.

3. Unsaturated zone total Porosity: Used value of 0.25 based on site specific information.

   No sensitivity analysis was performed since water dependent pathways were not significant contributors to dose and site specific data was used.

4. Unsaturated zone effective porosity: Used value of 0.1 based on site specific information.

No sensitivity analysis was performed since water dependent pathways were not significant contributors to dose.

5. Unsaturated zone field capacity: Default value of 0.2 was used. This value was used because it is at the midpoint of the range for the soil types at Antelope-JAB Project.

   No sensitivity analysis was performed since water dependent pathways were not significant contributors to dose.

6. Unsaturated zone hydraulic conductivity: A value of 1090 m/y was used based upon site specific information.

   No sensitivity analysis was performed since water dependent pathways were not significant contributors to dose.

7. Saturated zone b parameter: Used value of 4.9. The RESRAD Handbook and RESRAD Manual specify a value of 4.38 for loamy sand, which corresponds to the soil classification used for the hydraulic conductivity. The range from sand to loam is 4.05 to 5.39.

   No sensitivity analysis was performed since water dependent pathways were not significant contributors to dose.

Occupancy

1. Inhalation Rate: Used default value of 8,400 m^3/yr.

2. Mass Loading for Inhalation: Default is 0.0001 g/m^3. Handbook gives a value of 0.0003 g/ m^3 for agricultural generated dust loading. Used 0.0003 g/ m^3

No sensitivity analysis was performed since inhalation pathways were not significant contributors to dose.

3. Exposure Duration: Used default value of 30 years.

4. Indoor dust filtration factor: Used default value of 0.4.

5. External gamma shielding factor: The RESRAD default is 0.7, which assumes that the indoor gamma radiation level is 30% lower than the outdoor gamma radiation level. NUREG-1569 requires that a value between 0.33 and 0.55 be used. The screening level was set at 0.55. This is a value suitable for a 7-inch thick concrete slab on grade house (NUREG/CR-5512 Vol.3, p 6-25). This is representative of the thickness of the local slab or basement floor thicknesses.

   Sensitivity analysis using a 1.5 multiple (i.e., 0.367, 0.55 and 0.825 resulted in a change in the maximum dose. See graph. The low range (0.367) resulted in a maximum dose for the external exposure pathway of approximately 20 mrem/yr compared to a dose of 23 mrem/yr for a shielding factor of 0.55. Based upon the fact that most construction of rural homes in the local area includes a thick concrete basement floor or slab, a shielding factor of 0.55 for the Antelope-JAB Project area is justified.

6. Indoor/Outdoor Fractions: Used defaults of 0.5 indoors and 0.25 outdoors for farmer scenario. As discussed above, the resident farmer scenario was chosen as the most likely land use for the foreseeable future (i.e., 200 years).

7. Shape of contaminated zone: NUREG-1569 suggests use of actual shape. However, the shape is unknown at this time. Various shapes were assumed including a rectangle having a length of up to four times the width. The results were independent of these shapes as long as the receptor was centered. When the receptor

was at the edge of the area, the dose was reduced significantly as expected. A circular shape was adopted for the modeling.

Ingestion: Dietary

1. Consumption Rates:

A. Fruit, vegetable and grain: RESRAD default is 160 kg/yr. This value was used based upon EPA estimated consumption. NRC Reg. Guide 1.109 has an estimated consumption for an adult of 190 kg/yr. Screening level set at default of 160 kg/yr. This amount is the total consumption. RESRAD adjusts for contaminated and uncontaminated fractions based upon the size of the contaminated area.

B. Leafy Vegetable: Used default value of 14 kg/yr. NRC Reg. Guide 1.109 has an estimated consumption for an adult of 64 kg/yr, while NRC estimates for dose from nuclear power plants uses a consumption rate of 30 kg/yr. Screening level for total set at default of 190 kg/yr (see above entry). This amount is the total consumption. RESRAD adjusts for contaminated and uncontaminated fractions based upon the size of the contaminated area.

C. Milk: A value of 83 L/yr was used. Assumes resident farmer producing own milk locally.

D. Meat and Poultry: Used RESRAD default value of 63 kg/yr. According to NRC Regulatory Guide 1.109 (NRC, 1977), the recommended average value for consumption of meat and poultry is 37 kg/yr for children, 59 kg/yr for teenagers, and 95 kg/yr. for adults.

E. Fish/Seafood: No consumption of locally produced and consumed fish or seafood products was considered as recommended by NUREG-1569.

F. Soil ingestion: Used the RESRAD default value of 36.5 g/yr.

G. Drinking water intake: Used the RESRAD default of 510 l/yr. (1.4 L/d) as a screening level. This value is based upon EPA estimates of drinking water intake. The EPA (1990) has suggested that the average adult drinking water consumption rate is 1.4 L/d; the reasonable worst-case value is 2.0 L/d.

2. Contaminated Fractions:

NUREG-1569 states that for sites with over 25 acres (10,117 square meters) of contamination, the fraction of diet from contaminated area should be assumed to be 25% (0.25). A sensitivity analysis on these parameters was not performed based upon the guidance.

A. Water: Used the default value of 1 (i.e., 100% of consumption is from contaminated well water). All current water use in rural areas around the site is from private wells and will likely continue to be in the foreseeable future.

B. Livestock Water: Used default of 1 (i.e., 100% is from contaminated water). All current water use in rural areas around the site is from private wells and will likely continue to be in the foreseeable future.

C. Irrigation Water: Used the RESRAD default of 1 (i.e., 100% is from contaminated water). All current water use in rural areas around the site is from private wells and will likely continue to be in the foreseeable future.

D. Plant food: Used 0.25 as percentage of plant food that is contaminated.

E. Meat: Used 0.75 as percentage of meat that is contaminated.

F. Milk: Used o.75 as percentage of milk that is contaminated.

Ingestion: Nondietary

1. **Consumption Rates:**

A. Livestock fodder intake for meat: Used the RESRAD default of 68 kg/day.

B. Livestock water intake for meat: Used the RESRAD default of 50 L/day. According to NRC Regulatory Guide 1.109 (NRC 1977), the water ingestion rate for beef cattle is 50 L/d.

C. Livestock intake of soil for meat: Used the RESRAD default of 0.5 g/day.

D. Mass loading for foliar deposition: Used the same value of 0.0003 g/m^3 for agricultural generated dust loading as the inhalation parameter discussed above.

Sensitivity analysis was run with a multiple of 100 (i.e., 0.000003, 0.0003, and 0.03 g/m^3). There was no impact on dose.

E. Depth of soil mixing layer: Used the RESRAD default of 0.15 meters.

F. Depth of roots: Used 0.3 meters as a screening level based upon NUREG-1569 instead of the RESRAD default of 0.9. The root depth varies for different plants. For some plants, such as beets, carrots, lettuce, and so forth, it does not extend below about 0.3 m, which is the basis of the NRC guidance. For others, such as fruit trees, the roots may extend 2 or 3 m below the surface. Tap roots for some crops (e.g., alfalfa) can extend to 5 m. Most of the plant roots from which nutrients are obtained, however, usually extend to less than 1 m below the surface. Due to the common use of grazing crops such as alfalfa in the immediate area surrounding the Antelope-JAB Project site, a sensitivity

analysis was chosen that would determine the dose using the 0.3 m NRC guidance as the screening level as well as the 0.9 m RESRAD default.

Sensitivity analysis was run with a multiple of 2 (i.e., 0.15, 0.3, and 0.6 meters). There was a significant impact on the maximum dose. Assumption of a shallow root system increased the dose significantly. In a review of the exposure pathways, the plant pathway resulted in approximately 35% of the total maximum dose. The meat pathway, which would be the primary pathway affected by deeper roots such as alfalfa was insignificant. Therefore, the root depth recommended in the NRC NUREG-1569 was chosen for this parameter.

G. Groundwater fractional usage:

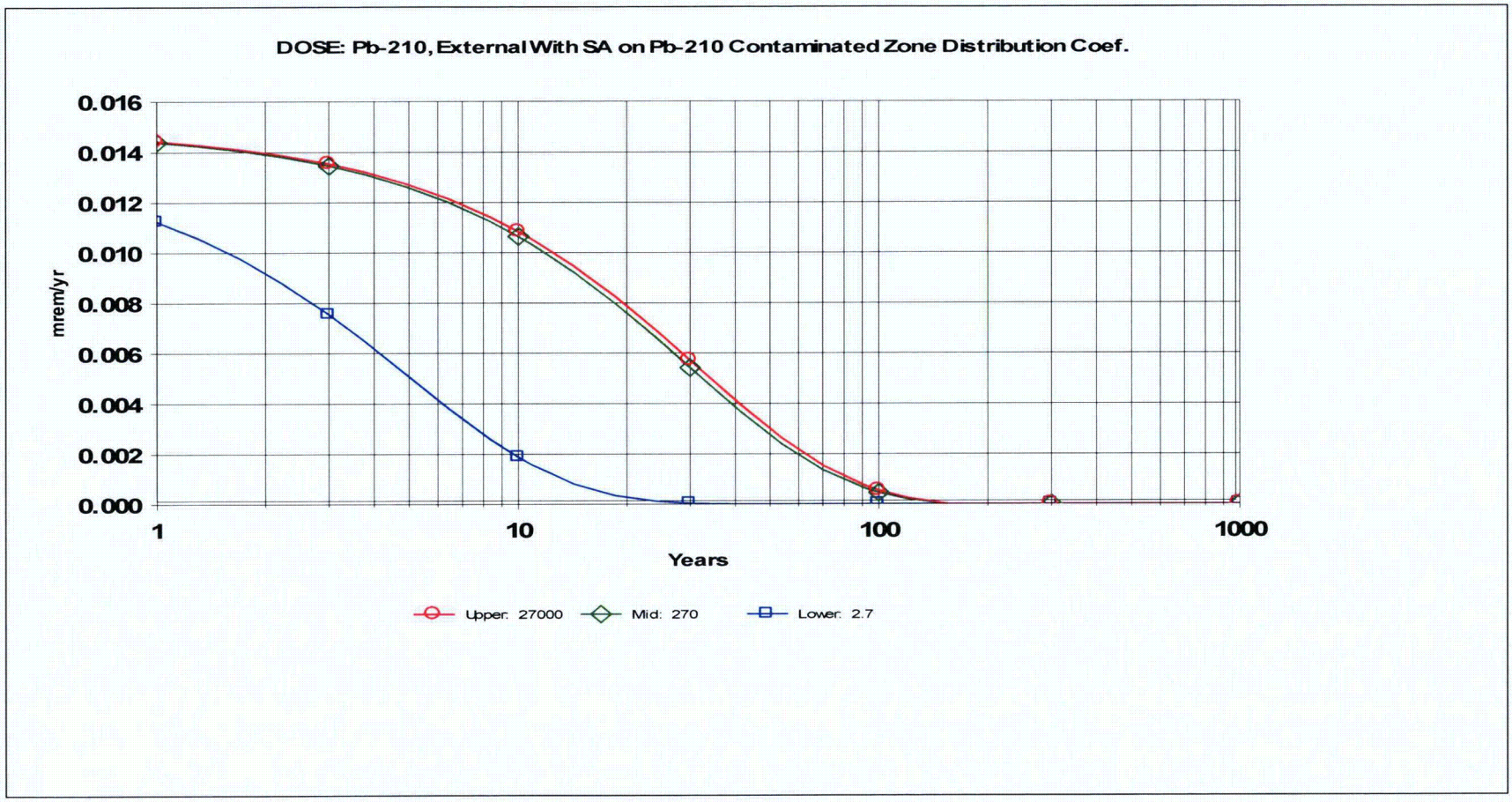
- Drinking water: Used the RESRAD default of 1 (i.e., 100% from well).
- Livestock water: Used the RESRAD default of 1 (i.e., 100% from well).
- Irrigation water: Used the RESRAD default of 1 (i.e., 100% from well).

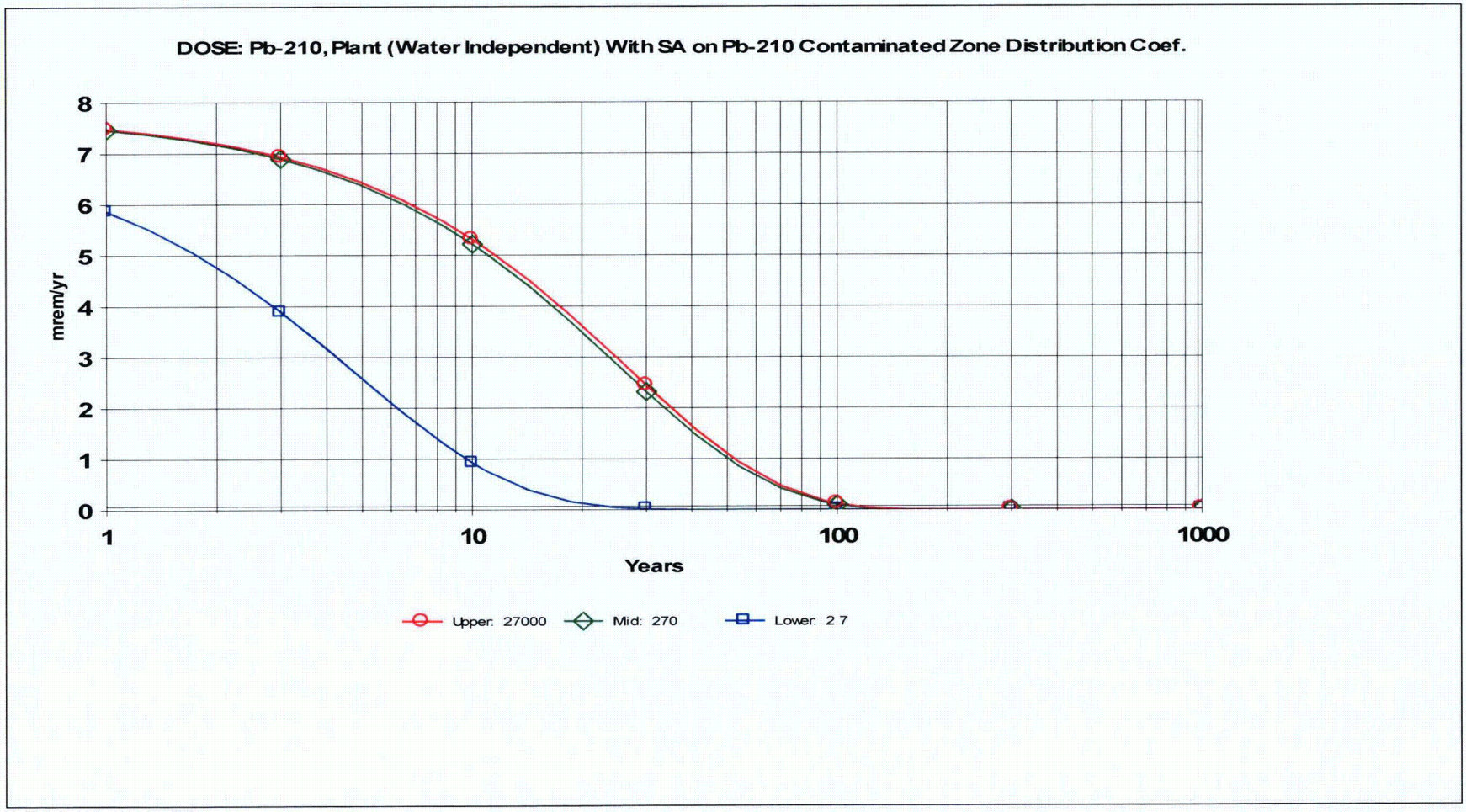
Storage Times

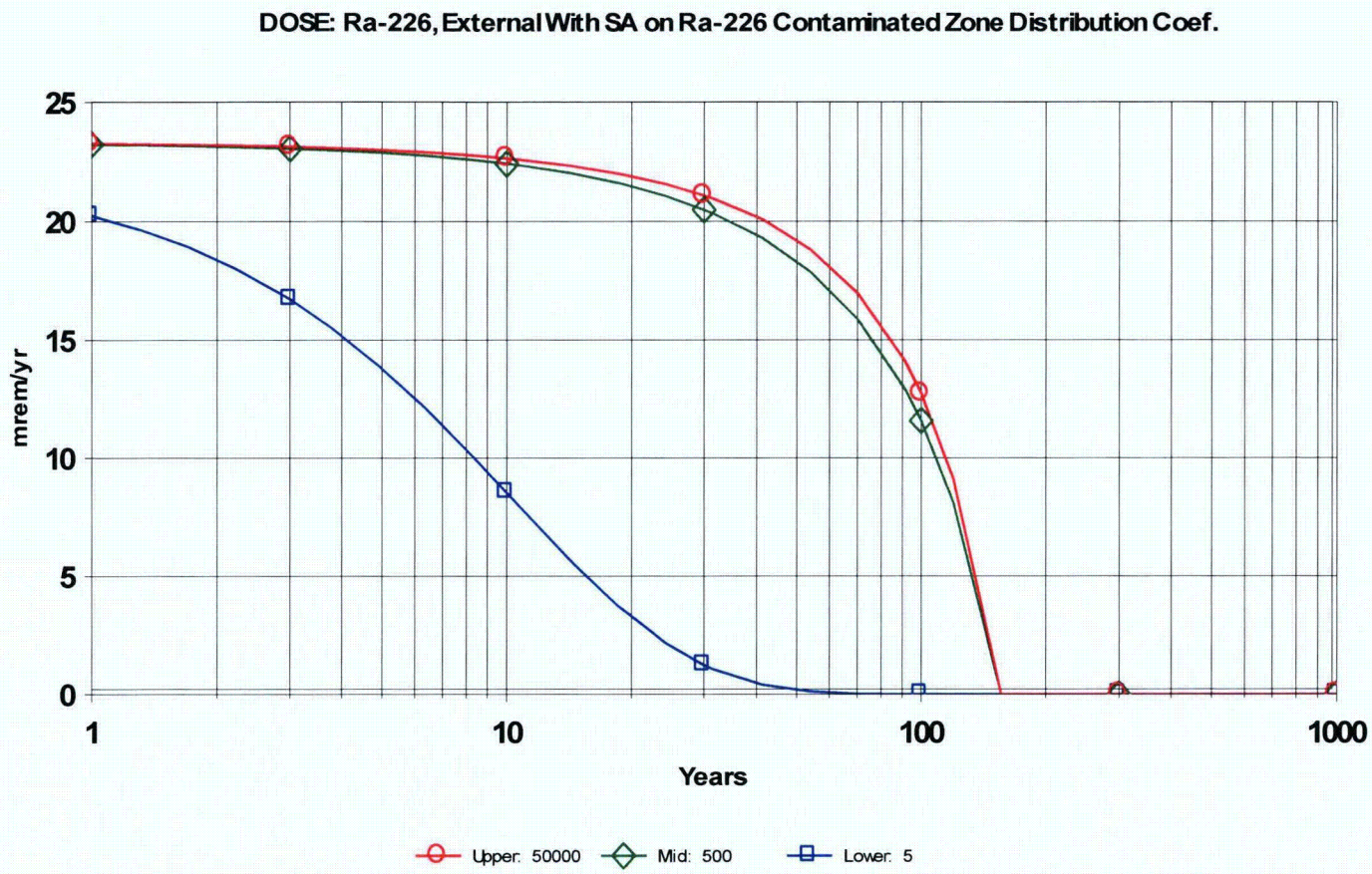
Used the RESRAD default values for all storage times (for vegetables, meats, fodder, etc.).

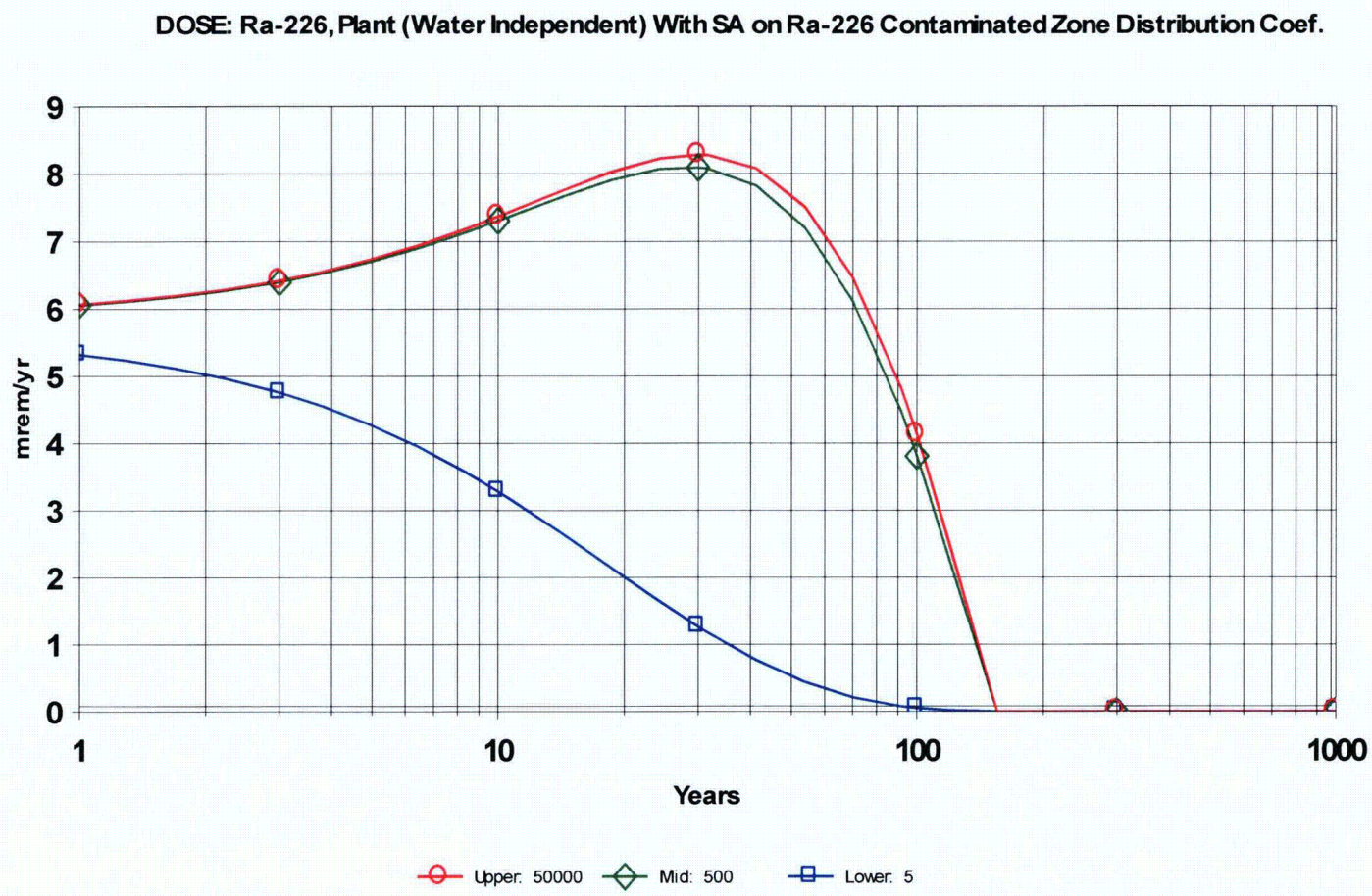
APPENDIX C-2

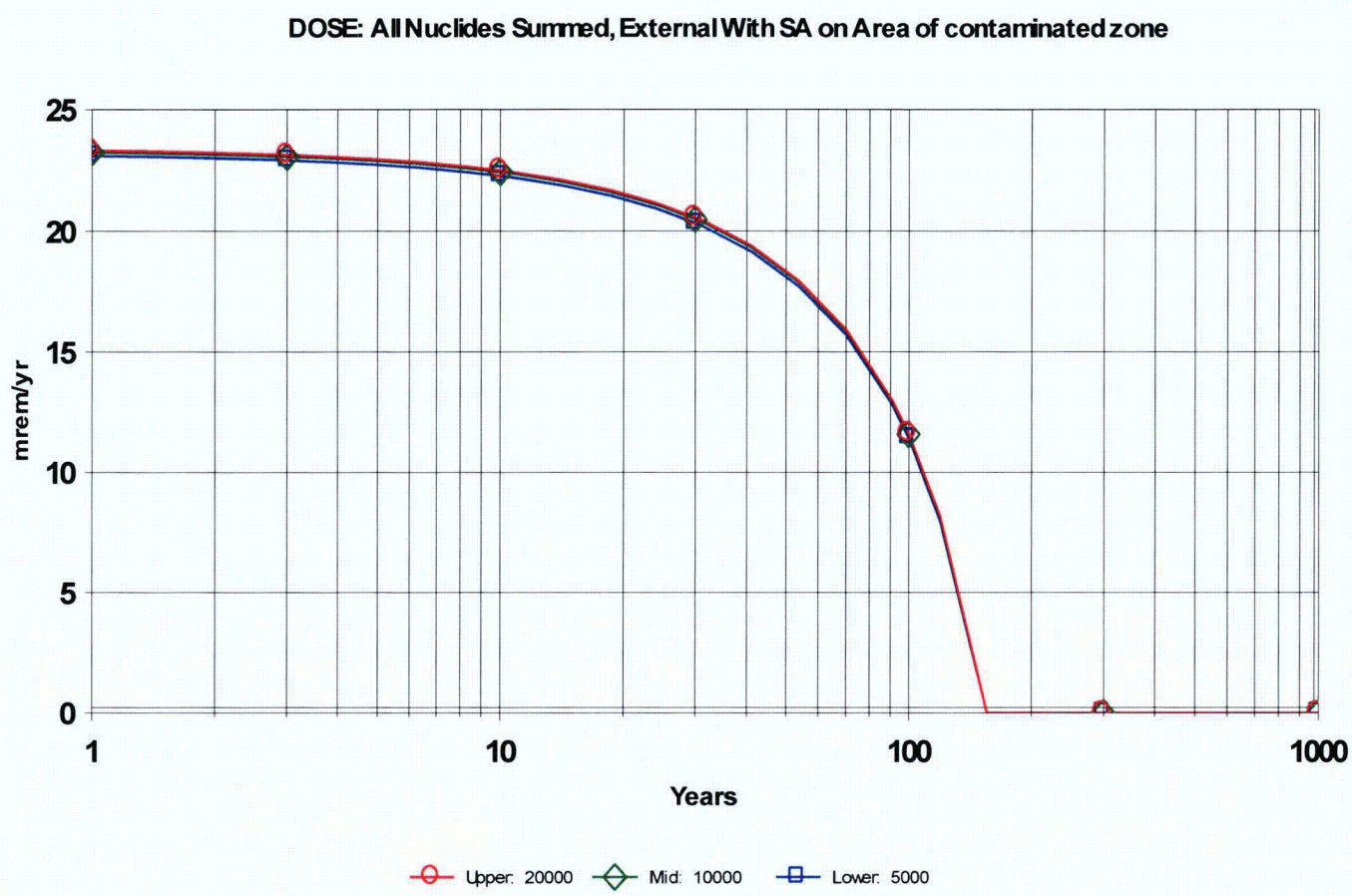
RESRAD Input Parameter Sensitivity Analysis

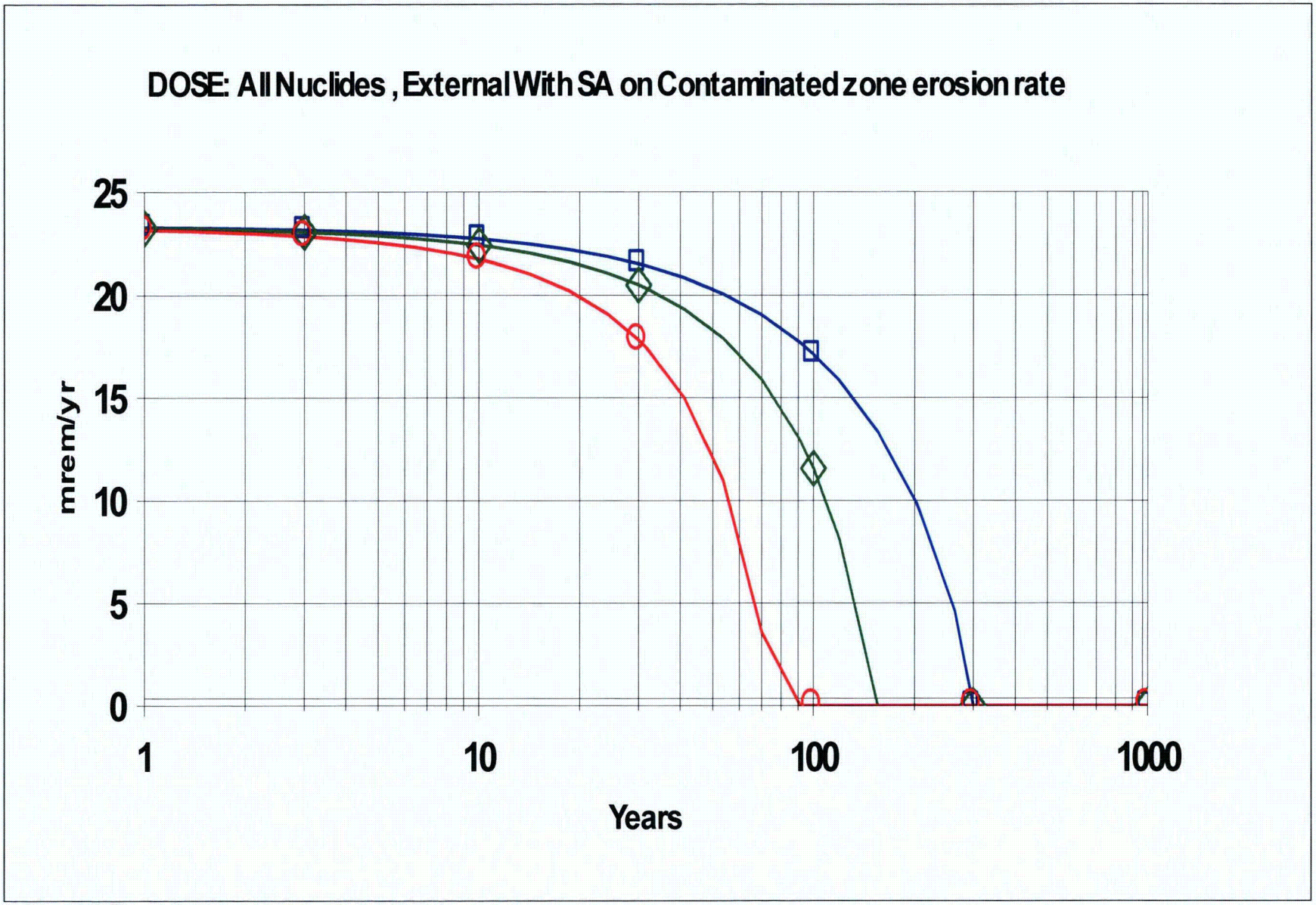

DOSE: Pb-210, External With SA on Pb-210 Contaminated Zone Distribution Coef.
0.016
0.014
0.012
0.010
0.008
0.006
0.004
0.002
0.000
mrem/yr
1
10
100
1000
Years
Upper: 27000
Mid: 270
Lower: 2.7

