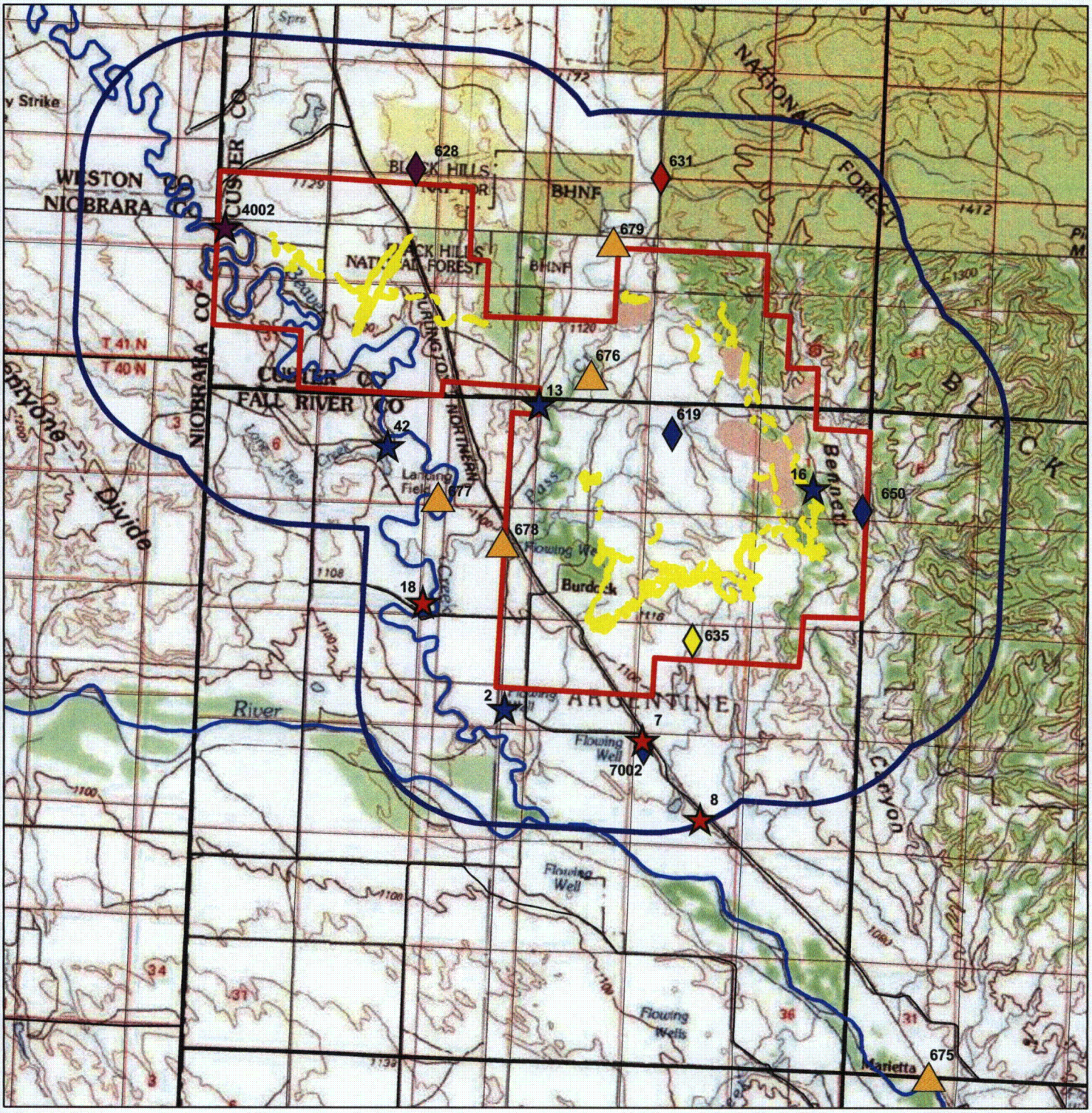
DEWEY-BURDOCK

POWERTECH (USA) INC. URANIUM PROJECT

In Situ Uranium Project Baseline Sampling: Site Visit

January 15, 2008

40-9075



Permit Boundary
2 km Buffer
Sections
Ore Bodies
Roads
Streams

Well Use

Use
- Domestic
- Stock
- Monitor or Pump Test
- Abandoned
- Unknown

Aquifer

Aquifer
- Alluvium
- Fall River
- Fuson Shale
- Lakota
- Inyan Kara
- Sundance
- Madison
- Unknown

