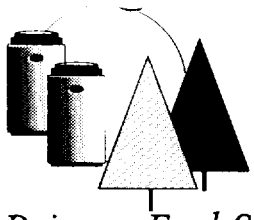
72-22



Private Fuel Storage, L.L.C.

P.O. Box C4010, La Crosse, WI 54602-4010
Phone 303-741-7009 Fax: 303-741-7806
John L. Donnell, P.E., Project Director

June 15, 1998

Director
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

SUPPLEMENTAL RESPONSE TO RAIs
PRIVATE FUEL STORAGE FACILITY
DOCKET NO. 72-22 / TAC NO. L22462
PRIVATE FUEL STORAGE L.L.C.

References: 1) NRC Letter, Delligatti to Parkyn, Request for Additional Information, dated April 1, 1998
2) PFSLLC Letter, Parkyn to Director, Office of Material Safety and Safeguards, Response to Request for Additional Information, dated April 29, 1998
3) PFSLLC Letter, Parkyn to Director, Office of Material Safety and Safeguards, Responses to Request for Additional Information, dated May 19, 1998

Please find enclosed Private Fuel Storage responses (original plus 15 copies) to the NRC Request for Additional Information (Ref. 1) for three of the four responses scheduled for June 15, 1998 in accordance with Reference 2. The fourth response scheduled for June 15, 1998, LA 1-6, is expected to be transmitted later this week. These responses supplement the information provided in Reference 3.

If you have any questions regarding this response, please contact me at 303-741-7009.

JP Hennessy

FOR John Donnell
Project Director
Private Fuel Storage L.L.C.

Enclosure

c: Mr. Leon Bear
Ms. Denise Chancellor
Mr. Mark Delligatti
Mr. Jay Silberg

SAR CHAPTER 2 - SITE CHARACTERISTICS

Section 2.5.1 Regional Characteristics

2-3 Provide the following information relative to the withdrawal and use of water on or near the proposed Private Fuel Storage Facility (PFSF):

(a) A map that shows where water withdrawal is occurring on or in the vicinity of the PFSF site with particular reference to the proposed storage pad. At the least, include all wells located within a minimum 8-km (5 mi) radius of the PFSF.

(b) For each identified well-
- Depth to water
- Formation from which water is withdrawn
- Quantity of water withdrawn annually and pumping rates
- Discussion of use of the water from each well with particular reference to any consumption by humans or animals

(c) If no water wells are located within the specified 8-km radius of the proposed PFSF site, include a specific statement such as "No groundwater is extracted within the 8-km (5 mi) radius of the proposed PFSF."

(d) Potentiometric contours of groundwater at and around the proposed PFSF site (if relevant).

(e) Classification of the aquifer beneath the PFSF site based on class of use and water quality (if relevant).
- NUREG–1567 (Section 2.4.5), Subsurface Hydrology, indicates this information should be provided.

RESPONSE

(a) The enclosed figure indicates the locations of all known water wells within 5 miles (8 km) of the PFSF. Other off-Reservation wells may have been drilled within five miles of the PFSF but they do not have a current water right on-file with the State's Division of Water Rights. Some of the wells in the table appear to be abandoned or have not been utilized in many years, such as the wells to the west and south of the Reservation, but the water right has been maintained.

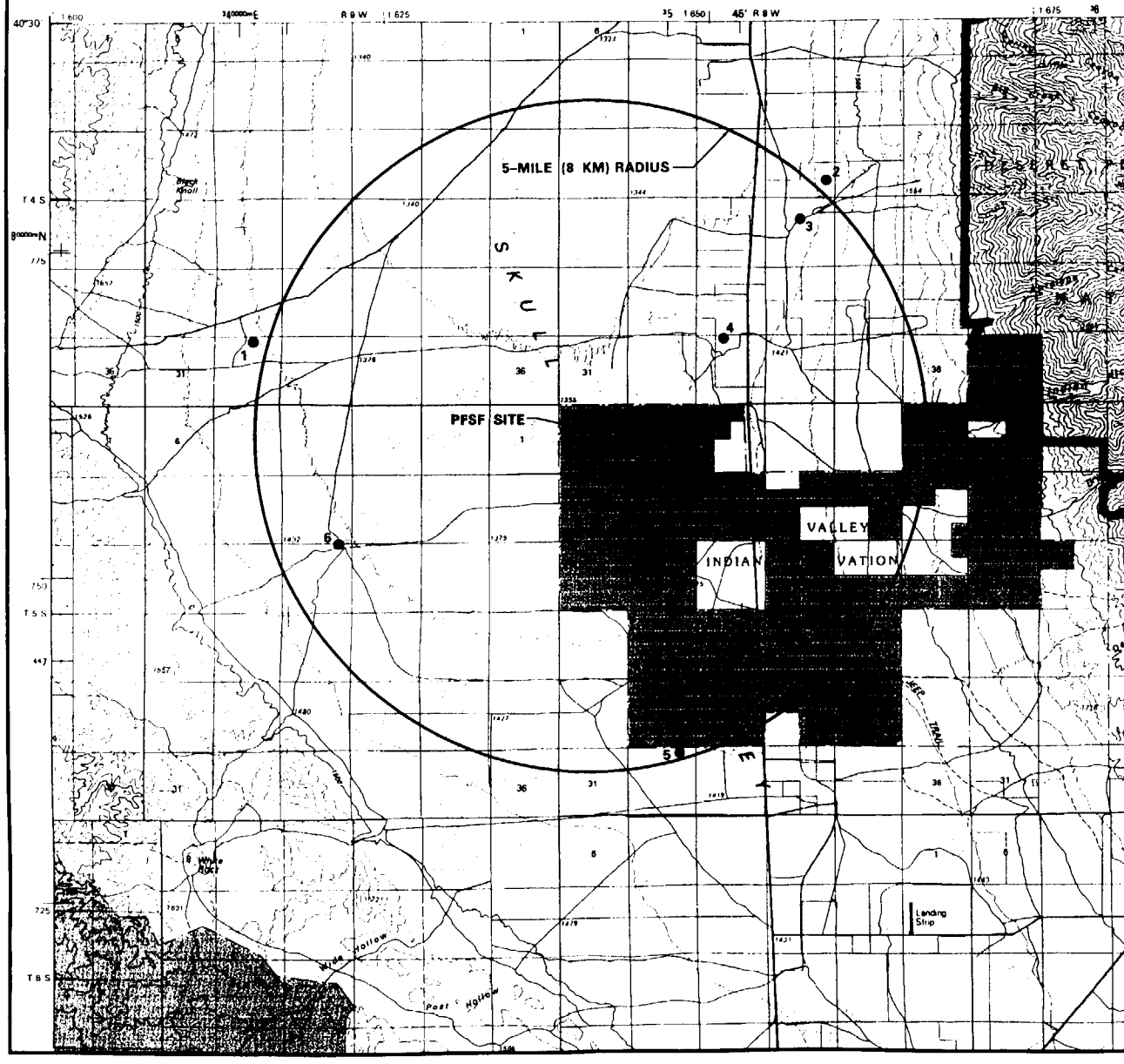
(b) The enclosed figure includes a table listing the requested information, where available. No crops for human consumption are grown with water from irrigation wells listed in the table.