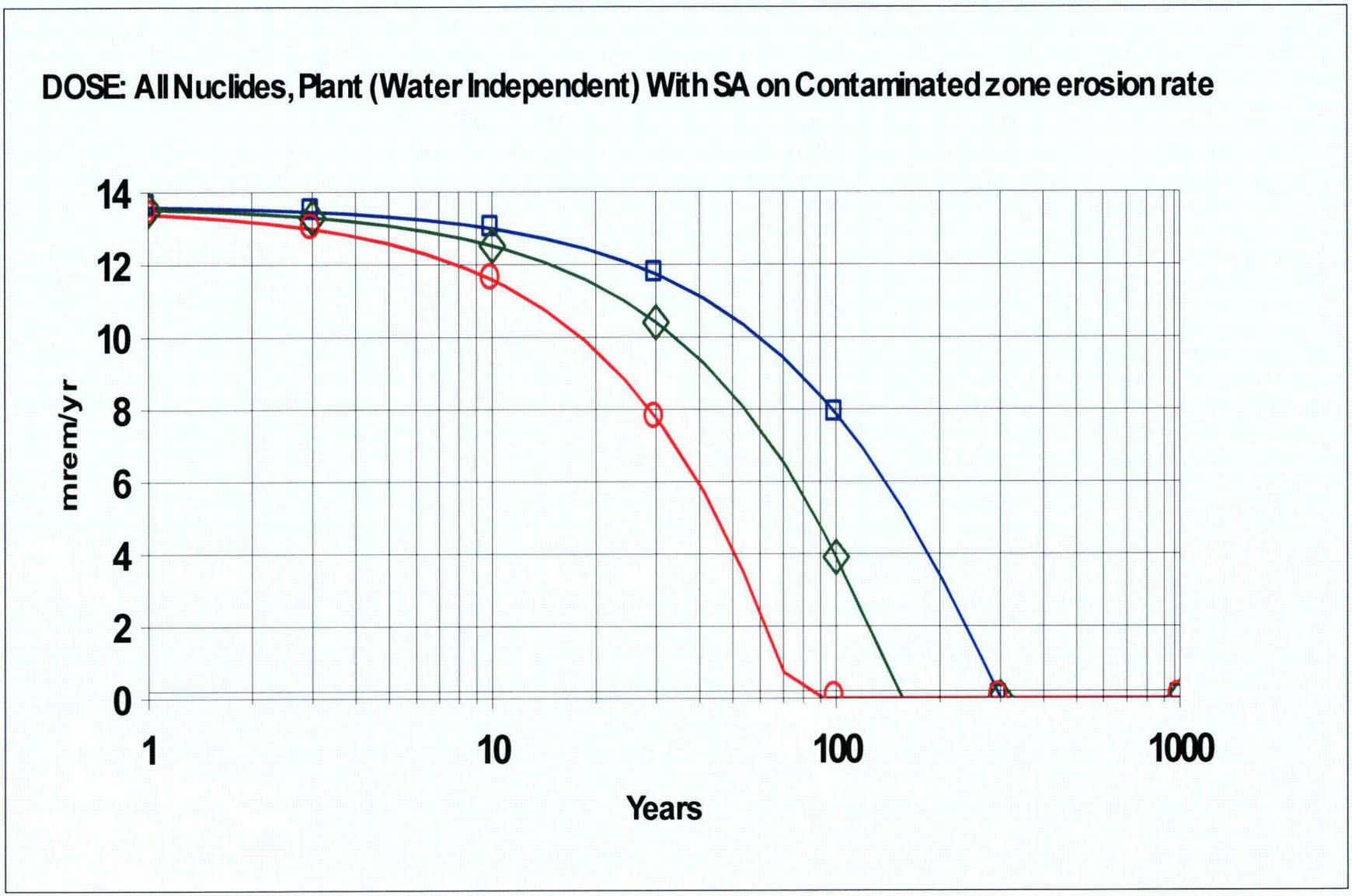

DOSE: Pb-210, Plant (Water Independent) With SA on Pb-210 Contaminated Zone Distribution Coef.
mrem/yr
8
7
6
5
4
3
2
1
0
1
10
100
1000
Years
Upper: 27000
Mid: 270
Lower: 2.7

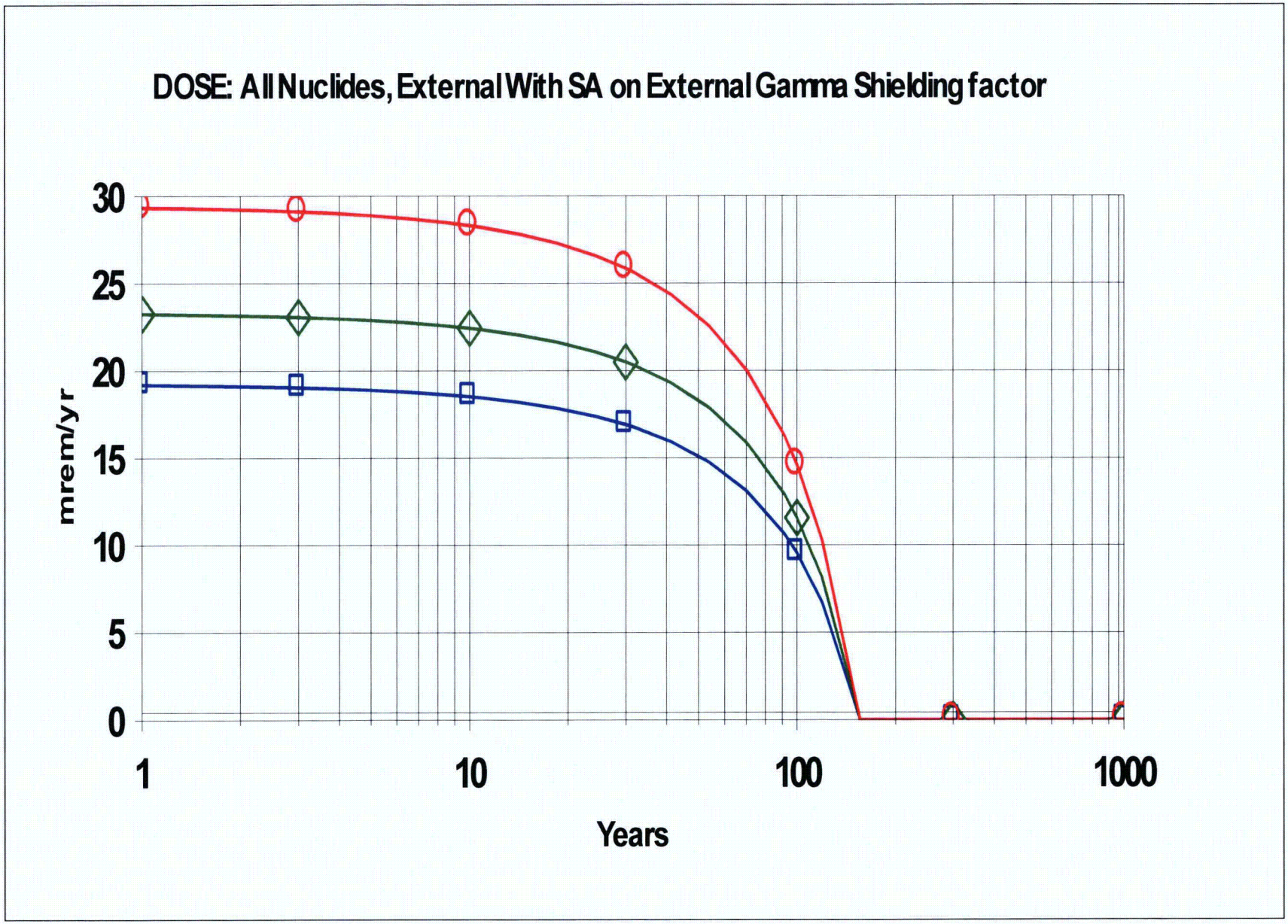

DOSE: Ra-226, External With SA on Ra-226 Contaminated Zone Distribution Coef.
25
20
15
10
5
0
mrem/yr
1
10
100
1000
Years
Upper: 50000
Mid: 500
Lower: 5

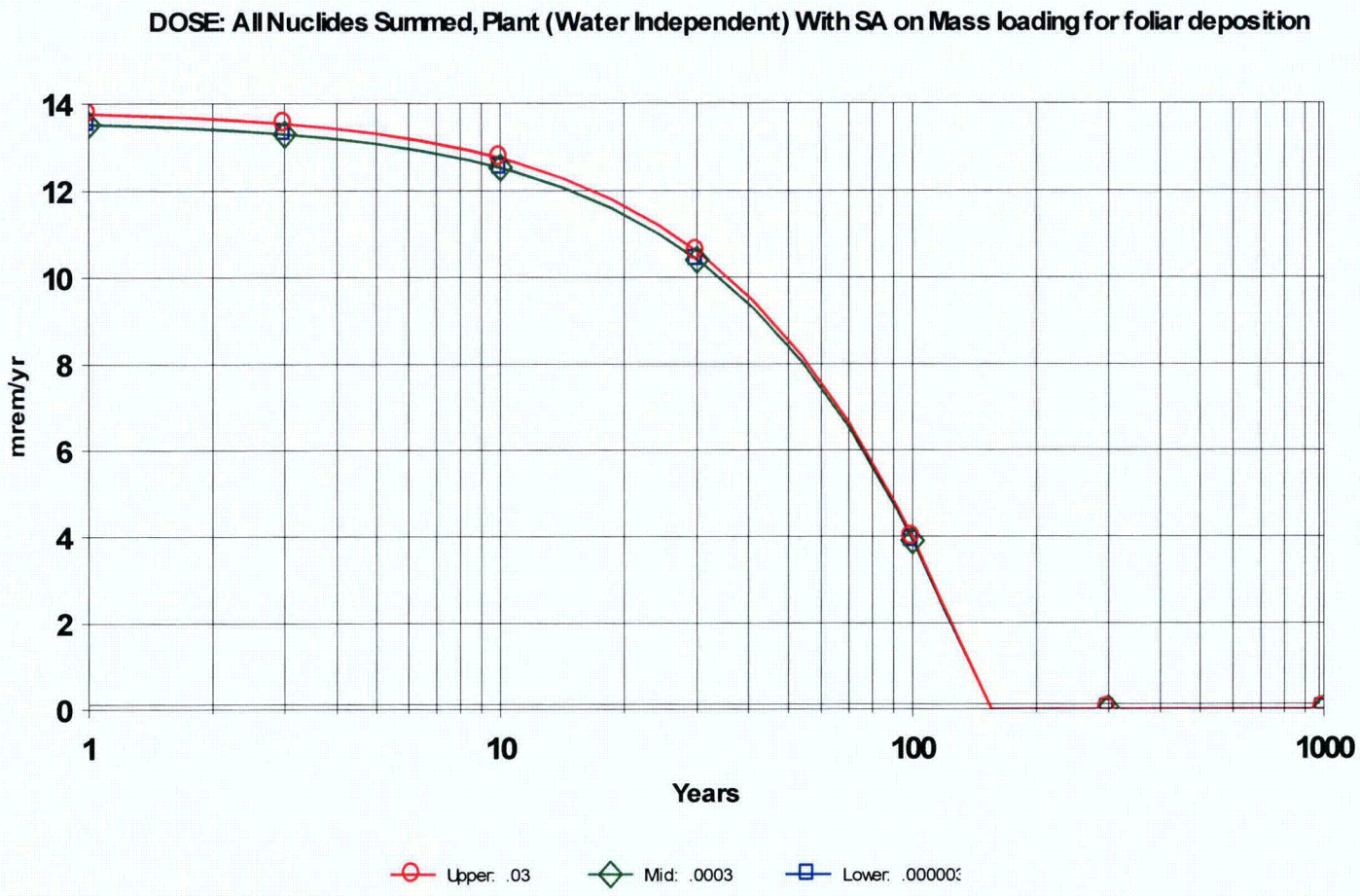

DOSE: Ra-226, Plant (Water Independent) With SA on Ra-226 Contaminated Zone Distribution Coef.
mrem/yr
9
8
7
6
5
4
3
2
1
0
1
10
100
1000
Years
Upper: 50000
Mid: 500
Lower: 5

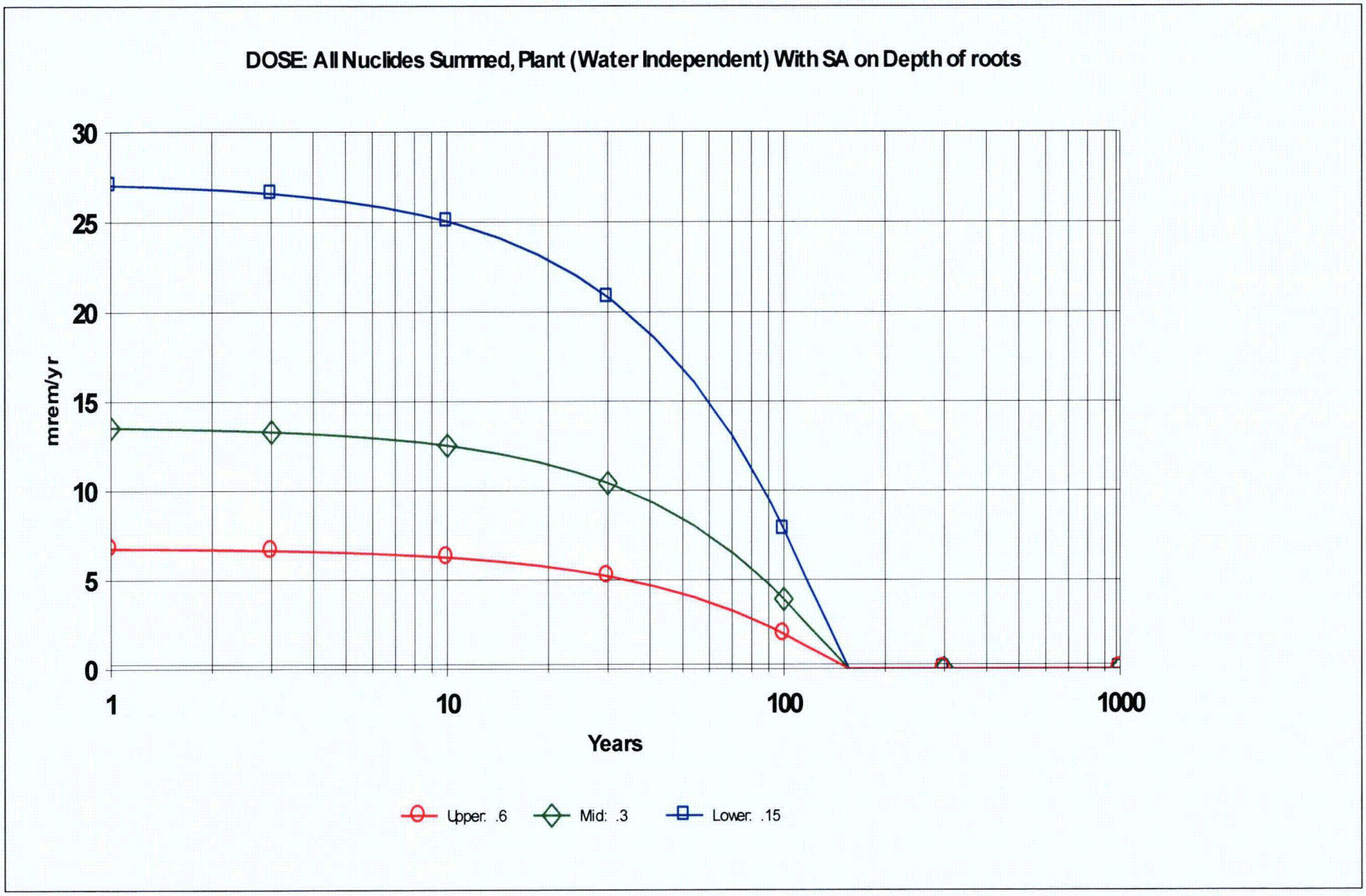

DOSE: All Nuclides Summed, External With SA on Area of contaminated zone
25
20
15
10
5
0
mrem/yr
1
10
100
1000
Years
Upper: 20000
Mid: 10000
Lower: 5000


DOSE: All Nuclides , External With SA on Contaminated zone erosion rate
25
20
15
10
5
0
mrem/yr
1
10
100
1000
Years


DOSE: All Nuclides, Plant (Water Independent) With SA on Contaminated zone erosion rate
mrem/yr
14
12
10
8
6
4
2
0
1
10
100
1000
Years


DOSE: All Nuclides, External With SA on External Gamma Shielding factor
30
25
20
15
10
5
0
mrem/yr
1
10
100
1000
Years


DOSE: All Nuclides Summed, Plant (Water Independent) With SA on Mass loading for foliar deposition
mrem/yr
14
12
10
8
6
4
2
0
1
10
100
1000
Years
Upper: .03
Mid: .0003
Lower: .000003


DOSE: All Nuclides Summed, Plant (Water Independent) With SA on Depth of roots
mrem/yr
30
25
20
15
10
5
0
1
10
100
1000
Years
Upper: .6
Mid: .3
Lower: .15

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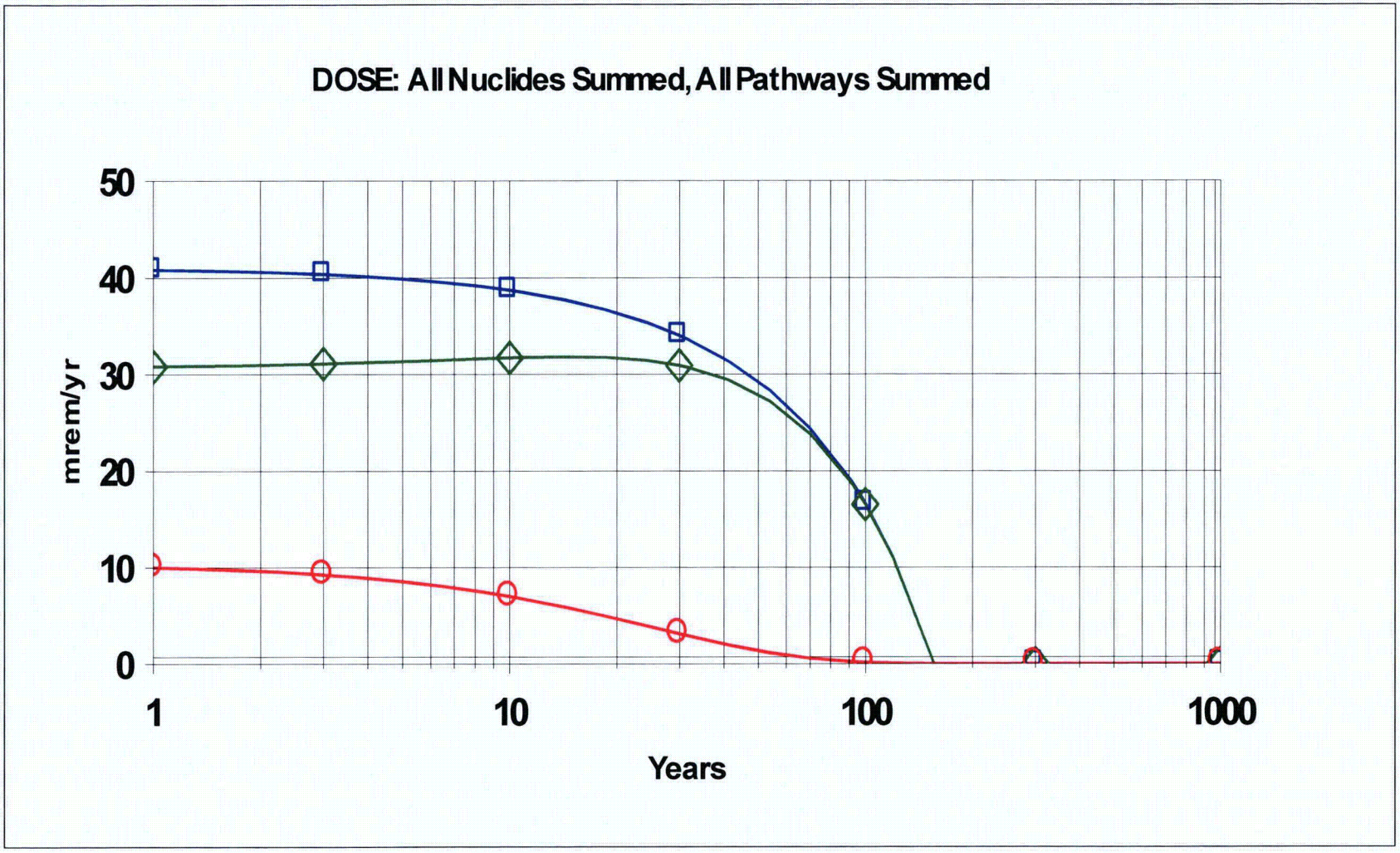
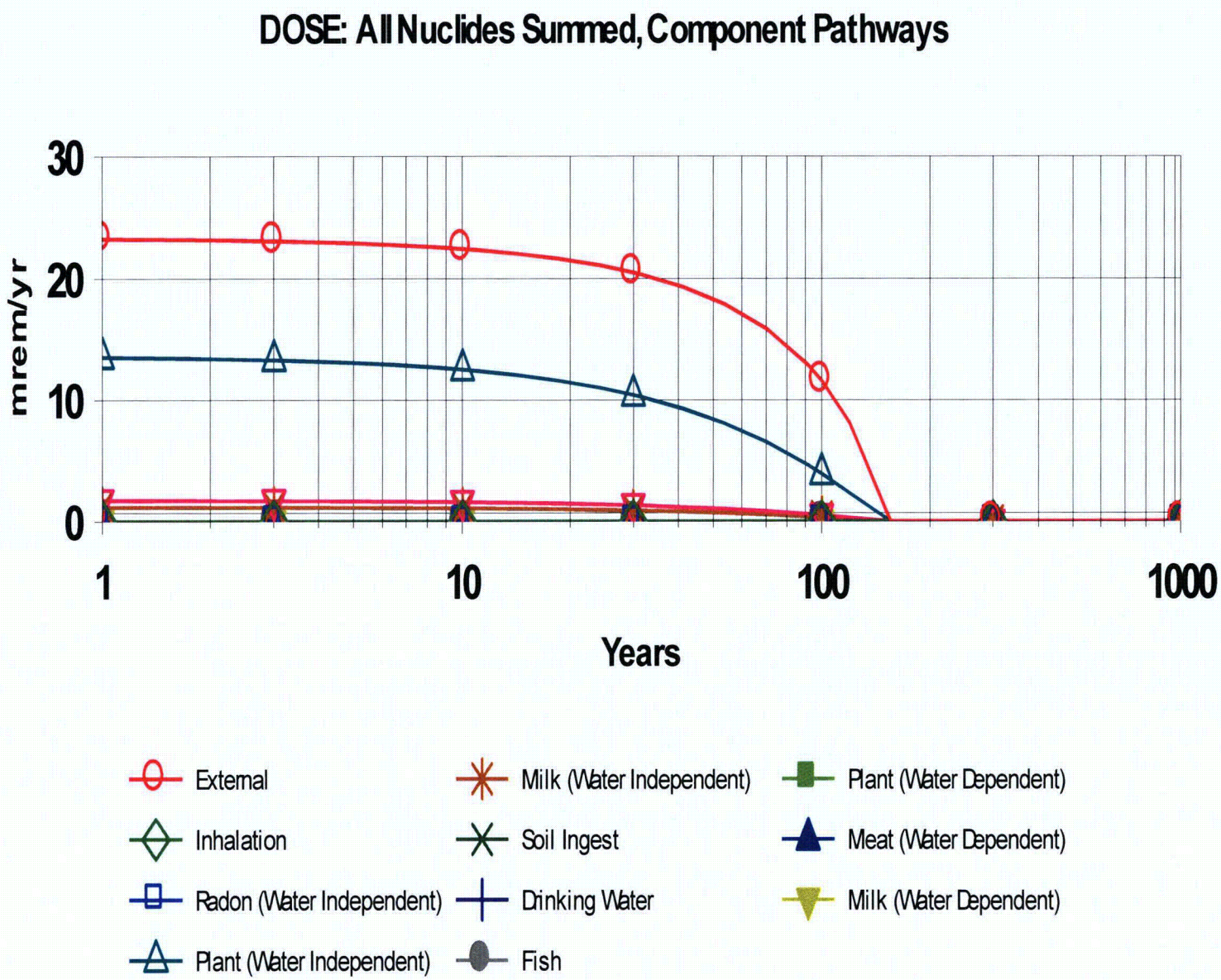
APPENDIX C-3

RESRAD Model Output- Radium

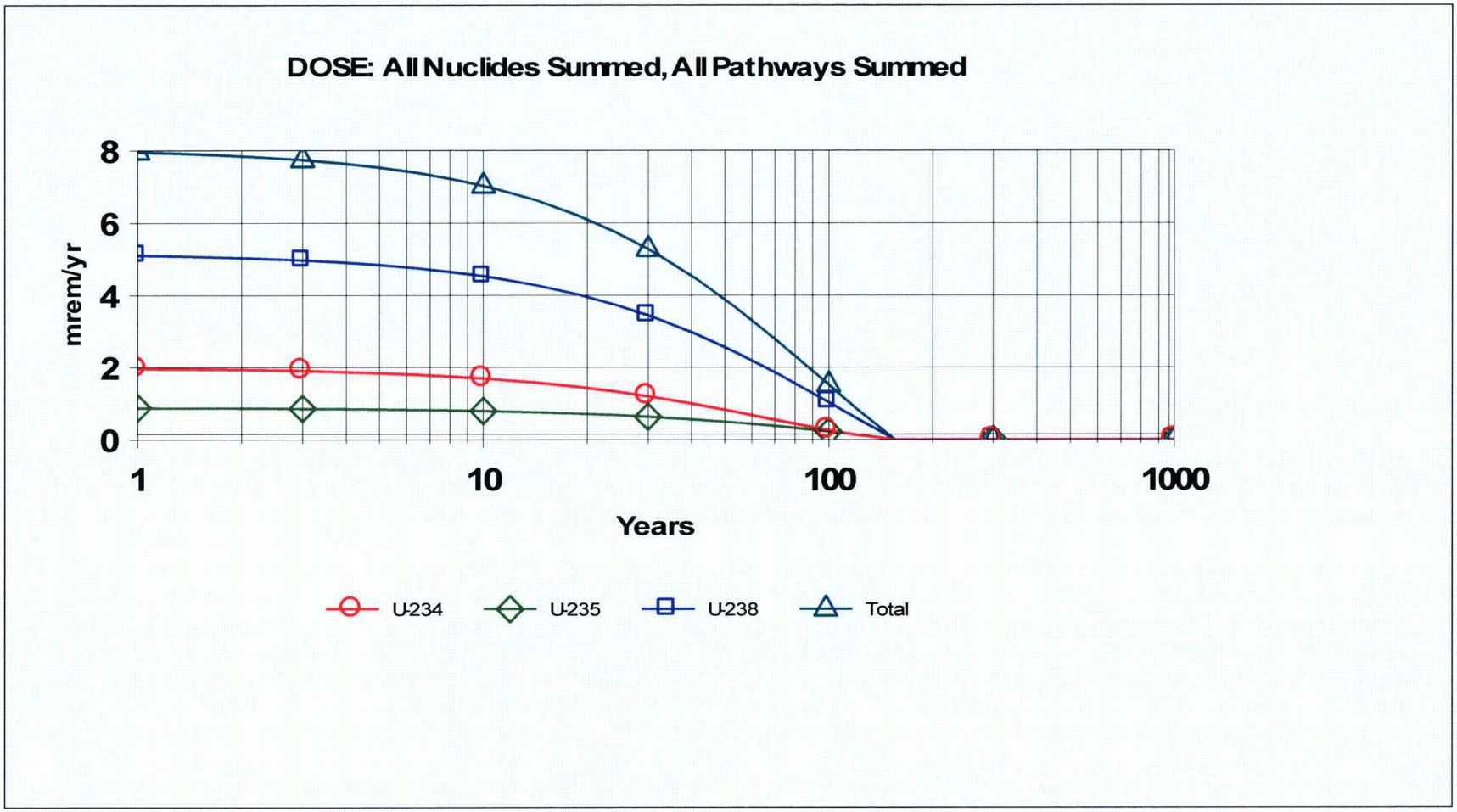

DOSE: All Nuclides Summed, All Pathways Summed
50
40
30
20
10
0
mrem/yr
1
10
100
1000
Years

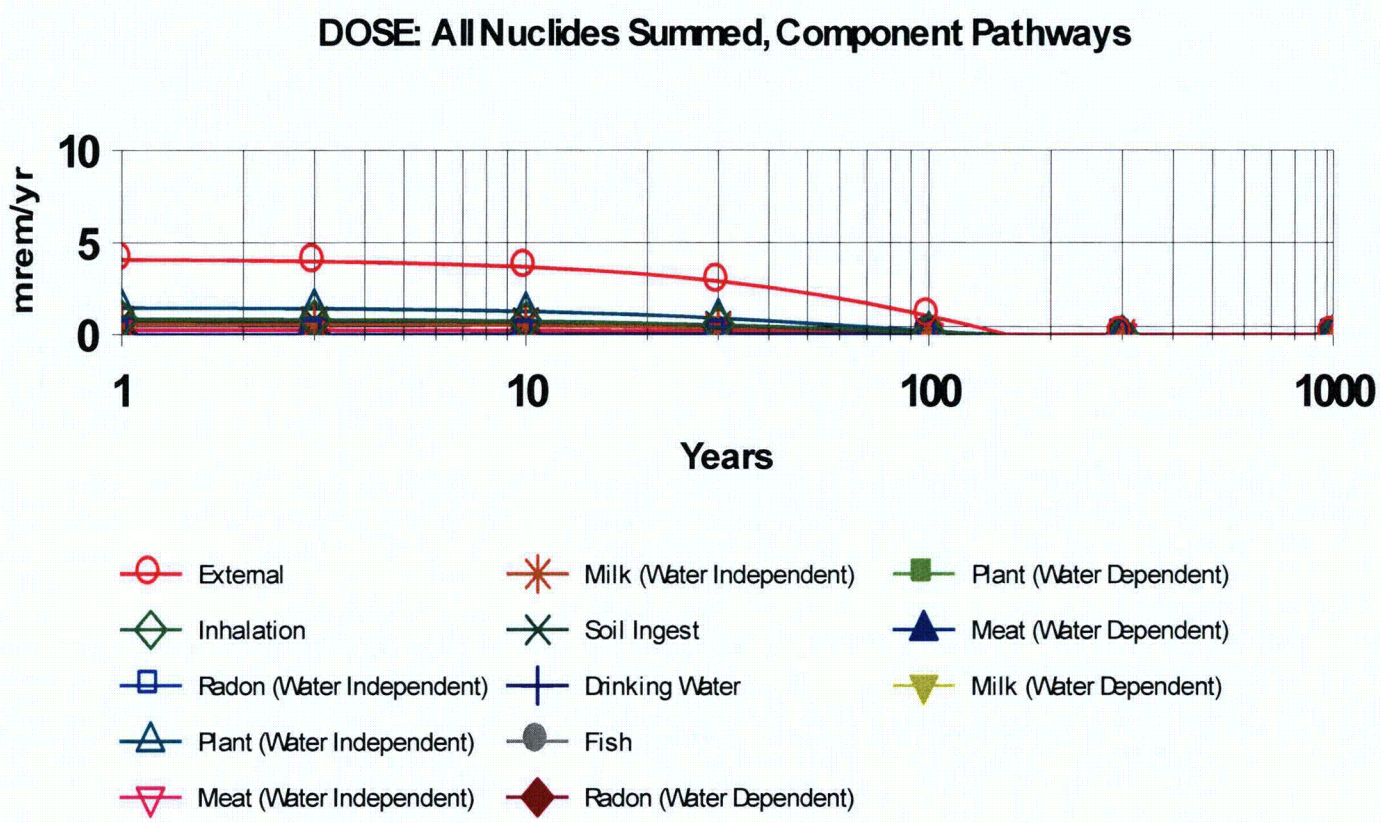

DOSE: All Nuclides Summed, Component Pathways
30
20
10
0
mrem/yr
1
10
100
1000
Years
External
Inhalation
Radon (Water Independent)
Plant (Water Independent)
Milk (Water Independent)
Soil Ingest
Drinking Water
Fish
Plant (Water Dependent)
Meat (Water Dependent)
Milk (Water Dependent)

APPENDIX C-4

RESRAD Model Output- Uranium

Natural Uranium Dose Graphics


DOSE: All Nuclides Summed, All Pathways Summed
mrem/yr
8
6
4
2
0
1
10
100
1000
Years
U-234
U-235
U-238
Total


DOSE: All Nuclides Summed, Component Pathways
mrem/yr
10
5
0
1
10
100
1000
Years
External
Inhalation
Radon (Water Independent)
Plant (Water Independent)
Meat (Water Independent)
Milk (Water Independent)
Soil Ingest
Drinking Water
Fish
Radon (Water Dependent)
Plant (Water Dependent)
Meat (Water Dependent)
Milk (Water Dependent)

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APPENDIX C-5

Standard Graphics for Radium and Uranium Dose Modeling

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Time = 3.000E+00 11
Time = 1.000E+01 12
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Dose Conversion Factor (and Related) Parameter Summary
File: FGR 13 MORBIDITY

Menu	Parameter	Current Value	Base Case*	Parameter Name
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Pb-210+D	2.320E-02	1.360E-02	DCF2(1)
B-1	Ra-226+D	8.594E-03	8.580E-03	DCF2(2)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Pb-210+D	7.276E-03	5.330E-03	DCF3(1)
D-1	Ra-226+D	1.321E-03	1.320E-03	DCF3(2)
D-34	Food transfer factors:			
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(1,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF(1,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(1,3)
D-34				
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(2,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(2,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(2,3)
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC(1,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(1,2)
D-5				
D-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC(2,1)
D-5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(2,2)

*Base Case means Default.Lib w/o Associate Nuclide contributions.