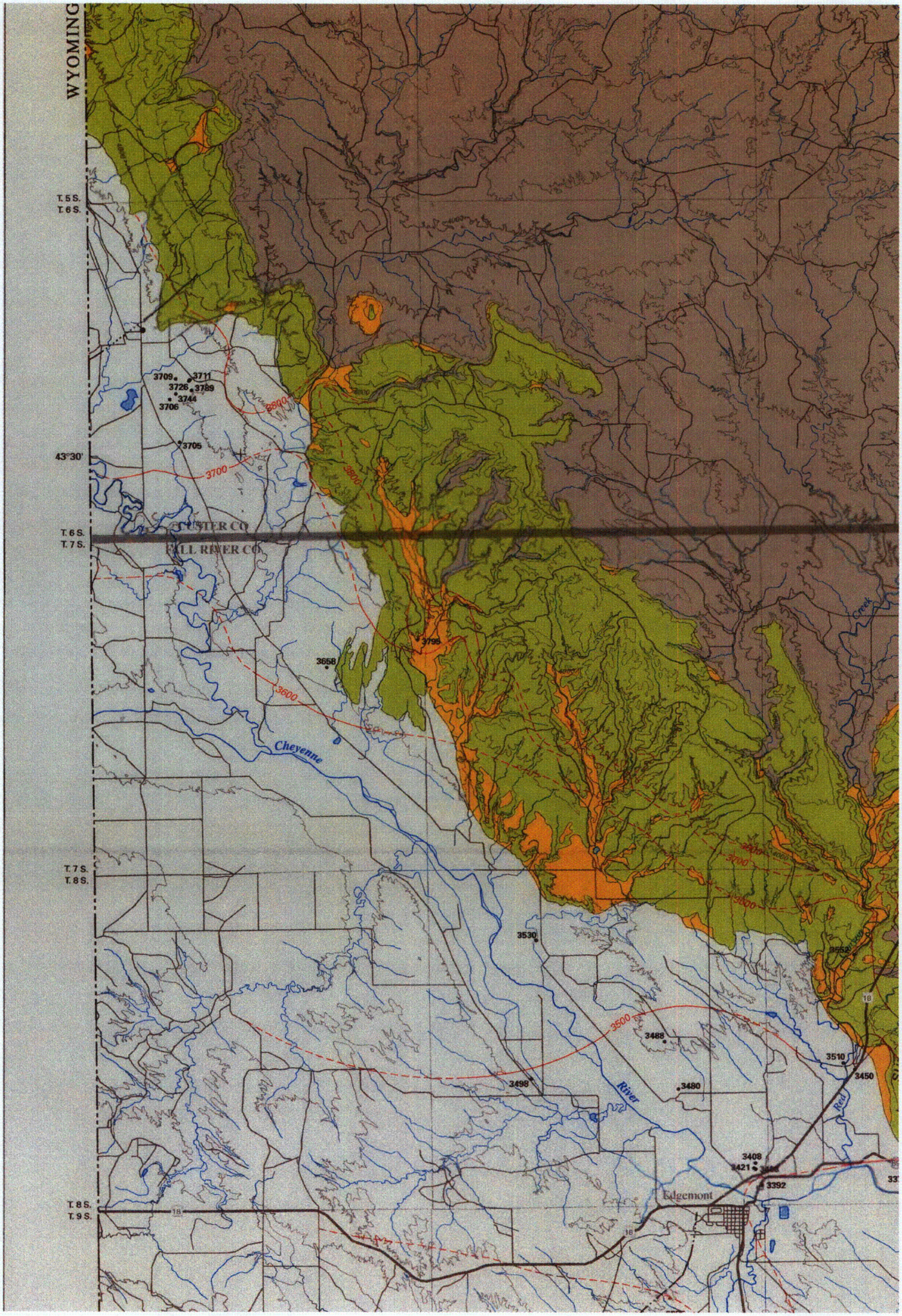
0 0.5 1 2 Miles

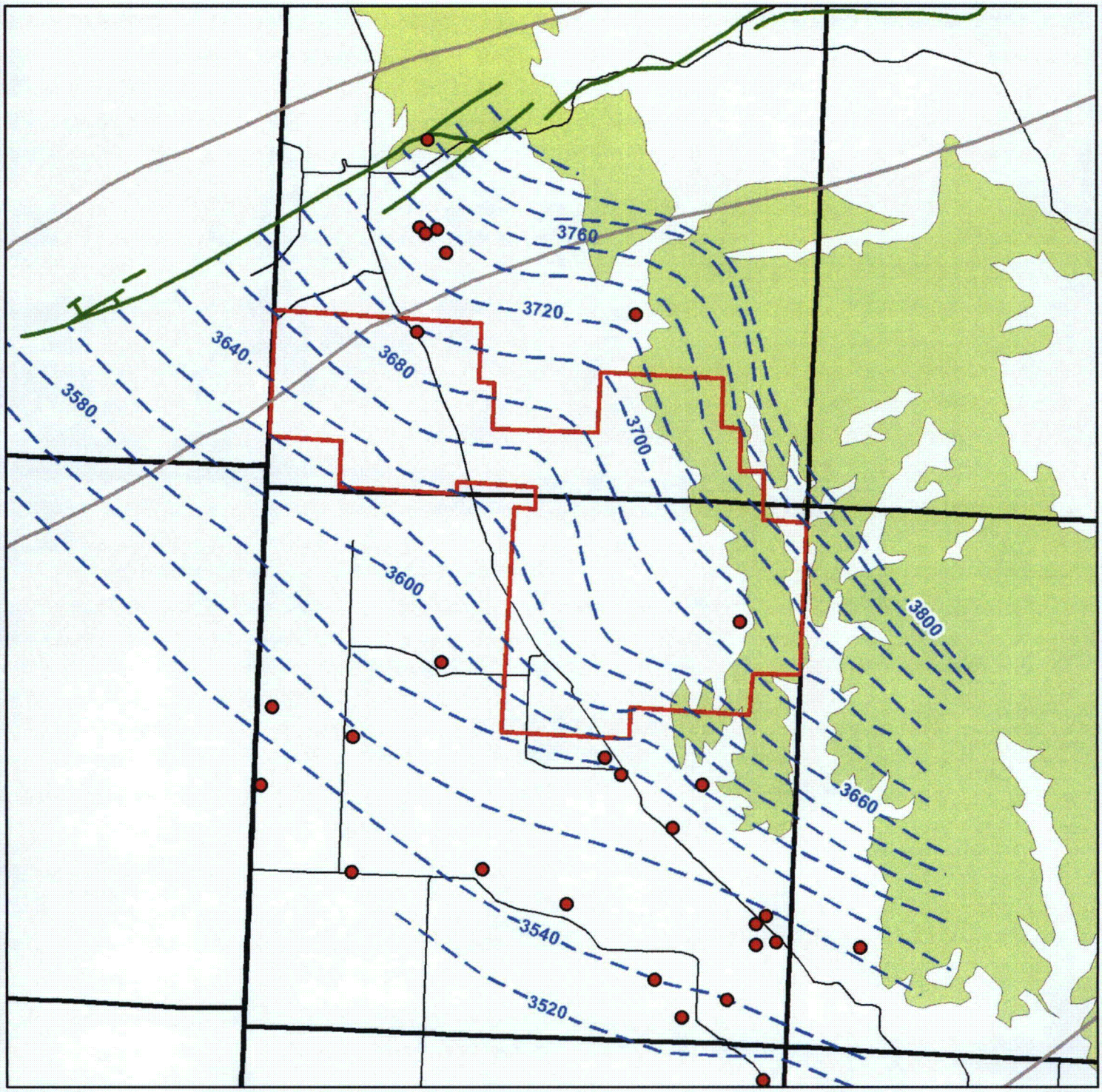
N

Created By:	C.M. Hocking
Date:	01/11/08
Map File:	Wells

Dewey-Burdock Ground Water Sampling Sites

RESPEC
WATER & NATURAL RESOURCES


WYOMING
T. 5 S.
T. 6 S.
43°30'
T. 6 S.
T. 7 S.
CUSTER CO.
FALL RIVER CO.
T. 7 S.
T. 8 S.
T. 8 S.
T. 9 S.
3709
3711
3726
3789
3744
3706
3705
3700
3800
3600
3798
3658
Cheyenne
3500
3530
3488
3498
3480
River
3510
3450
Red
Creek
3408
3421
3392
Edgemont
18



Legend

- Township/Range
- Permit Boundary
- Inyan Kara Outcrop
- Fall River Wells
- Roads
- Fault
- Fault zone boundary
- Water Level (ft)