(c) See response to (a), above.

(d) The potentiometric map (Plate 1) from Hood and Waddell is included as part of this response.

(e) The State has not applied an aquifer classification system to the aquifer in Skull Valley. A water quality map (Plate 2) from Hood and Waddell is included as part of this response.

Hood,J.W., and Waddell,K.M., Hydrologic Reconnaissance of Skull Valley, Tooele County, Utah, DNR Tech Pub. No. 18, 1968



WELL MAP NO	OWNER	TOTAL DEPTH	DATE DRILLED	USE	DEPTH TO WATER	YIELD	CURRENT WATER RIGHT
1	SKULL VALLEY CO LTD	340'	1956	STOCK WATERING		35 gpm	
2	ISLAND RANCHING CO INC	325	NO INFO	IRRIGATION, STOCK		NO DATA	c/s
3	ISLAND RANCHING CO INC	347'	19-	IRRIGATION, STOCK		NO DATA	YES (1954) 1 228 cfs
4	ANSCHUTZ LAND CO , LTD.	408'		IRRIGATION, STOCK		NO DATA	YES (1960) 0 7487 cfs
5	ANSCHUTZ LAND CO , LTD	209'		STOCK WATERING		20 gpm	YES (1948) 0 015 cfs
6	ANSCHUTZ LAND CO , LTD	292'		STOCK WATERING		12 gpm	YES (1940) 0 015 cfs
7	SKULL VALLEY INDIAN RESERV	401'		DOMESTIC, INDUSTRIAL		15 gpm	NOT REQUIRED
8	SKULL VALLEY INDIAN RESERV	651'		DOMESTIC		60 gpm	NOT REQUIRED
9	SKULL VALLEY INDIAN RESERV	NO DATA		DOMESTIC		NO DATA	NOT REQUIRED

SOURCES: BASE MAP IS RUSH VALLEY, UT BUREAU OF LAND MANAGEMENT SPECIAL EDITION SURFACE MANAGEMENT STATUS 1:100,000 SCALE METRIC 1981 WELL DATA ARE FROM STATE OF UTAH DIVISION OF WATER RIGHTS AND HOOD AND WADDELL (1968)

LEGEND:

● WATER WELL LOCATION

SCALE 1 100,000

CONTOUR INTERVAL IS 50 METERS

KILOMETERS 0 1 2 3 4 5 6

MILES 0 1 2 3 4

REQUEST FOR ADDITIONAL INFORMATION NO. 1
QUESTION 2-3

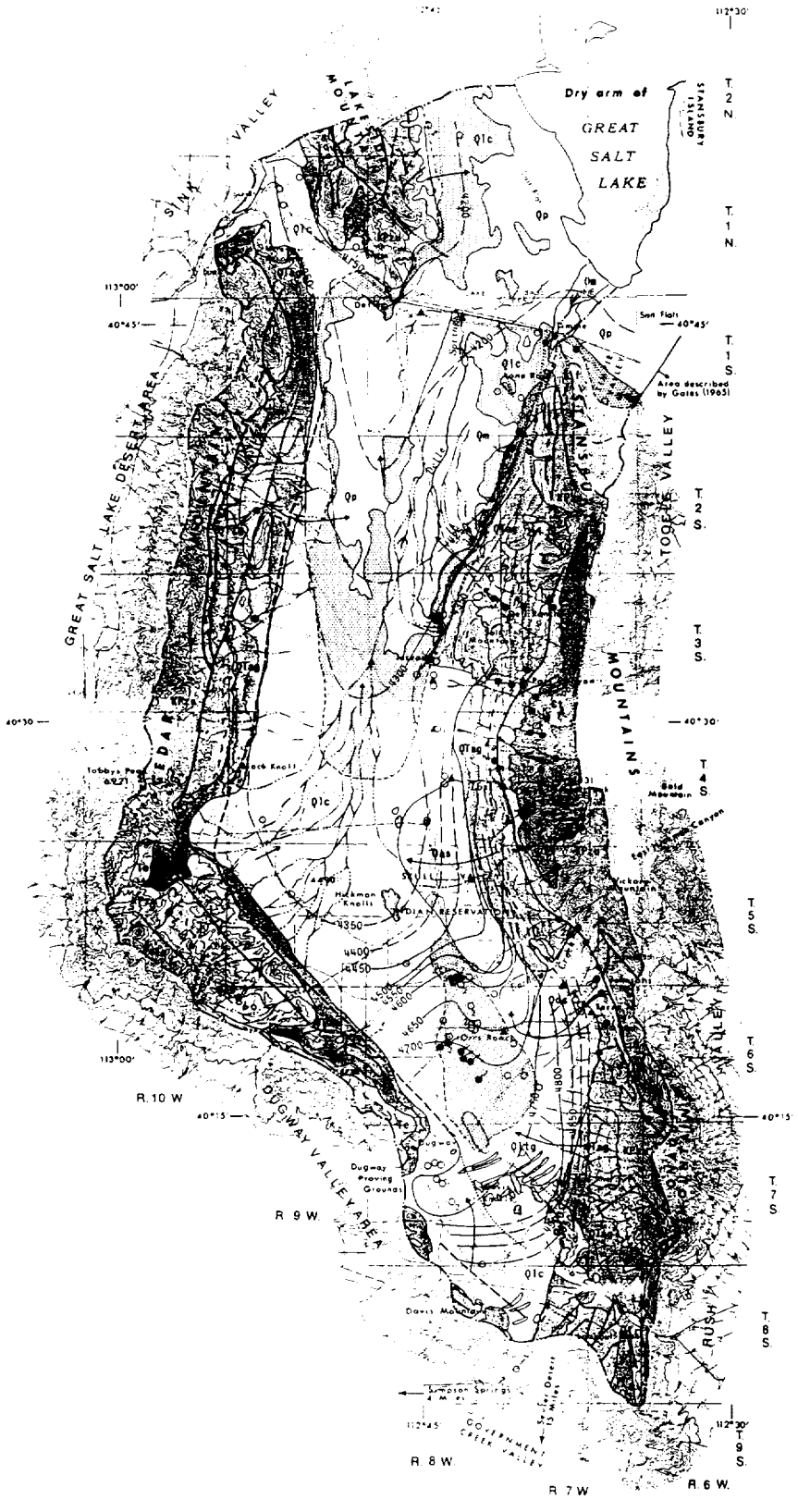
WATER WELLS WITHIN 5 MILES (8 KM) OF PFSF SITE

PRIVATE FUEL STORAGE FACILITY

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES

TECHNICAL PUBLICATION NO. 18
PLATE I 1968



EXPLANATION

GEOLOGY

Qp — Playa deposits

Qm — Marshy land
Includes local small open bodies of moderately to very saline water

Qas — Alluvial surface
Mostly sloping and well-drained and generally not stony; locally may be part of recharge area; moderate permeability

Qds — Dune sand
Locally acts as recharge area; moderate to high permeability

Qltg — Gravel in constructional lakeshore features (terraces, spits, and bars)
Locally acts as recharge area; high permeability

Qlc — Lakebed sediments
Clays with low to moderate permeability, but generally tight enough to inhibit recharge

QUATERNARY

QTsg — Colluvium and alluvium
Mostly stony; recharge area; yields water freely to wells

Te — Extrusive rocks
Volcanic flows and pyroclastics; low permeability

TERTIARY

MIDDLE CAMBRIAN to PERMIAN and CRETACEOUS(?)