Site-Specific Parameter Summary

Menu	Parameter	User Input	Default	Used by RESRAD (if different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	1.000E+04	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	1.500E-01	3.000E+00	---	THICK0
R011	Length parallel to aquifer flow (m)	1.000E+02	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	2.500E+01	3.000E+00	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T(2)
R011	Times for calculations (yr)	3.000E+00	3.000E+00	---	T(3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	---	T(4)
R011	Times for calculations (yr)	3.000E+01	3.000E+01	---	T(5)
R011	Times for calculations (yr)	1.000E+02	1.000E+02	---	T(6)
R011	Times for calculations (yr)	3.000E+02	3.000E+02	---	T(7)
R011	Times for calculations (yr)	1.000E+03	1.000E+03	---	T(8)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): Pb-210	5.000E+00	0.000E+00	---	S1(1)
R012	Initial principal radionuclide (pCi/g): Ra-226	5.000E+00	0.000E+00	---	S1(2)
R012	Concentration in groundwater (pCi/L): Pb-210	not used	0.000E+00	---	W1(1)
R012	Concentration in groundwater (pCi/L): Ra-226	not used	0.000E+00	---	W1(2)
R013	Cover depth (m)	0.000E+00	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)	not used	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	not used	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.300E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	2.000E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	1.000E+02	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	5.300E+00	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	2.000E+00	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	5.500E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	2.400E-01	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	2.000E-01	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	2.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	7.000E+07	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	1.000E-03	1.000E-03	---	EPS
R014	Density of saturated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	2.500E-01	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	1.000E-01	2.000E-01	---	EPSZ
R014	Saturated zone field capacity	2.000E-01	2.000E-01	---	FCSZ
R014	Saturated zone hydraulic conductivity (m/yr)	1.000E+03	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	2.000E-02	2.000E-02	---	HGWT
R014	Saturated zone b parameter	not used	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	0.000E+00	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	1.500E+02	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	ND	ND	---	MODEL
R014	Well pumping rate (m**3/yr)	2.500E+02	2.500E+02	---	UW

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (if different from user input)	Parameter Name
R015	Number of unsaturated zone strata	1	1	---	NS
R015	Unsat. zone 1, thickness (m)	1.080E+02	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	1.440E+00	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	2.500E-01	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	1.000E-01	2.000E-01	---	EPUZ(1)
R015	Unsat. zone 1, field capacity	2.000E-01	2.000E-01	---	FCUZ(1)
R015	Unsat. zone 1, soil-specific b parameter	4.900E+00	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	1.090E+03	1.000E+01	---	HCUZ(1)
R016	Distribution coefficients for Pb-210				
R016	Contaminated zone (cm**3/g)	2.700E+02	1.000E+02	---	DCNUCC(1)
R016	Unsaturated zone 1 (cm**3/g)	2.700E+02	1.000E+02	---	DCNUCU(1,1)
R016	Saturated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.778E-03	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBY(1)
R016	Distribution coefficients for Ra-226				
R016	Contaminated zone (cm**3/g)	5.000E+02	7.000E+01	---	DCNUCC(2)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+02	7.000E+01	---	DCNUCU(2,1)
R016	Saturated zone (cm**3/g)	5.000E+02	7.000E+01	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	9.605E-04	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBY(2)
R017	Inhalation rate (m**3/yr)	8.400E+03	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	1.000E-04	1.000E-04	---	MLINH
R017	Exposure duration	3.000E+02	3.000E+01	---	ED
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	3.500E-01	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	5.000E-01	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	2.500E-01	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows circular AREA.	FS
R017	Radii of shape factor array (used if FS = -1):				
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	---	RAD_SHAPE(1)
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	---	RAD_SHAPE(2)
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	---	RAD_SHAPE(3)
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	---	RAD_SHAPE(4)
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	---	RAD_SHAPE(5)
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	---	RAD_SHAPE(6)
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	---	RAD_SHAPE(7)
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE(8)
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	---	RAD_SHAPE(9)
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	---	RAD_SHAPE(10)
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	---	RAD_SHAPE(11)
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	---	RAD_SHAPE(12)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA(1)
R017	Ring 2	not used	2.732E-01	---	FRACA(2)
R017	Ring 3	not used	0.000E+00	---	FRACA(3)
R017	Ring 4	not used	0.000E+00	---	FRACA(4)
R017	Ring 5	not used	0.000E+00	---	FRACA(5)
R017	Ring 6	not used	0.000E+00	---	FRACA(6)
R017	Ring 7	not used	0.000E+00	---	FRACA(7)
R017	Ring 8	not used	0.000E+00	---	FRACA(8)
R017	Ring 9	not used	0.000E+00	---	FRACA(9)
R017	Ring 10	not used	0.000E+00	---	FRACA(10)
R017	Ring 11	not used	0.000E+00	---	FRACA(11)
R017	Ring 12	not used	0.000E+00	---	FRACA(12)
R018	Fruits, vegetables and grain consumption (kg/yr)	1.600E+02	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	1.400E+01	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	9.200E+01	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	6.300E+01	6.300E+01	---	DIET(4)
R018	Fish consumption (kg/yr)	5.400E+00	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	9.000E+00	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	3.650E+01	3.650E+01	---	SOIL
R018	Drinking water intake (L/yr)	5.100E+02	5.100E+02	---	DWI
R018	Contamination fraction of drinking water	1.000E+00	1.000E+00	---	FDW
R018	Contamination fraction of household water	not used	1.000E+00	---	FHHW
R018	Contamination fraction of livestock water	1.000E+00	1.000E+00	---	FLW
R018	Contamination fraction of irrigation water	1.000E+00	1.000E+00	---	FIRW
R018	Contamination fraction of aquatic food	5.000E-01	5.000E-01	---	FR9
R018	Contamination fraction of plant food	2.500E-01	-1	---	FPLANT
R018	Contamination fraction of meat	7.500E-01	-1	---	FMEAT
R018	Contamination fraction of milk	7.500E-01	-1	---	FMILK
R019	Livestock fodder intake for meat (kg/day)	6.800E+01	6.800E+01	---	LFI5
R019	Livestock fodder intake for milk (kg/day)	5.500E+01	5.500E+01	---	LFI6
R019	Livestock water intake for meat (L/day)	5.000E+01	5.000E+01	---	LWI5
R019	Livestock water intake for milk (L/day)	1.600E+02	1.600E+02	---	LWI6
R019	Livestock soil intake (kg/day)	5.000E-01	5.000E-01	---	LSI
R019	Mass loading for foliar deposition (g/m**3)	3.000E-04	1.000E-04	---	MLFD
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	---	DM
R019	Depth of roots (m)	3.000E+01	9.000E-01	---	DROOT
R019	Drinking water fraction from ground water	1.000E+00	1.000E+00	---	FGWDW
R019	Household water fraction from ground water	not used	1.000E+00	---	FGWHH
R019	Livestock water fraction from ground water	1.000E+00	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	1.000E+00	1.000E+00	---	FGWIR
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	7.000E-01	7.000E-01	---	YV(1)
R19B	Wet weight crop yield for Leafy (kg/m**2)	1.500E+00	1.500E+00	---	YV(2)
R19B	Wet weight crop yield for Fodder (kg/m**2)	1.100E+00	1.100E+00	---	YV(3)
R19B	Growing Season for Non-Leafy (years)	1.700E-01	1.700E-01	---	TE(1)
R19B	Growing Season for Leafy (years)	2.500E-01	2.500E-01	---	TE(2)
R19B	Growing Season for Fodder (years)	8.000E-02	8.000E-02	---	TE(3)
R19B	Translocation Factor for Non-Leafy	1.000E-01	1.000E-01	---	TIV(1)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (if different from user input)	Parameter Name
R19B	Translocation Factor for Leafy	1.000E+00	1.000E+00	---	TIV(2)
R19B	Translocation Factor for Fodder	1.000E+00	1.000E+00	---	TIV(3)
R19B	Dry Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	---	RDRY(1)
R19B	Dry Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	---	RDRY(2)
R19B	Dry Foliar Interception Fraction for Fodder	2.500E-01	2.500E-01	---	RDRY(3)
R19B	Wet Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	---	RWET(1)
R19B	Wet Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	---	RWET(2)
R19B	Wet Foliar Interception Fraction for Fodder	2.500E-01	2.500E-01	---	RWET(3)
R19B	Weathering Removal Constant for Vegetation	2.000E+01	2.000E+01	---	WLAM
C14	C-12 concentration in water (g/cm**3)	not used	2.000E-05	---	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	---	C12CZ
C14	Fraction of vegetation carbon from soil	not used	2.000E-02	---	CSOIL
C14	Fraction of vegetation carbon from air	not used	9.800E-01	---	CAIR
C14	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	---	DMC
C14	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	---	EVSN
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	---	REVSN
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	---	AVFG4
C14	Fraction of grain in milk cow feed	not used	2.000E-01	---	AVFG5
C14	DCF correction factor for gaseous forms of C14	not used	0.000E+00	---	CO2F
STOR	Storage times of contaminated foodstuffs (days):				
STOR	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	---	STOR_T(1)
STOR	Leafy vegetables	1.000E+00	1.000E+00	---	STOR_T(2)
STOR	Milk	1.000E+00	1.000E+00	---	STOR_T(3)
STOR	Meat and poultry	2.000E+01	2.000E+01	---	STOR_T(4)
STOR	Fish	7.000E+00	7.000E+00	---	STOR_T(5)
STOR	Crustacea and mollusks	7.000E+00	7.000E+00	---	STOR_T(6)
STOR	Well water	1.000E+00	1.000E+00	---	STOR_T(7)
STOR	Surface water	1.000E+00	1.000E+00	---	STOR_T(8)
STOR	Livestock fodder	4.500E+01	4.500E+01	---	STOR_T(9)
R021	Thickness of building foundation (m)	not used	1.500E-01	---	FLOOR1
R021	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	---	DENSFL
R021	Total porosity of the cover material	not used	4.000E-01	---	TPCV
R021	Total porosity of the building foundation	not used	1.000E-01	---	TPFL
R021	Volumetric water content of the cover material	not used	5.000E-02	---	PH2OCV
R021	Volumetric water content of the foundation	not used	3.000E-02	---	PH2OFL
R021	Diffusion coefficient for radon gas (m/sec):				
R021	in cover material	not used	2.000E-06	---	DIFCV
R021	in foundation material	not used	3.000E-07	---	DIFFL
R021	in contaminated zone soil	not used	2.000E-06	---	DIFCZ
R021	Radon vertical dimension of mixing (m)	not used	2.000E+00	---	HMIX
R021	Average building air exchange rate (1/hr)	not used	5.000E-01	---	REXG
R021	Height of the building (room) (m)	not used	2.500E+00	---	HRM
R021	Building interior area factor	not used	0.000E+00	---	FAI
R021	Building depth below ground surface (m)	not used	-1.000E+00	---	DMFL
R021	Emanating power of Rn-222 gas	not used	2.500E-01	---	EMANA(1)
R021	Emanating power of Rn-220 gas	not used	1.500E-01	---	EMANA(2)
TITL	Number of graphical time points	32	---	---	NPTS
TITL	Maximum number of integration points for dose	17	---	---	LYMAX

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (if different from user input)	Parameter Name
TITLE	Maximum number of integration points for risk	257	---	---	KYMAX

Summary of Pathway Selections

Pathway	User Selection
1 -- external gamma	active
2 -- inhalation (w/o radon)	active
3 -- plant ingestion	active
4 -- meat ingestion	active
5 -- milk ingestion	active
6 -- aquatic foods	active
7 -- drinking water	active
8 -- soil ingestion	active
9 -- radon	suppressed
Find peak pathway doses	active

Contaminated Zone Dimensions		Initial Soil Concentrations, pCi/g	
Area:	10000.00 square meters	Pb-210	5.000E+00
Thickness:	0.15 meters	Ra-226	5.000E+00
Cover Depth:	0.00 meters		

Total Dose TDOSE(t), mrem/yr

Basic Radiation Dose Limit = 2.500E+01 mrem/yr

Total Mixture Sum M(t) = Fraction of Basic Dose Limit Received at Time (t)

t (years):	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
TDOSE(t):	4.107E+01	4.064E+01	4.037E+01	3.872E+01	3.403E+01	1.665E+01	0.000E+00	0.000E+00
M(t):	1.643E+00	1.634E+00	1.615E+00	1.549E+00	1.361E+00	6.659E-01	0.000E+00	0.000E+00

Maximum TDOSE(t): 4.[illegible]E-01 mrem/yr at t = 0.000E+00 years

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract
Pb-210	1.486E-02	0.0004	9.943E-03	0.0002	0.000E+00	0.0000	2.[illegible]E+00	0.1898	1.134E+00	0.0376	5.[illegible]E-01	0.0126	9.765E-01	0.02
Ra-226	2.532E+01	0.5678	2.113E-03	0.0001	0.000E+00	0.0000	1.[illegible]E+00	0.1420	6.540E-01	0.0147	6.658E-01	0.0183	1.953E-01	0.00
Total	2.333E+01	0.5682	1.106E-02	0.0003	0.000E+00	0.0000	1.363E+01	0.3319	1.738E+00	0.0423	1.182E+00	0.0289	1.172E+00	0.02

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Dependent Pathways

Radio-	Water*		Fish		Radon		Plant		Meat		Milk		All Pathways	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	frac
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.041E+01	0.25
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.066E-01	0.74
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.107E+01	1.00

* Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	frac
Pb-210	1.439E-02	0.0004	7.035E-03	0.0002	0.000E+00	0.0000	7.462E+00	0.1927	1.090E+00	0.0267	4.966E-01	0.0127	9.386E-01	0.02
Ra-226	2.323E+01	0.5689	3.325E-03	0.0001	0.000E+00	0.0000	6.060E+00	0.1464	6.349E-01	0.0155	6.765E-01	0.0166	2.334E-01	0.00
Total	2.325E+01	0.5692	1.096E-02	0.0003	0.000E+00	0.0000	1.352E+01	0.3313	1.723E+00	0.0422	1.173E+00	0.0287	1.162E+00	0.02

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways	
nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	frac
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.401E+01	0.34
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.087E+01	0.75
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.084E+01	1.00

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	frac
Pb-210	1.346E-02	0.0006	7.053E-03	0.0002	0.000E+00	0.0000	6.863E+00	0.1708	1.007E+00	0.0249	4.588E-01	0.0114	8.673E-01	0.02
Ra-226	2.305E+01	0.5711	3.928E-03	0.0001	0.000E+00	0.0000	6.404E+00	0.1586	6.892E-01	0.0171	6.960E-01	0.0172	2.754E-01	0.00
Total	2.307E+01	0.5714	1.078E-02	0.0003	0.000E+00	0.0000	1.330E+01	0.3294	1.696E+00	0.0420	1.154E+00	0.0286	1.142E+00	0.02

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	frac
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.247E+00	0.22
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.112E+01	0.77
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.037E+01	1.00

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract
Pb-210	1.064E-02	0.0003	5.336E-03	0.0001	0.000E+00	0.0000	5.216E+00	0.1347	7.619E-01	0.0197	3.471E-01	0.0090	6.560E-01	0.01
Ra-226	2.240E+01	0.5790	4.814E-03	0.0001	0.000E+00	0.0000	7.308E+00	0.1887	8.354E-01	0.0216	7.398E-01	0.0191	4.194E-01	0.01
Total	2.243E+01	0.5793	1.015E-02	0.0003	0.000E+00	0.0000	1.252E+01	0.3234	1.597E+00	0.0412	1.087E+00	0.0281	1.075E+00	0.07

Total Dose Contributions TDOSE(i,p,t) For Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	frac
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.996E+00	0.18
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.173E+01	0.83
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.872E+01	1.00

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Pb-210	5.417E-03	0.0002	2.369E-03	0.0001	0.000E+00	0.0000	2.316E+00	0.0980	3.393E-01	0.0090	1.541E-01	0.0045	2.913E-01	0.01
Ra-226	2.048E+01	0.6019	6.061E-03	0.0002	0.000E+00	0.0000	8.093E+00	0.2378	5.990E-01	0.0181	7.429E-01	0.0220	6.015E-01	0.01
Total	2.049E+01	0.6021	8.430E-03	0.0002	0.000E+00	0.0000	1.041E+01	0.3059	1.327E+00	0.0390	9.039E-01	0.0266	8.927E-01	0.02

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	frac
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.107E+00	0.09
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.092E+01	0.90
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.403E+01	1.00

Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Fish	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	frac
Pb-210	4.499E-04	0.0000	9.836E-05	0.0000	0.000E+00	0.0000	9.619E-02	0.0058	1.406E-02	0.0008	6.402E-03	0.0004	1.209E-02	0.00
Ra-226	1.157E+01	0.6950	3.059E-03	0.0002	0.000E+00	0.0000	3.907E+00	0.2287	4.835E-01	0.0291	3.329E-01	0.0200	3.231E-01	0.01
Total	1.157E+01	0.6950	3.159E-03	0.0002	0.000E+00	0.0000	3.903E+00	0.2345	4.990E-01	0.0299	3.393E-01	0.0204	3.342E-01	0.02

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+02 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	frac
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.231E-01	0.00
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.652E+01	0.95
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.655E+01	1.00

Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+02 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	frac
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0

Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Groand		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	frac
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.00
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.00
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.00

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	frac
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.00
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.00
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.00

Sum of all water independent and dependent pathways.

Dose/Source Ratios Summed Over All Pathways
Parent And Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Thread Fraction	DSR(j,t) At Time In Years (mrem/yr)/(pCi/g) 0.000E+00	3.000E-00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Pb-210+D	Pb-210+D	1.000E+00	2.083E+00	2.082E+00	1.849E+00	1.339E+00	6.214E-01	3.586E-02	0.000E+00	0.000E+00
Ra-226+D	Ra-226+D	1.000E+00	6.051E+00	6.083E+00	6.005E+00	5.708E+00	5.180E+00	3.7[illegible]E+00	0.000E+00	0.000E+00
Ra-226+D	Pb-210+D	1.000E+00	3.865E-02	1.029E-01	2.198E-01	5.479E-01	9.945E-01	5.901E-01	0.000E+00	0.000E+00
Ra-226+D	ΣDSR(j)		6.131E+00	6.166E+00	6.224E+00	6.346E+00	6.154E+00	3.904E+00	0.000E+00	0.000E+00

The DSR includes contributions from accumulated (half-life < 180 days) daughters.

Single Radionuclide Soil Guidelines G(i,t) in pCi/g
Basic Radiation Dose Limit = 2.500E+01 mrem/yr

Nuclide (i)	t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Pb-210	1.200E+01	1.245E+01	1.352E+01	1.787E+01	4.023E+01	8.653E+02	*7.634E+13	*7.634E+13
Ra-226	4.078E+00	4.055E+00	4.016E+00	3.940E+00	4.042E+00	7.160E+00	*9.885E+11	*9.885E+11

*At specific activity limit

Summed Dose/Source Ratios DSR(i,t) in (mrem/yr)/(pCi/g)
and Single Radionuclide Soil Guidelines G(i,t) in pCi/g
at tmin = time of minimum single radionuclide soil guideline
and at tmax = time of maximum total dose = 0.000E+00 years

Nuclide (i)	Initial (pCi/g)	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
Pb-210	5.000E+00	0.000E+00	2.083E+00	1.200E+01	2.083E+00	1.200E+01
Ra-226	5.000E+00	14.58 ± 0.03	6.366E+00	3.927E+00	6.131E+00	4.078E+00

Individual Nuclide Dose Summed Over All Pathways
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	DOSE(j,t), mrem/yr							
			t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Pb-210	Pb-210	1.000E+00	1.041E+01	1.001E+01	9.247E+00	6.996E+00	3.397E+00	1.293E-01	0.000E+00	0.000E+00
Pb-210	Ra-226	1.000E+00	1.943E-01	5.147E-01	1.099E+00	2.739E+00	4.972E+00	2.900E+00	0.000E+00	0.000E+00
Pb-210	∑DOSE(j)		1.061E+01	1.052E+01	1.035E+01	9.735E+00	8.369E+00	2.939E+00	0.000E+00	0.000E+00
Ra-226	Ra-226	1.000E+00	3.046E+01	3.032E+01	3.002E+01	2.895E+01	2.595E+01	1.362E+01	0.000E+00	0.000E+00

THF(i) is the thread fraction of the parent nuclide.

Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	S(j,t), pCi/g							
			t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Pb-210	Pb-210	1.000E+00	5.000E+00	4.836E+00	4.531E+00	3.680E+00	1.866E+00	1.830E-01	2.616E-04	5.677E-14
Pb-210	Ra-226	1.000E+00	0.000E+00	1.628E-01	4.431E-01	1.315E+00	3.[illegible]E+00	4.110E+00	3.251E+00	1.226E+00
Pb-210	∑S(j):		5.000E+00	4.998E+00	4.974E+00	4.915E+00	4.759E+00	4.298E+00	3.251E+00	1.226E+00
Ra-226	Ra-226	1.000E+00	5.000E+00	4.993E+00	4.979E+00	4.931E+00	4.795E+00	4.350E+00	3.291E+00	1.241E+00

THF(i) is the thread fraction of the parent nuclide.

RESCALC.EXE execution time = 25.31 seconds

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Dose Conversion Factor (and Related) Parameter Summary
File: PSR 13 MORBIDITY

Menu	Parameter	Current Value	Rand Case	Parameter Name
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Ac-227+D	6.700E+00	6.700E+00	DCF2(1)
B-1	Pa-231	1.280E+00	1.280E+00	DCF2(2)
B-1	Pb-210+D	3.320E-02	1.360E-02	DCF2(3)
B-1	Ra-226+D	8.594E-03	8.580E-03	DCF2(4)
B-1	Th-230	3.360E-01	3.260E-01	DCF2(5)
B-1	U-234	1.320E-01	1.320E-01	DCF2(6)
B-1	U-235+D	1.230E-01	1.230E-01	DCF2(7)
B-1	U-238	1.180E-01	1.150E-01	DCF2(8)
B-1	U-238+D	1.180E-01	1.150E-01	DCF2(9)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Ac-227+D	1.480E-02	1.410E-02	DCF3(1)
D-1	Pa-231	1.090E-02	1.060E-02	DCF3(2)
D-1	Pb-210+D	7.270E-03	5.170E-03	DCF3(3)
D-1	Ra-226+D	1.320E-03	1.320E-03	DCF3(4)
D-1	Th-230	9.480E-04	9.480E-04	DCF3(5)
D-1	U-234	2.830E-04	2.830E-04	DCF3(6)
D-1	U-235+D	2.670E-04	2.660E-04	DCF3(7)
D-1	U-238	2.550E-04	2.550E-04	DCF3(8)
D-1	U-238+D	2.667E-04	2.550E-04	DCF3(9)
	Food transfer factors:			
D-34	Ac-227+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(1,1)
D-34	Ac-227+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-05	2.000E-05	RTF(1,2)
D-34	Ac-227+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(1,3)
D-34				
D-34	Pa-231 , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(2,1)
D-34	Pa-231 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(2,2)
D-34	Pa-231 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(2,3)
D-34				
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(3,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF(3,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(3,3)
D-34				
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(4,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(4,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(4,3)
D-34				
D-34	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(5,1)
D-34	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(5,2)
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(5,3)
D-34				
D-34	U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(6,1)
D-34	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(6,2)
D-34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(6,3)
D-34				
D-34	U-235+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(7,1)
D-34	U-235+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(7,2)
D-34	U-235+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(7,3)
D-34				

Dose Conversion Factor (and Related) Parameter Summary (continued)
File: MGR L3 MORBIDITY

Menu	Parameter	Current Value	Base Case*	Parameter Name
D-34	U-238 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(8,1)
D-35	U-238 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(8,2)
D-36	U-238 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(8,3)
D-34				
D-34	U-238+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(9,1)
D-35	U-238+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(9,2)
D-36	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(9,3)
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	Ac-227+D , fish	1.000E+01	1.000E+01	BIOFAC(1,1)
D-5	Ac-227+D , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(1,2)
D-5				
D-5	Pa-231 , fish	1.000E+01	1.000E+01	BIOFAC(2,1)
D-5	Pa-231 , crustacea and mollusks	1.100E+02	1.100E+02	BIOFAC(2,2)
D-5				
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC(3,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(3,2)
D-5				
D-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC(4,1)
D-5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(4,2)
D-5				
D-5	Th-230 , fish	1.000E+02	1.000E+02	BIOFAC(5,1)
D-5	Th-230 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(5,2)
D-5				
D-5	U-234 , fish	1.000E+01	1.000E+01	BIOFAC(6,1)
D-5	U-234 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(6,2)
D-5				
D-5	U-235+D , fish	1.000E+01	1.000E+01	BIOFAC(7,1)
D-5	U-235+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(7,2)
D-5				
D-5	U-238 , fish	1.000E+01	1.000E+01	BIOFAC(8,1)
D-5	U-238 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(8,2)
D-5				
D-5	U-238+D , fish	1.000E+01	1.000E+01	BIOFAC(9,1)
D-5	U-238+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(9,2)

*Base Case means Default.lib w/o Associate Nuclide contributions.

Site-Specific Parameter Summary

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	1.000E+04	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	1.540E-01	2.000E+00	---	THICK0
R011	Length parallel to aquifer flow (m)	1.000E+02	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	2.500E+02	3.000E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T(2)
R011	Times for calculations (yr)	3.000E+00	3.000E+00	---	T(3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	---	T(4)
R011	Times for calculations (yr)	3.000E+01	3.000E+01	---	T(5)
R011	Times for calculations (yr)	1.000E+02	1.000E+02	---	T(6)
R011	Times for calculations (yr)	3.000E+02	3.000E+02	---	T(7)
R011	Times for calculations (yr)	1.000E+03	1.000E+03	---	T(8)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): U-234	4.800E+01	0.000E+00	---	S1(6)
R012	Initial principal radionuclide (pCi/g): U-235	2.200E+00	0.000E+00	---	S1(7)
R012	Initial principal radionuclide (pCi/g): U-238	4.800E+01	0.000E+00	---	S1(8)
R012	Concentration in groundwater (pCi/L): U-234	not used	0.000E+00	---	W1(6)
R012	Concentration in groundwater (pCi/L): U-235	not used	0.000E+00	---	W1(7)
R012	Concentration in groundwater (pCi/L): U-238	not used	0.000E+00	---	W1(8)
R013	Cover depth (m)	0.000E+00	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)	not used	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	not used	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.360E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.000E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	2.000E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	1.000E+02	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	5.300E+00	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	6.600E+00	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	7.500E-01	5.500E-01	---	EVAPTR
R013	Precipitation (m/yr)	2.400E-01	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	2.000E-01	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	2.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	7.000E+07	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	1.000E-03	1.000E-03	---	EPS
R014	Density of saturated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	2.300E-01	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	1.000E-01	2.000E-01	---	EPSZ
R014	Saturated zone field capacity	2.000E-01	2.000E-01	---	FCSZ
R014	Saturated zone hydraulic conductivity (m/yr)	1.000E+03	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	2.000E-02	2.000E-02	---	HGWT
R014	Saturated zone b parameter	not used	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	0.000E+00	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	7.320E+02	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	ND	ND	---	MODEL