0 0.5 1 2 3 Miles

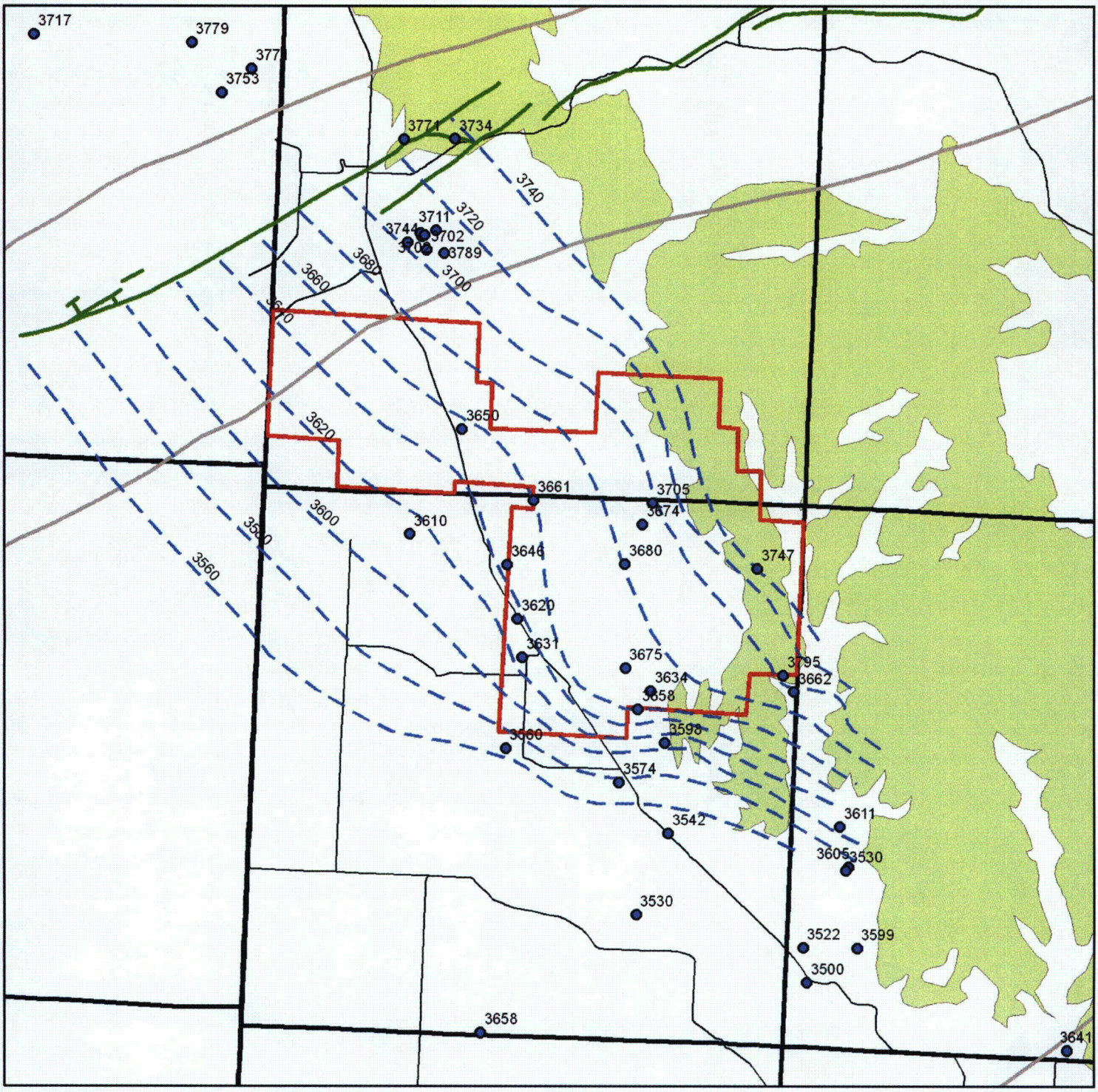
N

Created By:	C.M. Hocking
Date:	8/30/07
Map File:	PT_Fall_River

Dewey - Burdock Potentiometric Map

Fall River Formation

RESPEC
WATER & NATURAL RESOURCES



Legend

- Township/Range
- Permit Boundary
- Inyan Kara Outcrop
- Lakota Wells
- Roads
- Fault
- Fault zone boundary
- Water Level (ft)

0 0.5 1 2 3 Miles

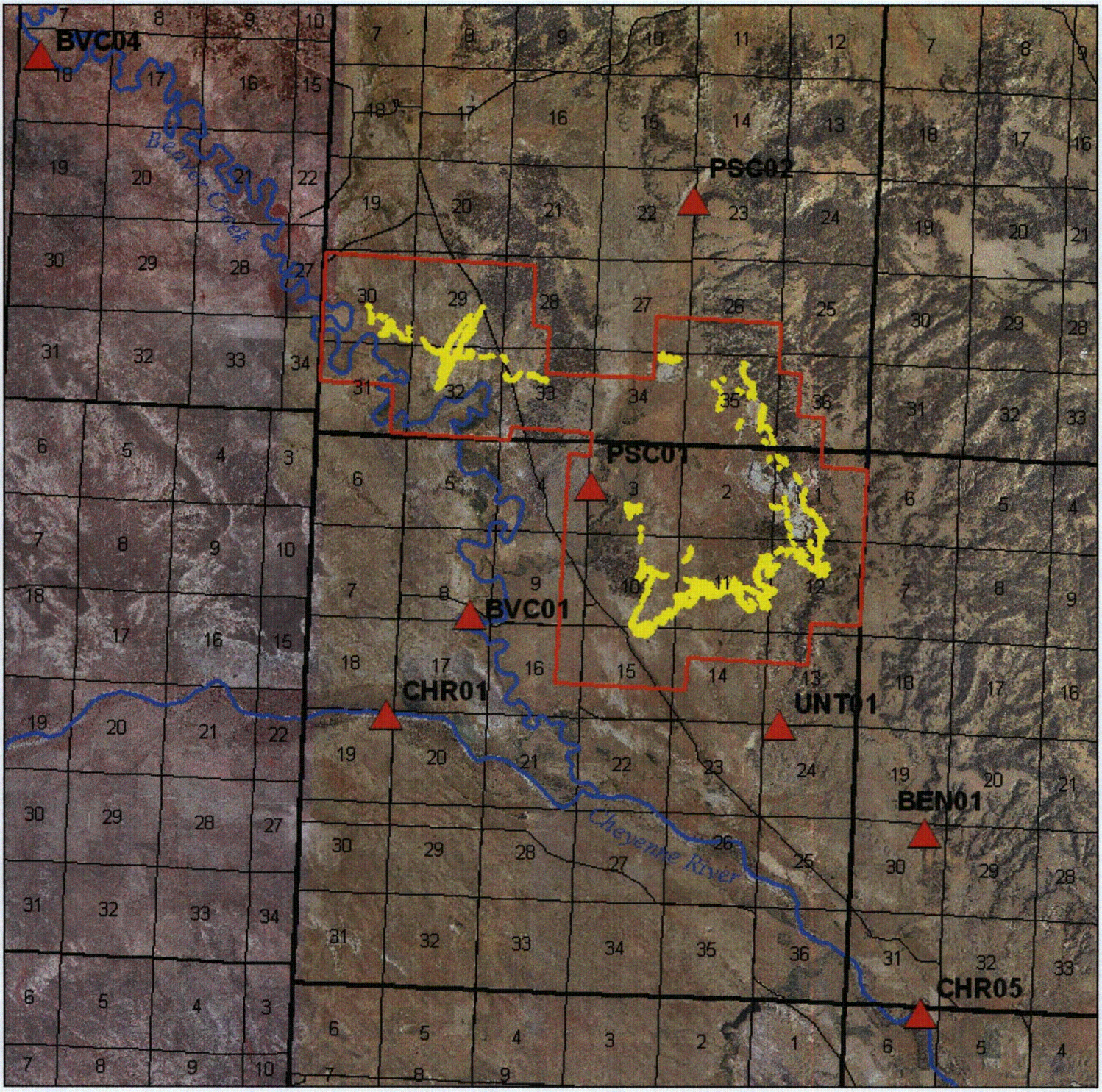
N

Dewey Burdock Potentiometric Map

Lakota Formation

Created By:	C.M. Hocking
Date:	8/30/07
Map File:	PT_Lakota

RESPEC
WATER & NATURAL RESOURCES



Legend

- Township/Range
- Roads
- Permit Boundary
- Streams
- Ore Bodies
- Sampling Sites