KPzu — Sedimentary rocks
Mainly carbonate rocks, generally low in permeability, but locally high in permeability along joints, faults, and cavernous zones

LOWER and MIDDLE CAMBRIAN

Tintic Quartzite
Low in permeability

PALEOZOIC

Approximate geologic contact

Fault
Solid line where exposed; dashed where inferred; dotted where concealed

Highest recognized Lake Bonneville shoreline

HYDROLOGY

4300 — Water-level contour
Shows altitude of water level. Dashed where approximate. Contour interval is 50 feet. Datum is mean sea level. Arrow indicates direction of ground-water movement

Flowing Nonflowing
Well

Spring
Number indicates more than one well or spring at site

Surface-water or pipeline data site

Boundary of evapotranspiration areas

Phreatophytes
Mainly greasewood and rabbitbrush in southern part of valley; mainly greasewood and saltgrass in northern part

Boundary of drainage basin

Base from Army Map Service 1:250,000 series: Tooele (1962)

5 0 5 Miles
5 0 5 Kilometers

CONTOUR INTERVAL 200 FEET
WITH SUPPLEMENTARY CONTOURS AT 100 FOOT INTERVALS
DATUM IS MEAN SEA LEVEL

Geohydrology by J. W. Hood, 1965. Geology adapted from Stokes (1964) and Rigby (1958).

Plate 1. — GENERALIZED GEOHYDROLOGIC MAP OF SKULL VALLEY, TOOELE COUNTY, UTAH

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES

TECHNICAL PUBLICATION NO. 18
PLATE 2
1968

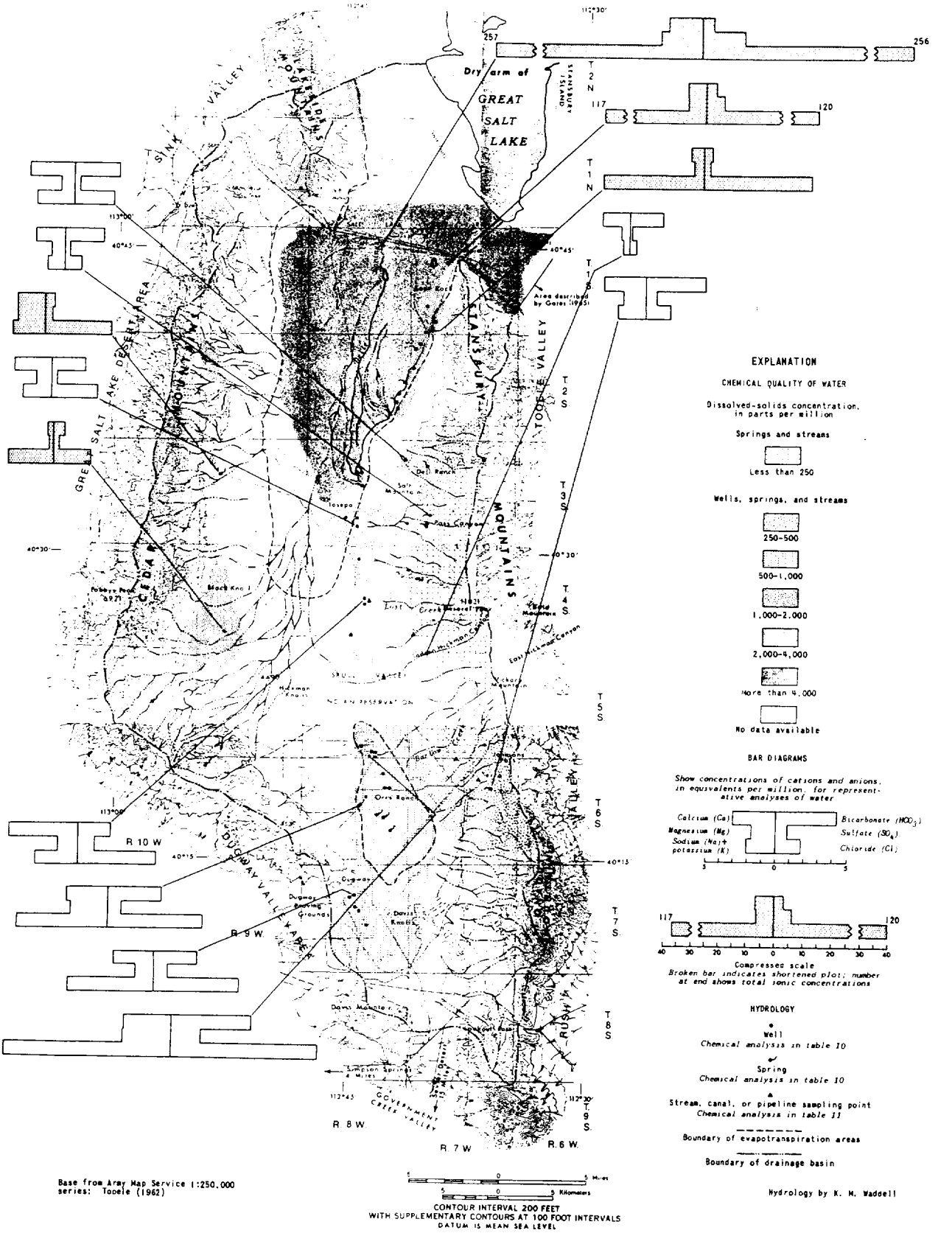
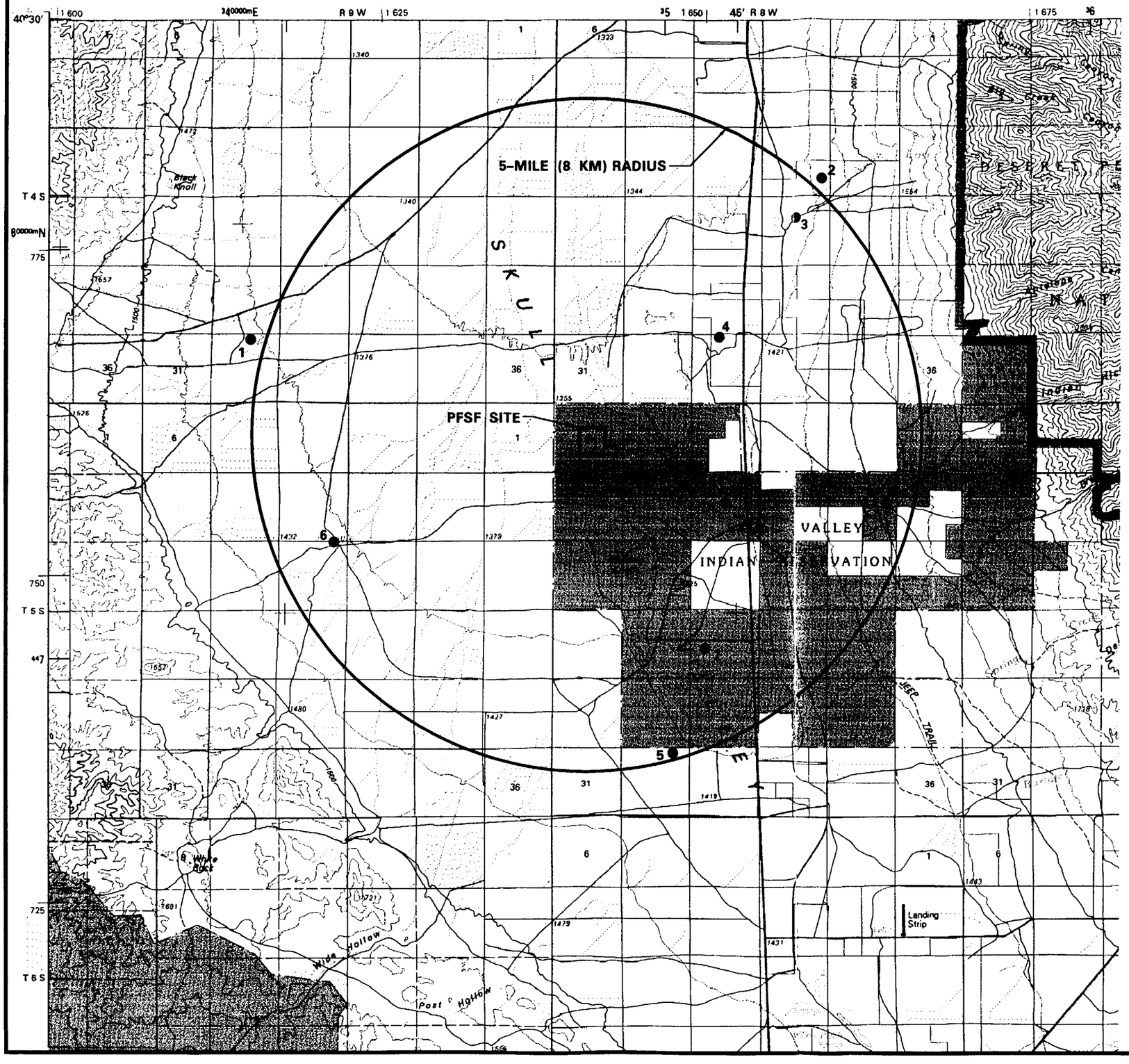