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (IF different from user input)	Parameter Name
R014	Well pumping rate (m**3/yr)	2.500E+02	2.500E+02	---	WW
R015	Number of unsaturated zone strata	1	1	---	NS
R015	Unsat. zone 1, thickness (m)	1.000E+02	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	1.440E+00	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	2.500E-01	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	1.000E-01	2.000E-01	---	EPUZ(1)
R015	Unsat. zone 1, field capacity	2.000E-01	2.000E-01	---	FCUZ(1)
R015	Unsat. zone 1, soil-specific b parameter	4.500E+00	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	1.370E+03	1.000E+01	---	HCUZ(1)
R016	Distribution coefficients for U-234				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(6)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(6,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(6)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	9.576E-03	ALEACH(6)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(6)
R016	Distribution coefficients for U-235				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(7)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(7,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(7)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	9.576E-03	ALEACH(7)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(7)
R016	Distribution coefficients for U-238				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(8)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(8,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(8)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	9.576E-03	ALEACH(8)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(8)
R016	Distribution coefficients for daughter Ac-227				
R016	Contaminated zone (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCC(1)
R016	Unsaturated zone 1 (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCU(1,1)
R016	Saturated zone (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.382E-02	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for daughter Th-231				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(2)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(2,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	9.576E-03	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R016	Distribution coefficients for daughter Pb-210				
R016	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCC(3)
R016	Unsaturated zone 1 (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCU(3,1)
R016	Saturated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	9.576E-03	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (if different from user input)	Parameter Name
RD16	Distribution coefficients for daughter Ra-226				
RD16	Contaminated zone (cm^3/g)	7.000E+01	7.000E+01	---	DCNUCC(4)
RD16	Unsaturated zone 1 (cm^3/g)	7.000E+01	7.000E+01	---	DCNUCU(4,1)
RD16	Saturated zone (cm^3/g)	7.000E+01	7.000E+01	---	DCNUCS(4)
RD16	Leach rate (/yr)	0.000E+00	0.000E+00	6.931E+03	ALEACH(4)
RD16	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)
RD16	Distribution coefficients for daughter Th-230				
RD16	Contaminated zone (cm^3/g)	6.000E+04	6.000E+04	---	DCNUCC(5)
RD16	Unsaturated zone 1 (cm^3/g)	6.000E+04	6.000E+04	---	DCNUCU(5,1)
RD16	Saturated zone (cm^3/g)	6.000E+04	6.000E+04	---	DCNUCS(5)
RD16	Leach rate (/yr)	0.000E+00	0.000E+00	8.007E-06	ALEACH(5)
RD16	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(5)
RD17	Inhalation rate (m^3/yr)	8.400E+03	8.400E+03	---	INHALR
RD17	Mass loading for inhalation (g/m^3)	1.000E-04	1.000E-04	---	MLINH
RD17	Exposure duration	3.000E+01	3.000E+01	---	ED
RD17	Shielding factor, inhalation	4.000E-01	4.000E-01	---	SHF3
RD17	Shielding factor, external gamma	7.000E-01	7.000E-01	---	SHF1
RD17	Fraction of time spent indoors	5.000E-01	5.000E-01	---	FIND
RD17	Fraction of time spent outdoors (on site)	2.500E-01	2.500E-01	---	FOTD
RD17	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows circular AREA.	FS
RD17	Radii of shape factor array (used if FS = -1):				
RD17	Outer annular radius (m), ring 1:	not used	5.000E+01	---	RAD_SHAPE(1)
RD17	Outer annular radius (m), ring 2:	not used	9.071E+01	---	RAD_SHAPE(2)
RD17	Outer annular radius (m), ring 3:	not used	0.000E+00	---	RAD_SHAPE(3)
RD17	Outer annular radius (m), ring 4:	not used	0.000E+00	---	RAD_SHAPE(4)
RD17	Outer annular radius (m), ring 5:	not used	0.000E+00	---	RAD_SHAPE(5)
RD17	Outer annular radius (m), ring 6:	not used	0.000E+00	---	RAD_SHAPE(6)
RD17	Outer annular radius (m), ring 7:	not used	0.000E+00	---	RAD_SHAPE(7)
RD17	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE(8)
RD17	Outer annular radius (m), ring 9:	not used	0.000E+00	---	RAD_SHAPE(9)
RD17	Outer annular radius (m), ring 10:	not used	0.000E+00	---	RAD_SHAPE(10)
RD17	Outer annular radius (m), ring 11:	not used	0.000E+00	---	RAD_SHAPE(11)
RD17	Outer annular radius (m), ring 12:	not used	0.000E+00	---	RAD_SHAPE(12)
RD17	Fractions of annular areas within AREA:				
RD17	Ring 1	not used	1.000E+00	---	FRACA(1)
RD17	Ring 2	not used	2.752E-01	---	FRACA(2)
RD17	Ring 3	not used	0.000E+00	---	FRACA(3)
RD17	Ring 4	not used	0.000E+00	---	FRACA(4)
RD17	Ring 5	not used	0.000E+00	---	FRACA(5)
RD17	Ring 6	not used	0.000E+00	---	FRACA(6)
RD17	Ring 7	not used	0.000E+00	---	FRACA(7)
RD17	Ring 8	not used	0.000E+00	---	FRACA(8)
RD17	Ring 9	not used	0.000E+00	---	FRACA(9)
RD17	Ring 10	not used	0.000E+00	---	FRACA(10)
RD17	Ring 11	not used	0.000E+00	---	FRACA(11)
RD17	Ring 12	not used	0.000E+00	---	FRACA(12)
RD18	Fruits, vegetables and grain consumption (kg/yr)	1.600E+02	1.600E+02	---	DIET(1)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from User Input)	Parameter Name
R018	Leafy vegetable consumption (kg/yr)	1.400E+01	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	9.300E+01	9.300E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	6.300E+01	6.300E+01	---	DIET(4)
R018	Fish consumption (kg/yr)	5.400E+00	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	9.000E-01	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	3.650E+01	3.650E+01	---	SOIL
R018	Drinking water intake (L/yr)	5.100E+02	5.100E+02	---	DWI
R018	Contamination fraction of drinking water	1.000E+00	1.000E+00	---	FDW
R018	Contamination fraction of household water	not used	1.000E+00	---	FHHW
R018	Contamination fraction of livestock water	1.000E+00	1.000E+00	---	FLW
R018	Contamination fraction of irrigation water	1.000E+00	1.000E+00	---	FIRW
R018	Contamination fraction of aquatic food	5.000E-01	5.000E-01	---	FR9
R019	Contamination fraction of plant food	2.500E-03	-1	---	FPLANT
R018	Contamination fraction of meat	7.500E-01	-1	---	FMEAT
R018	Contamination fraction of milk	7.500E-01	-1	---	FMILK
R019	Livestock fodder intake for meat (kg/day)	6.800E+01	6.800E+01	---	LFI5
R019	Livestock fodder intake for milk (kg/day)	5.500E+01	5.500E+01	---	LFI6
R019	Livestock water intake for meat (L/day)	5.000E+01	5.000E+01	---	LWI5
R019	Livestock water intake for milk (L/day)	1.600E+02	1.600E+02	---	LWI6
R019	Livestock soil intake (kg/day)	5.000E-01	5.000E-01	---	LSI
R019	Mass loading for foliar deposition (g/m**3)	3.000E-04	1.000E-04	---	MLFD
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	---	DM
[illegible]	Depth of roots (m)	9.000E-01	9.000E-01	---	DROOT
[illegible]	Drinking water fraction from ground water	1.000E+00	1.000E+00	---	FGWDW
R019	Household water fraction from ground water	not used	1.000E+00	---	FGWHH
R019	Livestock water fraction from ground water	1.000E+00	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	1.000E+00	1.000E+00	---	FGWIR
R19B	Net weight crop yield for Non-Leafy (kg/m**2)	7.000E-01	7.000E-01	---	YV(1)
R19B	Net weight crop yield for Leafy (kg/m**2)	1.500E+00	1.500E+00	---	YV(2)
R19B	Net weight crop yield for Fodder (kg/m**2)	1.100E+00	1.100E+00	---	YV(3)
R19B	Growing Season for Non-Leafy (years)	1.700E-01	1.700E-01	---	TE(1)
R19B	Growing Season for Leafy (years)	2.500E-01	2.500E-01	---	TE(2)
R19B	Growing Season for Fodder (years)	8.000E-02	8.000E-02	---	TE(3)
R19B	Translocation Factor for Non-Leafy	1.000E-01	1.000E-01	---	TIV(1)
R19B	Translocation Factor for Leafy	1.000E+00	1.000E+00	---	TIV(2)
R19B	Translocation Factor for Fodder	1.000E+00	1.000E+00	---	TIV(3)
R19B	Dry Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	---	RDRY(1)
R19B	Dry Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	---	RDRY(2)
R19B	Dry Foliar Interception Fraction for Fodder	2.500E-01	2.500E-01	---	RDRY(3)
R19B	Wet Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	---	RWET(1)
R19B	Wet Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	---	RWET(2)
R19B	Wet Foliar Interception Fraction for Fodder	2.500E-01	2.500E-01	---	RWET(3)
R19B	Weathering Removal Constant for Vegetation	2.000E+01	2.000E+01	---	WLAM
C14	C-12 concentration in water (g/cm**3)	not used	2.000E-05	---	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	---	C12CZ
C14	Fraction of vegetation carbon from soil	not used	2.000E-02	---	CSOIL
C14	Fraction of vegetation carbon from air	not used	9.800E-01	---	CAIR
[illegible]	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	---	DMC

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (if different from user input)	Parameter Name
C14	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	---	EVSN
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	---	REVSN
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	---	AVFG4
C14	Fraction of grain in milk cow feed	not used	2.200E-01	---	AVFG5
C14	DCF conversion factor for gaseous forms of C14	not used	3.000E+00	---	DCFC
STOR	Storage times of contaminated foodstuffs (days):				
STOR	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	---	STOR_T(1)
STOR	Leafy vegetables	1.000E+00	1.000E+00	---	STOR_T(2)
STOR	Milk	1.000E+00	1.000E+00	---	STOR_T(3)
STOR	Meat and poultry	2.000E+01	2.000E+01	---	STOR_T(4)
STOR	Fish	7.000E-00	7.000E+00	---	STOR_T(5)
STOR	Crustacea and mollusks	7.000E+00	7.000E+00	---	STOR_T(6)
STOR	Well water	1.000E+00	1.000E+00	---	STOR_T(7)
STOR	Surface water	1.000E+00	1.000E+00	---	STOR_T(8)
STOR	Livestock fodder	4.500E+01	4.500E+01	---	STOR_T(9)
R021	Thickness of building foundation (m)	not used	1.500E+01	---	FLOOR1
R021	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	---	BDENFL
R021	Total porosity of the cover material	not used	4.000E-01	---	TPCV
R021	Total porosity of the building foundation	not used	1.000E-01	---	TPFL
R021	Volumetric water content of the cover material	not used	5.000E-02	---	PH2OCV
R021	Volumetric water content of the foundation	not used	3.000E-02	---	PH2OFL
R021	Diffusion coefficient for radon gas (m/sec):				
R021	in cover material	not used	2.000E-06	---	DIFCV
R021	in foundation material	not used	3.000E-07	---	DIFFL
R021	in contaminated zone soil	not used	2.000E-06	---	DIFCZ
R021	Radon vertical dimension of mixing (m)	not used	2.000E+00	---	HMIX
R021	Average building air exchange rate (1/hr)	not used	5.000E-01	---	REXG
R021	Height of the building (room) (m)	not used	2.500E+00	---	HRM
R021	Building interior area factor	not used	0.000E+00	---	FAI
R021	Building depth below ground surface (m)	not used	-1.000E+00	---	DHFL
R021	Emanating power of Rn-222 gas	not used	2.500E-01	---	EMANA(1)
R021	Emanating power of Rn-220 gas	not used	1.500E-01	---	EMANA(2)
TITL	Number of graphical time points	32	---	---	NPTS
TITL	Maximum number of integration points for dose	17	---	---	IDMAX
TITL	Maximum number of integration points for risk	257	---	---	IRMAX

Summary of Pathway Selections

Pathway	User Selection
1 -- external gamma	active
2 -- inhalation (w/o radon)	active
3 -- plant ingestion	active
4 -- meat ingestion	active
5 -- milk ingestion	active
6 -- aquatic foods	active
7 -- drinking water	active
8 -- soil ingestion	active
9 -- radon	suppressed
Find peak pathway doses	active

Contaminated Zone Dimensions		Initial Soil Concentrations, pCi/g	
Area:	10000.00 square meters	U-234	4.850E+01
Thickness:	0.15 meters	U-235	2.200E+00
Cover Depth:	0.00 meters	U-238	4.830E+01

Total Dose TDOSE(t), mrem/yr
Basic Radiation Dose Limit = 2.500E+01 mrem/yr
Total Mixture Sum M(t) = Fraction of Basic Dose Limit Received at Time (t)

t (years):	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
TDOSE(t):	8.064E+00	7.965E+00	7.741E+00	7.027E+00	5.275E+00	1.518E+00	0.000E+00	0.000E+00
M(t):	3.226E-01	3.186E-01	3.096E-01	2.811E-01	2.110E-01	6.071E-02	0.000E+00	0.000E+00

Maximum TDOSE(t): 8.064E+00 mrem/yr at t = 0.000E+00 years

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Egg mrem/yr	Egg fract.
U-234	9.876E-03	0.0012	4.472E-01	0.0555	0.000E+00	0.0000	7.476E-01	0.0927	1.292E-01	0.0160	2.938E-01	0.0362	3.758E-01	0.0466
U-235	8.027E-01	0.0995	1.875E-02	0.0023	0.000E+00	0.0000	3.180E-02	0.0039	5.733E-03	0.0007	1.240E-02	0.0015	1.593E-02	0.0020
U-238	3.309E+00	0.4104	3.959E-01	0.0496	0.000E+00	0.0000	7.294E-01	0.0905	1.227E-01	0.0152	2.771E-01	0.0344	3.368E-01	0.0442
Total	4.133E+00	0.5111	8.689E-01	0.1074	0.000E+00	0.0000	1.489E+00	0.1847	2.574E-01	0.0319	5.913E-01	0.0731	7.485E-01	0.0926

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Dependent Pathways

Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.001E+00	0.2482
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.871E-01	0.1100
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.176E+00	0.6418
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.064E+00	1.0000

*Sum of all Water Independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years

Water Independent Pathways (Inhalation Excludes Radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	9.780E-03	0.0012	4.408E-01	0.0553	0.000E+00	0.0000	7.255E-01	0.0925	1.272E-01	0.0160	2.871E-01	0.0361	3.697E-01	0.0465
U-235	7.942E-01	0.0998	1.845E-02	0.0023	0.000E+00	0.0000	3.147E-02	0.0039	5.539E-03	0.0007	1.328E-02	0.0015	1.577E-02	0.0020
U-238	3.278E-02	0.4113	3.534E-01	0.0445	0.000E+00	0.0000	6.984E-01	0.0889	1.207E-01	0.0152	2.726E-01	0.0343	3.510E-01	0.0441
Total	4.075E+00	0.5124	5.519E-01	0.1071	0.000E+00	0.0000	1.368E+00	0.1342	2.534E-01	0.0319	5.719E-01	0.0719	7.365E-01	0.0926

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.969E+00	0.2472
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.776E-01	0.1103
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.104E+00	0.6421
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.955E+00	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	9.595E-03	0.0012	4.259E-01	0.0550	0.000E+00	0.0000	7.119E-01	0.0920	1.231E-01	0.0159	2.779E-01	0.0359	3.578E-01	0.0462
U-235	7.776E-01	0.1005	3.787E-02	0.0049	0.000E+00	0.0000	3.261E-02	0.0042	5.547E-03	0.0007	1.393E-02	0.0018	1.620E-02	0.0209
U-238	3.199E+00	0.4132	3.809E-01	0.0492	0.000E+00	0.0000	6.758E-01	0.0873	1.168E-01	0.0151	2.698E-01	0.0349	3.397E-01	0.0439
Total	3.986E+00	0.5149	4.245E-01	0.1085	0.000E+00	0.0000	1.418E+00	0.1832	2.455E-01	0.0317	5.535E-01	0.0715	7.123E-01	0.0921

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.906E+00	0.2462
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.567E-01	0.1105
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.975E+00	0.6428
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.741E+00	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions (DOSE(i,p,t)) for Individual Radionuclides (pi)
As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio-nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
U-234	4.994E-03	0.0013	3.710E-01	0.0540	0.0000E+00	0.0000	6.540E-01	0.0902	3.096E-01	0.0155	3.474E-01	0.0352	3.187E-01	0.[illegible]
U-235	7.215E-01	0.1027	1.596E-02	0.0023	0.0000E+00	0.0000	3.794E-02	0.0040	5.514E-03	0.0008	1.022E-02	0.0010	1.368E-02	0.0019
U-238	2.958E+00	0.4200	3.301E-01	0.0483	0.0000E+00	0.0000	6.019E-01	0.0927	3.041E-01	0.0148	3.350E-01	0.0334	3.035E-01	0.0431
Total:	3.682E+00	0.5240	7.303E-01	0.1045	0.0000E+00	0.0000	1.648E+00	0.1700	3.103E+01	0.0312	4.920E-01	0.0701	6.349E-01	0.0902

Total Dose Contributions (DOSE(i,p,t)) for Individual Radionuclides (pi) and Pathways (pt)
As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years

Water Dependent Pathways

Radio-nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
U-234	0.0000E+00	0.0000	0.0000E+00	0.0000	0.0000E+00	0.0000	0.0000E+00	0.0000	0.0000E+00	0.0000	0.0000E+00	0.0000	1.690E+00	0.2417
U-235	0.0000E+00	0.0000	0.0000E+00	0.0000	0.0000E+00	0.0000	0.0000E+00	0.0000	0.0000E+00	0.0000	0.0000E+00	0.0000	7.952E-01	0.1137
U-238	0.0000E+00	0.0000	0.0000E+00	0.0000	0.0000E+00	0.0000	0.0000E+00	0.0000	0.0000E+00	0.0000	0.0000E+00	0.0000	4.538E-01	0.0649
Total:	0.0000E+00	0.0000	0.0000E+00	0.0000	0.0000E+00	0.0000	0.0000E+00	0.0000	0.0000E+00	0.0000	0.0000E+00	0.0000	7.027E+00	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TODSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground mrem/yr	Ground fract.	Inhalation mrem/yr	Inhalation fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	Soil mrem/yr	Soil fract.
U-234	7.637E-03	0.0014	2.684E-01	0.0505	0.000E+00	0.0000	4.488E-01	0.0850	7.754E-02	0.0147	1.780E-01	0.0332	2.255E-01	0.0427
U-235	5.781E-01	0.1095	1.145E-02	0.0022	0.000E+00	0.0000	2.122E-02	0.0040	5.070E-03	0.0010	7.444E-03	0.0014	9.938E-03	0.0013
U-238	2.324E+00	0.4403	2.339E-01	0.0454	0.000E+00	0.0000	4.250E-01	0.0807	7.361E-02	0.0139	1.462E-01	0.0315	2.140E-01	0.0405
Total	2.910E+00	0.5511	5.197E-01	0.0984	0.000E+00	0.0000	8.450E-01	0.1600	1.563E-01	0.0296	3.487E-01	0.0660	4.474E-01	0.0845

Total Dose Contributions TODSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+01 years

Water Dependent Pathways

Radio-Nuclide	Water mrem/yr	Water fract.	Fish mrem/yr	Fish fract.	Radon mrem/yr	Radon fract.	Plant mrem/yr	Plant fract.	Meat mrem/yr	Meat fract.	Milk mrem/yr	Milk fract.	All Pathways* mrem/yr	All Pathways* fract.
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.203E+00	0.2278
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.339E-01	0.1200
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.440E+00	0.6522
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.276E+00	1.0000

(*)Sum of all water independent and dependent pathways.

Total Dose Contributions TH05E15,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+02 years

Water Independent Pathways (inhalation excludes radon)

Radio-Nuclide	Ground mrem/yr	Ground Fract.	Inhalation mrem/yr	Inhalation Fract.	Radon mrem/yr	Radon Fract.	Plant mrem/yr	Plant Fract.	Meat mrem/yr	Meat Fract.	Milk mrem/yr	Milk Fract.	Soil mrem/yr	Soil Fract.
U-234	4.671E-03	0.0031	5.703E-02	0.0376	0.000E+00	0.0000	9.552E-02	0.0629	1.649E-02	0.0109	3.712E-02	0.0245	4.791E-02	0.0316
U-235	2.108E-01	0.1389	2.586E-03	0.0017	0.000E+00	0.0000	5.659E-03	0.0037	1.947E-03	0.0013	1.582E-03	0.0010	2.330E-03	0.0015
U-238	7.969E-01	0.5250	5.084E-02	0.0335	0.000E+00	0.0000	9.029E-02	0.0595	1.561E-02	0.0103	3.523E-02	0.0232	4.536E-02	0.0299
Total	1.012E+00	0.6670	1.108E-01	0.0728	0.000E+00	0.0000	1.913E-01	0.1261	4.406E-02	0.0290	9.194E-02	0.0487	9.580E-02	0.0630

Total Dose Contributions TH05E(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+02 years

Water Dependent Pathways

Radio-Nuclide	Water mrem/yr	Water Fract.	Fish mrem/yr	Fish Fract.	Radon mrem/yr	Radon Fract.	Plant mrem/yr	Plant Fract.	Meat mrem/yr	Meat Fract.	Milk mrem/yr	Milk Fract.	All Pathways* mrem/yr	All Pathways* Fract.
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.587E-01	0.1704
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.250E-01	0.1482
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.034E+00	0.6813
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.518E+00	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+02 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

*Sum of all water independent and dependent pathways.

Dose/Source Ratios Summed Over All Pathways

Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Progeny (j)	Thread Fraction	DSR(j,t) At Time in Years (mrem/yr)/(pCi/g) 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
U-234	U-234	1.000E+00	4.093E-02	4.027E-02	3.898E-02	3.472E-02	2.458E-02	5.240E-03	0.000E+00	0.000E+00
U-234	Th-230	1.000E+00	2.382E-07	6.950E-07	1.975E-06	4.342E-06	9.855E-06	1.009E-05	0.000E+00	0.000E+00
U-234	Ra-226+D	1.000E+00	3.8[illegible]E-09	2.701E-06	7.814E-07	1.191E-06	3.230E-06	3.582E-05	0.000E+00	0.000E+00
U-234	Pb-210+D	1.000E+00	1.4[illegible]E-11	7.856E-10	7.910E-09	4.178E-08	6.686E-07	4.027E-06	0.000E+00	0.000E+00
U-234	ΣDSR(j)		4.093E-02	4.027E-02	3.972E-02	3.472E-02	2.458E-02	5.291E-03	0.000E+00	0.000E+00
U-235+D	U-235+D	1.000E+00	4.032E-01	3.987E-01	3.900E-01	3.609E-01	2.956E-01	1.004E-01	0.000E+00	0.000E+00
U-235+D	Pa-231	1.000E+00	4.667E-05	1.461E-04	3.036E-04	9.048E-04	1.879E-03	1.331E-03	0.000E+00	0.000E+00
U-235+D	Ac-227+D	1.000E+00	3.603E-07	2.211E-06	1.042E-05	7.359E-05	3.497E-04	5.159E-04	0.000E+00	0.000E+00
U-235+D	ΣDSR(j)		4.032E-01	4.069E-01	3.903E-01	3.614E-01	2.976E-01	1.023E-01	0.000E+00	0.000E+00
U-238	U-238	5.400E-05	3.981E-06	1.949E-06	1.886E-06	1.680E-06	1.148E-06	2.556E-07	0.000E+00	0.000E+00
U-238+D	U-238+D	9.999E-01	1.053E-01	1.043E-01	1.028E-01	9.272E-02	7.041E-02	2.115E-02	0.000E+00	0.000E+00
U-238+D	U-234	9.999E-01	5.798E-08	1.711E-07	3.846E-07	1.033E-06	2.129E-06	1.403E-06	0.000E+00	0.000E+00
U-238+D	Th-230	9.999E-01	7.286E-13	1.542E-12	7.394E-12	6.368E-11	4.056E-10	1.210E-09	0.000E+00	0.000E+00
U-238+D	Ra-226+D	9.999E-01	2.683E-15	4.070E-14	4.707E-13	1.370E-11	2.316E-10	3.063E-09	0.000E+00	0.000E+00
U-238+D	Pb-210+D	9.999E-01	5.431E-18	2.257E-16	4.970E-15	3.168E-13	1.470E-11	3.378E-10	0.000E+00	0.000E+00
U-238+D	ΣDSR(j)		1.053E-01	1.043E-01	1.028E-01	9.272E-02	7.042E-02	2.115E-02	0.000E+00	0.000E+00

The DSR includes contributions from associated (half-life < 180 days) daughters.

Single Radionuclide Soil Guidelines G(i,t) in pCi/g

Basic Radiation Dose Limit = 2.500E+01 mrem/yr

Nuclide (i)	t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
U-234	6.109E+02	6.209E+02	6.414E+02	7.200E+02	1.016E+03	4.725E+03	*6.247E+03	*6.247E+03
U-235	6.200E+01	6.267E+01	6.405E+01	6.917E+01	8.505E+01	2.445E+02	*2.161E+06	*2.161E+06
U-238	2.362E+02	2.393E+02	2.457E+02	2.696E+02	3.550E+02	1.182E+03	*3.361E+05	*3.361E+05

*At specific activity limit

Summed Dose/Source Ratios DSR(j,t) in (mrem/yr)/(pCi/g)
and Single Radionuclide Soil Guidelines G(i,t) in pCi/g
at tmin = time of minimum single radionuclide soil guideline
and at tmax = time of maximum total dose = 0.000E+00 years

Nuclide (i)	Initial (pCi/g)	tmin (years)	DSR(j,tmin)	G(i,tmin) (pCi/g)	DSR(j,tmax)	G(i,tmax) (pCi/g)
U-234	4.890E+01	0.000E+00	4.093E-02	6.109E+02	4.093E-02	6.109E+02
U-235	2.200E+00	0.000E+00	4.032E-01	6.200E+01	4.032E-01	6.200E+01
U-238	4.890E+01	0.000E+00	1.053E-01	2.362E+02	1.053E-01	2.362E+02

Individual Nuclide Dose Summed Over All Pathways
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	DOSE(j,t), mrem/yr t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
U-234	U-234	1.000E+00	2.081E+00	1.969E+00	1.906E+00	1.699E+00	1.292E+00	2.562E-01	0.000E+00	0.000E+00
U-234	U-238	9.999E-01	2.829E-06	8.366E-06	1.890E-05	5.053E-05	1.559E-04	7.301E-05	0.000E+00	0.000E+00
U-234	∑DOSE(j)		2.081E+00	1.969E+00	1.906E+00	1.699E+00	1.292E+00	2.563E-01	0.000E+00	0.000E+00
Th-230	U-234	1.000E+00	1.165E-05	3.399E-05	7.703E-05	2.123E-04	4.819E-04	4.930E-04	0.000E+00	0.000E+00
Th-230	U-238	9.999E-01	1.119E-11	9.546E-11	3.643E-10	3.114E-09	1.966E-08	8.518E-08	0.000E+00	0.000E+00
Th-230	∑DOSE(j)		1.165E-05	3.399E-05	7.703E-05	2.123E-04	4.819E-04	4.931E-04	0.000E+00	0.000E+00
Ra-226	U-234	1.000E+00	1.071E-07	1.321E-06	6.912E-06	5.833E-05	4.052E-04	1.751E-03	0.000E+00	0.000E+00
Ra-226	U-238	9.999E-01	1.312E-13	1.906E-12	3.363E-11	5.720E-10	1.132E-08	1.498E-07	0.000E+00	0.000E+00
Ra-226	∑DOSE(j)		1.071E-07	1.321E-06	6.912E-06	5.833E-05	4.052E-04	1.752E-03	0.000E+00	0.000E+00
Pb-210	U-234	1.000E+00	6.986E-10	9.075E-09	9.355E-08	2.043E-06	3.271E-05	2.214E-04	0.000E+00	0.000E+00
Pb-210	U-238	9.999E-01	4.123E-16	1.104E-14	2.480E-23	3.549E-11	7.210E-10	1.613E-08	0.000E+00	0.000E+00
Pb-210	∑DOSE(j)		6.986E-10	9.075E-09	9.355E-08	2.043E-06	3.271E-05	2.214E-04	0.000E+00	0.000E+00
U-235	U-235	1.000E+00	8.870E-01	8.772E-01	8.679E-01	7.930E-01	6.284E-01	2.209E-01	0.000E+00	0.000E+00
Pa-231	U-235	1.000E+00	1.027E-04	3.214E-04	7.603E-04	2.001E-03	4.133E-03	2.928E-03	0.000E+00	0.000E+00
Ac-227	U-235	1.000E+00	7.527E-07	4.863E-04	3.292E-03	1.619E-02	7.672E-02	1.136E-01	0.000E+00	0.000E+00
[illegible]	U-238	5.480E-03	9.687E-05	9.531E-05	9.235E-05	8.319E-05	6.813E-05	1.235E-05	0.000E+00	0.000E+00
[illegible]	U-238	9.999E-01	5.176E+00	5.108E+00	4.976E+00	4.534E+00	3.443E+00	1.034E+00	0.000E+00	0.000E+00
U-238	∑DOSE(j)		5.176E+00	5.108E+00	4.976E+00	4.534E+00	3.443E+00	1.034E+00	0.000E+00	0.000E+00

THF(i) is the branch fraction of the parent nuclide.

Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	S(j,t), pCi/g t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
U-234	U-234	1.000E+00	4.830E+01	4.823E+01	4.751E+01	4.443E+01	3.660E+01	1.876E+01	2.765E+00	3.384E-03
U-234	U-238	9.999E-01	0.000E+00	1.373E-04	4.041E-04	1.260E-03	3.120E-03	3.320E-03	2.361E-03	9.606E-06
U-234	∑S(j):		4.830E+01	4.824E+01	4.752E+01	4.443E+01	3.660E+01	1.877E+01	2.765E+00	3.394E-03
Th-230	U-234	1.000E+00	0.000E+00	5.318E-04	1.308E-03	4.197E-03	1.147E-02	2.879E-02	4.720E-02	4.526E-02
Th-230	U-238	9.999E-01	0.000E+00	2.200E-10	2.600E-09	5.855E-09	4.646E-09	9.391E-06	1.560E-05	1.318E-05
Th-230	∑S(j):		0.000E+00	5.318E-04	1.308E-03	4.197E-03	1.148E-02	2.888E-02	4.921E-02	4.657E-02
Ra-226	U-234	1.000E+00	0.000E+00	9.482E-09	4.435E-07	9.015E-06	7.263E-05	5.550E-04	1.500E-03	2.693E-03
Ra-226	U-238	9.999E-01	0.000E+00	8.951E-14	2.785E-12	5.435E-11	1.998E-09	4.726E-08	3.908E-07	7.975E-07
Ra-226	∑S(j):		0.000E+00	9.482E-09	4.435E-07	9.015E-06	7.263E-05	5.550E-04	1.537E-03	2.693E-03
Pb-210	U-234	1.000E+00	0.000E+00	9.750E-10	2.564E-08	8.674E-07	1.825E-05	3.099E-04	1.280E-03	2.332E-03
Pb-210	U-238	9.999E-01	0.000E+00	6.910E-16	5.464E-14	6.188E-12	3.944E-10	2.245E-08	2.946E-07	6.862E-07
Pb-210	∑S(j):		0.000E+00	9.750E-10	2.564E-08	8.674E-07	1.825E-05	3.100E-04	1.550E-03	2.332E-03
U-235	U-235	1.000E+00	2.200E+00	2.179E+00	2.139E+00	1.999E+00	1.651E+00	8.484E-01	1.244E-01	1.527E-04
Pa-231	U-235	1.000E+00	0.000E+00	6.010E-05	1.357E-04	4.229E-04	1.047E-03	1.388E-03	7.877E-04	5.195E-06
Ac-227	U-235	1.000E+00	0.000E+00	7.227E-07	6.131E-06	5.307E-05	3.316E-04	9.683E-04	5.046E-04	2.161E-06
[illegible]	U-238	5.400E-05	2.641E-03	2.615E-03	2.566E-03	2.399E-03	1.881E-03	1.014E-03	1.493E-04	1.832E-07
U-238	U-238	9.999E-01	4.830E+01	4.824E+01	4.751E+01	4.443E+01	3.660E+01	1.877E+01	2.765E+00	3.394E-03
U-238	∑S(j):		4.830E+01	4.824E+01	4.752E+01	4.443E+01	3.660E+01	1.877E+01	2.765E+00	3.394E-03

THF(i) is the thread fraction of the parent nuclide.