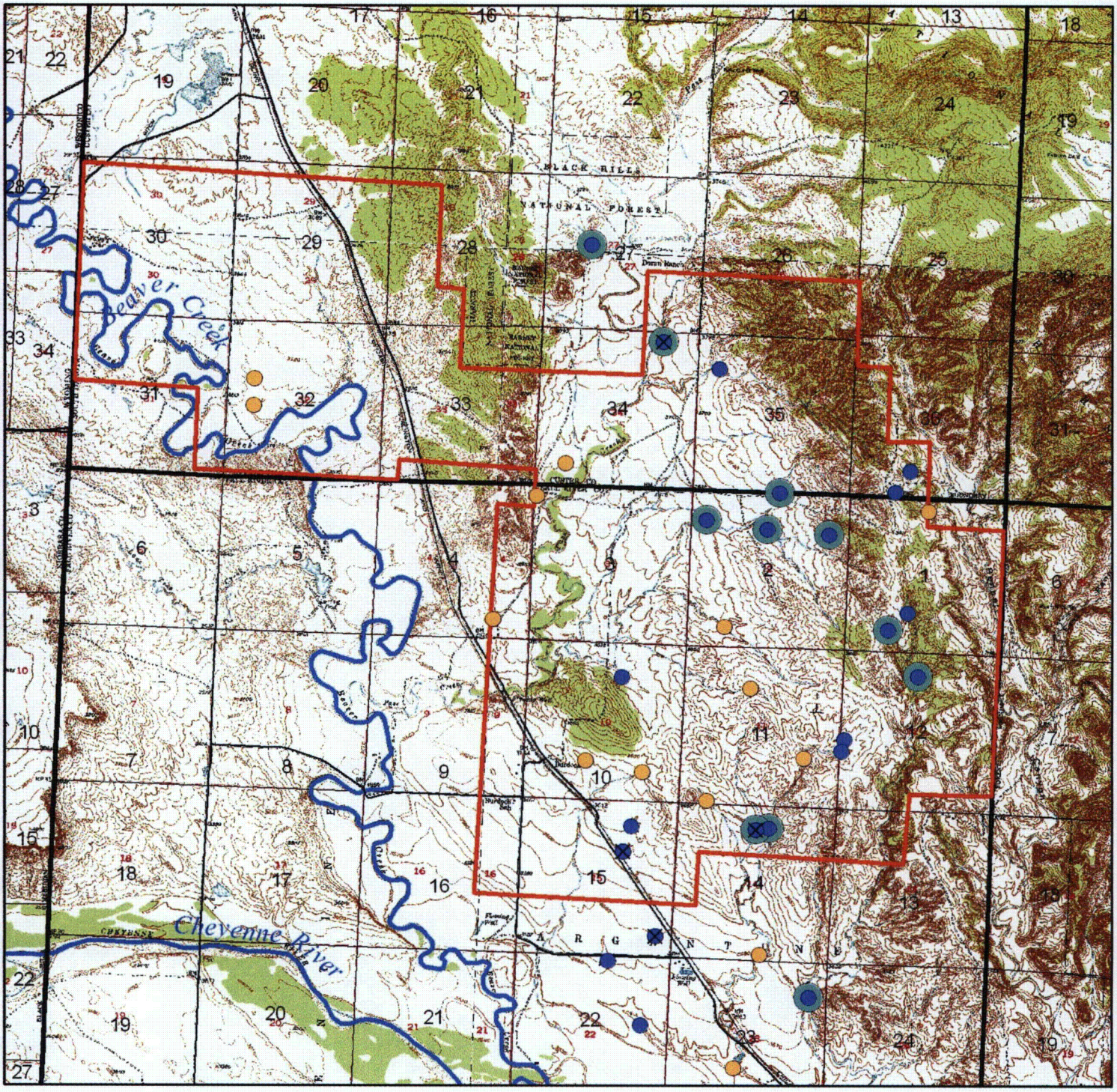
0 0.4 0.8 1.6 2.4 Miles

N

Created By:	C.M. Hocking
Date:	9/12/07
Map File:	Stream Sampling

Dewey-Burdock Stream Sampling Sites

RESPEC
WATER & NATURAL RESOURCES



Legend

- Permit Boundary
- Sections
- Ore Bodies
- Roads
- Streams
- Sample Sites
- Influenced by Springs
- Dry

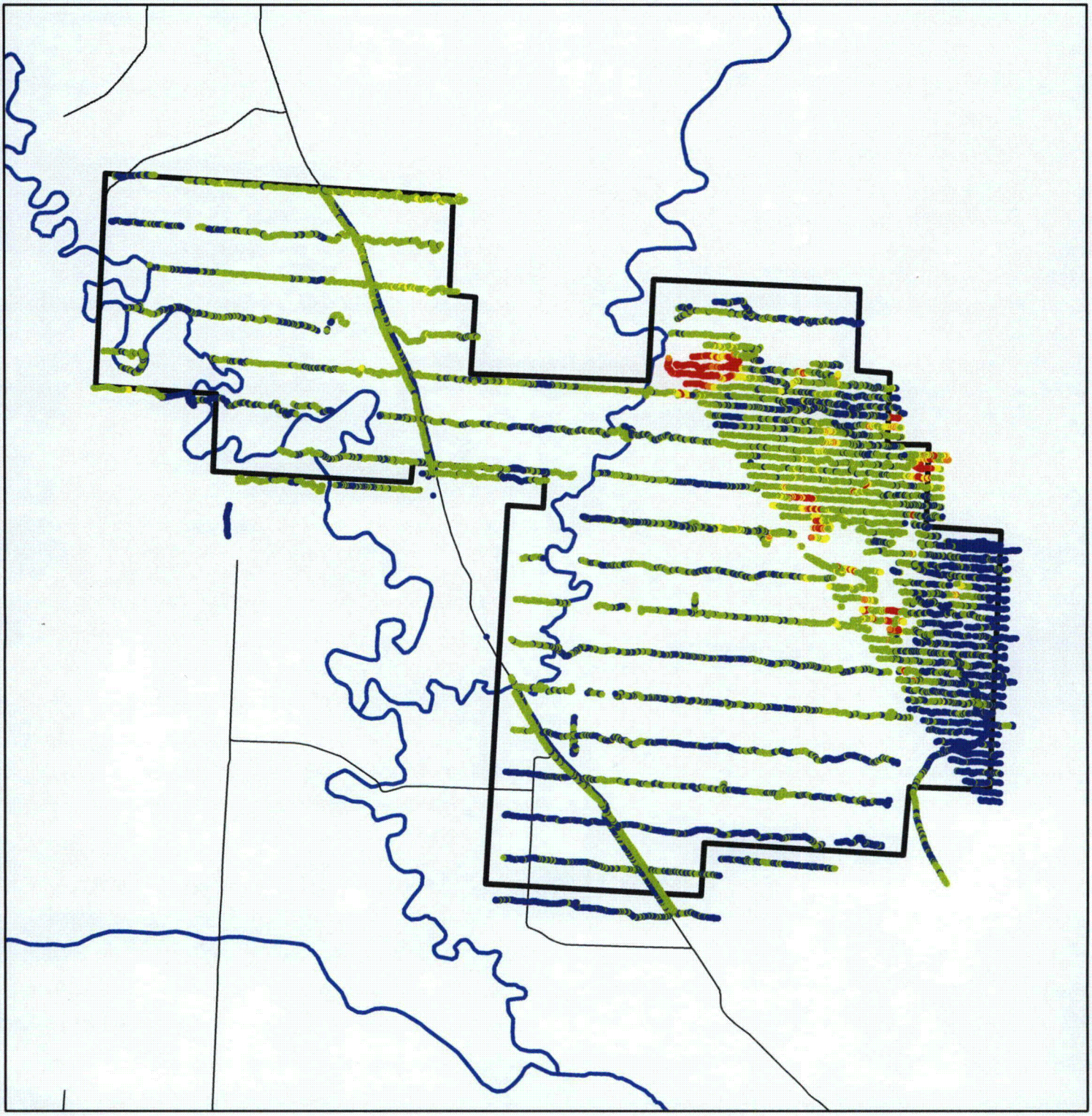
0 0.25 0.5 1 1.5 Miles

N

Dewey-Burdock Impoundment Sampling Sites

Created By:	C.M. Hocking
Date:	1/4/08
Map File:	Impoundment Sampling

RESPEC
WATER & NATURAL RESOURCES



Legend

Permit Boundary

Roads

Streams

Gamma Count Rate

(cpm)