Plate 2. — MAP SHOWING THE GENERALIZED DISTRIBUTION OF DISSOLVED SOLIDS IN GROUND AND SURFACE WATERS, THE CHEMICAL CHARACTER OF REPRESENTATIVE WATER SOURCES, AND THE RELATION OF QUALITY TO THE SOURCES OF RECHARGE AND THE AREAS OF DISCHARGE IN SKULL VALLEY, TOOELE COUNTY, UTAH



ANSTEC APERTURE CARD

Also Available on Aperture Card

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2	ISLAND RANCHING CO., INC.	325'	NO INFO.	IRRIGATION, STOCK		NO DATA	cfs
3	ISLAND RANCHING CO., INC.	347'	19[illegible]	IRRIGATION, STOCK		NO DATA	YES (1954) 1.226 cfs
4	ANSCHUTZ LAND CO., LTD.	408'		IRRIGATION, STOCK		NO DATA	YES (1960) 0.7487 cfs
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SOURCES: BASE MAP IS RUSH VALLEY, UT, BUREAU OF LAND MANAGEMENT SPECIAL EDITION, SURFACE MANAGEMENT STATUS, 1:100,000 SCALE METRIC, 1981. WELL DATA ARE FROM STATE OF UTAH, DIVISION OF WATER RIGHTS AND HOOD AND WADDELL (1968).

LEGEND:

● WATER WELL LOCATION

9806250030-01

SCALE 1 : 100,000

CONTOUR INTERVAL IS 50 METERS

KILOMETERS 0 1 2 3 4 5 6

MILES 0 1 2 3 4

REQUEST FOR ADDITIONAL INFORMATION NO. 1
QUESTION 2-3

WATER WELLS WITHIN 5 MILES (8 KM) OF PFSF SITE

PRIVATE FUEL STORAGE FACILITY

UNITED STATES DEPARTMENT OF THE INTERIOR
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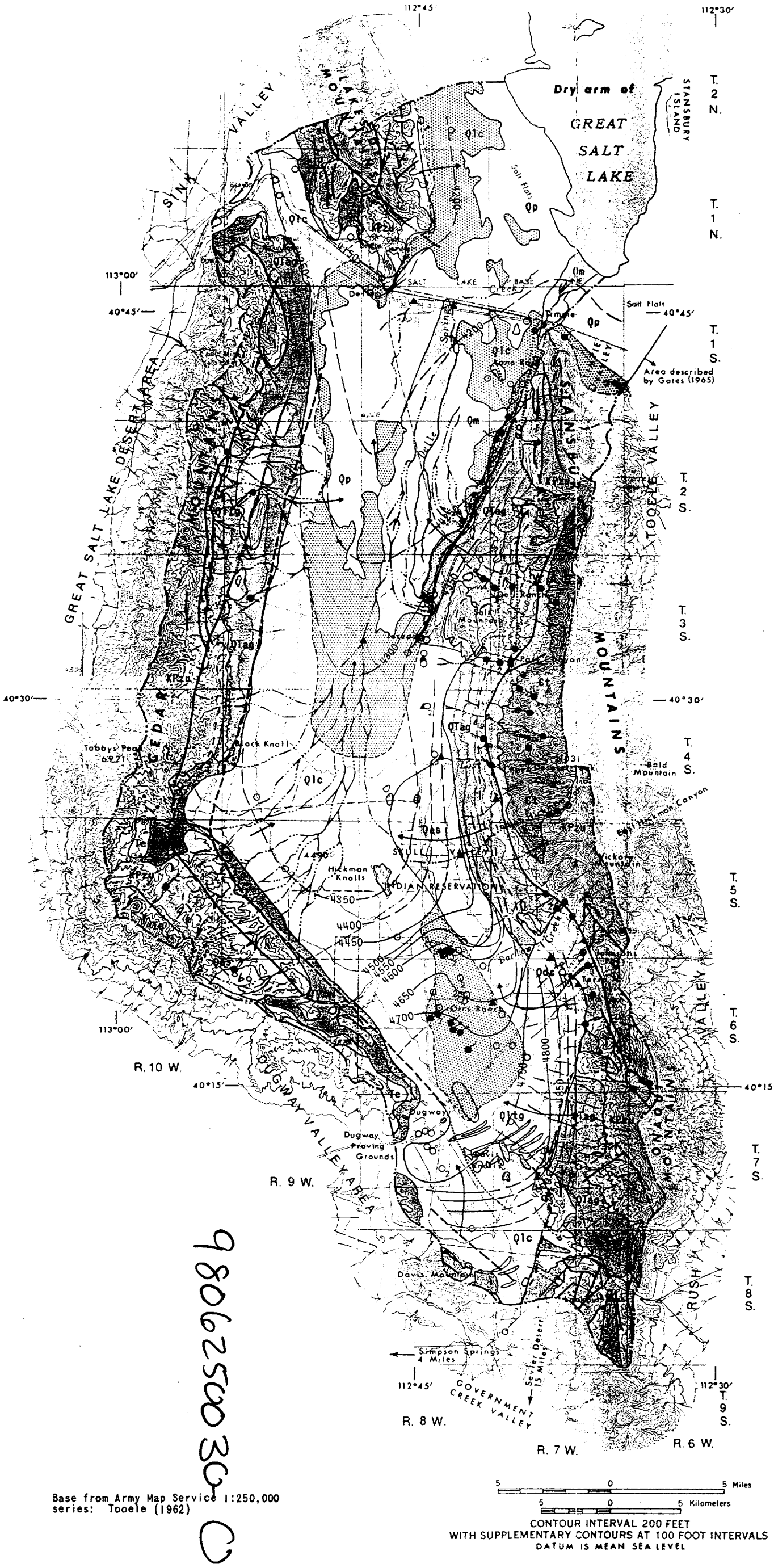