RESCALC.EXE execution time = 117.53 seconds

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APPENDIX D

Reclamation Cost Estimates

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Closure Cost Estimate
Antelope and JAB In-Situ Recovery Project
Uranium One, Americas

Total Restoration and Reclamation Cost Estimates

No.	Cost Item	Cost
1	GROUNDWATER RESTORATION COST*	$25,113,794
2a1	PLANT EQUIPMENT REMOVAL AND DISPOSAL COST (CPP)	$482,741
2a2	PLANT EQUIPMENT REMOVAL AND DISPOSAL COST (SATELLITE)	$372,933
2b1	BUILDING DEMOLITION AND DISPOSAL COST (CPP)	$1,588,076
2b2	BUILDING DEMOLITION AND DISPOSAL COST (Satellite)	$391,768
3	SOIL REMOVAL & DISPOSAL COST	$625,530
4	TOTAL WELL ABANDONMENT COST	$1,343,672
5	WELLFIELD EQUIPMENT REMOVAL & DISPOSAL COST	$2,466,260
6	TOPSOIL REPLACEMENT & REVEGETATION COST	$979,319
7	MISCELLANEOUS RECLAMATION COST	$267,567
	Subtotal Restoration and Reclamation Cost Estimate -	$33,631,660
	Administration,Overhead and Contingency (25%) -	$8,407,915
	Total -	$42,039,575

*Includes 7 pore volumes for RO treatment, labor costs not included
Labor costs are included in 2a1 through 7 within unit prices

Worksheet 1, No. I --
GROUNDWATER RESTORATION

Cost Item	Mining Unit Antelope WF 1	Mining Unit JAB WF 1	Sub Total	Notes
Technical Assumptions				
Wellfield Area (Ft^2)	6,534,000	6,098,400		
Wellfield Area (Acres)	150.00	140.00		
Affected Ore Zone Area (Ft^2)	6,534,000	6,098,400		
Avg Completed Thickness (Ft)	20	20		
Factor for Flare	1.5	1.5		
Affected Volume:	196,020,000	182,952,000		
Porosity	0.25	0.25		
Gallons per Cubic Foot	7.48	7.48		
Gallon per Pore Volume	366,557,400	342,120,240		
Number of Wells in Unit(s)				
Recovery Wells	648	608		
Injection Wells	762	716		
Monitor Wells	88	81		
Average Well Spacing (Ft)	112	112		
Average Well Depth (Ft)	300	250		
I Groundwater Sweep				
A. Plant & Office				
Operating Assumptions:				
Flowrate (gpm)	1000	500		
PV's Required	1.00	1.00		
Total Gallons for Treatment	366,557,400	342,120,240		
Total Kgals for Treatment	366,557	342,120		
Cost Assumptions:				
Power				
Avg Connected Hp	100	100		
Kwh's/Hp	0.75	0.75		
$/Kwh	0.05	0.05		$.02 plus demand charges per quote
Gallons per Minute	1000	500		
Gallons per Hour	60000	30000		
Cost per Hour	$3.75	$3.75		
Cost per Kgal ($)	$0.063	$0.125		
Chemicals				
Barium Chloride ($/Kgals)	$0.041	$0.041		Costs from operating ISR facility experience (Cogema)
Antiscalent ($/Kgals)	$0.000	$0.000		Costs from operating ISR facility experience (Cogema)
Elution ($/Kgals)	$0.099	$0.099		Costs from operating ISR facility experience (Cogema)
Repair & Maintenance ($/Kgals)	$0.061	$0.061		Costs from operating ISR facility experience (Cogema)
Analysis ($/Kgals)	$0.164	$0.164		Costs from operating ISR facility experience (Cogema)
Total Cost per Kgal	$0.43	$0.49		
Total Treatment Cost	$156,703	$167,639		
Utilities				
Power ($/Month)	1,800	1200		
Propane ($/Month)	800	400		
Time for Treatment				
Minutes for Treatment	366,557	684,240		
Hours for Treatment	6,109	11,404		
Days for Treatment	255	475		
Average Days per Month	30	30		
Months for Treatment	8.5	15.8		
Years for Treatment	0.71	1.32		
Utilities Cost ($)	$22,061	$25,342		
TOTAL PLANT & OFFICE COST	**$178,765**	**$192,981**	**$371,746**	
B. WELLFIELD				
Cost Assumptions:				
Power				
Avg Flow/Pump (gpm)	5	5		
Avg Hp/Pump	5	5		
Avg # of Pumps Required	200	100		
Avg Connected Hp	1000	500		
Kwh's/Hp	0.75	0.75		
$/Kwh	0.05	0.05		
Gallons per Minute	1000	500		
Gallons per Hour	60000	30000		
Costs per Hour ($)	$37.50	$18.75		
Costs per Gallon ($)	$0.0006	$0.0006		
Costs per Kgal ($)	$0.63	$0.63		
Repair & Maintenance ($/Kgals)	$0.016	$0.016		
Total Cost per Kgal	$0.641	$0.641		
TOTAL WELLFIELD COST	$234,963	$219,299		
TOTAL GROUNDWATER SWEEP COST	**$413,728**	**$412,280**	**$826,008**	

Worksheet 1, No. II
GROUNDWATER RESTORATION

Cost Item	Mining Unit Antelope WF 1	Mining Unit JAB WF 1	Sub Total	Notes
II GW Treatment - RO				
A. PLANT				
Operating Assumptions:				
Flowrate (gpm)	1000	500		
PV's Required	7.00	7.00		
Total Gallons for Treatment	2,565,901,800	2,394,841,680		
Total Kgals for Treatment	2,565,902	2,394,842		
Feed to RO (gpm)	1000	500		
Permeate Flow (gpm)	750	375		
Brine Flow (gpm)	250	125		
Average RO Recovery	75%	75%		
Cost Assumptions:				
Power				
Avg Connected Hp	20	20		
kWh/Hp	0.75	0.75		
$/Kwh	0.05	0.05		$.02 plus demand charges per quote
Gallons per Minute	1000	500		
Gallons per Hour	60000	30000		
Cost per Hour ($)	$0.75	$0.75		
Cost per Gallon ($)	$0.0000	$0.0000		
Cost per Kgal ($)	$0.01	$0.03		
Chemicals				
Sulfuric Acid ($/Kgals)	$0.076	$0.076		Costs from operating ISR facility experience (Cogema)
Caustic Soda ($/Kgals)	$0.111	$0.111		Costs from operating ISR facility experience (Cogema)
Hydrochloric Acid ($Kgals)	$0.009	$0.009		Costs from operating ISR facility experience (Cogema)
Hydrochloric Sulfide ($Kgals)	$0.304	$0.304		Costs from operating ISR facility experience (Cogema)
Repair & Maintenance ($Kgals)	$0.279	$0.279		Costs from operating ISR facility experience (Cogema)
Sampling & Analysis ($/Kgals)	$0.164	$0.164		Costs from operating ISR facility experience (Cogema)
Total Cost per Kgal ($)	$0.96	$0.97		
Total Pumping Cost ($)	$2,451,719	$2,318,207		
Utilities				
Power ($/Month)	1,800	1,200		
Propane ($/Month)	800	400		
Time for Treatment	0	0		
Minutes for Treatment	2,565,902	4,789,683		
Hours for Treatment	42,765	79,828		
Days for Treatment	1,782	3,326		
Average Days per Month	30	30		
Months for Treatment	59	109		
Utilities Cost ($)	$152,397	$175,062		
TOTAL PLANT COST	**$2,604,116**	**$2,493,268**	**$5,097,385**	
B. WELLFIELD				
Cost Assumptions:				
Power				
Avg Flow/Pump (gpm)	1.54	0.82		
Avg Hp/Pump	5	5		
Avg # of Pumps Required	648	608		Using Recovery Pumps
Avg Connected Hp	3240	3040		
Kwh's/Hp	0.75	0.75		
$/Kwh	0.05	0.05		
Gallons per Minute	1000	500		
Gallons per Hour	60000	30000		
Costs per Hour ($)	$121.50	$114.00		
Costs per Gallon ($)	$0.0020	$0.0038		
Costs per Kgal ($)	$2.03	$3.80		
Repair & Maintenance ($/Kgals)	$0.016	$0.016		
Total Cost per Kgal	$2.041	$3.816		
TOTAL WELLFIELD COST	**$5,237,006**	**$9,138,716**	**$14,375,721**	
TOTAL GW TREATMENT RO COST	**$7,841,122**	**$11,631,984**	**$19,473,106**	

Surety Estimate
First Year of Operation
Moore Ranch ISR Project
Uranium One, Americas

Worksheet 1, No III --
GROUNDWATER RESTORATION

	Mining Unit			
Cost Item	Antelope WF 1	JAB WF 1	**Sub Total**	**Notes**
III Deep Disposal Well				
Operating Assumptions:				
Total Disposal Requirement				
RO Brine Total Gallons	641,475,450	598,710,420		
RO Brine Total Kgallons	641,475	598,710		
Brine Concentration Factor	1	1		
Total Concentrated Brine (Gals)	641,475,450	598,710,420		
Months of RO Operation	58.6	109.4		
Average Monthly Reqm't (Gallons)	10,944,000	5,472,000		
Average Brine Flow (gpm)	250.0	125.0		
Total DDW Disposal (Gallons)	641,475,450	598,710,420		
Total DDW Disposal (Kgallons)	641,475	598,710		
Cost Assumptions:				
Avg Connected Hp	150	150		
Kwh's/Hp	0.75	0.75		
$/Kwh	0.05	0.05		$.02 plus demand charges per quote
Gallons per Minute	250.0	125.0		
Gallons per Hour	15000	7500		
Cost per Hour ($)	$5.63	$5.63		
Cost per Gallon ($)	$0.0004	$0.0008		
Cost per Kgal ($)	$0.38	$0.75		
Chemicals				
RO Antiscalent ($/Kgals)	$0.192	$0.192		Costs from operating ISR facility experience (Cogema)
WDW Antiscalent ($/Kgals)	$0.226	$0.226		Costs from operating ISR facility experience (Cogema)
Sulfuric Acid ($/Kgals)	$0.280	$0.280		Costs from operating ISR facility experience (Cogema)
Corrosion Inhibitor	$0.217	$0.217		Costs from operating ISR facility experience (Cogema)
Algacide	$0.080	$0.080		Costs from operating ISR facility experience (Cogema)
Other	$0.000	$0.000		Costs from operating ISR facility experience (Cogema)
Repair & Maint. ($/Kgals)	$0.230	$0.230		Costs from operating ISR facility experience (Cogema)
Total Cost per Kgal	$1.600	$1.975		
TOTAL DEEP DISPOSAL WELL COST	**$1,026,361**	**$1,182,453**	**$2,208,814**	

Worksheet 1, Nos. IV & V --
GROUNDWATER RESTORATION

Cost Item	Mining Unit Antelope WF 1	Labor Cost Factors			JAB WF 1	Notes
IV STABILIZATION MONITORING						
Operating Assumptions:						
Time of Stabilization (mos)	58.6				109.4	
Frequency of Analysis (mos)	3				3	
Total Sets of Analysis	20				37	
Cost Assumptions:						
Power ($/Month)	$1,600				$1,600	
Total Power Cost	$93,783				$175,062	
Sampling & Analysis (each set)	$29,040				$26,730	88, 81 Monitoring Wells @ $330 per event
Total Sampling & Analysis Cost ($)	$580,800				$989,010	
Utilities ($/Month)	$400				$400	
Total Utilities Cost ($)	$23,446				$43,765	
TOTAL STABILIZATION COST	$698,029				$1,207,837	
V LABOR						
Cost Assumptions:	No.	Cost/Hour	Hours/Year	Cost		
Crew:						
1. Supervisor	0	29	2080	$0		
2. Operators	0	22	2080	$0		
3. Maintenance	0	20	2080	$0		
4. Vehicles	0	20.21	1000	$0		WDEQ Guideline No.12, Table D-1
Cost per Year				$0		
Time Required - Years	4.88				9.12	
TOTAL RESTORATION LABOR COST	**$0**				**$0.00**	

Worksheet 1, Nos. VI, VII & Summary --
GROUNDWATER RESTORATION

Cost Item	Mining Unit			Notes
	Antelope WF 1	JAB WF 1	Sub Total	
VI RESTORATION CAPITAL REQUIREMENTS				
I Deep Disposal Well(s)	2	2		
II Plug and Abandon DDW	$250,000	$250,000		
III Reverse Osmosis Unit	$0	0		Already in Processing Plant
TOTAL RESTORATION CAPITAL REQUIREMENTS	**$250,000**	**$250,000**		
VII RESTORATION OF EXCURSION WELLS				
I Overlying Sand Well(s)				
Total Wells in Excursion	0	0		Assume no excursions during Year 1
Cost of Clean-Up	$100,000	$100,000		
Total Overlying Sand Cleanup	$0	$0		
II Ore Zone (70 sand) Wells				
Total Wells in Excursion	1	1		
Cost of Clean-Up	$100,000	$100,000		
Total Ore Zone (70 Sand) Cleanup	$100,000	$100,000		
III Underlying Sand Wells				
Total Wells in Excursion	0	0		Assume no excursions during Year 1
Cost of Clean-Up	$100,000	$100,000		
Total Underlying Sand Well Cleanup	$0	$0		
TOTAL WELLFIELD COST				
TOTAL EXCURSION CLEANUP COST	**$100,000**	**$100,000**	**$200,000**	
SUMMARY:				
I GROUNDWATER SWEEP	$413,728	$412,280		
II REVERSE OSMOSIS	$7,841,122	$11,631,984		
III WASTE DISPOSAL WELL	$1,026,361	$1,182,453		
IV STABILIZATION	$698,029	$1,207,837		
SUB TOTAL	$9,979,239	$14,434,554		
V LABOR	$0	$0		
VI CAPITAL	$250,000	$250,000		
VII EXCURSION CLEANUP	$100,000	$100,000		
TOTAL GROUNDWATER RESTORATION COST	**$10,329,239**	**$14,784,554**	**$25,113,794**	

Worksheet 2 a 1
CENTRAL PROCESSING PLANT EQUIPMENT REMOVAL AND DISPOSAL

Cost Item	Antelope CPP								Notes
	Office & Laboratory	Main Process Building	Maintenance Building	Resin + Sand Filter Media	External Tanks	Header Houses		Sub Total	
Volume (Yds^3)	0	200	40	110	20	281			
Quantity per Truck Load (Yds^3)	20	20	20	20	20	20			
Number of Truck Loads	0	10	2	5.5	1	14			
I Decontamination Cost									
Decontamination Cost ($/Load)	900	900	900	900	900	900			
Percent Requiring Decontamination	20%	100%	20%	0%	50%	100%			
Total Cost	$0	$9,000	$360	$0	$450	$12,667			
II Dismantle and Loading Cost									
Cost per Truck Load ($)	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000			
Total Cost	$0	$100,000	$20,000	$55,000	$10,000	$140,741			
III Oversize Charges									
Percent Requiring Permits	40%	40%	40%	0%	50%	40%			
Cost per Truck Load ($)	$500	$500	$500	$500	$500	$500			
Total Cost	$0	$2,000	$400	$0	$250	$2,815			
IV Transportation & Disposal									
A. Landfill									
Percent to be Shipped	100%	80%	100%	0%	100%	80%			
Distance (Miles)	50	50	50	50	50	50			
Transport Cost ($/Ton-Mile)	$0.22	$0.22	$0.22	$0.22	$0.22	$0.22			
Transportation Cost	$0	$1,901	$475	$0	$238	$2,675			
Disposal Fee per Cubic Yard	$58	$58	$58	$58	$58	$58			
Disposal Cost ($)	$0	$9,280	$2,320	$0	$1,160	$13,061			
Total Cost	$0	$11,181	$2,795	$0	$1,398	$15,736			
B. Licensed Site									
Percent to be Shipped	0%	20%	0%	100%	0%	20%			
Distance (Miles)	160	160	160	160	160	160			
Transport Cost ($/Ton-Mile)	$0.22	$0.22	$0.22	$0.22	$0.22	$0.22			
Transport Cost	$0	$6,912	$0	$19,008	$0	$9,728			
Disposal Cost ($/Ton)	$300	$300	$300	$300	$300	$300			
Quantity per Truck Load (Yds^3)	20	20	20	20	20	20			
Quantity per Truck Load (Tons)	21.6	21.6	21.6	21.6	21.6	21.6			Based on avg 80lbs per cf
Disposal Cost	$0	$12,960	$0	$35,640	$0	$18,240			
Total Cost	$0	$24,141	$2,795	$35,640	$1,398	$33,976			
Total Cost	$0	$35,322	$5,590	$35,640	$2,795	$49,712			
TOTAL COST	**$0**	**$146,322**	**$26,350**	**$90,640**	**$13,495**	**$205,934**		**$482,741**	

Worksheet 2 a 2
SATELLITE PLANT EQUIPMENT REMOVAL AND DISPOSAL

Cost Item	JAB Satellite						Notes
	Satellite Process Building	Resin + Sand Filter Media	External Tanks	Header Houses		Sub Total	
Volume (Yds^3)	100	110	20	267			
Quantity per Truck Load (Yds^3)	20	20	20	20			
Number of Truck Loads	5.0	5.5	1	13.4			
I Decontamination Cost							
Decontamination Cost ($/Load)	900	900	900	900			
Percent Requiring Decontamination	100%	0%	50%	100%			
Total Cost	$4,500	$0	$450	$12,033			
II Dismantle and Loading Cost							
Cost per Truck Load ($)	$10,000	$10,000	$10,000	$10,000			
Total Cost	$50,000	$55,000	$10,000	$133,704			
III Oversize Charges							
Percent Requiring Permits	40%	0%	50%	40%			
Cost per Truck Load ($)	$500	$500	$500	$500			
Total Cost	$1,000	$0	$250	$2,674			
IV Transportation & Disposal							
A. Landfill							
Percent to be Shipped	80%	0%	100%	80%			
Distance (Miles)	50	50	50	50			
Transport Cost ($/Ton-Mile)	$0.22	$0.22	$0.22	$0.22			
Transportation Cost	$950	$0	$238	$2,541			
Disposal Fee per Cubic Yard	$58	$58	$58	$58			
Disposal Cost ($)	$4,640	$0	$1,160	$12,408			
Total Cost	$5,590	$0	$1,398	$14,949			
B. Licensed Site							
Percent to be Shipped	20%	100%	0%	20%			
Distance (Miles)	160	160	160	160			
Transport Cost ($/Ton-Mile)	$0.22	$0.22	$0.22	$0.22			
Transport Cost	$3,456	$19,008	$0	$9,242			
Disposal Cost ($/Ton)	$300	$300	$300	$300			
Quantity per Truck Load (Yds^3)	20	20	20	20			
Quantity per Truck Load (Tons)	21.6	21.6	21.6	21.6			Based on avg 80lbs per cf
Disposal Cost	$6,480	$35,640	$0	$17,328			
Total Cost	$12,070	$35,640	$1,398	$32,277			
Total Cost	$17,661	$35,640	$2,795	$47,226			
TOTAL COST	**$73,161**	**$90,640**	**$13,495**	**$195,637**		**$372,933**	

Worksheet 2 b 1--
CENTRAL PROCESSING PLANT BUILDING DEMOLITION AND DISPOSAL

Cost Item	Antelope CPP					Notes
	Office & Laboratory	Main Process Building	Maintenance Building	Header Houses	Sub Total	
STRUCTURE DEMOLITION & DISPOSAL						
Structural Character						
Demolition Volume (Ft^3)	90,000	1,700,000	144,000	4,000		
Unit Cost of Demolition ($/ Ft^3)	$0.300	$0.300	$0.300	$0.300		
Total Demolition Cost	$27,000	$510,000	$43,200	$1,200		
Weight of Disposal Material in Tons	41	765	65	2		
Factor for Gutting	0.5	1	0.8	1		
Cost for Gutting ($)	$13,500	$510,000	$34,560	$1,200		
Quantity per Truck Load (Ton)	21.6	21.6	21.6	21.6		
Number of Truckloads	1.9	35.4	3.0	0.1		
Distance to Landfill	60	60	60	60		
Unit Cost (Ton-Mile)	$0.22	$0.22	$0.22	$0.22		
Transportation Cost	$534.60	$10,098.00	$855.36	$23.76		
Disposal Cost ($/ton)	$58.00	$58.00	$58.00	$58.00		
Disposal Cost ($)	$2,349.00	$44,370.00	$3,758.40	$104.40		
TOTAL STRUCTURE DEMO & DISPOSAL	**$43,384**	**$1,074,468**	**$82,374**	**$2,528**	**$1,202,754**	
CONCRETE DECONTAMINATION, DEMO & DISPOSAL						
Area	9000	29700	8000	3000		
Average Thickness (Ft)	0.75	0.75	0.75	0.75		
Volume (Ft^3)	6750	22275	6000	11880		
Weight of Disposal Concrete Assuming 145lbs/cubic foot	978,750	3,229,875	870,000	1,722,600		
Weight of Disposal in Tons	489	1615	435	861		
Percent Requiring Decontamination	0%	100%	0%	10%		
Volume Decontaminated (Ft^2)	0	22,275	0	1,188		
Decontamination ($/$Ft^2$)	$0.4500	$0.4500	$0.4500	$0.4500		
Decontamination Cost	$0	$10,024	$0	$535		
Demolition ($/$Ft^2$)	$5.10	$5.10	$5.10	$5.10		
Demolition Cost	$45,900	$151,470	$40,800	$15,300		
Transportation & Disposal						
A. Onsite Disposal						
Percent to be Disposed Onsite	100%	80%	100%	100%		
Transportation Cost	$0	$0	$0	$0		
Disposal Cost per Cubic Yard ($)	$7.50	$7.50	$7.50	$7.50		On-site disposal
Disposal Cost ($)	$1,875	$6,188	$1,667	$3,300		
B. Licensed Site						
Percent to be Shipped	0%	20%	0%	0%		
Distance (Miles)	160	160	160	160		
Unit Cost (Ton-Mile)	$0.22	$0.22	$0.22	$0.22		
Transportation Cost ($)	$0	$11,369	$0	$0		
Disposal Cost ($/Ton)	$300	$300	$300	$300		
Disposal Cost ($)	$0	$96,896	$0	$0		
TOTAL TRANSPORT & DISPOSAL COST	**$47,775**	**$275,947**	**$42,467**	**$19,135**	**$385,323**	
TOTAL BUILDING DEMO & DISPOSAL COST	**$91,159**	**$1,350,415**	**$124,840**	**$21,663**	**$1,588,076**	

Worksheet 2 b 2 --
SATELLITE PLANT BUILDING DEMOLITION AND DISPOSAL

Cost Item	JAB Satellite Plant			Notes
	Satellite Process Building	Header Houses	Sub Total	
STRUCTURE DEMOLITION & DISPOSAL				
Structural Character				
Demolition Volume (Ft^3)	192000	3800		
Unit Cost of Demolition ($/ Ft^3)	$0.300	$0.300		
Total Demolition Cost	$57,600	$1,140		
Weight of Disposal Material in Tons	86	2		
Factor for Gutting	1	1		
Cost for Gutting ($)	$57,600	$1,140		
Quantity per Truck Load (Ton)	21.6	21.6		
Number of Truckloads	4.0	0.1		
Distance to Landfill	60	60		
Unit Cost (Ton-Mile)	$0.22	$0.22		
Transportation Cost	$1,140.48	$22.57		
Disposal Cost ($/ton)	$58.00	$58.00		
Disposal Cost ($)	$5,011.20	$99.18		
TOTAL STRUCTURE DEMO & DISPOSAL	**$121,352**	**$2,402**	**$123,753**	
CONCRETE DECONTAMINATION, DEMO & DISPOSAL				
Area	29700	3000		
Average Thickness (Ft)	0.75	0.75		
Volume (Ft^3)	22275	11880		
Weight of Disposal Concrete Assuming 145lbs/cubic foot	3,229,875	1,722,600		
Weight of Disposal in Tons	1615	861		
Percent Requiring Decontamination	100%	10%		
Volume Decontaminated (Ft^2)	22,275	1,188		
Decontamination ($/$Ft^2$)	$0.4500	$0.4500		
Decontamination Cost	$10,024	$535		
Demolition ($/$Ft^2$)	$5.10	$5.10		
Demolition Cost	$151,470	$15,300		
Transportation & Disposal				
A. Onsite Disposal				
Percent to be Disposed Onsite	85%	100%		
Transportation Cost	$0	$0		
Disposal Cost per Cubic Yard ($)	$7.50	$7.50		On-site disposal
Disposal Cost ($)	$6,188	$3,300		
B. Licensed Site				
Percent to be Shipped	15%	0%		
Distance (Miles)	160	160		
Unit Cost (Ton-Mile)	$0.22	$0.22		
Transportation Cost ($)	$8,527	$0		
Disposal Cost ($/Ton)	$300	$300		
Disposal Cost ($)	$72,672	$0		
TOTAL TRANSPORT & DISPOSAL COST	**$248,880**	**$19,135**	**$268,015**	
TOTAL BUILDING DEMO & DISPOSAL COST	**$370,232**	**$21,536**	**$391,768**	

Worksheet 3 b --
SOIL REMOVAL & DISPOSAL

	Antelope and JAB Uranium Project						
Cost Item	Office & Laboratory	JAB Satellite	Antelope CPP	Maintenance Building	Header Houses	Sub Total	**Notes**
SOIL EXCAVATION, TRANSPORT & DISPOSAL							
Removal Under Building Footprints							
Excavation, Front End Loader	$38	$126	$126	$34	$13		$81.81/hr per WDEQ Guideline12 and 150 cy/hr
Quantity to be Shipped (Ft^3)	563	1,856	1,856	500	188		Assume removal of 3" of Contaminated Soil under Primary Areas over 25% of building area, Disposal at a Licensed facility (ft3)
Weight in Tons	28.125	92.8125	92.8125	25	9.375		
Distance (Miles)	160	160	160	160	160		
Transportation Unit Cost (Ton/Mile)	$0.220	$0.220	$0.220	$0.220	$0.220		
Transportation Cost	$990	$3,267	$3,267	$880	$330		
Disposal Fee ($/Ton)	$2,500	$2,500	$2,500	$2,500	$2,500		
Disposal Cost ($)	$70,313	$232,031	$232,031	$62,500	$23,438	$620,313	
Removal NPDES Pts.							
Quantity to be Shipped (Ft^3)	0	0	0	0	0		Zero discharge facility
Weight in Tons	0	0	0	0	0		
Distance (Miles)	160	160	160	160	160		
Transportation Cost Ton/Mile ($)	$0.220	$0.220	$0.220	$0.220	$0.220		
Transportation Cost	$0	$0	$0	$0	$0		
Disposal Fee ($/Ton)	$300	$300	$300	$300	$300		
Disposal Cost ($)	$0	$0	$0	$0	$0		
Total NPDES Removal Cost	$0	$0	$0	$0	$0	$0	
TOTAL SOILS EXC., TRANSPORT & DISPOSAL	**$70,313**	**$232,031**	**$232,031**	**$62,500**	**$23,438**	**$620,313**	
RADIATION SURVEY							
Area Required (Acres)	0.21	0.21	0.68	0.18	0.07		
Survey Cost ($/Acre)	$1,200	$1,200	$1,200	$1,200	$1,200		
Number of Structures	1	1	1	1	12		
Cost per Structure ($)	$225	$225	$225	$225	$225		
TOTAL RAD SURVEY COST	**$473**	**$473**	**$1,043**	**$445**	**$2,783**	**$5,217**	
TOTAL SOIL REMOVAL & DISPOSAL COST	**$70,785**	**$232,504**	**$233,074**	**$62,945**	**$26,220**	**$625,530**	

Worksheet 4 --
Well Abandonment

Cost Item	Mining Unit			Notes
	Antelope WF1	JAB WF 1	Sub Total	
Number of Wells	1498	1405		Includes injection, recovery and monitor wells.
Average Depth (ft)	300	250		
Average Diameter (inch)	5	5		
Area of Annulus (ft^2)	0.1364	0.1364		
Materials				
Bentonite Chips Required (Ft^3/Well)	20.5	20.5		150 feet of clay above water
Bags of Chips Required/Well	27	27		
Cost per Bag ($)	$6.45	$6.45		
Cost/Well Bentonite Chips ($)	$174	$174		
Gravel Fill Required (Ft^3/Well)	20.5	13.6		Avg depth less 300 feet filled w/ gravel
Cost of Gravel/Yd^3 ($)	$20	$20		
Cost/Well Gravel Fill ($)	$15	$10		
Cement Cone/Markers Req'd/Well	1	1		
Cost of Cement Cones Markers ($)	$6	$6		
Total Materials Cost per Well	$195	$190		
Labor				
Hours Required per Well	3	3		
Labor Cost per Hour	$70	$70		
Total Labor Cost per Well ($)	210	210		
Equipment Rental				
Hours Required per Well	1	1		
Backhoe w/Operator Cost/Hr ($)	$60	$60		
Total Equipment Cost per Well ($)	$60	$60		
Total Cost per Well ($)	$465	$460		
TOTAL WELL ABANDONMENT COST ($)	**$697,020**	**$646,652**	**$1,343,672**	

Worksheet 5, No. I --
WELLFIELD EQUIPMENT REMOVAL & DISPOSAL

	Mining Unit			
Cost Item	Antelope WF1	JAB WF 1	Sub Total	**Notes**
I Wellfield Piping				
A. Removal				
Total Number of Wells	1,410	1,324		Includes total injection and recovery wells
Feeder lines from HH to Injection wells 1" HDPE (Ft)	334,000	334,000		Estimated From Preliminary Design for Moore Ranch Project proportional to Antelope/JAB WF size
Pregnant solution feeder lines from production wells to HH 1" HDPE (Ft)	154,190	154,190		Estimated From Preliminary Design for Moore Ranch Project proportional to Antelope/JAB WF size
Total Quantity of 1" HDPE Piping (Ft)	488,190	488,190		
Plastic Volume (Ft^3)	1,600.99	1,600.99		ISCO specs.for 1" HDPE DR 11
Chipped Volume Assuming 30% Void Space (Ft^3)	2,081.29	2,081.29		
Disposal Weight (tons)	83.25	83.25		Year 1 buildout only to include Wellfield 1
Quantity per Truck Load (Tons)	21.6	21.6		Based on 20 cy per truckload and 80lbs per cf
Total Number of Truck Loads	4	4		
Total Length of Feeder line Trench (ft)	41,580	47,340		Includes Shared Trenches
Pipeline Removal Unit Cost ($/ft of trench)	$2.25	$2.25		Quote - Jordan Construction
Total Cost for Trunkline Removal ($)	$93,556	$106,516		
Total Cost - Removal	$93,556	$106,516	$200,072	
B. Survey & Decontamination				
Percent Requiring Decontamination	0	0		No survey or decon needed. Total volume to low level disposal
Loads for Decontamination	0	0		
Cost for Decontamination ($/Load)	$600	$600		
Cost for Decontamination ($)	$0	$0	$0	
C. Transport & Disposal				
1.) Landfill				
a. Transportation				
Percent to be Shipped	0%	0%		
Loads to be Shipped	0	0		
Distance (Miles)	50	50		
Transportation Cost (Ton/Mile) ($)	$0.22	$0.15		
Transportation Cost ($)	$0	$0	$0	
b. Disposal				
Disposal Fee per Yd^3	$58	$58		
Yds^3 per Load	20	20		
Disposal Cost ($)	$0	$0		
Total Cost - Landfill	$0	$0	$0	
2.) Licensed Site				
a. Transportation				
Percent to be Shipped	100%	100%		
Loads to be Shipped	2	4		
Tons to be Shipped	83.25	83.25		
Distance (Miles)	160	160		
Transportation Ton/Mile ($)	$0.220	$0.220		
Transportation Cost ($)	$2,930	$2,930		
b. Disposal				
Disposal Fee per ton	$300	$300		
Disposal Cost ($)	24,976	24,976		
Total Cost - Licensed Site	27,906	27,906		
Total Cost - Transport & Disposal	27,906	27,906		
Total Cost - WF Piping Removal & Disposal	**121,462**	**134,422**	**$255,884**	

Worksheet 5, No. II
WELLFIELD EQUIPMENT REMOVAL & DISPOSAL

Cost Item	Mining Unit Antelope WF1	Mining Unit JAB WF 1	Sub Total	Notes
II Production Well Pumps				
A. Pump and Tubing Removal				
Number of Production Wells	648	608		
Cost of Removal ($/well)	$200	$200		
Cost of Removal ($)	$129,600	$121,600		
Number of Pumps per Truck Load	180	180		
Number of Truck Loads (Pumps)	3.60	3.38		
Weight of Pumps	23.60	23.38		Assume 20 T per truck
B. Survey & Decontamination (Pumps)				
Percent Requiring Decontamination	50%	50%		
Loads for Decontamination	1.80	1.69		
Cost for Decontamination ($/Load)	$600	$600		
Cost for Decontamination ($)	$1,080	$1,013		
C. Tubing Volume Reduction & Loading				
Length per Well (Ft)	300	250		
Total Quantity (Ft^3)	637.5	498.5		Thickness Based on ISCO DR 11 1" HDPE PSI 160 (R1=.05479', R2=.04425')
Chipped Volume Assuming 30% Void Space (Ft^3)	828.8	648.0		
Cost of Removal ($/Ft)	$0.03	$0.03		
Cost of Removal ($)	$9.00	$7.50		
Quantity per Truck Load (Ft^3)	540	540		
Number of Truck Loads	2	1		
D. Transport & Disposal				
1.) Landfill				
a. Transportation				
Percent to be Shipped (Pumps)	50%	50%		
Loads to be Shipped	1.8	1.7		
Distance (Miles)	50	50		
Transportation Ton/Mile ($)	$0.22	$0.22		
Transportation Cost ($)	$428	$401		
b. Disposal				
Disposal Fee per Yd^3	$58	$58		
Yds^3 per Load	20	20		
Disposal Cost ($)	$2,088	$1,959		
Total Cost - Landfill	$2,516	$2,360		
2.) Licensed Site				
a. Transportation				
Percent to be Shipped (Pumps)	50%	50%		
Percent to be Shipped (Tubing)	100%	100%		
Loads to be Shipped	4.00	3.00		
Distance (Miles)	50	50		
Transportation Ton/Mile ($)	$0.22	$0.22		
Transportation Cost ($)	$950	$713		
b. Disposal				
Disposal Cost per Ft^3	$300	$300		
Disposal Fee per Yd^3	20	20		
Quantity Per Truck Load (Yds^3)	$24,000	$18,000		
Disposal Cost ($)	$24,950	$18,713		
Total Cost - Licensed Site	$25,901	$19,426		
Total Cost - Transport & Disposal	$28,416	$21,786		
Total Cost - Pump Removal & Disposal	**$159,105**	**$144,407**	**$303,512**	