- <12,000
- 12,000 - 18,000
- 18,000 - 24,000
- 24,000 - 30,000
- >30,000

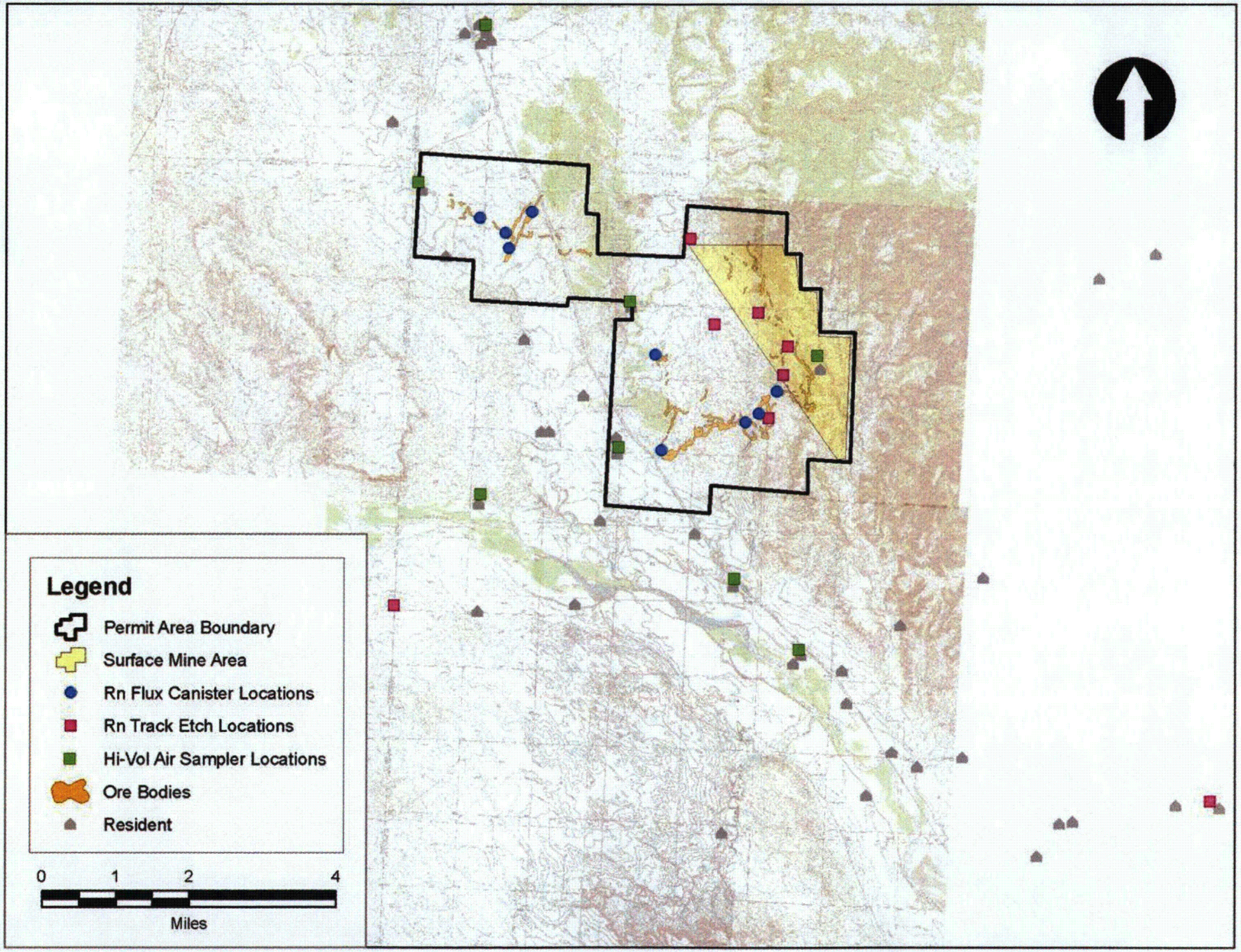
0 0.5 1 Miles

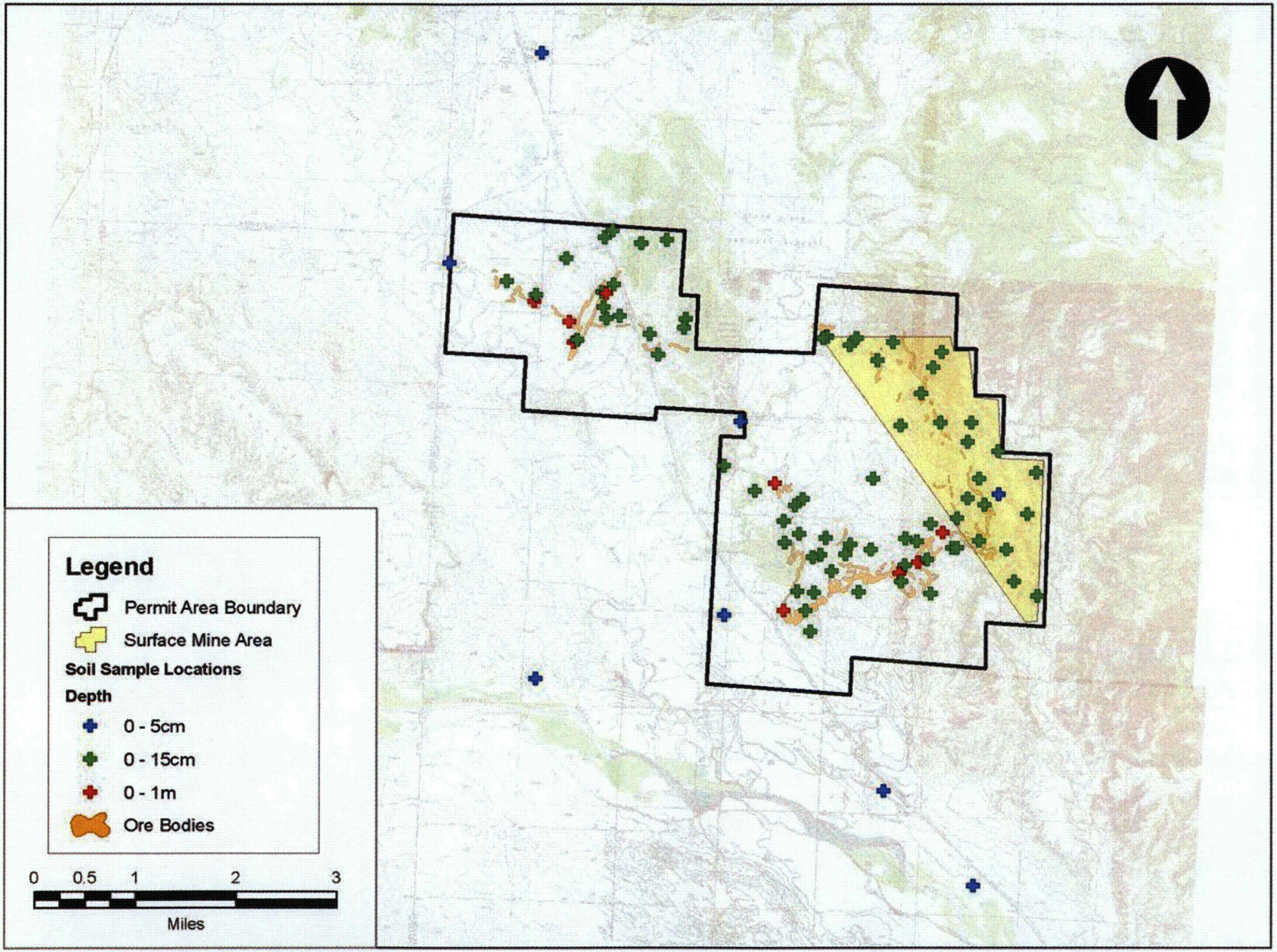
N

Created By:	C.M. Hocking
Date:	1/09/08
Map File:	Sampling_Server

Dewey-Burdock Baseline Gamma Survey

RESPEC
WATER & NATURAL RESOURCES


Legend
Permit Area Boundary
Surface Mine Area
Rn Flux Canister Locations
Rn Track Etch Locations
Hi-Vol Air Sampler Locations
Ore Bodies
Resident
0
1
2
4
Miles