Base from Army Map Service 1:250,000 series: Tooele (1962)

5 0 5 Miles
5 0 5 Kilometers

CONTOUR INTERVAL 200 FEET
WITH SUPPLEMENTARY CONTOURS AT 100 FOOT INTERVALS
DATUM IS MEAN SEA LEVEL

EXPLANATION

GEOLOGY

Qp — Playa deposits

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Mostly sloping and well-drained and generally not stony; locally may be part of recharge area; moderate permeability

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Qlc — Lakebed sediments
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QTag — Colluvium and alluvium
Mostly stony; recharge area; yields water freely to wells

Te — Extrusive rocks
Volcanic flows and pyroclastics; low permeability

QUATERNARY / TERTIARY

KPzu — Sedimentary rocks (MIDDLE CAMBRIAN to PERMIAN and CRETACEOUS(?))
Mainly carbonate rocks, generally low in permeability, but locally high in permeability along joints, faults, and cavernous zones

St — Tintic Quartzite (LOWER and MIDDLE CAMBRIAN)
Low in permeability

PALEOZOIC

Approximate geologic contact

Fault
Solid line where exposed; dashed where inferred; dotted where concealed

Highest recognized Lake Bonneville shoreline

HYDROLOGY

4300 — Water-level contour
Shows altitude of water level. Dashed where approximate. Contour interval is 50 feet. Datum is mean sea level. Arrow indicates direction of ground-water movement

●² *Flowing* ○² *Nonflowing* Well

●² Spring
Number indicates more than one well or spring at site

▲ Surface-water or pipeline data site

Boundary of evapotranspiration areas

Phreatophytes
Mainly greasewood and rabbitbrush in southern part of valley; mainly greasewood and saltgrass in northern part

Boundary of drainage basin

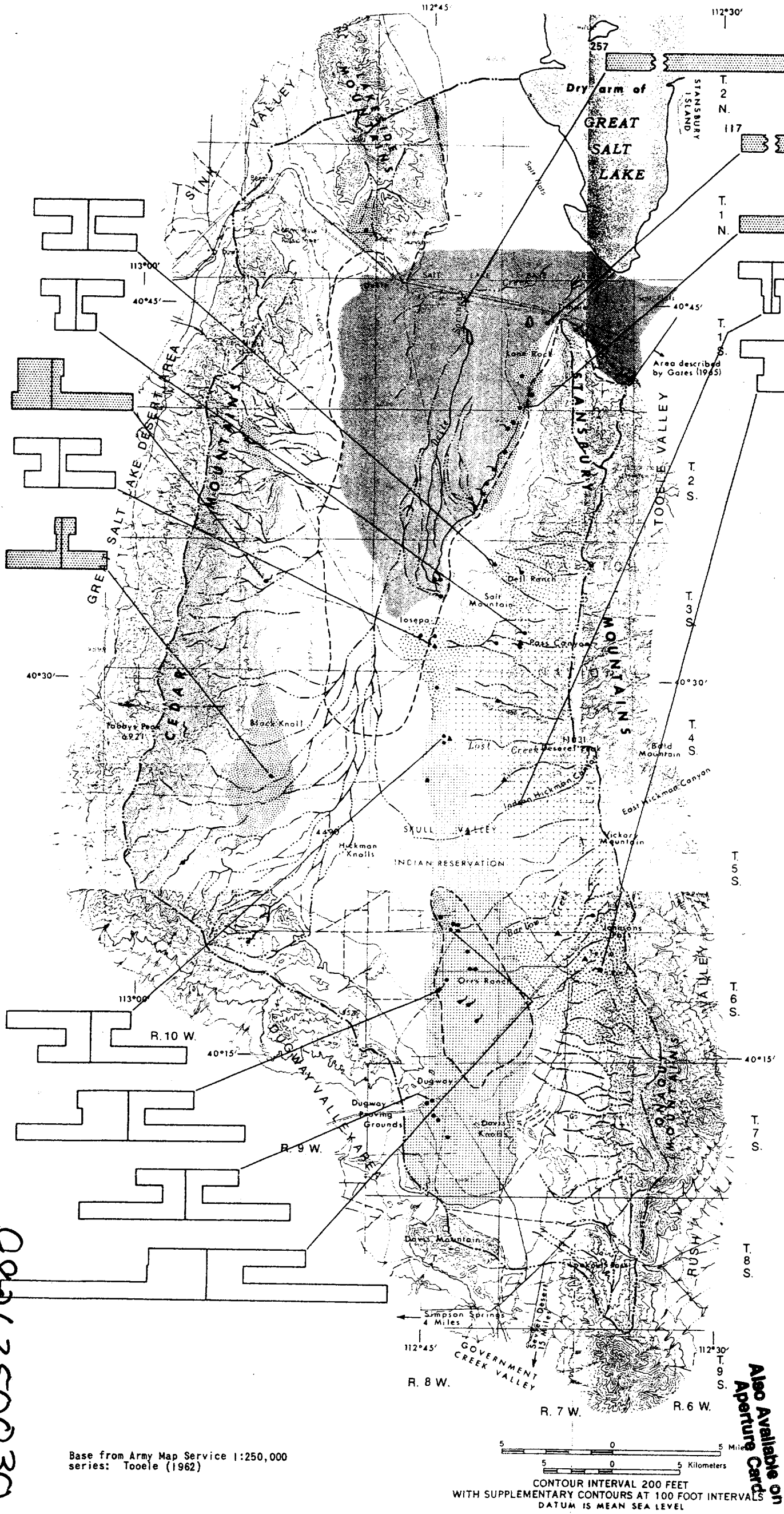
Geohydrology by J. W. Hood, 1965. Geology adapted from Stokes (1964) and Rigby (1958).