Worksheet 5, No. III
WELLFIELD EQUIPMENT REMOVAL & DISPOSAL

Cost Item	Mining Unit Wellfield 1	Wellfield 2	Sub Total	Notes
III Buried Trunkline				
A. Removal				
Trunk lines from Resin Plant to HH HDPE Pipe (Ft)	221,800	199,600		Estimated From Preliminary Design for Moore Ranch Project proportional to Antelope/JAB WF size
Pregnant solution trunk lines form HH to Resin Plant 8" HDPE Pipe (Ft)	221,800	199,600		Estimated From Preliminary Design for Moore Ranch Project proportional to Antelope/JAB WF size
Total Quantity of HDPE Piping (Ft)	443,600	399,200		assume avg 8-in dia.
Plastic Volume (Ft^3)	299,242	269,291		Thickness Based on ISCO DR 11 8" PSI 160 (R1=.7188', R2=.5494')
Chipped Volume Assuming 30% Void Space (Ft^3)	389,014	350,078		
Disposal Tons	2,903	2,613		13.089lb/ft per ISCO
Quantity per Truck Load (Tons)	21.6	21.6		
Total Number of Truck Loads	135	121		
Total Length of Trunkline Trench (ft)	6,000	8,500		
Pipeline Removal Unit Cost ($/ft of trench)	$4.00	$4.00		
Total Cost for Trunkline Removal ($)	$24,000	$34,000	$58,000	
B. Survey & Decontamination				
Percent Requiring Decontamination	0	0		No survey or decon needed. Total volume to low level disposal
Loads for Decontamination	0	0		
Cost for Decontamination ($/Load)	$600	$600		
Cost for Survey & Decontamination ($)	$0	$0	$0	
C. Transportation & Disposal				
1.) Landfill				
a. Transportation				
Percent to be Shipped	0%	0%		
Loads to be Shipped	0	0		
Distance (Miles)	50	50		
Transportation Cost (Ton/Mile) ($)	$0.22	$0.22		
Transportation Cost ($)	$0	$0		
b. Disposal				
Disposal Fee per Yd^3	$58	$58		
Yds^3 per Load	20	20		
Disposal Cost ($)	$0	$0		
Total Cost - Landfill	$0	$0		
2.) Licensed Site				
a. Transportation				
Percent to be Shipped	100%	100%		
Loads to be Shipped	135	121		
Tons to be Shipped	2,903.14	2,612.56		
Distance (Miles)	160	160		
Transportation Ton/Mile ($)	$0.220	$0.220		
Transportation Cost ($)	$102,191	$91,962		
b. Disposal				
Disposal Fee per ton	$300	$300		
Disposal Cost ($)	$870,942	$783,769		
Total Cost - Licensed Site	$973,133	$875,732	$1,848,864	
Total Cost Transportation & Disposal	**$973,133**	**$875,732**	**$1,848,864**	
Total Cost - Buried Trunkline Removal & Disposal	**$997,133**	**$909,732**	$1,906,864	
TOTAL WELLFIELD EQUIPMENT REMOVAL & DISPOSAL COST	**$1,277,700**	**$1,188,560**	**$2,466,260**	

Worksheet 6, No. I
TOPSOIL REPLACEMENT & REVEGETATION

	Mining Unit			
Cost Item	Antelope	JAB	Sub Total	**Notes**
I Process Plant and Office Building				
A. Topsoil Handling & Grading				
Affected Area (Acres)	11.0	5		
Average Affected Thickness (Ins)	12	13		
Topsoil Volume (Yds^3)	17,779	8,739		
Unit Cost	$5	$6		Price from Dragstrip Soil Cover Project MT
Sub Total - Topsoil	$88,895	$52,433		
B. Radiation Survey & Soil Analysis				
Unit Cost ($/Ac)	$800	$801		
Sub Total - Survey & Analysis	$8,816	$4,005		
C. Revegation				
Fertilizer ($/Ac)	$232.00	$232.00		Price from Dragstrip Soil Cover Project MT
Seeding Prep & Seeding ($/Ac)	$227.00	$227.00		Price from Dragstrip Soil Cover Project MT
Mulching & Crimping ($/Ac)	$100.00	$100.00		Price from Dragstrip Soil Cover Project MT
Sub Total Cost/Acre	$559.00	$559.00		
Sub Total Revegation	$6,160	$2,795		
TOTAL PLANT AND OFFICE BUILDING TOPSOIL REPLACEMENT & REVEG COST	**$103,871**	**$59,233**	**$163,104**	

Worksheet 6, Nos. II & III
TOPSOIL REPLACEMENT & REVEGETATION

Cost Item	Mining Unit Antelope WF1	Mining Unit JAB WF 1	Sub Total	Notes
II Wellfields				
A. Topsoil Handling & Grading				
Affected Area (Acres)	16	19		Equals trench length times 15 feet wide
Average Affected Thickness (Inch)	12	12		
Topsoil Volume (Yds^3)	26,433	31,022		
Unit Cost - Haul/Place/Grading ($/cy)	$5.00	$5.00		Price from Dragstrip Soil Cover Project MT
Sub Total - Topsoil	$132,167	$155,112		
B. Radiation Survey & Soil Analysis				
Unit Cost ($/Ac)	$800	$800		
Sub Total - Survey & Analysis	$13,108	$15,383		
C. Spill Cleanup				
Affected Area (Acres)	0	0		
Affected Area (Ft^2)	0	0		
Affected Area Thickness (Ft)	0.5	0.5		
Affected Volume (Ft^3)	0	0		
Quantity per Truckload (Ft^3)	540	540		
Quantity to be Shipped (Loads)	0	0		
Distance (Miles)	160	160		
Transportation Cost (Ton/Mile) ($)	$0.22	$0.22		
Transportation Cost ($)	$0	$0		
Handling Cost ($/Load)	$400	$400		
Handling Cost ($)	$0	$0		
Disposal Fee ($/Ton)	$300	$300		
Disposal Cost ($)	$0	$0		
Sub Total - Spill Cleanup	$0	$0		
D. Revegation				
Fertilizer ($/Ac)	$232.00	$232.00		Price from Dragstrip Soil Cover Project MT
Seeding Prep & Seeding ($/Ac)	$227.00	$227.00		Price from Dragstrip Soil Cover Project MT
Mulching & Crimping ($/Ac)	$100.00	$100.00		Price from Dragstrip Soil Cover Project MT
Sub Total Cost/Acre	$559.00	$559.00		
Sub Total Revegation	$9,159	$10,749		
Sub Total - Wellfields	$154,434	$181,244		
TOTAL WELLFIELDS COST	**$154,434**	**$181,244**		
III Roads				
A. Topsoil Handling & Grading				
Lengh of gravel roads	6100	38500		JAB includes 30500' of connector road @ 25' and 8000' of WF road at 14' wide (22' avg. width)
Affected Area (Acres)	1.96	19.44		Antelope WF road 6100' by 14'
Average Affected Thickness (Ins)	12	12		
Topsoil Volume (Yds^3)	3,163	31,370		
Unit Cost - Haul/Place/Grading ($/cy)	$5.00	$5.00		Price from Dragstrip Soil Cover Project MT
Sub Total - Topsoil	$15,815	$156,852		
B. Radiation Survey & Soil Analysis				
Unit Cost ($/Ac)	$800	$800		
Sub Total - Survey & Analysis	$1,568	$15,556		
C. Revegation				
Fertilizer ($/Ac)	$232	$232		Price from Dragstrip Soil Cover Project MT
Seeding Prep & Seeding ($/Ac)	$227	$227		Price from Dragstrip Soil Cover Project MT
Mulching & Crimping ($/Ac)	$100	$100		Price from Dragstrip Soil Cover Project MT
Sub Total Cost/Acre	$559	$559		
Sub Total Revegation	$1,096	$10,869		
Sub Total - Roads	$18,479	$183,277		
TOTAL ROADS COST	**$18,479.15**	**$183,276.85**		

Worksheet 6, Nos IV & V
TOPSOIL REPLACEMENT & REVEGETATION

Cost Item	Mining Unit Wellfield 1	Wellfield 2	Sub Total	Notes
IV Other				
A. Topsoil Handling & Grading				
Affected Area (Acres)	4	4		
Average Affected Thickness (Ins)	6	6		
Topsoil Volume (Yds^3)	3,227	3,227		
Unit Cost - Haul/Place/Grading ($/Ac)	$5.00	$5.00		Price from Dragstrip Soil Cover Project MT
Sub Total - Topsoil	$16,133	$16,133		
B. Radiation Survey & Soil Analysis				
Unit Cost ($/Ac)	$800	$800		
Sub Total - Survey & Analysis	$3,200	$3,200		
C. Revegation				
Fertilizer ($/Ac)	$232.00	$232.00		Price from Dragstrip Soil Cover Project MT
Seeding Prep & Seeding ($/Ac)	$227.00	$227.00		Price from Dragstrip Soil Cover Project MT
Mulching & Crimping ($/Ac)	$100.00	$100.00		Price from Dragstrip Soil Cover Project MT
Sub Total Cost/Acre	$559.00	$559.00		
Sub Total Revegation	$2,236	$2,236		
Sub Total - Other	$21,569	$21,569		
TOTAL OTHER COST	**$21,569**	**$21,569**		
V Remedial Action				
A. Topsoil Handling & Grading				
Affected Area (Acres)	15	10		
Average Affected Thickness (Ins)	12	12		
Topsoil Volume (Yds^3)	24,200	16,133		
Unit Cost - Haul/Place/Grading ($/cy)	$5.00	$5.00		Price from Dragstrip Soil Cover Project MT
Sub Total - Topsoil	$121,000	$80,667		
B. Radiation Survey & Soil Analysis				
Unit Cost ($/Ac)	$800	$800		
Sub Total - Survey & Analysis	$12,000	$8,000		
C. Revegation				
Fertilizer ($/Ac)	$232.00	$232.00		Price from Dragstrip Soil Cover Project MT
Seeding Prep & Seeding ($/Ac)	$227.00	$227.00		Price from Dragstrip Soil Cover Project MT
Mulching & Crimping ($/Ac)	$100.00	$100.00		Price from Dragstrip Soil Cover Project MT
Sub Total Cost/Acre	$559.00	$559.00		
Sub Total Revegation	$8,385	$5,590		
TOTAL REMEDIAL ACTION	**$141,385**	**$94,257**	**$235,642**	
TOTAL TOPSOIL REPLACEMENT & REVEGETATION COST (Total of 7I through 7V)	**$439,738**	**$539,581**	**$979,319**	

Worksheet 7, Nos I - VII
MISCELLANEOUS RECLAMATION

	Cost Item	Mining Unit Antelope WF1	Mining Unit JAB WF1	Sub Total	Notes
I	**Fence Removal & Disposal**				
	Quantity (Ft)	32,000	18,000		
	Cost of Removal/Disposal ($/Ft)	$1.50	$1.50		
	Cost of Removal/Disposal ($)	$48,000	$27,000	$75,000	
II	**Powerline Removal & Disposal**				
	Quantity (Ft)	159,783	143,804		Power to Wells, header houses. Estimated From Preliminary Design for Moore Ranch Project proportional to Antelope/JAB WF siz
	Cost of Removal/Disposal ($/Ft)	$0.50	$0.50		
	Cost of Removal/Disposal ($)	$79,892	$71,902	151793.5	
III	**Powerpole Removal & Disposal**				
	Quantity	0	0		
	Cost of Removal/Disposal ($/Each)	0	0		
	Cost of Removal/Disposal ($)	$0.00	$0.00	$0.00	
IV	**Transformer Removal & Disposal**				
	Quantity	4	5		
	Cost of Removal/Disposal ($/Each)	4500	4500		Tri-County Electric will remove at no cost, WDEQ Guideline No.12, App. H
	Cost of Removal/Disposal ($)	18000	22500	40500	
V	**Culvert Removal & Disposal**				
	Quantity (Ft)	0	60		None
	Cost of Removal/Disposal ($/Ft)	$4.56	$4.56		($91.24/20') WDEQ Guideline No.12, App. J
	Cost of Removal/Disposal ($)	$0.00	$273.60	273.6	
VI	**Guardrail Removal**				
	Quantity (Ft)	0	0		None
	Cost of Removal/Disposal ($/Ft)	$6.50	$6.50		
	Cost of Removal/Disposal ($)	$0	0	0	
VII	**Low Water Stream Crossing**				
	Quantity	0	0		None
	Cost of Removal/Disposal ($/Each)	$8,000	$8,000		
	Cost of Removal/Disposal ($)	$0	$0	0	
	TOTAL MISCELLANEOUS COST	**$145,892**	**$121,676**	**$267,567**	

APPENDIX E

MILDOS Modeling Output

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1REGION: Antelope-Jab 2008 CODE: MILDOS-AREA (02/97) PAGE 2
METSET: DATA: ANTJAB2.MIL 05/12/08
JOINT FREQUENCY IN PERCENT, DIRECTION INDICATES WHERE WIND IS FROM FREQWS=0.05576,0.14264,0.20571,0.27430,0.15641,0.16529

MPH	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTALS
STABILITY CLASS 1																	
1.5	0.0240	0.0530	0.0600	0.1060	0.0670	0.0990	0.0870	0.0700	0.0630	0.1010	0.1030	0.1110	0.0940	0.0430	0.0340	0.0290	1.1440
5.5	0.1030	0.1420	0.1440	0.1470	0.1300	0.1510	0.0940	0.0710	0.0730	0.1140	0.1830	0.2450	0.2270	0.1010	0.1030	0.0870	2.1150
10.0	0.0890	0.0890	0.0850	0.1170	0.1140	0.0530	0.0370	0.0320	0.0370	0.0850	0.1600	0.2820	0.3480	0.3430	0.2080	0.1030	2.1820
15.5	0.0140	0.0180	0.0210	0.0160	0.0250	0.0110	0.0070	0.0000	0.0140	0.0600	0.0870	0.1080	0.1970	0.1560	0.0710	0.0140	0.8190
21.5	0.0050	0.0000	0.0000	0.0000	0.0000	0.0020	0.0020	0.0000	0.0000	0.0000	0.0070	0.0020	0.0020	0.0050	0.0020	0.0020	0.0290
28.0	0.0000	0.0000	0.0020	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0020	0.0000	0.0000	0.0050	0.0000	0.0000	0.0090
ALL	0.2350	0.3020	0.3120	0.3860	0.3360	0.3160	0.2270	0.1730	0.1870	0.3600	0.5420	0.7480	0.8680	0.6530	0.4180	0.2350	6.2980
STABILITY CLASS 2																	
1.5	0.0070	0.0120	0.0120	0.0140	0.0170	0.0140	0.0120	0.0100	0.0120	0.0140	0.0290	0.0290	0.0260	0.0050	0.0020	0.0050	0.2200
5.5	0.0020	0.0280	0.0410	0.0550	0.0370	0.0320	0.0110	0.0110	0.0050	0.0090	0.0250	0.0710	0.0460	0.0280	0.0160	0.0050	0.4220
10.0	0.0110	0.0320	0.0340	0.0550	0.0780	0.0160	0.0230	0.0070	0.0140	0.0210	0.0760	0.1370	0.1670	0.1330	0.0660	0.0410	0.9110
15.5	0.0140	0.0250	0.0180	0.0160	0.0250	0.0180	0.0140	0.0020	0.0070	0.0370	0.1140	0.3070	0.5170	0.2310	0.1170	0.0390	1.5010
21.5	0.0000	0.0050	0.0000	0.0000	0.0000	0.0000	0.0020	0.0000	0.0000	0.0140	0.0370	0.0410	0.0730	0.0410	0.0070	0.0000	0.2200
28.0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0020	0.0000	0.0090	0.0020	0.0050	0.0020	0.0000	0.0200
ALL	0.0340	0.1020	0.1050	0.1400	0.1570	0.0800	0.0620	0.0300	0.0380	0.0970	0.2810	0.5940	0.8310	0.4430	0.2100	0.0900	3.2940
STABILITY CLASS 3																	
1.5	0.0050	0.0120	0.0070	0.0140	0.0070	0.0050	0.0120	0.0050	0.0100	0.0070	0.0240	0.0120	0.0390	0.0020	0.0070	0.0100	0.1780
5.5	0.0090	0.0530	0.0920	0.0550	0.0530	0.0140	0.0090	0.0070	0.0050	0.0050	0.0370	0.1370	0.1190	0.0390	0.0020	0.0090	0.6450
10.0	0.0210	0.0340	0.0640	0.1100	0.0780	0.0300	0.0210	0.0180	0.0160	0.0250	0.0780	0.2520	0.2700	0.0980	0.0660	0.0320	1.2130
15.5	0.0250	0.0320	0.0180	0.0550	0.1030	0.0800	0.0180	0.0110	0.0140	0.0570	0.2380	0.7800	0.8990	0.4370	0.1970	0.0640	3.0280
21.5	0.0110	0.0070	0.0020	0.0110	0.0140	0.0070	0.0000	0.0000	0.0090	0.0760	0.2110	0.5700	0.6340	0.1990	0.0340	0.0140	1.7990
28.0	0.0000	0.0000	0.0000	0.0000	0.0020	0.0000	0.0000	0.0020	0.0000	0.0160	0.0600	0.2010	0.4120	0.0820	0.0090	0.0000	0.7840
ALL	0.0710	0.1380	0.1830	0.2450	0.2570	0.1360	0.0600	0.0430	0.0540	0.1860	0.6480	1.9520	2.3730	0.8570	0.3150	0.1290	7.6470
STABILITY CLASS 4																	
1.5	0.0170	0.0290	0.0480	0.0190	0.0260	0.0170	0.0120	0.0170	0.0140	0.0140	0.0190	0.0430	0.0820	0.0990	0.0120	0.0100	0.4780
5.5	0.0890	0.3730	0.6450	0.2220	0.1760	0.0890	0.0440	0.0440	0.0370	0.0660	0.1490	0.5470	1.5590	1.0070	0.0710	0.0530	5.1710
10.0	0.1950	0.5580	0.9360	0.7050	0.5220	0.1970	0.1080	0.0870	0.0800	0.1690	0.5010	2.0620	3.2610	1.1370	0.4010	0.1970	11.1160
15.5	0.2130	0.5520	0.8030	1.4920	1.3800	0.3250	0.0690	0.0640	0.0800	0.3730	1.6000	5.3320	6.7100	2.0390	0.8100	0.2400	22.0820
21.5	0.0940	0.2130	0.1950	0.3640	0.6820	0.1830	0.0820	0.0140	0.0280	0.2360	1.4490	4.7690	3.9340	0.9540	0.3320	0.0640	13.5930
28.0	0.0550	0.0570	0.0180	0.0780	0.2660	0.0960	0.0210	0.0070	0.0250	0.1690	2.2290	7.7060	3.9450	0.8170	0.1880	0.0390	15.7160
ALL	0.6630	1.7820	2.6450	2.8800	3.0520	0.9070	0.3360	0.2330	0.2640	1.0270	5.947020	.459019	.4910	6.0530	1.8140	0.6030	68.1560
STABILITY CLASS 5																	
1.5	0.0260	0.0460	0.0870	0.0460	0.0480	0.0260	0.0260	0.0100	0.0190	0.0260	0.0390	0.0840	0.0960	0.1110	0.0460	0.0360	0.7720
5.5	0.0760	0.3590	0.3590	0.1690	0.0890	0.0710	0.0390	0.0250	0.0370	0.0530	0.1210	0.2860	0.7090	0.6160	0.0710	0.0320	3.1120
10.0	0.0940	0.7320	0.7000	0.1670	0.1920	0.0620	0.0210	0.0110	0.0390	0.0500	0.0980	0.4810	1.3390	0.8950	0.1830	0.0850	5.1490
15.5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
21.5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
28.0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
ALL	0.1960	1.1370	1.1460	0.3820	0.3290	0.1590	0.0860	0.0460	0.0950	0.1290	0.2580	0.8510	2.1440	1.6220	0.3000	0.1530	9.0330
STABILITY CLASS 6																	
1.5	0.1470	0.1730	0.1760	0.1880	0.1300	0.1390	0.1060	0.0720	0.1060	0.1780	0.2000	0.2720	0.3270	0.2400	0.1950	0.1350	2.7840
5.5	0.1580	0.2200	0.2590	0.2040	0.1330	0.1210	0.0870	0.0640	0.1080	0.1370	0.1670	0.3270	0.3300	0.2430	0.1240	0.1170	2.7990
10.0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
15.5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
21.5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
28.0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
ALL	0.3050	0.3930	0.4350	0.3920	0.2630	0.2600	0.1930	0.1360	0.2140	0.3150	0.3670	0.5990	0.6570	0.4830	0.3190	0.2520	5.5830
ALL	1.5040	3.8540	4.8260	4.4250	4.3940	1.8580	0.9640	0.6610	0.8520	2.1140	8.043025	.203026	.364010	.1110	3.3760	1.4620	100.0110

INDIVIDUAL RECEPTOR LOCATION DATA, 32 LOCATIONS INPUT THIS RUN

I	LOCATION NAMES	X(KM)	Y(KM)	Z(M)	DIST(KM)	TYPE	I	LOCATION NAMES	X(KM)	Y(KM)	Z(M)	DIST(KM)	TYPE
1	N Jab	-13.56	1.11	0.00	13.61	1	17	N Antelope	0.00	2.22	0.00	2.22	1
2	NNE Jab	-13.11	1.10	0.00	13.16	1	18	NNE Antelope	0.91	2.21	0.00	2.39	1
3	NE Jab	-12.45	1.11	0.00	12.50	1	19	NE Antelope	1.74	1.74	0.00	2.46	1
4	ENE Jab	-10.81	1.14	0.00	10.87	1	20	ENE Antelope	8.87	3.67	0.00	9.60	1
5	E Jab	-10.19	0.00	0.00	10.19	1	21	E Antelope	6.15	0.00	0.00	6.15	1
6	ESE Jab	-12.34	-0.51	0.00	12.35	1	22	ESE Antelope	2.97	-1.23	0.00	3.21	1
7	SE Jab	-13.20	-0.36	0.00	13.20	1	23	SE Antelope	1.80	-1.80	0.00	2.55	1
8	SSE Jab	-13.36	-0.50	0.00	13.37	1	24	SSE Antelope	0.12	-0.28	0.00	0.30	1
9	S Jab	-13.56	-0.50	0.00	13.57	1	25	S Antelope	0.00	-1.28	0.00	1.28	1
10	SSW Jab	-14.27	-1.72	0.00	14.37	1	26	SSW Antelope	-0.54	-1.30	0.00	1.41	1
11	SW Jab	-15.29	-1.73	0.00	15.39	1	27	SW Antelope	-1.30	-1.30	0.00	1.84	1
12	WSW Jab	-16.61	-1.26	0.00	16.66	1	28	WSW Antelope	-2.21	-0.91	0.00	2.39	1
13	W Jab	-17.02	0.00	0.00	17.02	1	29	W Antelope	-4.23	0.00	0.00	4.23	1
14	WNW Jab	-17.04	1.44	0.00	17.10	1	30	WNW Antelope	-3.49	1.45	0.00	3.78	1
15	NW Jab	-15.47	1.91	0.00	15.59	1	31	NW Antelope	-2.29	2.29	0.00	3.24	1
16	NNW Jab	-14.02	1.10	0.00	14.06	1	32	NNW Antelope	-0.96	2.32	0.00	2.51	1

MISCELLANEOUS INPUTABLE PARAMETER VALUES

DMM	DMA	TSTART	FFORI	FHAYI	FFORP	FHAYP	FPR(1)	FPR(2)	FPR(3)	ACTRAT
100.0	100.0	2008.00	0.50	0.50	0.50	0.50	0.00	0.00	0.00	2.50

IPACT EQUALS 0, 0, 0, 0, 0,

JC EQUALS 1, 0, 1, 1, 0, 0, 1, 0, 1, 0

TIME STEP DATA....	STEP NAMES	LENGTH, YRS	IFTODO
1		100.00	1

XRHO EQUALS 1.5, 2.5, 3.5, 4.5, 7.5, 15.0, 25.0, 35.0, 45.0, 55.0, 65.0, 75.0,

HDP EQUALS 50.0

POPULATION DISTRIBUTION

KILOMETERS	N 0.0	NNE 22.5	NE 45.0	ENE 67.5	E 90.0	ESE 112.5	SE 135.0	SSE 157.5	S 180.0	SSW 202.5	SW 225.0	WSW 247.5	W 270.0	WNW 292.5	NW 315.0	NNW 337.5
1.0- 2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.0- 3.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.0- 4.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.0- 5.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.0-10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10.0-20.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20.0-30.0	19	106	0	0	96	0	0	0	0	0	0	0	0	0	0	0
30.0-40.0	27	27	0	24	21	18	15	0	0	14	0	0	0	0	0	27
40.0-50.0	0	0	0	31	27	27	23	13	0	0	0	0	0	0	0	34
50.0-60.0	42	42	51	42	34	34	32	13	10	10	10	19	28	42	42	42
60.0-70.0	50	52	62	54	40	40	289	40	45	12	18	28	34	50	182	153
70.0-80.0	57	60	71	66	46	46	8658	103	71	14	31	33	39	57	358	346
1.0-80.0	195	287	184	217	264	165	9017	169	126	50	59	80	101	149	582	602

TOTAL 1-80 KM POPULATION IS 12247 PERSONS

NUMBER OF SOURCES= 5

NO.	KM X	KM Y	M Z	KM2 AREA	U-238	Th-230	CI/YEAR Ra-226	Pb-210	Rn-222	ID	PSIZE SET	M/SEC EXIT VEL	SOURCE NAME
1	-13.60	0.29	0.00	1.2000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.32E+02	2001	1	0.00E+00	Jab Well Field 1
2	-13.60	0.00	16.00	0.0000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.19E+02	1001	1	3.30E+00	Jab Plant Stack
3	-1.06	-0.30	0.00	0.9700	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.60E+01	2002	1	0.00E+00	Antelope WF 1
4	-2.25	1.41	0.00	0.9700	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.60E+01	2003	1	0.00E+00	Antelope WF3
5	0.00	0.00	16.00	0.0000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.18E+02	1002	1	3.30E+00	Antelope dryer

INPUT TAILS ACTIVITIES, PCI/G

SET	URANIUM	THORIUM	RADIUM	LEAD
1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3	0.00E+00	0.00E+00	0.00E+00	0.00E+00

AMAD AND FRACTIONAL DISTRIBUTION

SET	1.5	3.0	7.7	54.0
1	0.000	1.000	0.000	0.000
2	1.000	0.000	0.000	0.000
3	0.000	0.000	0.300	0.700

PARTICULATE SOURCE STRENGTH MULTIPLIERS BY TIME STEP, 1 TIME STEP(S) USED FOR THIS RUN

SOURCE NUMBER	TSTEP 1 100.00YRS	TSTEP 2 5.00YRS	TSTEP 3 5.00YRS	TSTEP 4 5.00YRS	TSTEP 5 5.00YRS	TSTEP 6 5.00YRS	TSTEP 7 5.00YRS	TSTEP 8 5.00YRS	TSTEP 9 5.00YRS	TSTEP10 5.00YRS
1	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
2	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
3	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
4	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
5	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00

RADON SOURCE STRENGTH MULTIPLIERS BY TIME STEP, 1 TIME STEP(S) USED FOR THIS RUN

SOURCE NUMBER	TSTEP 1 100.00YRS	TSTEP 2 5.00YRS	TSTEP 3 5.00YRS	TSTEP 4 5.00YRS	TSTEP 5 5.00YRS	TSTEP 6 5.00YRS	TSTEP 7 5.00YRS	TSTEP 8 5.00YRS	TSTEP 9 5.00YRS	TSTEP10 5.00YRS
1	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
2	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
3	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
4	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
5	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00

TIME STEP NUMBER 1, DURATION IN YRS IS...100.0

CONCENTRATION DATA FOR THE N DIRECTION, THETA EQUALS 0.0 DEGREES

TOTAL AIR CONCENTRATIONS, PCI/M3, AND WL

XRHO, KM	U-238	Th-230	Ra-226	Pb-210	Rn-222	Po-218	Pb-214	Bi-214	Pb-210	WL
1.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.461E+00	3.092E+00	1.411E+00	7.887E-01	3.279E-06	1.328E-05
2.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.509E+00	2.302E+00	1.205E+00	7.538E-01	3.337E-06	1.129E-05
3.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.640E+00	1.566E+00	9.585E-01	6.579E-01	3.326E-06	8.927E-06
4.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.167E+00	1.145E+00	7.713E-01	5.585E-01	3.255E-06	7.174E-06
7.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.890E-01	6.873E-01	5.079E-01	3.921E-01	3.128E-06	4.746E-06
15.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.351E-01	2.351E-01	2.025E-01	1.752E-01	2.597E-06	1.923E-06
25.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.137E-01	1.137E-01	1.065E-01	9.867E-02	2.354E-06	1.025E-06
35.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.348E-02	6.352E-02	6.229E-02	6.041E-02	2.118E-06	6.066E-07
45.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.535E-02	4.538E-02	4.497E-02	4.417E-02	1.980E-06	4.395E-07
55.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.437E-02	3.439E-02	3.428E-02	3.393E-02	1.867E-06	3.358E-07
65.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.716E-02	2.718E-02	2.718E-02	2.703E-02	1.773E-06	2.666E-07
75.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.214E-02	2.215E-02	2.219E-02	2.214E-02	1.694E-06	2.179E-07

GROUND SURFACE CONCENTRATIONS, PCI/M2

XRHO, KM	U-238	Th-230	Ra-226	Pb-210	Rn-222	Po-218	Pb-214	Bi-214	Pb-210
1.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.449E+00	2.449E+00	2.449E+00	6.830E+00
2.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.823E+00	1.823E+00	1.823E+00	6.952E+00
3.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.241E+00	1.241E+00	1.241E+00	6.927E+00
4.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.073E-01	9.073E-01	9.073E-01	6.781E+00
7.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.443E-01	5.443E-01	5.443E-01	6.515E+00
15.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.862E-01	1.862E-01	1.862E-01	5.409E+00
25.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.006E-02	9.006E-02	9.006E-02	4.902E+00
35.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.031E-02	5.031E-02	5.031E-02	4.411E+00
45.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.594E-02	3.594E-02	3.594E-02	4.124E+00
55.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.724E-02	2.724E-02	2.724E-02	3.889E+00
65.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.153E-02	2.153E-02	2.153E-02	3.694E+00
75.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.755E-02	1.755E-02	1.755E-02	3.528E+00

TOTAL DEPOSITION RATES, PCI/M2-SEC

XRHO, KM	U-238	Th-230	Ra-226	Pb-210
1.5	0.000E+00	0.000E+00	0.000E+00	9.836E-09
2.5	0.000E+00	0.000E+00	0.000E+00	1.001E-08
3.5	0.000E+00	0.000E+00	0.000E+00	9.977E-09
4.5	0.000E+00	0.000E+00	0.000E+00	9.766E-09
7.5	0.000E+00	0.000E+00	0.000E+00	9.383E-09
15.0	0.000E+00	0.000E+00	0.000E+00	7.790E-09
25.0	0.000E+00	0.000E+00	0.000E+00	7.061E-09
35.0	0.000E+00	0.000E+00	0.000E+00	6.353E-09
45.0	0.000E+00	0.000E+00	0.000E+00	5.939E-09
55.0	0.000E+00	0.000E+00	0.000E+00	5.601E-09
65.0	0.000E+00	0.000E+00	0.000E+00	5.320E-09
75.0	0.000E+00	0.000E+00	0.000E+00	5.082E-09

TIME STEP NUMBER 1, DURATION IN YRS IS...100.0

CONCENTRATION DATA FOR THE E DIRECTION, THETA EQUALS 90.0 DEGREES

TOTAL AIR CONCENTRATIONS, PCI/M3, AND WL

XRHO, KM	U-238	Th-230	Ra-226	Pb-210	Rn-222	Po-218	Pb-214	Bi-214	Pb-210	WL
1.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.584E+00	6.799E+00	2.161E+00	1.080E+00	4.041E-06	2.199E-05
2.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.929E+00	4.439E+00	1.882E+00	1.096E+00	4.515E-06	1.821E-05
3.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.472E+00	3.287E+00	1.639E+00	1.038E+00	4.904E-06	1.557E-05
4.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.770E+00	2.682E+00	1.475E+00	9.758E-01	5.229E-06	1.388E-05
7.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.811E+00	1.797E+00	1.169E+00	8.238E-01	5.822E-06	1.085E-05
15.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.001E+00	1.001E+00	7.971E-01	6.248E-01	6.343E-06	7.403E-06
25.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.319E-01	6.322E-01	5.630E-01	4.836E-01	6.552E-06	5.310E-06
35.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.617E-01	4.619E-01	4.332E-01	3.929E-01	6.630E-06	4.138E-06
45.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.628E-01	3.630E-01	3.500E-01	3.284E-01	6.649E-06	3.373E-06
55.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.980E-01	2.981E-01	2.919E-01	2.801E-01	6.632E-06	2.832E-06
65.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.522E-01	2.524E-01	2.495E-01	2.428E-01	6.601E-06	2.431E-06
75.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.184E-01	2.185E-01	2.173E-01	2.135E-01	6.563E-06	2.123E-06