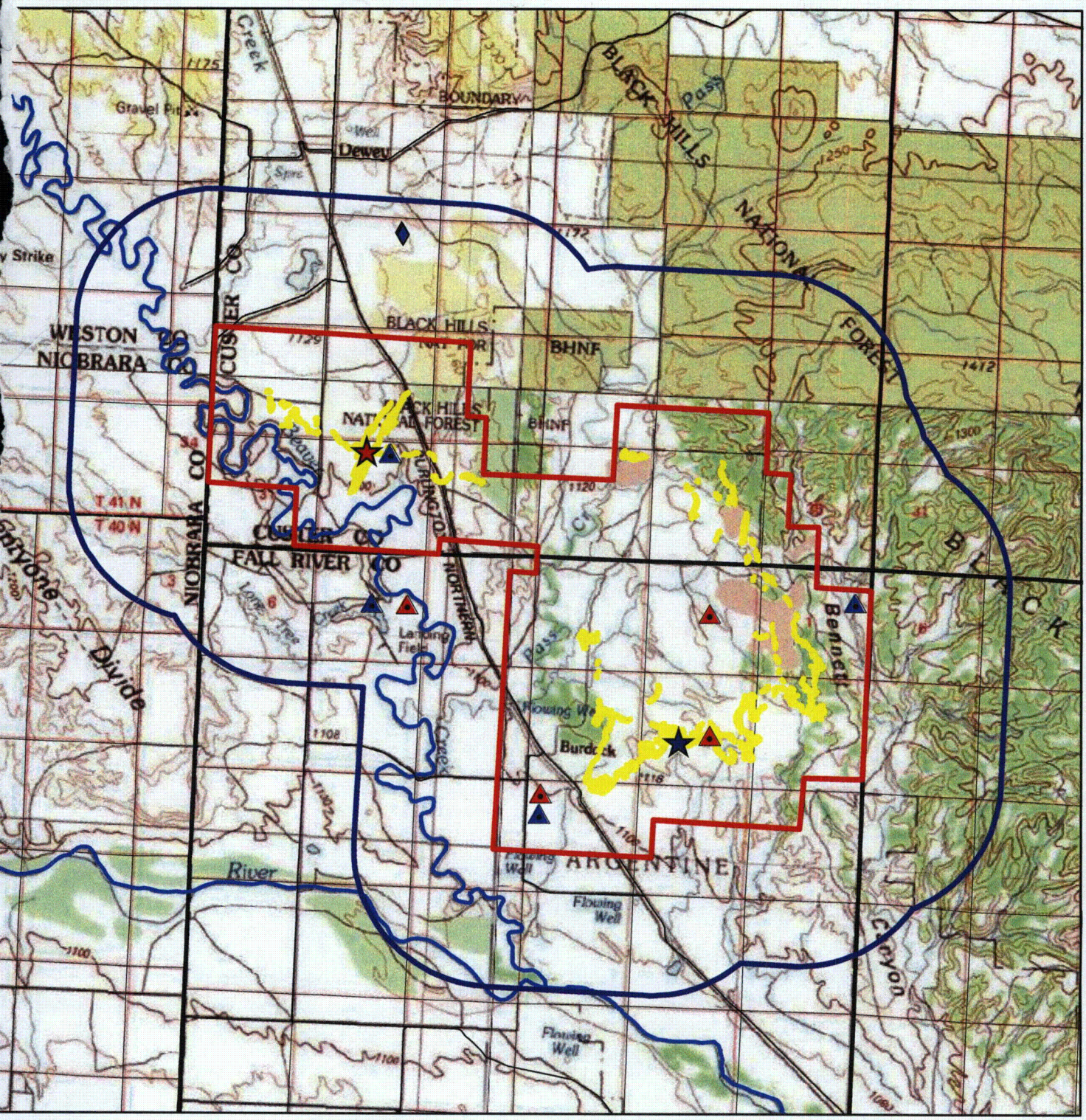

Legend
Permit Area Boundary
Surface Mine Area
Soil Sample Locations
Depth
0 - 5cm
0 - 15cm
0 - 1m
Ore Bodies
0
0.5
1
2
3
Miles

THIS PAGE IS AN OVERSIZED DRAWING OR FIGURE, THAT CAN BE VIEWED AT THE RECORD TITLED:

"DEWEY-BURDOCK BASELINE SAMPLING"

WITHIN THIS PACKAGE...

D-01X



Permit Boundary	Existing Fall River Well
2 km Buffer	Existing Lakota Well
Sections	New Dewey Pump Test Well
Ore Bodies	New Burdock Pump Test Well
Roads	Proposed Fall River Well
Streams	Proposed Lakota Well

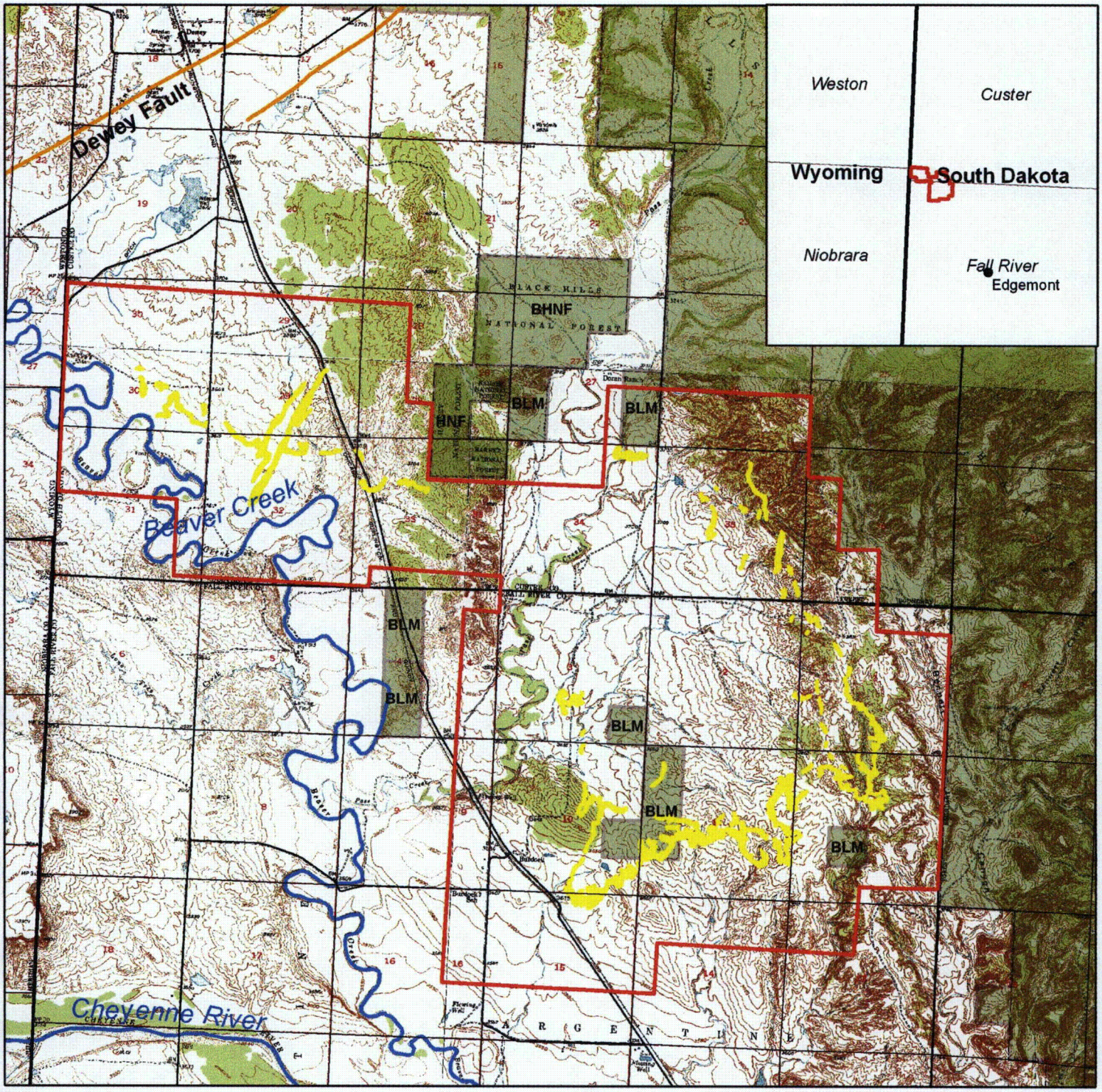
0 0.5 1 2 Miles

N

Dewey-Burdock DENR Additional Ground Water Sampling Sites

Created By:	C.F. Foreman
Date:	12/14/07
Map File:	DENR_Requested_Wells

RESPEC
WATER & NATURAL RESOURCES



Legend

- Township/Range
- Permit Boundary
- Ore Bodies
- Public Land
- Roads
- Streams
- Fault