Plate 1. — GENERALIZED GEOHYDROLOGIC MAP OF SKULL VALLEY, TOOELE COUNTY, UTAH

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES

TECHNICAL PUBLICATION NO. 18
PLATE 2 1968



EXPLANATION

CHEMICAL QUALITY OF WATER

Dissolved-solids concentration, in parts per million

Springs and streams

Less than 250

Wells, springs, and streams

250-500

500-1,000

1,000-2,000

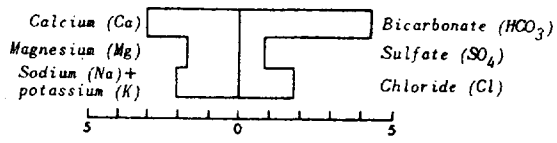
2,000-4,000

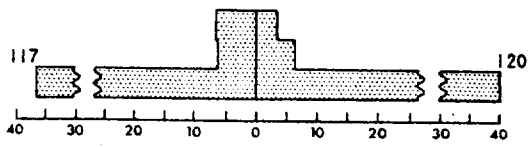
More than 4,000

No data available

BAR DIAGRAMS

Show concentrations of cations and anions, in equivalents per million, for representative analyses of water





Compressed scale

Broken bar indicates shortened plot; number at end shows total ionic concentrations

HYDROLOGY

Well
Chemical analysis in table 10

Spring
Chemical analysis in table 10

Stream, canal, or pipeline sampling point
Chemical analysis in table 11

Boundary of evapotranspiration areas

Boundary of drainage basin

Hydrology by K. M. Waddell

Plate 2. — MAP SHOWING THE GENERALIZED DISTRIBUTION OF DISSOLVED SOLIDS IN GROUND AND SURFACE WATERS, THE CHEMICAL CHARACTER OF REPRESENTATIVE WATER SOURCES, AND THE RELATION OF QUALITY TO THE SOURCES OF RECHARGE AND THE AREAS OF DISCHARGE IN SKULL VALLEY, TOOELE COUNTY, UTAH

SAR CHAPTER 2 - SITE CHARACTERISTICS

Section 2.6.1 Basic Geologic and Seismic Information

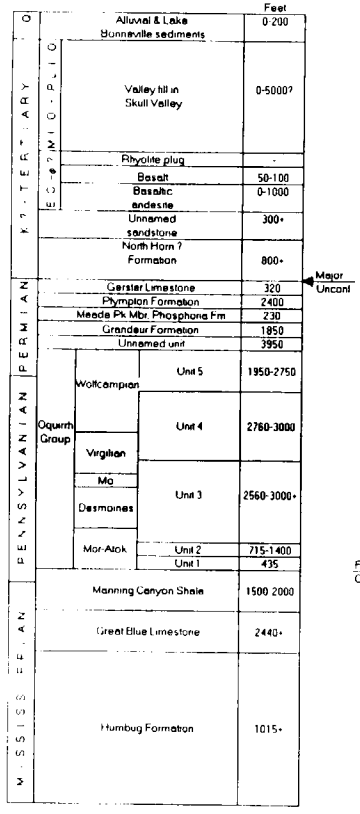
2-4 Provide a column with geologic descriptions summarizing the eastern Great Basin stratigraphy.

- NUREG–1567 (Section 2.4.6.1), Basic Geology and Seismic Information, indicates this information should be included.

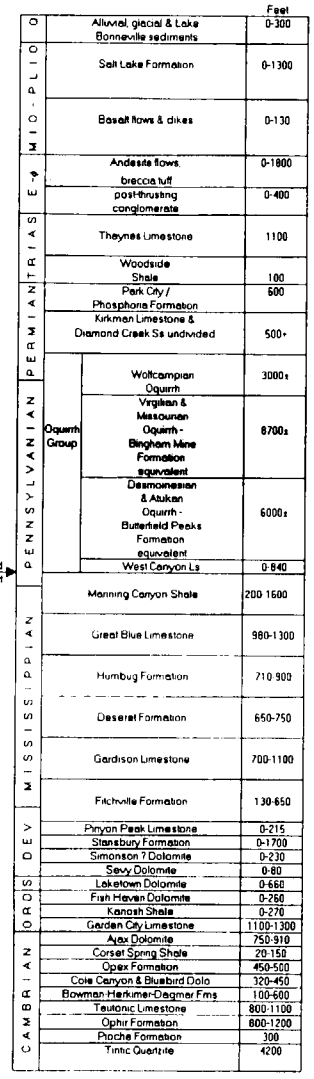
RESPONSE

A stratigraphic column for the Skull Valley area is shown in the attached figure.

CEDAR MOUNTAINS



STANSBURY MOUNTAINS



CENOZOIC

Quaternary

Alluvial, glacial, and Lake Bonneville sediments – unconsolidated sand, gravel, silt, and clay with some ash beds and marl.

Miocene-Pliocene

Salt Lake Formation (or Group) – valley fill deposits – semi to unconsolidated sand, gravel, silt, clay, tuff and freshwater limestone.

Basalt flows and dikes – olivine basalts believed to mark beginning of Basin and Range rifting

Eocene-Oligocene

Andesite flows, breccia tuffs – widespread, voluminous rhyolite, dacite, latite, andesite, and welded tuff.

Unnamed post-thrusting conglomerate (= North Horn? Formation?) – reddish pebble conglomerate with argillaceous and calcareous matrix.

MESOZOIC

Triassic

Thaynes Limestone – light gray limestone with red-brown to light gray shaley siltstone and sandstone, minor dolomite

Woodside Shale – reddish-brown, shaley siltstone and cross-bedded, fine to medium-grained sandstone.

PALEOZOIC

Permian

Park City/Phosphoria Formation – light gray to pink, thin to thick bedded limestone with brown-black cherty limestone, phosphorite and phosphatic siltstone.

Kirkman Limestone and Diamond Creek Sandstone – Kirkman is light to medium-gray, thin to thick-bedded limestone with chert; Diamond Creek Sandstone is red-brown to light brown, cross-bedded sandstone with some intercalated limestone.

Penn. to Perm

Oquirrh Group – cyclic alternation of sandy limestone, brown sandstone and minor shale, siltstone, and quartzite, fossiliferous

Miss. to Penn.