GROUND SURFACE CONCENTRATIONS, PCI/M2

XRHO, KM	U-238	Th-230	Ra-226	Pb-210	Rn-222	Po-218	Pb-214	Bi-214	Pb-210
1.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.385E+00	5.385E+00	5.385E+00	8.416E+00
2.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.516E+00	3.516E+00	3.516E+00	9.405E+00
3.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.603E+00	2.603E+00	2.603E+00	1.022E+01
4.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.125E+00	2.125E+00	2.125E+00	1.089E+01
7.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.423E+00	1.423E+00	1.423E+00	1.213E+01
15.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.926E-01	7.926E-01	7.926E-01	1.321E+01
25.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.007E-01	5.007E-01	5.007E-01	1.365E+01
35.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.659E-01	3.659E-01	3.659E-01	1.381E+01
45.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.875E-01	2.875E-01	2.875E-01	1.385E+01
55.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.361E-01	2.361E-01	2.361E-01	1.382E+01
65.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.999E-01	1.999E-01	1.999E-01	1.375E+01
75.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.731E-01	1.731E-01	1.731E-01	1.367E+01

TOTAL DEPOSITION RATES, PCI/M2-SEC

XRHO, KM	U-238	Th-230	Ra-226	Pb-210
1.5	0.000E+00	0.000E+00	0.000E+00	1.212E-08
2.5	0.000E+00	0.000E+00	0.000E+00	1.355E-08
3.5	0.000E+00	0.000E+00	0.000E+00	1.471E-08
4.5	0.000E+00	0.000E+00	0.000E+00	1.569E-08
7.5	0.000E+00	0.000E+00	0.000E+00	1.747E-08
15.0	0.000E+00	0.000E+00	0.000E+00	1.903E-08
25.0	0.000E+00	0.000E+00	0.000E+00	1.966E-08
35.0	0.000E+00	0.000E+00	0.000E+00	1.989E-08
45.0	0.000E+00	0.000E+00	0.000E+00	1.995E-08
55.0	0.000E+00	0.000E+00	0.000E+00	1.990E-08
65.0	0.000E+00	0.000E+00	0.000E+00	1.980E-08
75.0	0.000E+00	0.000E+00	0.000E+00	1.969E-08

TIME STEP NUMBER 1, DURATION IN YRS IS...100.0

CONCENTRATION DATA FOR THE S DIRECTION, THETA EQUALS 180.0 DEGREES

TOTAL AIR CONCENTRATIONS, PCI/M3, AND WL

XRHO, KM	U-238	Th-230	Ra-226	Pb-210	Rn-222	Po-218	Pb-214	Bi-214	Pb-210	WL
1.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.579E+00	2.349E+00	1.157E+00	6.689E-01	3.147E-06	1.078E-05
2.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.475E+00	1.440E+00	9.224E-01	6.256E-01	3.176E-06	8.494E-06
3.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.110E+00	1.099E+00	7.787E-01	5.733E-01	3.205E-06	7.218E-06
4.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.582E-01	8.545E-01	6.443E-01	4.991E-01	3.148E-06	6.009E-06
7.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.904E-01	4.901E-01	4.049E-01	3.360E-01	2.865E-06	3.811E-06
15.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.843E-01	1.844E-01	1.671E-01	1.491E-01	2.231E-06	1.593E-06
25.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.710E-02	9.715E-02	9.315E-02	8.775E-02	2.002E-06	8.997E-07
35.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.044E-02	6.047E-02	5.950E-02	5.779E-02	1.826E-06	5.795E-07
45.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.596E-02	4.598E-02	4.566E-02	4.491E-02	1.787E-06	4.463E-07
55.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.640E-02	3.642E-02	3.634E-02	3.601E-02	1.738E-06	3.561E-07
65.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.976E-02	2.978E-02	2.979E-02	2.966E-02	1.687E-06	2.924E-07
75.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.493E-02	2.495E-02	2.500E-02	2.496E-02	1.638E-06	2.455E-07

GROUND SURFACE CONCENTRATIONS, PCI/M2

XRHO, KM	U-238	Th-230	Ra-226	Pb-210	Rn-222	Po-218	Pb-214	Bi-214	Pb-210
1.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.861E+00	1.861E+00	1.861E+00	6.555E+00
2.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.141E+00	1.141E+00	1.141E+00	6.615E+00
3.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.704E-01	8.704E-01	8.704E-01	6.677E+00
4.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.768E-01	6.768E-01	6.768E-01	6.556E+00
7.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.882E-01	3.882E-01	3.882E-01	5.967E+00
15.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.461E-01	1.461E-01	1.461E-01	4.648E+00
25.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.695E-02	7.695E-02	7.695E-02	4.170E+00
35.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.790E-02	4.790E-02	4.790E-02	3.805E+00
45.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.642E-02	3.642E-02	3.642E-02	3.723E+00
55.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.885E-02	2.885E-02	2.885E-02	3.619E+00
65.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.358E-02	2.358E-02	2.358E-02	3.514E+00
75.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.976E-02	1.976E-02	1.976E-02	3.412E+00

TOTAL DEPOSITION RATES, PCI/M2-SEC

XRHO, KM	U-238	Th-230	Ra-226	Pb-210
1.5	0.000E+00	0.000E+00	0.000E+00	9.441E-09
2.5	0.000E+00	0.000E+00	0.000E+00	9.528E-09
3.5	0.000E+00	0.000E+00	0.000E+00	9.616E-09
4.5	0.000E+00	0.000E+00	0.000E+00	9.443E-09
7.5	0.000E+00	0.000E+00	0.000E+00	8.594E-09
15.0	0.000E+00	0.000E+00	0.000E+00	6.694E-09
25.0	0.000E+00	0.000E+00	0.000E+00	6.006E-09
35.0	0.000E+00	0.000E+00	0.000E+00	5.479E-09
45.0	0.000E+00	0.000E+00	0.000E+00	5.362E-09
55.0	0.000E+00	0.000E+00	0.000E+00	5.213E-09
65.0	0.000E+00	0.000E+00	0.000E+00	5.060E-09
75.0	0.000E+00	0.000E+00	0.000E+00	4.914E-09

TIME STEP NUMBER 1, DURATION IN YRS IS...100.0

CONCENTRATION DATA FOR THE W DIRECTION, THETA EQUALS 270.0 DEGREES

TOTAL AIR CONCENTRATIONS, PCI/M3, AND WL

XRHO, KM	U-238	Th-230	Ra-226	Pb-210	Rn-222	Po-218	Pb-214	Bi-214	Pb-210	WL
1.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.308E+00	3.501E+00	1.323E+00	6.781E-01	3.159E-06	1.284E-05
2.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.052E+00	2.810E+00	1.351E+00	7.612E-01	3.252E-06	1.258E-05
3.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.657E+00	2.538E+00	1.355E+00	8.304E-01	3.411E-06	1.258E-05
4.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.322E+00	2.265E+00	1.302E+00	8.474E-01	3.529E-06	1.210E-05
7.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.352E+00	2.300E+00	1.275E+00	8.454E-01	3.419E-06	1.199E-05
15.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.196E+00	2.662E+00	9.310E-01	4.110E-01	1.454E-06	8.995E-06
25.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.291E-01	3.289E-01	2.661E-01	2.188E-01	2.491E-06	2.504E-06
35.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.736E-01	1.737E-01	1.574E-01	1.391E-01	2.474E-06	1.496E-06
45.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.170E-01	1.171E-01	1.113E-01	1.030E-01	2.415E-06	1.069E-06
55.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.764E-02	8.769E-02	8.536E-02	8.135E-02	2.356E-06	8.265E-07
65.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.974E-02	6.977E-02	6.881E-02	6.679E-02	2.306E-06	6.699E-07
75.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.764E-02	5.767E-02	5.730E-02	5.627E-02	2.259E-06	5.598E-07

GROUND SURFACE CONCENTRATIONS, PCI/M2

XRHO, KM	U-238	Th-230	Ra-226	Pb-210	Rn-222	Po-218	Pb-214	Bi-214	Pb-210
1.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.773E+00	2.773E+00	2.773E+00	6.581E+00
2.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.226E+00	2.226E+00	2.226E+00	6.773E+00
3.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.010E+00	2.010E+00	2.010E+00	7.106E+00
4.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.794E+00	1.794E+00	1.794E+00	7.351E+00
7.5	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.822E+00	1.822E+00	1.822E+00	7.122E+00
15.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.108E+00	2.108E+00	2.108E+00	3.028E+00
25.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.605E-01	2.605E-01	2.605E-01	5.189E+00
35.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.376E-01	1.376E-01	1.376E-01	5.154E+00
45.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.274E-02	9.274E-02	9.274E-02	5.031E+00
55.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.945E-02	6.945E-02	6.945E-02	4.909E+00
65.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.526E-02	5.526E-02	5.526E-02	4.803E+00
75.0	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.568E-02	4.568E-02	4.568E-02	4.705E+00

TOTAL DEPOSITION RATES, PCI/M2-SEC

XRHO, KM	U-238	Th-230	Ra-226	Pb-210
1.5	0.000E+00	0.000E+00	0.000E+00	9.478E-09
2.5	0.000E+00	0.000E+00	0.000E+00	9.755E-09
3.5	0.000E+00	0.000E+00	0.000E+00	1.023E-08
4.5	0.000E+00	0.000E+00	0.000E+00	1.059E-08
7.5	0.000E+00	0.000E+00	0.000E+00	1.026E-08
15.0	0.000E+00	0.000E+00	0.000E+00	4.361E-09
25.0	0.000E+00	0.000E+00	0.000E+00	7.473E-09
35.0	0.000E+00	0.000E+00	0.000E+00	7.422E-09
45.0	0.000E+00	0.000E+00	0.000E+00	7.245E-09
55.0	0.000E+00	0.000E+00	0.000E+00	7.069E-09
65.0	0.000E+00	0.000E+00	0.000E+00	6.917E-09
75.0	0.000E+00	0.000E+00	0.000E+00	6.776E-09

TIME STEP NUMBER 1, DURATION IN YRS IS...100.0

EXPOSURE PATHWAY IS INHAL. EXPOSED ORGAN IS EFFECTIV

DOSES SHOWN BELOW ARE ANNUAL POPULATION DOSE COMMITMENTS, PERSON-REM PER YEAR

DIRECTION	XRHO 1.5	XRHO 2.5	XRHO 3.5	XRHO 4.5	XRHO 7.5	XRHO 15.0	XRHO 25.0	XRHO 35.0	XRHO 45.0	XRHO 55.0	XRHO 65.0	XRHO 75.0
N	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.268E-06	4.180E-06	0.000E+00	5.737E-06	6.489E-06	7.070E-06
NNE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.387E-05	5.686E-06	0.000E+00	8.102E-06	9.645E-06	1.073E-05
NE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.330E-05	1.563E-05	1.735E-05
ENE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.322E-06	1.185E-05	1.580E-05	2.003E-05	2.415E-05
E	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.596E-05	1.018E-05	1.313E-05	1.649E-05	1.932E-05	2.209E-05
ESE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.415E-06	9.372E-06	1.150E-05	1.320E-05	1.483E-05
SE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.327E-06	4.757E-06	6.231E-06	5.336E-05	1.524E-03
SSE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.822E-06	1.731E-06	5.087E-06	1.257E-05
S	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.271E-06	5.555E-06	8.515E-06
SSW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.439E-06	0.000E+00	1.797E-06	2.152E-06	2.491E-06
SW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.357E-06	4.193E-06	7.113E-06
WSW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.348E-06	6.242E-06	7.175E-06
W	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.825E-06	5.735E-06	6.446E-06
WNW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.559E-06	7.635E-06	8.505E-06
NW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.052E-06	2.161E-05	4.180E-05
NNW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.061E-06	3.619E-06	4.295E-06	1.508E-05	3.298E-05

TOTAL DOSE COMMITMENT IS 2.231E-03 PERSON-REM/YR

TIME STEP NUMBER 1, DURATION IN YRS IS...100.0

EXPOSURE PATHWAY IS INHAL. EXPOSED ORGAN IS BONE

DOSES SHOWN BELOW ARE ANNUAL POPULATION DOSE COMMITMENTS, PERSON-REM PER YEAR

DIRECTION	XRHO 1.5	XRHO 2.5	XRHO 3.5	XRHO 4.5	XRHO 7.5	XRHO 15.0	XRHO 25.0	XRHO 35.0	XRHO 45.0	XRHO 55.0	XRHO 65.0	XRHO 75.0
N	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.649E-05	3.388E-05	0.000E+00	4.646E-05	5.253E-05	5.720E-05
NNE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.936E-04	4.608E-05	0.000E+00	6.561E-05	7.807E-05	8.684E-05
NE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.077E-04	1.265E-04	1.404E-04
ENE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.555E-05	9.599E-05	1.280E-04	1.622E-04	1.955E-04
E	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.727E-04	8.249E-05	1.064E-04	1.336E-04	1.564E-04	1.789E-04
ESE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.200E-05	7.594E-05	9.315E-05	1.069E-04	1.200E-04
SE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.696E-05	3.854E-05	5.046E-05	4.319E-04	1.233E-02
SSE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.476E-05	1.401E-05	4.117E-05	1.017E-04
S	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.030E-05	4.497E-05	6.890E-05
SSW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.977E-05	0.000E+00	1.456E-05	1.743E-05	2.016E-05
SW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.910E-05	3.396E-05	5.759E-05
WSW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.522E-05	5.055E-05	5.809E-05
W	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.909E-05	4.645E-05	5.219E-05
WNW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.314E-05	6.182E-05	6.884E-05
NW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.092E-05	1.750E-04	3.383E-04
NNW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.481E-05	2.932E-05	3.478E-05	1.221E-04	2.669E-04

TOTAL DOSE COMMITMENT IS 1.806E-02 PERSON-REM/YR

TIME STEP NUMBER 1, DURATION IN YRS IS...100.0

EXPOSURE PATHWAY IS INHAL. EXPOSED ORGAN IS AVG.LUNG

DOSES SHOWN BELOW ARE ANNUAL POPULATION DOSE COMMITMENTS, PERSON-REM PER YEAR

DIRECTION	XRHO 1.5	XRHO 2.5	XRHO 3.5	XRHO 4.5	XRHO 7.5	XRHO 15.0	XRHO 25.0	XRHO 35.0	XRHO 45.0	XRHO 55.0	XRHO 65.0	XRHO 75.0
N	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.968E-07	5.201E-07	0.000E+00	7.476E-07	8.653E-07	9.646E-07
NNE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.913E-06	7.099E-07	0.000E+00	1.059E-06	1.289E-06	1.467E-06
NE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.727E-06	2.072E-06	2.347E-06
ENE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.156E-06	1.496E-06	2.030E-06	2.618E-06	3.208E-06
E	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.589E-06	1.260E-06	1.653E-06	2.112E-06	2.514E-06	2.921E-06
ESE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.967E-07	1.186E-06	1.483E-06	1.733E-06	1.982E-06
SE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.154E-07	6.070E-07	8.120E-07	7.101E-06	2.071E-04
SSE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.328E-07	2.262E-07	6.795E-07	1.716E-06
S	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.651E-07	7.374E-07	1.155E-06
SSW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.001E-07	0.000E+00	2.300E-07	2.811E-07	3.317E-07
SW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.987E-07	5.416E-07	9.364E-07
WSW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.513E-07	8.084E-07	9.488E-07
W	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.116E-07	7.423E-07	8.516E-07
WNW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.385E-07	9.987E-07	1.138E-06
NW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.505E-07	2.849E-06	5.642E-06
NNW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.780E-07	4.575E-07	5.558E-07	1.998E-06	4.470E-06

TOTAL DOSE COMMITMENT IS 2.992E-04 PERSON-REM/YR

TIME STEP NUMBER 1, DURATION IN YRS IS...100.0

EXPOSURE PATHWAY IS INHAL. EXPOSED ORGAN IS BRONCHI

DOSES SHOWN BELOW ARE ANNUAL POPULATION DOSE COMMITMENTS, PERSON-REM PER YEAR

DIRECTION	XRHO 1.5	XRHO 2.5	XRHO 3.5	XRHO 4.5	XRHO 7.5	XRHO 15.0	XRHO 25.0	XRHO 35.0	XRHO 45.0	XRHO 55.0	XRHO 65.0	XRHO 75.0
N	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.699E-03	2.143E-03	0.000E+00	1.804E-03	1.698E-03	1.578E-03
NNE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.291E-02	3.730E-03	0.000E+00	3.225E-03	3.186E-03	3.019E-03
NE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.261E-03	8.139E-03	7.769E-03
ENE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.206E-02	1.209E-02	1.334E-02	1.444E-02	1.519E-02
E	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.583E-02	1.212E-02	1.225E-02	1.266E-02	1.261E-02	1.256E-02
ESE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.830E-03	6.627E-03	6.652E-03	6.458E-03	6.287E-03
SE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.372E-03	2.655E-03	2.853E-03	2.070E-02	5.129E-01
SSE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.260E-04	6.395E-04	1.583E-03	3.372E-03
S	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.550E-04	1.674E-03	2.213E-03
SSW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.767E-03	0.000E+00	8.355E-04	8.429E-04	8.413E-04
SW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.308E-03	1.918E-03	2.766E-03
WSW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.491E-03	2.899E-03	2.804E-03
W	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.067E-03	2.964E-03	2.810E-03
WNW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.675E-03	2.538E-03	2.385E-03
NW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.680E-03	5.888E-03	9.617E-03
NNW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.609E-03	1.426E-03	1.349E-03	3.922E-03	7.292E-03

TOTAL DOSE COMMITMENT IS 9.271E-01 PERSON-REM/YR

TIME STEP NUMBER 1, DURATION IN YRS IS...100.0

EXPOSURE PATHWAY IS GROUND EXPOSED ORGAN IS EFFECTIV

DOSES SHOWN BELOW ARE ANNUAL POPULATION DOSE COMMITMENTS, PERSON-REM PER YEAR

DIRECTION	XRHO 1.5	XRHO 2.5	XRHO 3.5	XRHO 4.5	XRHO 7.5	XRHO 15.0	XRHO 25.0	XRHO 35.0	XRHO 45.0	XRHO 55.0	XRHO 65.0	XRHO 75.0
N	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.802E-07	4.658E-07	0.000E+00	5.103E-07	5.382E-07	5.554E-07
NNE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.870E-06	7.260E-07	0.000E+00	7.973E-07	8.749E-07	9.138E-07
NE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.645E-06	1.755E-06	1.805E-06
ENE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.863E-06	2.002E-06	2.354E-06	2.704E-06	3.008E-06
E	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.104E-05	1.916E-06	2.088E-06	2.314E-06	2.459E-06	2.601E-06
ESE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.003E-06	1.251E-06	1.367E-06	1.435E-06	1.502E-06
SE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.462E-07	5.545E-07	6.555E-07	5.189E-06	1.393E-04
SSE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.907E-07	1.647E-07	4.504E-07	1.051E-06
S	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.193E-07	4.858E-07	7.044E-07
SSW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.303E-07	0.000E+00	1.905E-07	2.103E-07	2.281E-07
SW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.739E-07	4.409E-07	6.926E-07
WSW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.141E-07	6.613E-07	7.002E-07
W	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.049E-07	6.416E-07	6.620E-07
WNW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.529E-07	6.946E-07	7.235E-07
NW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.598E-07	1.819E-06	3.317E-06
NNW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.457E-07	3.547E-07	3.819E-07	1.248E-06	2.583E-06

TOTAL DOSE COMMITMENT IS 2.239E-04 PERSON-REM/YR

TIME STEP NUMBER 1, DURATION IN YRS IS...100.0

EXPOSURE PATHWAY IS CLOUD EXPOSED ORGAN IS EFFECTIV

DOSES SHOWN BELOW ARE ANNUAL POPULATION DOSE COMMITMENTS, PERSON-REM PER YEAR

DIRECTION	XRHO 1.5	XRHO 2.5	XRHO 3.5	XRHO 4.5	XRHO 7.5	XRHO 15.0	XRHO 25.0	XRHO 35.0	XRHO 45.0	XRHO 55.0	XRHO 65.0	XRHO 75.0
N	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.074E-05	1.793E-05	0.000E+00	1.562E-05	1.481E-05	1.383E-05
NNE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.650E-04	2.902E-05	0.000E+00	2.698E-05	2.714E-05	2.603E-05
NE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.658E-05	6.747E-05	6.566E-05
ENE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.568E-05	9.224E-05	1.066E-04	1.190E-04	1.279E-04
E	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.190E-04	9.153E-05	9.791E-05	1.048E-04	1.067E-04	1.078E-04
ESE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.633E-05	5.484E-05	5.638E-05	5.554E-05	5.458E-05
SE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.918E-05	2.219E-05	2.434E-05	1.788E-04	4.466E-03
SSE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.013E-06	5.517E-06	1.378E-05	2.952E-05
S	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.948E-06	1.462E-05	1.941E-05
SSW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.471E-05	0.000E+00	7.228E-06	7.353E-06	7.375E-06
SW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.127E-05	1.671E-05	2.425E-05
WSW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.103E-05	2.492E-05	2.437E-05
W	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.510E-05	2.496E-05	2.409E-05
WNW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.288E-05	2.197E-05	2.079E-05
NW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.464E-05	5.156E-05	8.449E-05
NNW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.376E-05	1.239E-05	1.181E-05	3.445E-05	6.420E-05

TOTAL DOSE COMMITMENT IS 7.774E-03 PERSON-REM/YR

TIME STEP NUMBER 1, DURATION IN YRS IS...100.0

EXPOSURE PATHWAY IS VEG. ING EXPOSED ORGAN IS EFFECTIV

DOSES SHOWN BELOW ARE ANNUAL POPULATION DOSE COMMITMENTS, PERSON-REM PER YEAR

DIRECTION	XRHO 1.5	XRHO 2.5	XRHO 3.5	XRHO 4.5	XRHO 7.5	XRHO 15.0	XRHO 25.0	XRHO 35.0	XRHO 45.0	XRHO 55.0	XRHO 65.0	XRHO 75.0
N	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NNE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ENE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
E	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ESE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SSE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
S	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SSW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
WSW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
W	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
WNW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NNW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

TOTAL DOSE COMMITMENT IS 0.000E+00 PERSON-REM/YR

WARNING--POPULATION FOOD INGESTION DOSES SHOWN ABOVE HAVE NOT BEEN CORRECTED TO REFLECT POTENTIAL FOOD EXPORT AND MAY EXCEED DOSES ACTUALLY RECEIVED BY THE POPULATION OF THIS REGION. SEE SUMMARY TABLE FOR THIS INFORMATION.

TIME STEP NUMBER 1, DURATION IN YRS IS...100.0

EXPOSURE PATHWAY IS VEG. ING EXPOSED ORGAN IS BONE

DOSES SHOWN BELOW ARE ANNUAL POPULATION DOSE COMMITMENTS, PERSON-REM PER YEAR

DIRECTION	XRHO 1.5	XRHO 2.5	XRHO 3.5	XRHO 4.5	XRHO 7.5	XRHO 15.0	XRHO 25.0	XRHO 35.0	XRHO 45.0	XRHO 55.0	XRHO 65.0	XRHO 75.0
N	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NNE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ENE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
E	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ESE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SSE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
S	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SSW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
WSW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
W	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
WNW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NNW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

TOTAL DOSE COMMITMENT IS 0.000E+00 PERSON-REM/YR

WARNING--POPULATION FOOD INGESTION DOSES SHOWN ABOVE HAVE NOT BEEN CORRECTED TO REFLECT POTENTIAL FOOD EXPORT AND MAY EXCEED DOSES ACTUALLY RECEIVED BY THE POPULATION OF THIS REGION. SEE SUMMARY TABLE FOR THIS INFORMATION.

TIME STEP NUMBER 1, DURATION IN YRS IS...100.0

EXPOSURE PATHWAY IS MEAT ING EXPOSED ORGAN IS EFFECTIV

DOSES SHOWN BELOW ARE ANNUAL POPULATION DOSE COMMITMENTS, PERSON-REM PER YEAR

DIRECTION	XRHO 1.5	XRHO 2.5	XRHO 3.5	XRHO 4.5	XRHO 7.5	XRHO 15.0	XRHO 25.0	XRHO 35.0	XRHO 45.0	XRHO 55.0	XRHO 65.0	XRHO 75.0
N	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NNE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ENE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
E	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ESE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SSE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
S	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SSW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
WSW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
W	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
WNW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NNW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

TOTAL DOSE COMMITMENT IS 0.000E+00 PERSON-REM/YR

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TIME STEP NUMBER 1, DURATION IN YRS IS...100.0

EXPOSURE PATHWAY IS MEAT ING EXPOSED ORGAN IS BONE

DOSES SHOWN BELOW ARE ANNUAL POPULATION DOSE COMMITMENTS, PERSON-REM PER YEAR

DIRECTION	XRHO 1.5	XRHO 2.5	XRHO 3.5	XRHO 4.5	XRHO 7.5	XRHO 15.0	XRHO 25.0	XRHO 35.0	XRHO 45.0	XRHO 55.0	XRHO 65.0	XRHO 75.0
N	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NNE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ENE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
E	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ESE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SSE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
S	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SSW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
WSW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
W	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
WNW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NNW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

TOTAL DOSE COMMITMENT IS 0.000E+00 PERSON-REM/YR

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DIRECTION	XRHO 1.5	XRHO 2.5	XRHO 3.5	XRHO 4.5	XRHO 7.5	XRHO 15.0	XRHO 25.0	XRHO 35.0	XRHO 45.0	XRHO 55.0	XRHO 65.0	XRHO 75.0
N	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NNE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ENE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
E	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ESE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SSE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
S	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SSW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
WSW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
W	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
WNW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NNW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

TOTAL DOSE COMMITMENT IS 0.000E+00 PERSON-REM/YR

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EXPOSURE PATHWAY IS MILK ING EXPOSED ORGAN IS BONE

DOSES SHOWN BELOW ARE ANNUAL POPULATION DOSE COMMITMENTS, PERSON-REM PER YEAR

DIRECTION	XRHO 1.5	XRHO 2.5	XRHO 3.5	XRHO 4.5	XRHO 7.5	XRHO 15.0	XRHO 25.0	XRHO 35.0	XRHO 45.0	XRHO 55.0	XRHO 65.0	XRHO 75.0
N	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NNE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ENE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
E	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ESE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SSE	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
S	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SSW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
WSW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
W	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
WNW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NNW	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

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TIME STEP NUMBER 1, DURATION IN YRS IS...100.0

SUMMARY PRINT OF POPULATION DOSES COMPUTED FOR TSTEP 1--DOSES SHOWN ARE ANNUAL POPULATION DOSE COMMITMENTS, PERSON-REM PER YEAR

DOSES RECEIVED BY PEOPLE WITHIN 80 KILOMETERS

PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INHAL.	2.231E-03	1.806E-02	2.992E-04	1.354E-02	6.513E-03	9.271E-01
GROUND	2.239E-04	2.239E-04	2.239E-04	2.239E-04	2.239E-04	2.239E-04
CLOUD	7.774E-03	7.774E-03	7.774E-03	7.774E-03	7.774E-03	7.774E-03
VEG. ING	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
MEAT ING	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
MILK ING	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RNPLUS50	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TOTALS	1.023E-02	2.605E-02	8.297E-03	2.154E-02	1.451E-02	9.351E-01

DOSES RECEIVED BY PEOPLE BEYOND 80 KILOMETERS

PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INHAL.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
GROUND	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CLOUD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
VEG. ING	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
MEAT ING	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
MILK ING	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RNPLUS50	4.407E+00	6.009E+01	1.002E+00	4.407E+00	4.407E+00	2.804E+01
TOTALS	4.407E+00	6.009E+01	1.002E+00	4.407E+00	4.407E+00	2.804E+01

TOTAL DOSES COMPUTED OVER ALL POPULATIONS

PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INHAL.	2.231E-03	1.806E-02	2.992E-04	1.354E-02	6.513E-03	9.271E-01
GROUND	2.239E-04	2.239E-04	2.239E-04	2.239E-04	2.239E-04	2.239E-04
CLOUD	7.774E-03	7.774E-03	7.774E-03	7.774E-03	7.774E-03	7.774E-03
VEG. ING	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
MEAT ING	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
MILK ING	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RNPLUS50	4.407E+00	6.009E+01	1.002E+00	4.407E+00	4.407E+00	2.804E+01
TOTALS	4.417E+00	6.012E+01	1.010E+00	4.428E+00	4.421E+00	2.898E+01

TIME STEP NUMBER 1, DURATION IN YRS IS...100.0

INDIVIDUAL RECEPTOR PARTICULATE CONCENTRATIONS

NO.	NAME	PTSZ	AIRBORNE CONCENTRATIONS, PCI/M3 U-238	Th-230	Ra-226	Pb-210	GROUND CONCENTRATIONS, PCI/M2 U-238	Th-230	Ra-226	Pb-210
1	N Jab	1	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1	N Jab	2	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1	N Jab	3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1	N Jab	4	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
	CONCENTRATION TOTALS		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2	NNE Jab	1	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2	NNE Jab	2	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2	NNE Jab	3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2	NNE Jab	4	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
	CONCENTRATION TOTALS		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
3	NE Jab	1	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
3	NE Jab	2	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
3	NE Jab	3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
3	NE Jab	4	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
	CONCENTRATION TOTALS		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
4	ENE Jab	1	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
4	ENE Jab	2	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
4	ENE Jab	3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
4	ENE Jab	4	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
	CONCENTRATION TOTALS		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
5	E Jab	1	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
5	E Jab	2	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
5	E Jab	3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
5	E Jab	4	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
	CONCENTRATION TOTALS		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
6	ESE Jab	1	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
6	ESE Jab	2	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
6	ESE Jab	3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
6	ESE Jab	4	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
	CONCENTRATION TOTALS		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
7	SE Jab	1	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
7	SE Jab	2	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
7	SE Jab	3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
7	SE Jab	4	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
	CONCENTRATION TOTALS		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
8	SSE Jab	1	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
8	SSE Jab	2	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
8	SSE Jab	3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
8	SSE Jab	4	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
	CONCENTRATION TOTALS		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

TIME STEP NUMBER 1, DURATION IN YRS IS...100.0

INDIVIDUAL RECEPTOR PARTICULATE CONCENTRATIONS

NO.	NAME	PTSZ	AIRBORNE CONCENTRATIONS, PCI/M3 U-238	Th-230	Ra-226	Pb-210	GROUND CONCENTRATIONS, PCI/M2 U-238	Th-230	Ra-226	Pb-210
9	S Jab	1	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
9	S Jab	2	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
9	S Jab	3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
9	S Jab	4	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
	CONCENTRATION TOTALS		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
10	SSW Jab	1	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
10	SSW Jab	2	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
10	SSW Jab	3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
10	SSW Jab	4	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
	CONCENTRATION TOTALS		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
11	SW Jab	1	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
11	SW Jab	2	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
11	SW Jab	3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
11	SW Jab	4	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
	CONCENTRATION TOTALS		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
12	WSW Jab	1	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
12	WSW Jab	2	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
12	WSW Jab	3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
12	WSW Jab	4	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
	CONCENTRATION TOTALS		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
13	W Jab	1	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
13	W Jab	2	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
13	W Jab	3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
13	W Jab	4	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
	CONCENTRATION TOTALS		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
14	WNW Jab	1	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
14	WNW Jab	2	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
14	WNW Jab	3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
14	WNW Jab	4	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
	CONCENTRATION TOTALS		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
15	NW Jab	1	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
15	NW Jab	2	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
15	NW Jab	3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
15	NW Jab	4	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
	CONCENTRATION TOTALS		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
16	NNW Jab	1	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
16	NNW Jab	2	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
16	NNW Jab	3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
16	NNW Jab	4	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
	CONCENTRATION TOTALS		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