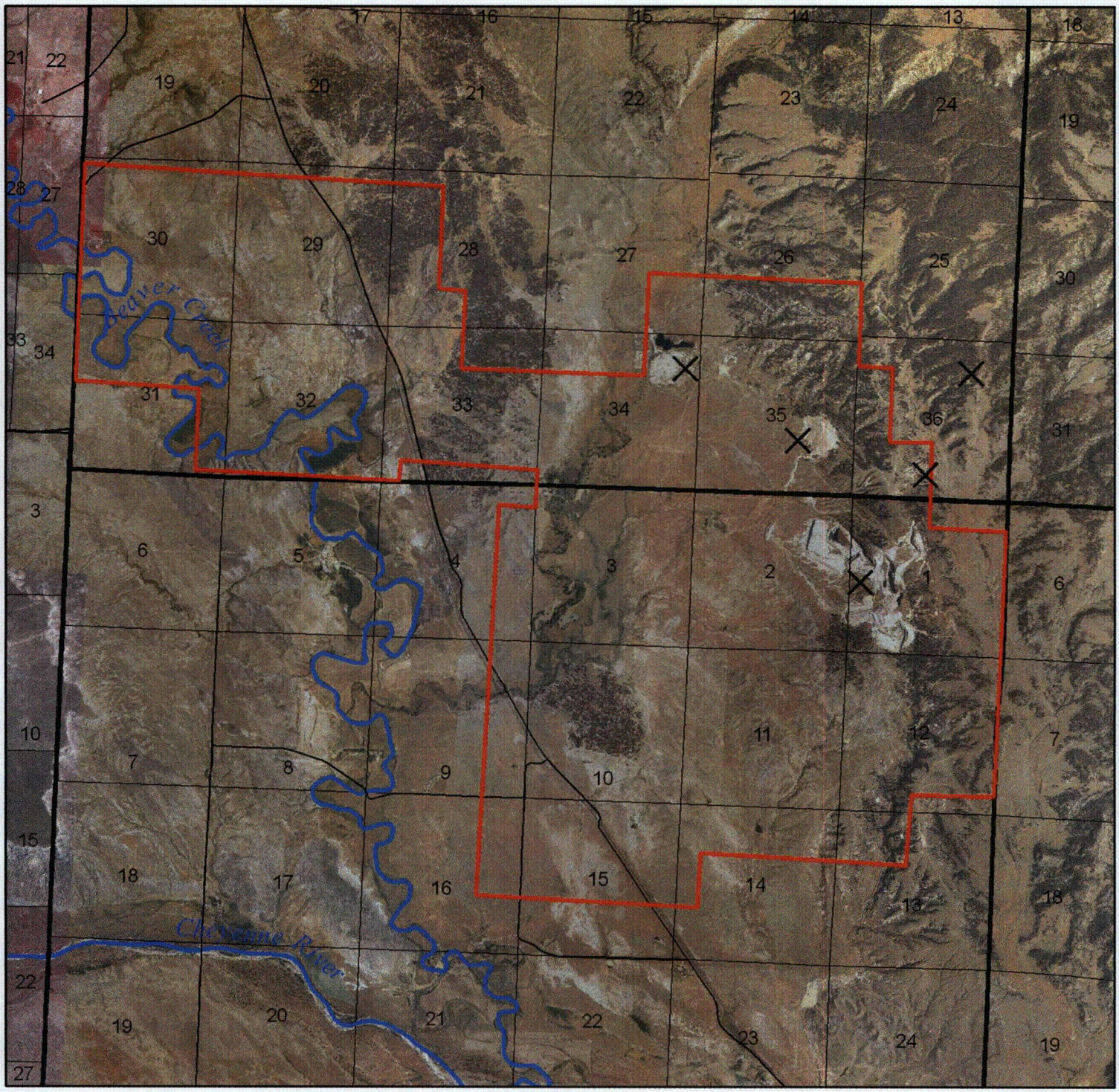
0 0.25 0.5 1 1.5 Miles

N

Created By:	C.M. Hocking
Date:	10/15/07
Map File:	Dewey Burdock Prospect 3

Dewey-Burdock Prospect

RESPEC
WATER & NATURAL RESOURCES



Legend

- Permit Boundary
- Roads
- Sections
- Streams
- Ore Bodies
- Uranium_Mines

0 0.25 0.5 1 1.5 Miles

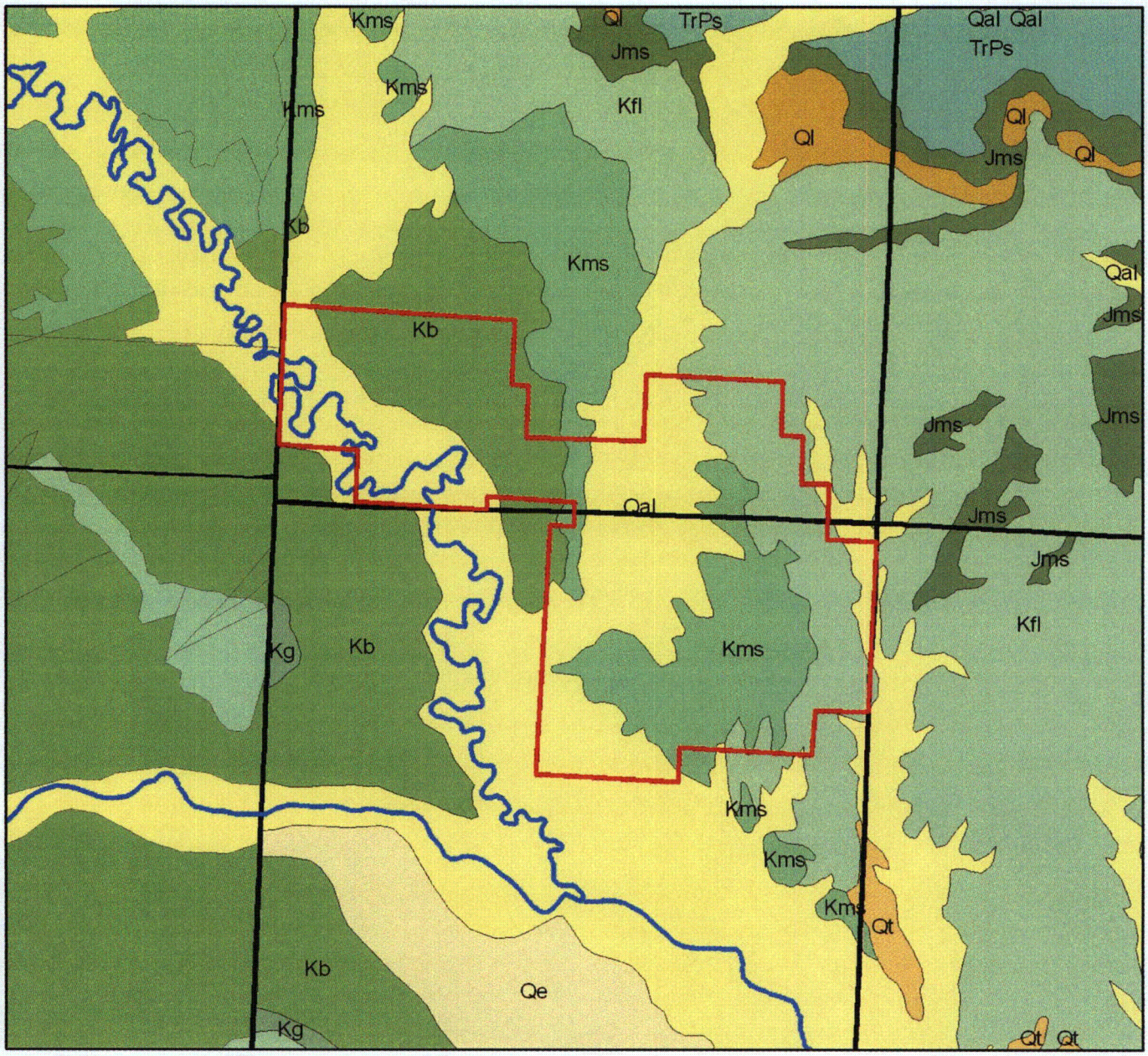
N

Dewey-Burdock Open Pit Uranium Mines

Created By:	C.M. Hocking
Date:	1/4/08
Map File:	U Mines

RESPEC
WATER & NATURAL RESOURCES

Dewey Burdock Geology



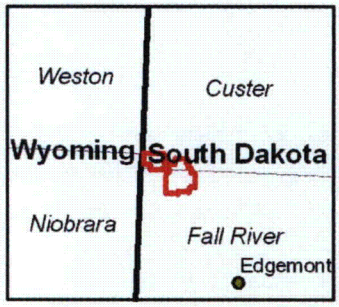
Legend

- DeweyBurdockBoundary
- Streams

Qal - Alluvium
Kg - Greenhorn
Kb - Belle Fourche
Kms - Mowry/Skull Creek
Kfl - Fall River/Lakota
Jms - Morrison/Sundance

0 0.5 1 2 3 4 Miles

N

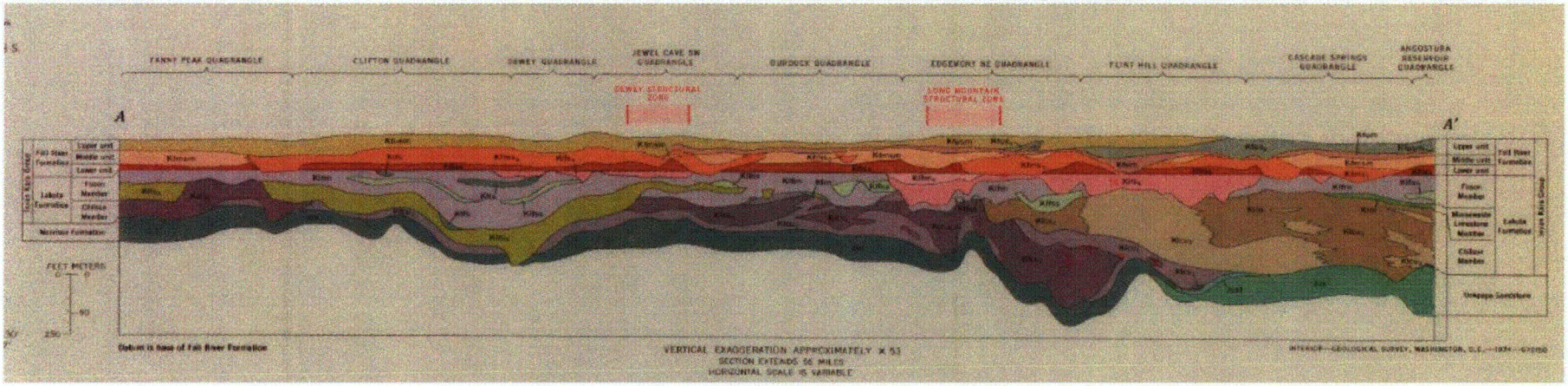


ERATHEM	SYSTEM	ABBREVIATION FOR STRATIGRAPHIC INTERVAL	GEOLOGIC UNIT	THICKNESS IN FEET	DESCRIPTION
CENOZOIC	QUATERNARY & TERTIARY (?)	QTu	UNDIFFERENTIATED SANDS AND GRAVELS	0-50	Sand, gravel, and boulders.
		Tw	WHITE RIVER GROUP	0-600	Light colored clays with sandstone channel fillings and local limestone lenses.
	TERTIARY[1]				
MESOZOIC	CRETACEOUS	Kps	PIERRE SHALE	1,200-2,000	Principal horizon of limestone lenses giving teepee buttes.
					Dark-gray shale containing scattered concretions.
					Widely scattered limestone masses, giving small teepee buttes.
			Sharon Springs Mem.		Black fissile shale with concretions.
			NIOBRARA FORMATION	100-225	Impure chalk and calcareous shale.
			CARLILE FORMATION: Turner Sand Member	400-750	Light-gray shale with numerous large concretions and sandy layers.
			CARLILE FORMATION: Wall Creek Sands		Dark-gray shale
			GREENHORN FORMATION	(25-30)	Impure slabby limestone. Weathers buff.
				(200-350)	Dark-gray calcareous shale, with thin Orman Lake limestone at base.
			GRANEROS GROUP: BELLE FOURCHE SHALE	300-550	Gray shale with scattered limestone concretions.
					Clay spur bentonite at base.