Manning Canyon Shale – (lower) black shale, (middle) dark gray limestone, and (upper) black shale and quartzite, with some pyrite nodules and chert

Mississippian

Great Blue Limestone – medium to massive bedded, nearly pure, gray to dark gray limestone with some chert, dark green calcareous shale near top

Humbug Formation – alternating beds of limey sandstone, ortho-quartzite, crinoidal limestone, and sandy limestone, yellow to red-brown and gray alternations

Deseret Formation – dark gray and blue, somewhat clastic limestone with chert banding and blebs (eyes).

Gardison Limestone – dense, bluish-gray limestone, fossiliferous.

PALEOZOIC (CONT.)

Devonian Miss

Fitchville Formation – massive to thin-bedded, light to dark gray dolomite and gray to buff clastic limestone

Devonian

Pinyon Peak Limestone – thin, platy, silty, or argillaceous limestone

Stansbury Formation – highly variable conglomerate, sandstone, and quartzite with thin beds of gray limestone and dolomite

Simonson (?) Dolomite – dark gray with minor light gray, medium to coarse crystalline, weakly bedded dolomite

Sevy Dolomite – very fine crystalline, light gray dolomite with well-defined bedding. Sand layer or dolomitic conglomerate marks the top of the formation

Silurian

Laketown Dolomite – alternating light to dark gray well-bedded dolomite in lower part and coarse crystalline, massive to obscurely thick-bedded gray dolomite in upper part

Ordovician

Fish Haver Dolomite – dark gray to black dolomite with some interbeds of light to medium gray dolomite

Kanosh Shale – green to black, graptolitic shale with interbeds of argillaceous sandstone and limestone or dolomite

Garden City Limestone – cherty limestone and dolomite, medium gray, argillaceous limestone, interbedded gray argillaceous limestone and green to brown shale or siltstone, sandy limestone with chert and siltstone bands

Cambrian

Ajax Limestone – thick-bedded, dark gray, ledge-forming dolomite with pisolites, oolites, and chert nodules.

Corset Spring Shale (= Dunderberg Shale?) – thinly bedded, argillaceous limestone and dolomite interbedded with olive to brown-green silty shale.

Opex Formation – gray to black oolitic dolomite, interbedded limestone, dolomite, and shale, light gray to tan dolomite at top.

Cole Canyon and Bluebird Dolomites – thick to massive bedded, dark gray, medium to fine crystalline dolomite (Bluebird), laminated light and dark gray dolomite (Cole Canyon)

Bowman Herkimer Dagmar Formations – medium gray, crystalline, laminated dolomite (Dagmar), thin to medium-bedded gray limestone, interbedded light and dark gray dolomite (Herkimer), olive and tan shale with interbedded blue-gray limestone (Bowman)

Teutonic Limestone – blue-gray to dark gray dolomite, thinly interbedded shale and limestone, massive gray dolomite, and argillaceous limestone

Ophir Formation – calcareous sandstone and sandy limestone, pisolitic limestone, green shale, dark gray limestone

Pioche Formation – interbedded green phyllitic shale, shale maroon graywacke and quartzite with prominent cross bedding

Tintic Quartzite – light colored (white, light gray, reddish brown), medium grained, medium bedded quartzite, with a few beds of micaceous shale in the upper part and pebble conglomerate

SOURCES

Heylmun, E.B., 1965. Reconnaissance of the Tertiary Sedimentary Rocks in Western Utah. Utah Geological and Mineralogical Survey, Bulletin 75, 38 pp.

Hintze, L.F., 1988. Geologic History of Utah, Brigham Young University Geology Studies, Spec. Pub. 7, 203 pp.

Rigby, J.K., 1958. Geology of the Stansbury Mountains, Tooele County, Utah. Utah Geological Society Guidebook 13, 134 pp.

Teichert, J.A., 1959. Geology of the Southern Stansbury Range, Tooele County, Utah. Utah Geological and Mineralogical Survey, Bulletin 65, 75 pp.

Witkind, I.J., 1983. Overthrusts and Salt Diapirs, Central Utah, in D.M. Miller et al., editors, Tectonic and Stratigraphic Studies in the Eastern Great Basin. Geological Society of America, Memoir 157, pp. 45-59.

REQUEST FOR ADDITIONAL INFORMATION NO. 1
QUESTION 2-4

STRATIGRAPHIC COLUMN FOR SKULL VALLEY AREA

PRIVATE FUEL STORAGE FACILITY

CEDAR MOUNTAINS

			Feet
Q		Alluvial & Lake Bonneville sediments	0-200
K?-TERTIARY	EO-?/MIO-PLIO	Valley fill in Skull Valley	0-5000?
		Rhyolite plug	-
		Basalt	50-100
		Basaltic andesite	0-1000
		Unnamed sandstone	300+
		North Horn ? Formation	800+
PERMIAN		Gerster Limestone	320
		Plympton Formation	2400
		Meade Pk Mbr, Phosphoria Fm	230
		Grandeur Formation	1850
		Unnamed unit	3950
PENNSYLVANIAN	Oquirrh Group	Wolfcampian — Unit 5	1950-2750
		Virgilian — Unit 4	2760-3000
		Mo / Desmoines — Unit 3	2560-3000+
		Mor-Atok — Unit 2	715-1400
		Mor-Atok — Unit 1	435
MISSISSIPPIAN		Manning Canyon Shale	1500-2000
		Great Blue Limestone	2440+
		Humbug Formation	1015+

Major Unconf.

Faulted Contact

STANSBURY MOUNTAINS

			Feet
Q		Alluvial, glacial & Lake Bonneville sediments	0-300
MIO-PLIO		Salt Lake Formation	0-1300
		Basalt flows & dikes	0-130
E-?		Andesite flows, breccia tuff	0-1800
		post-thrusting conglomerate	0-400
TRIASSIC		Thaynes Limestone	1100
		Woodside Shale	100
PERMIAN		Park City / Phosphoria Formation	600
		Kirkman Limestone & Diamond Creek Ss undivided	500+
PENNSYLVANIAN	Oquirrh Group	Wolfcampian Oquirrh	3000±
		Virgilian & Missourian Oquirrh - Bingham Mine Formation equivalent	8700±
		Desmoinesian & Atokan Oquirrh - Butterfield Peaks Formation equivalent	6000±
		West Canyon Ls	0-840
MISSISSIPPIAN		Manning Canyon Shale	200-1600
		Great Blue Limestone	980-1300
		Humbug Formation	710-900
		Deseret Formation	650-750
		Gardison Limestone	700-1100
		Fitchville Formation	130-650
DEV		Pinyon Peak Limestone	0-215
		Stansbury Formation	0-1700
		Simonson ? Dolomite	0-230
		Sevy Dolomite	0-80
ORDIS		Laketown Dolomite	0-660
		Fish Haven Dolomite	0-260
		Kanosh Shale	0-270
		Garden City Limestone	1100-1300
CAMBRIAN		Ajax Dolomite	750-910
		Corset Spring Shale	20-150
		Opex Formation	450-500
		Cole Canyon & Bluebird Dolo	320-450
		Bowman-Herkimer-Dagmar Fms	100-600
		Teutonic Limestone	800-1100
		Ophir Formation	800-1200
		Pioche Formation	300
		Tintic Quartzite	4200

CENOZOIC

Quaternary

Alluvial, glacial, and Lake Bonneville sediments – unconsolidated sand, gravel, silt, and clay with some ash beds and marl.