TIME STEP NUMBER 1, DURATION IN YRS IS...100.0

INDIVIDUAL RECEPTOR PARTICULATE CONCENTRATIONS

NO.	NAME	PTSZ	AIRBORNE CONCENTRATIONS, PCI/M3 U-238	Th-230	Ra-226	Pb-210	GROUND CONCENTRATIONS, PCI/M2 U-238	Th-230	Ra-226	Pb-210
17	N Antelope	1	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
17	N Antelope	2	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
17	N Antelope	3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
17	N Antelope	4	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
	CONCENTRATION TOTALS		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
18	NNE Antelope	1	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
18	NNE Antelope	2	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
18	NNE Antelope	3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
18	NNE Antelope	4	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
	CONCENTRATION TOTALS		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
19	NE Antelope	1	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
19	NE Antelope	2	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
19	NE Antelope	3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
19	NE Antelope	4	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
	CONCENTRATION TOTALS		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
20	ENE Antelope	1	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
20	ENE Antelope	2	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
20	ENE Antelope	3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
20	ENE Antelope	4	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
	CONCENTRATION TOTALS		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
21	E Antelope	1	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
21	E Antelope	2	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
21	E Antelope	3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
21	E Antelope	4	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
	CONCENTRATION TOTALS		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
22	ESE Antelope	1	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
22	ESE Antelope	2	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
22	ESE Antelope	3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
22	ESE Antelope	4	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
	CONCENTRATION TOTALS		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
23	SE Antelope	1	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
23	SE Antelope	2	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
23	SE Antelope	3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
23	SE Antelope	4	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
	CONCENTRATION TOTALS		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
24	SSE Antelope	1	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
24	SSE Antelope	2	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
24	SSE Antelope	3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
24	SSE Antelope	4	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
	CONCENTRATION TOTALS		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

TIME STEP NUMBER 1, DURATION IN YRS IS...100.0

INDIVIDUAL RECEPTOR PARTICULATE CONCENTRATIONS

NO.	NAME	PTSZ	AIRBORNE CONCENTRATIONS, PCI/M3 U-238	Th-230	Ra-226	Pb-210	GROUND CONCENTRATIONS, PCI/M2 U-238	Th-230	Ra-226	Pb-210
25	S Antelope	1	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
25	S Antelope	2	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
25	S Antelope	3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
25	S Antelope	4	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
	CONCENTRATION TOTALS		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
26	SSW Antelope	1	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
26	SSW Antelope	2	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
26	SSW Antelope	3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
26	SSW Antelope	4	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
	CONCENTRATION TOTALS		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
27	SW Antelope	1	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
27	SW Antelope	2	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
27	SW Antelope	3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
27	SW Antelope	4	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
	CONCENTRATION TOTALS		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
28	WSW Antelope	1	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
28	WSW Antelope	2	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
28	WSW Antelope	3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
28	WSW Antelope	4	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
	CONCENTRATION TOTALS		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
29	W Antelope	1	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
29	W Antelope	2	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
29	W Antelope	3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
29	W Antelope	4	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
	CONCENTRATION TOTALS		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
30	WNW Antelope	1	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
30	WNW Antelope	2	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
30	WNW Antelope	3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
30	WNW Antelope	4	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
	CONCENTRATION TOTALS		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
31	NW Antelope	1	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
31	NW Antelope	2	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
31	NW Antelope	3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
31	NW Antelope	4	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
	CONCENTRATION TOTALS		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
32	NNW Antelope	1	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
32	NNW Antelope	2	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
32	NNW Antelope	3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
32	NNW Antelope	4	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
	CONCENTRATION TOTALS		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

TIME STEP NUMBER 1, DURATION IN YRS IS...100.0

INDIVIDUAL RECEPTOR RADON AND RADON DAUGHTER CONCENTRATIONS

	AIRBORNE CONCENTRATIONS, PCI/M3								GROUND CONCENTRATIONS, PCI/M2			
NO.	Rn-222	Po-218	Pb-214	Bi-214	Pb-210	Bi-210	Po-210	WL	Po-218	Pb-214	Bi-214	Pb-210
1	2.242E+00	1.906E+00	6.697E-01	2.738E-01	1.267E-06	1.351E-08	3.989E-12	6.380E-06	1.510E+00	1.510E+00	1.510E+00	2.640E+00
2	3.694E+00	2.821E+00	9.155E-01	3.650E-01	1.317E-06	1.295E-08	3.659E-12	8.909E-06	2.234E+00	2.234E+00	2.234E+00	2.744E+00
3	5.126E+00	3.913E+00	1.256E+00	5.491E-01	1.493E-06	1.227E-08	3.207E-12	1.245E-05	3.099E+00	3.099E+00	3.099E+00	3.110E+00
4	4.165E+00	3.653E+00	1.450E+00	8.318E-01	2.287E-06	1.199E-08	2.314E-12	1.421E-05	2.893E+00	2.893E+00	2.893E+00	4.764E+00
5	4.026E+00	3.719E+00	1.608E+00	9.390E-01	2.679E-06	1.277E-08	2.175E-12	1.548E-05	2.946E+00	2.946E+00	2.946E+00	5.581E+00
6	6.525E+00	5.218E+00	1.540E+00	6.210E-01	1.573E-06	1.271E-08	3.291E-12	1.550E-05	4.133E+00	4.133E+00	4.133E+00	3.276E+00
7	5.609E+00	3.306E+00	7.092E-01	2.574E-01	1.289E-06	1.354E-08	3.881E-12	7.961E-06	2.618E+00	2.618E+00	2.618E+00	2.685E+00
8	3.189E+00	2.253E+00	6.153E-01	2.450E-01	1.295E-06	1.381E-08	4.015E-12	6.354E-06	1.785E+00	1.785E+00	1.785E+00	2.697E+00
9	3.261E+00	2.274E+00	5.945E-01	2.354E-01	1.292E-06	1.408E-08	4.167E-12	6.233E-06	1.801E+00	1.801E+00	1.801E+00	2.690E+00
10	2.437E+00	2.252E+00	9.584E-01	4.973E-01	1.710E-06	1.645E-08	5.077E-12	9.033E-06	1.783E+00	1.783E+00	1.783E+00	3.561E+00
11	2.251E+00	2.144E+00	1.024E+00	5.820E-01	1.966E-06	1.837E-08	6.002E-12	9.568E-06	1.698E+00	1.698E+00	1.698E+00	4.095E+00
12	1.439E+00	1.391E+00	7.983E-01	5.300E-01	2.127E-06	2.039E-08	7.123E-12	7.457E-06	1.102E+00	1.102E+00	1.102E+00	4.431E+00
13	1.143E+00	1.099E+00	6.421E-01	4.393E-01	1.949E-06	2.015E-08	7.355E-12	6.026E-06	8.702E-01	8.702E-01	8.702E-01	4.060E+00
14	7.953E-01	7.792E-01	5.316E-01	3.910E-01	1.900E-06	1.979E-08	7.165E-12	4.956E-06	6.171E-01	6.171E-01	6.171E-01	3.958E+00
15	8.712E-01	8.480E-01	5.437E-01	3.593E-01	1.568E-06	1.644E-08	5.545E-12	4.970E-06	6.716E-01	6.716E-01	6.716E-01	3.265E+00
16	1.671E+00	1.505E+00	5.778E-01	2.515E-01	1.266E-06	1.411E-08	4.339E-12	5.417E-06	1.192E+00	1.192E+00	1.192E+00	2.637E+00
17	2.762E+00	2.514E+00	1.270E+00	7.721E-01	3.326E-06	3.306E-08	1.028E-11	1.191E-05	1.992E+00	1.992E+00	1.992E+00	6.927E+00
18	2.584E+00	2.415E+00	1.296E+00	8.253E-01	3.619E-06	3.656E-08	1.205E-11	1.214E-05	1.913E+00	1.913E+00	1.913E+00	7.538E+00
19	2.930E+00	2.695E+00	1.381E+00	8.803E-01	3.914E-06	4.023E-08	1.390E-11	1.306E-05	2.135E+00	2.135E+00	2.135E+00	8.154E+00
20	1.337E+00	1.330E+00	8.897E-01	6.380E-01	5.350E-06	7.822E-08	3.678E-11	8.260E-06	1.053E+00	1.053E+00	1.053E+00	1.114E+01
21	2.138E+00	2.106E+00	1.286E+00	8.845E-01	5.610E-06	6.740E-08	2.814E-11	1.199E-05	1.668E+00	1.668E+00	1.668E+00	1.169E+01
22	2.525E+00	2.434E+00	1.352E+00	8.874E-01	4.282E-06	4.548E-08	1.671E-11	1.267E-05	1.928E+00	1.928E+00	1.928E+00	8.920E+00
23	2.039E+00	1.948E+00	1.135E+00	7.587E-01	3.698E-06	3.937E-08	1.371E-11	1.059E-05	1.543E+00	1.543E+00	1.543E+00	7.703E+00
24	5.931E+00	3.935E+00	1.314E+00	6.870E-01	3.247E-06	3.450E-08	1.093E-11	1.328E-05	3.117E+00	3.117E+00	3.117E+00	6.764E+00
25	3.069E+00	2.712E+00	1.222E+00	6.758E-01	3.149E-06	3.276E-08	1.022E-11	1.151E-05	2.148E+00	2.148E+00	2.148E+00	6.560E+00
26	3.960E+00	3.395E+00	1.327E+00	6.847E-01	3.070E-06	3.092E-08	9.246E-12	1.278E-05	2.689E+00	2.689E+00	2.689E+00	6.395E+00
27	3.732E+00	3.358E+00	1.412E+00	7.449E-01	3.084E-06	2.861E-08	7.974E-12	1.340E-05	2.660E+00	2.660E+00	2.660E+00	6.425E+00
28	3.086E+00	2.839E+00	1.366E+00	7.778E-01	3.124E-06	2.626E-08	6.670E-12	1.275E-05	2.249E+00	2.249E+00	2.249E+00	6.507E+00
29	2.390E+00	2.322E+00	1.316E+00	8.459E-01	3.505E-06	2.312E-08	4.546E-12	1.222E-05	1.839E+00	1.839E+00	1.839E+00	7.300E+00
30	2.356E+00	2.196E+00	1.156E+00	7.056E-01	3.098E-06	2.296E-08	5.011E-12	1.075E-05	1.739E+00	1.739E+00	1.739E+00	6.454E+00
31	1.985E+00	1.846E+00	9.867E-01	6.006E-01	2.958E-06	2.580E-08	6.555E-12	9.144E-06	1.462E+00	1.462E+00	1.462E+00	6.162E+00
32	2.761E+00	2.383E+00	1.137E+00	6.632E-01	3.043E-06	2.967E-08	8.590E-12	1.069E-05	1.887E+00	1.887E+00	1.887E+00	6.339E+00

TIME STEP NUMBER 1, DURATION IN YRS IS...100.0

NUMBER 1 NAME=N Jab X= -13.6KM, Y= 1.1KM, Z= 0.0M, DIST= 13.6KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	1.72E-01	4.51E-03	3.89E-03	7.37E-03	5.20E-03	2.81E+00
CHILD	TOTALS	1.72E-01	5.05E-03	4.07E-03	5.61E-03	4.65E-03	2.81E+00
TEENAGE	TOTALS	1.72E-01	6.27E-03	4.18E-03	4.85E-03	4.43E-03	2.81E+00
ADULT	TOTALS	1.72E-01	6.26E-03	4.33E-03	4.89E-03	4.50E-03	2.81E+00

NUMBER 2 NAME=NNE Jab X= -13.1KM, Y= 1.1KM, Z= 0.0M, DIST= 13.2KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	2.82E-01	5.88E-03	5.24E-03	8.86E-03	6.60E-03	4.62E+00
CHILD	TOTALS	2.82E-01	6.45E-03	5.42E-03	7.03E-03	6.02E-03	4.62E+00
TEENAGE	TOTALS	2.82E-01	7.71E-03	5.54E-03	6.23E-03	5.80E-03	4.62E+00
ADULT	TOTALS	2.82E-01	7.70E-03	5.70E-03	6.27E-03	5.87E-03	4.62E+00

TIME STEP NUMBER 1, DURATION IN YRS IS...100.0

NUMBER 3 NAME=NE Jab X= -12.4KM, Y= 1.1KM, Z= 0.0M, DIST= 12.5KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	3.92E-01	8.36E-03	7.63E-03	1.17E-02	9.18E-03	6.42E+00
CHILD	TOTALS	3.92E-01	9.01E-03	7.84E-03	9.67E-03	8.53E-03	6.42E+00
TEENAGE	TOTALS	3.92E-01	1.04E-02	7.98E-03	8.77E-03	8.28E-03	6.42E+00
ADULT	TOTALS	3.92E-01	1.04E-02	8.16E-03	8.81E-03	8.36E-03	6.42E+00

NUMBER 4 NAME=ENE Jab X= -10.8KM, Y= 1.1KM, Z= 0.0M, DIST= 10.9KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	3.23E-01	1.17E-02	1.06E-02	1.69E-02	1.30E-02	5.22E+00
CHILD	TOTALS	3.23E-01	1.27E-02	1.09E-02	1.37E-02	1.20E-02	5.22E+00
TEENAGE	TOTALS	3.23E-01	1.49E-02	1.11E-02	1.23E-02	1.16E-02	5.22E+00
ADULT	TOTALS	3.23E-01	1.49E-02	1.14E-02	1.24E-02	1.17E-02	5.22E+00

TIME STEP NUMBER 1, DURATION IN YRS IS...100.0

NUMBER 5 NAME=E Jab X= -10.2KM, Y= 0.0KM, Z= 0.0M, DIST= 10.2KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	3.14E-01	1.32E-02	1.19E-02	1.93E-02	1.47E-02	5.04E+00
CHILD	TOTALS	3.14E-01	1.44E-02	1.23E-02	1.55E-02	1.35E-02	5.04E+00
TEENAGE	TOTALS	3.14E-01	1.69E-02	1.25E-02	1.39E-02	1.30E-02	5.04E+00
ADULT	TOTALS	3.14E-01	1.69E-02	1.28E-02	1.40E-02	1.32E-02	5.04E+00

NUMBER 6 NAME=ESE Jab X= -12.3KM, Y= -0.5KM, Z= 0.0M, DIST= 12.4KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	4.98E-01	9.68E-03	8.91E-03	1.32E-02	1.05E-02	8.16E+00
CHILD	TOTALS	4.98E-01	1.04E-02	9.13E-03	1.10E-02	9.85E-03	8.16E+00
TEENAGE	TOTALS	4.98E-01	1.19E-02	9.28E-03	1.01E-02	9.58E-03	8.16E+00
ADULT	TOTALS	4.98E-01	1.18E-02	9.46E-03	1.01E-02	9.67E-03	8.16E+00

TIME STEP NUMBER 1, DURATION IN YRS IS...100.0

NUMBER 7 NAME=SE Jab X= -13.2KM, Y= -0.4KM, Z= 0.0M, DIST= 13.2KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	4.25E-01	4.62E-03	3.99E-03	7.54E-03	5.33E-03	7.02E+00
CHILD	TOTALS	4.25E-01	5.18E-03	4.17E-03	5.75E-03	4.76E-03	7.02E+00
TEENAGE	TOTALS	4.25E-01	6.42E-03	4.30E-03	4.97E-03	4.55E-03	7.02E+00
ADULT	TOTALS	4.25E-01	6.40E-03	4.45E-03	5.01E-03	4.62E-03	7.02E+00

NUMBER 8 NAME=SSE Jab X= -13.4KM, Y= -0.5KM, Z= 0.0M, DIST= 13.4KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	2.43E-01	4.22E-03	3.59E-03	7.15E-03	4.93E-03	3.99E+00
CHILD	TOTALS	2.43E-01	4.78E-03	3.77E-03	5.35E-03	4.36E-03	3.99E+00
TEENAGE	TOTALS	2.43E-01	6.03E-03	3.89E-03	4.57E-03	4.15E-03	3.99E+00
ADULT	TOTALS	2.43E-01	6.01E-03	4.05E-03	4.61E-03	4.22E-03	3.99E+00

TIME STEP NUMBER 1, DURATION IN YRS IS...100.0

NUMBER 9 NAME=S Jab X= -13.6KM, Y= -0.5KM, Z= 0.0M, DIST= 13.6KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	2.48E-01	4.10E-03	3.47E-03	7.02E-03	4.81E-03	4.08E+00
CHILD	TOTALS	2.48E-01	4.66E-03	3.65E-03	5.23E-03	4.24E-03	4.08E+00
TEENAGE	TOTALS	2.48E-01	5.90E-03	3.78E-03	4.45E-03	4.03E-03	4.08E+00
ADULT	TOTALS	2.48E-01	5.89E-03	3.93E-03	4.49E-03	4.10E-03	4.08E+00

NUMBER 10 NAME=SSW Jab X= -14.3KM, Y= -1.7KM, Z= 0.0M, DIST= 14.4KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	1.89E-01	7.33E-03	6.50E-03	1.12E-02	8.27E-03	3.05E+00
CHILD	TOTALS	1.89E-01	8.07E-03	6.74E-03	8.82E-03	7.52E-03	3.05E+00
TEENAGE	TOTALS	1.89E-01	9.71E-03	6.90E-03	7.79E-03	7.23E-03	3.05E+00
ADULT	TOTALS	1.90E-01	9.69E-03	7.10E-03	7.85E-03	7.33E-03	3.05E+00

TIME STEP NUMBER 1, DURATION IN YRS IS...100.0

NUMBER 11 NAME=SW Jab X= -15.3KM, Y= -1.7KM, Z= 0.0M, DIST= 15.4KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	1.76E-01	8.36E-03	7.40E-03	1.28E-02	9.44E-03	2.82E+00
CHILD	TOTALS	1.76E-01	9.21E-03	7.67E-03	1.01E-02	8.57E-03	2.82E+00
TEENAGE	TOTALS	1.76E-01	1.11E-02	7.86E-03	8.89E-03	8.24E-03	2.82E+00
ADULT	TOTALS	1.77E-01	1.11E-02	8.09E-03	8.95E-03	8.35E-03	2.82E+00

NUMBER 12 NAME=WSW Jab X= -16.6KM, Y= -1.3KM, Z= 0.0M, DIST= 16.7KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	1.15E-01	7.53E-03	6.49E-03	1.23E-02	8.70E-03	1.80E+00
CHILD	TOTALS	1.15E-01	8.45E-03	6.79E-03	9.38E-03	7.76E-03	1.80E+00
TEENAGE	TOTALS	1.15E-01	1.05E-02	6.99E-03	8.10E-03	7.40E-03	1.80E+00
ADULT	TOTALS	1.15E-01	1.05E-02	7.24E-03	8.17E-03	7.52E-03	1.80E+00

TIME STEP NUMBER 1, DURATION IN YRS IS...100.0

NUMBER 13 NAME=W Jab X= -17.0KM, Y= 0.0KM, Z= 0.0M, DIST= 17.0KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	9.13E-02	6.31E-03	5.35E-03	1.07E-02	7.38E-03	1.43E+00
CHILD	TOTALS	9.13E-02	7.15E-03	5.63E-03	8.01E-03	6.52E-03	1.43E+00
TEENAGE	TOTALS	9.13E-02	9.02E-03	5.81E-03	6.83E-03	6.19E-03	1.43E+00
ADULT	TOTALS	9.14E-02	9.00E-03	6.04E-03	6.89E-03	6.30E-03	1.43E+00

NUMBER 14 NAME=WNW Jab X= -17.0KM, Y= 1.4KM, Z= 0.0M, DIST= 17.1KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	6.46E-02	5.62E-03	4.69E-03	9.91E-03	6.66E-03	9.99E-01
CHILD	TOTALS	6.45E-02	6.44E-03	4.96E-03	7.28E-03	5.83E-03	9.99E-01
TEENAGE	TOTALS	6.46E-02	8.26E-03	5.14E-03	6.13E-03	5.51E-03	9.99E-01
ADULT	TOTALS	6.46E-02	8.24E-03	5.36E-03	6.19E-03	5.61E-03	9.99E-01

TIME STEP NUMBER 1, DURATION IN YRS IS...100.0

NUMBER 15 NAME=NW Jab X= -15.5KM, Y= 1.9KM, Z= 0.0M, DIST= 15.6KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	6.99E-02	5.16E-03	4.40E-03	8.70E-03	6.02E-03	1.09E+00
CHILD	TOTALS	6.99E-02	5.84E-03	4.62E-03	6.53E-03	5.33E-03	1.09E+00
TEENAGE	TOTALS	6.99E-02	7.34E-03	4.76E-03	5.58E-03	5.07E-03	1.09E+00
ADULT	TOTALS	6.99E-02	7.33E-03	4.95E-03	5.63E-03	5.15E-03	1.09E+00

NUMBER 16 NAME=NNW Jab X= -14.0KM, Y= 1.1KM, Z= 0.0M, DIST= 14.1KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	1.29E-01	4.11E-03	3.49E-03	6.97E-03	4.80E-03	2.09E+00
CHILD	TOTALS	1.29E-01	4.65E-03	3.67E-03	5.21E-03	4.25E-03	2.09E+00
TEENAGE	TOTALS	1.29E-01	5.87E-03	3.79E-03	4.45E-03	4.03E-03	2.09E+00
ADULT	TOTALS	1.29E-01	5.86E-03	3.94E-03	4.49E-03	4.10E-03	2.09E+00

TIME STEP NUMBER 1, DURATION IN YRS IS...100.0

NUMBER 17 NAME=N Antelope X= 0.0KM, Y= 2.2KM, Z= 0.0M, DIST= 2.2KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	2.17E-01	1.13E-02	9.69E-03	1.88E-02	1.31E-02	3.46E+00
CHILD	TOTALS	2.17E-01	1.27E-02	1.02E-02	1.42E-02	1.17E-02	3.46E+00
TEENAGE	TOTALS	2.17E-01	1.59E-02	1.05E-02	1.22E-02	1.11E-02	3.46E+00
ADULT	TOTALS	2.17E-01	1.59E-02	1.09E-02	1.23E-02	1.13E-02	3.46E+00

NUMBER 18 NAME=NNE Antelope X= 0.9KM, Y= 2.2KM, Z= 0.0M, DIST= 2.4KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	2.05E-01	1.20E-02	1.02E-02	2.02E-02	1.40E-02	3.24E+00
CHILD	TOTALS	2.04E-01	1.36E-02	1.07E-02	1.52E-02	1.24E-02	3.24E+00
TEENAGE	TOTALS	2.04E-01	1.70E-02	1.11E-02	1.30E-02	1.18E-02	3.24E+00
ADULT	TOTALS	2.05E-01	1.70E-02	1.15E-02	1.31E-02	1.20E-02	3.24E+00

TIME STEP NUMBER 1, DURATION IN YRS IS...100.0

NUMBER 19 NAME=NE Antelope X= 1.7KM, Y= 1.7KM, Z= 0.0M, DIST= 2.5KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	2.31E-01	1.28E-02	1.09E-02	2.17E-02	1.50E-02	3.67E+00
CHILD	TOTALS	2.31E-01	1.45E-02	1.15E-02	1.63E-02	1.33E-02	3.67E+00
TEENAGE	TOTALS	2.31E-01	1.83E-02	1.18E-02	1.39E-02	1.26E-02	3.67E+00
ADULT	TOTALS	2.31E-01	1.82E-02	1.23E-02	1.40E-02	1.28E-02	3.67E+00

NUMBER 20 NAME=ENE Antelope X= 8.9KM, Y= 3.7KM, Z= 0.0M, DIST= 9.6KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	1.09E-01	1.04E-02	7.82E-03	2.25E-02	1.34E-02	1.68E+00
CHILD	TOTALS	1.09E-01	1.27E-02	8.57E-03	1.51E-02	1.10E-02	1.68E+00
TEENAGE	TOTALS	1.09E-01	1.79E-02	9.07E-03	1.19E-02	1.01E-02	1.68E+00
ADULT	TOTALS	1.09E-01	1.78E-02	9.70E-03	1.20E-02	1.04E-02	1.68E+00

TIME STEP NUMBER 1, DURATION IN YRS IS...100.0

NUMBER 21 NAME=E Antelope X= 6.2KM, Y= 0.0KM, Z= 0.0M, DIST= 6.2KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	1.72E-01	1.36E-02	1.09E-02	2.63E-02	1.67E-02	2.68E+00
CHILD	TOTALS	1.72E-01	1.60E-02	1.16E-02	1.85E-02	1.42E-02	2.68E+00
TEENAGE	TOTALS	1.72E-01	2.14E-02	1.22E-02	1.51E-02	1.33E-02	2.68E+00
ADULT	TOTALS	1.72E-01	2.13E-02	1.28E-02	1.53E-02	1.36E-02	2.68E+00

NUMBER 22 NAME=ESE Antelope X= 3.0KM, Y= -1.2KM, Z= 0.0M, DIST= 3.2KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	2.01E-01	1.30E-02	1.09E-02	2.27E-02	1.54E-02	3.17E+00
CHILD	TOTALS	2.01E-01	1.49E-02	1.15E-02	1.68E-02	1.35E-02	3.17E+00
TEENAGE	TOTALS	2.01E-01	1.90E-02	1.19E-02	1.42E-02	1.28E-02	3.17E+00
ADULT	TOTALS	2.01E-01	1.89E-02	1.24E-02	1.43E-02	1.30E-02	3.17E+00

TIME STEP NUMBER 1, DURATION IN YRS IS...100.0

NUMBER 23 NAME=SE Antelope X= 1.8KM, Y= -1.8KM, Z= 0.0M, DIST= 2.5KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	1.63E-01	1.11E-02	9.31E-03	1.95E-02	1.31E-02	2.56E+00
CHILD	TOTALS	1.63E-01	1.27E-02	9.83E-03	1.43E-02	1.15E-02	2.56E+00
TEENAGE	TOTALS	1.63E-01	1.63E-02	1.02E-02	1.21E-02	1.09E-02	2.56E+00
ADULT	TOTALS	1.63E-01	1.62E-02	1.06E-02	1.22E-02	1.11E-02	2.56E+00

NUMBER 24 NAME=SSE Antelope X= 0.1KM, Y= -0.3KM, Z= 0.0M, DIST= 0.3KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	4.54E-01	1.07E-02	9.14E-03	1.81E-02	1.25E-02	7.42E+00
CHILD	TOTALS	4.54E-01	1.21E-02	9.59E-03	1.36E-02	1.11E-02	7.42E+00
TEENAGE	TOTALS	4.54E-01	1.52E-02	9.90E-03	1.16E-02	1.05E-02	7.42E+00
ADULT	TOTALS	4.54E-01	1.52E-02	1.03E-02	1.17E-02	1.07E-02	7.42E+00

TIME STEP NUMBER 1, DURATION IN YRS IS...100.0

NUMBER 25 NAME=S Antelope X= 0.0KM, Y= -1.3KM, Z= 0.0M, DIST= 1.3KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	2.39E-01	1.03E-02	8.72E-03	1.74E-02	1.20E-02	3.84E+00
CHILD	TOTALS	2.39E-01	1.16E-02	9.16E-03	1.30E-02	1.06E-02	3.84E+00
TEENAGE	TOTALS	2.39E-01	1.46E-02	9.45E-03	1.11E-02	1.01E-02	3.84E+00
ADULT	TOTALS	2.39E-01	1.46E-02	9.83E-03	1.12E-02	1.02E-02	3.84E+00

NUMBER 26 NAME=SSW Antelope X= -0.5KM, Y= -1.3KM, Z= 0.0M, DIST= 1.4KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	3.06E-01	1.05E-02	9.04E-03	1.75E-02	1.22E-02	4.96E+00
CHILD	TOTALS	3.06E-01	1.19E-02	9.47E-03	1.32E-02	1.09E-02	4.96E+00
TEENAGE	TOTALS	3.06E-01	1.48E-02	9.76E-03	1.14E-02	1.04E-02	4.96E+00
ADULT	TOTALS	3.06E-01	1.48E-02	1.01E-02	1.15E-02	1.05E-02	4.96E+00

TIME STEP NUMBER 1, DURATION IN YRS IS...100.0

NUMBER 27 NAME=SW Antelope X= -1.3KM, Y= -1.3KM, Z= 0.0M, DIST= 1.8KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	2.90E-01	1.12E-02	9.73E-03	1.82E-02	1.29E-02	4.67E+00
CHILD	TOTALS	2.90E-01	1.26E-02	1.02E-02	1.39E-02	1.16E-02	4.67E+00
TEENAGE	TOTALS	2.90E-01	1.55E-02	1.05E-02	1.21E-02	1.11E-02	4.67E+00
ADULT	TOTALS	2.90E-01	1.55E-02	1.08E-02	1.22E-02	1.12E-02	4.67E+00

NUMBER 28 NAME=WSW Antelope X= -2.2KM, Y= -0.9KM, Z= 0.0M, DIST= 2.4KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	2.42E-01	1.14E-02	9.91E-03	1.85E-02	1.31E-02	3.87E+00
CHILD	TOTALS	2.42E-01	1.28E-02	1.03E-02	1.42E-02	1.18E-02	3.87E+00
TEENAGE	TOTALS	2.42E-01	1.58E-02	1.06E-02	1.23E-02	1.12E-02	3.87E+00
ADULT	TOTALS	2.42E-01	1.57E-02	1.10E-02	1.24E-02	1.14E-02	3.87E+00

TIME STEP NUMBER 1, DURATION IN YRS IS...100.0

NUMBER 29 NAME=W Antelope X= -4.2KM, Y= 0.0KM, Z= 0.0M, DIST= 4.2KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	1.90E-01	1.21E-02	1.04E-02	2.01E-02	1.41E-02	3.00E+00
CHILD	TOTALS	1.90E-01	1.37E-02	1.09E-02	1.52E-02	1.25E-02	3.00E+00
TEENAGE	TOTALS	1.90E-01	1.70E-02	1.13E-02	1.31E-02	1.19E-02	3.00E+00
ADULT	TOTALS	1.90E-01	1.70E-02	1.17E-02	1.32E-02	1.21E-02	3.00E+00

NUMBER 30 NAME=WNW Antelope X= -3.5KM, Y= 1.5KM, Z= 0.0M, DIST= 3.8KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	1.86E-01	1.03E-02	8.83E-03	1.73E-02	1.20E-02	2.95E+00
CHILD	TOTALS	1.86E-01	1.17E-02	9.27E-03	1.30E-02	1.07E-02	2.95E+00
TEENAGE	TOTALS	1.86E-01	1.47E-02	9.56E-03	1.12E-02	1.02E-02	2.95E+00
ADULT	TOTALS	1.86E-01	1.46E-02	9.92E-03	1.13E-02	1.03E-02	2.95E+00

TIME STEP NUMBER 1, DURATION IN YRS IS...100.0

NUMBER 31 NAME=NW Antelope X= -2.3KM, Y= 2.3KM, Z= 0.0M, DIST= 3.2KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	1.57E-01	8.98E-03	7.54E-03	1.57E-02	1.06E-02	2.49E+00
CHILD	TOTALS	1.57E-01	1.03E-02	7.95E-03	1.16E-02	9.30E-03	2.49E+00
TEENAGE	TOTALS	1.57E-01	1.31E-02	8.23E-03	9.78E-03	8.81E-03	2.49E+00
ADULT	TOTALS	1.57E-01	1.31E-02	8.58E-03	9.87E-03	8.97E-03	2.49E+00

NUMBER 32 NAME=NNW Antelope X= -1.0KM, Y= 2.3KM, Z= 0.0M, DIST= 2.5KM, IRTYPE= 1

40CFR190 ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEENAGE	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ADULT	TOTALS	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TOTAL ANNUAL DOSE COMMITMENTS COMPUTED FOR THIS LOCATION, MREM/YR

AGE	PATHWAY	EFFECTIV	BONE	AVG.LUNG	LIVER	KIDNEY	BRONCHI
INFANT	TOTALS	2.16E-01	9.91E-03	8.43E-03	1.68E-02	1.16E-02	3.46E+00
CHILD	TOTALS	2.16E-01	1.12E-02	8.85E-03	1.26E-02	1.02E-02	3.46E+00
TEENAGE	TOTALS	2.16E-01	1.41E-02	9.14E-03	1.07E-02	9.73E-03	3.46E+00
ADULT	TOTALS	2.16E-01	1.41E-02	9.50E-03	1.08E-02	9.90E-03	3.46E+00

0Program execution time = 2.53 seconds