Miocene-Pliocene

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Basalt flows and dikes – olivine basalts believed to mark beginning of Basin and Range rifting.

Eocene-Oligocene

Andesite flows, breccia tuffs – widespread, voluminous rhyolite, dacite, latite, andesite, and welded tuff.

Unnamed post-thrusting conglomerate (= North Horn? Formation?) – reddish pebble conglomerate with argillaceous and calcareous matrix.

MESOZOIC

Triassic

Thaynes Limestone – light gray limestone with red-brown to light gray shaley siltstone and sandstone, minor dolomite.

Woodside Shale – reddish-brown, shaley siltstone and cross-bedded, fine to medium-grained sandstone.

PALEOZOIC

Permian

Park City/Phosphoria Formation – light gray to pink, thin to thick-bedded limestone with brown-black cherty limestone, phosphorite and phosphatic siltstone.

Kirkman Limestone and Diamond Creek Sandstone – Kirkman is light to medium-gray, thin to thick-bedded limestone with chert; Diamond Creek Sandstone is red-brown to light brown, cross-bedded sandstone with some intercalated limestone.

Penn. to Perm.

Oquirrh Group – cyclic alternation of sandy limestone, brown sandstone and minor shale, siltstone, and quartzite; fossiliferous.

Miss. to Penn.

Manning Canyon Shale – (lower) black shale, (middle) dark gray limestone, and (upper) black shale and quartzite, with some pyrite nodules and chert.

Mississippian

Great Blue Limestone – medium to massive bedded, nearly pure, gray to dark gray limestone with some chert; dark green calcareous shale near top.

Humbug Formation – alternating beds of limey sandstone, ortho-quartzite, crinoidal limestone, and sandy limestone; yellow to red-brown and gray alternations.

Deseret Formation – dark gray and blue, somewhat clastic limestone with chert banding and blebs (eyes).

Gardison Limestone – dense, bluish-gray limestone, fossiliferous.

PALEOZOIC (CONT.)

Devonian-Miss.

Fitchville Formation – massive to thin-bedded, light to dark gray dolomite and gray to buff clastic limestone

Devonian

Pinyon Peak Limestone – thin, platy, silty, or argillaceous limestone.

Stansbury Formation – highly variable conglomerate, sandstone, and quartzite with thin beds of gray limestone and dolomite.

Simonson (?) Dolomite – dark gray with minor light gray, medium to coarse crystalline, weakly bedded dolomite.

Sevy Dolomite – very fine crystalline, light gray dolomite with well-defined bedding. Sand layer or dolomitic conglomerate marks the top of the formation.

Silurian

Laketown Dolomite – alternating light to dark gray well-bedded dolomite in lower part and coarse crystalline, massive to obscurely thick-bedded gray dolomite in upper part.

Ordovician

Fish Haven Dolomite – dark gray to black dolomite with some interbeds of light to medium gray dolomite.

Kanosh Shale – green to black, graptolitic shale with interbeds of argillaceous sandstone and limestone or dolomite.

Garden City Limestone – cherty limestone and dolomite; medium gray, argillaceous limestone; interbedded gray argillaceous limestone and green to brown shale or siltstone; sandy limestone with chert and siltstone bands.

Cambrian

Ajax Limestone – thick-bedded, dark gray, ledge-forming dolomite with pisolites, oolites, and chert nodules.

Corset Spring Shale (= Dunderberg Shale?) – thinly bedded, argillaceous limestone and dolomite interbedded with olive to brown-green silty shale.

Opex Formation – gray to black oolitic dolomite, interbedded limestone, dolomite, and shale, light gray to tan dolomite at top.

Cole Canyon and Bluebird Dolomites – thick to massive bedded, dark gray, medium to fine crystalline dolomite (Bluebird); laminated light and dark gray dolomite (Cole Canyon).

Bowman-Herkimer-Dagmar Formations – medium gray, crystalline, laminated dolomite (Dagmar); thin to medium-bedded gray limestone, interbedded light and dark gray dolomite (Herkimer); olive and tan shale with interbedded blue-gray limestone (Bowman).

Teutonic Limestone – blue-gray to dark gray dolomite, thinly interbedded shale and limestone, massive gray dolomite, and argillaceous limestone.

Ophir Formation – calcareous sandstone and sandy limestone, pisolitic limestone, green shale, dark gray limestone.

Pioche Formation – interbedded green phyllitic shale, shale, maroon graywacke and quartzite with prominent cross-bedding.

Tintic Quartzite – light colored (white, light gray, reddish brown), medium grained, medium-bedded quartzite, with a few beds of micaceous shale in the upper part and pebble conglomerate.

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REQUEST FOR ADDITIONAL INFORMATION NO. 1
QUESTION 2-4

STRATIGRAPHIC COLUMN FOR SKULL VALLEY AREA

PRIVATE FUEL STORAGE FACILITY

CHAPTER 9—CONDUCT OF OPERATIONS

Emergency Plan Section 4 Organization

9-14 Provide a discussion in the EP explaining how radiation monitoring teams and the fire brigade will be staffed by available staff during an alert.

The EP provides insufficient information regarding the staffing of radiation teams and the fire brigade. Staffing requirements for the Emergency Response Organization below the supervisory positions for both normal working hours and off-hours should be provided to support an NRC evaluation of whether or not sufficient staffing is available for functions such as radiological assessment, fire fighting, and security control, among others.

RESPONSE

The response teams for off-normal events requiring radiation monitoring or firefighting will be staffed through a system of call-in personnel. During normal working hours, the response for a radiological assessment need will be met by maintaining a member of the health physics staff at the site at all times during the weekday day-shift. For off-hours events (weekday nights and evenings and weekends) one member of the health physics staff shall carry a response beeper. Training in emergency procedure techniques will be provided to the security force to ensure the capability for immediate emergency assessment. Members of the security force will always be at the site in accordance with the Security Plan.

Personnel trained in firefighting will provide the response to fires within the facility or approaching the facility. The facility will have two fire trucks available; one on the facility premises and one on the reservation which is within four miles of the facility. All members of the maintenance staff, health physics staff, and security staff will receive firefighting training. For the purposes of firefighting, at least two members of the staff trained in firefighting will be on-call with paging devices. For security control events the on-duty base security staff can be supplemented by an additional security person who will be provided a paging device. This security person will be available for either firefighting or security related response needs. Further supplementation of staff for security control issues, firefighting, or events requiring radiological assessment will be provided through a phone tree with automatic dial capability to ensure the ability to maximize the personnel response available to an off-normal event. It should be noted that the potential for fire (per Emergency Plan Section 3.2, D) is greatest during fuel deliveries (i.e., diesel fuel in trucks or train engines) and, during these deliveries, extra personnel are available for firefighting.