			GRANEROS GROUP: MOWRY SHALE	150-250	Light-gray siliceous shale. Fish scales and thin layers of bentonite.
			GRANEROS GROUP: MUDDY SANDSTONE: DYNNESON	20-60	Brown to light yellow and white sandstone.
			GRANEROS GROUP: MUDDY SANDSTONE: NEWCASTLE		
			GRANEROS GROUP: SKULL CREEK SHALE	170-270	Dark gray to black siliceous shale.
		Klk	INYAN KARA GROUP: FALL RIVER FORMATION	10-200	Massive to slabby sandstone.
			INYAN KARA GROUP: LAKOTA FM: Fuson Shale	10-188	Coarse gray to buff cross-bedded conglomeratic sandstone, interbedded with buff, red, and gray clay, especially toward top. Local fine-grained limestone.
			INYAN KARA GROUP: LAKOTA FM: Minnewaste Limestone	0-25	
			INYAN KARA GROUP: LAKOTA FM	25-485	
	JURASSIC	Ju	MORRISON FORMATION	0-220	Green to maroon shale. Thin sandstone.
			UNKPAPA SS	0-225	Massive fine-grained sandstone.
			SUNDANCE FORMATION: Redwater Member	250-450	Greenish-gray shale, thin limestone lenses.
			SUNDANCE FORMATION: Lak Member, Hulett Member, Stockade Beaver, Canyon Spr Member		Glauconitic sandstone; red sandstone near middle.
			GYPSUM SPRING FORMATION	0-45	Red siltstone, gypsum, and limestone.
	TRIASSIC	TRPs	SPEARFISH FORMATION	250-700	Red sandy shale, soft red sandstone and siltstone with gypsum and thin limestone layers.
			Goose Egg Equivalent		Gypsum locally near the base.
PALEOZOIC	PERMIAN	Pmk	MINNEKAHTA LIMESTONE	[2]25-65	Thin to medium-bedded finely-crystalline, purplish gray laminated limestone.
		Po	OPECHE SHALE	50-135	Red shale and sandstone.
		PIPm	MINNELUSA FORMATION	[2]375-1,175	Yellow to red cross-bedded sandstone, limestone, and anhydrite locally at top.
					Interbedded sandstone, limestone, dolomite, shale, and anhydrite.
	PENNSYLVANIAN				Red shale with interbedded limestone and sandstone at base.
	MISSISSIPPIAN	MDm	MADISON (PAHASAPA) LIMESTONE	[2]250-1,000	Massive light-colored limestone. Dolomite in part. Cavernous in upper part.
	DEVONIAN		ENGLEWOOD FORMATION	30-60	Pink to buff limestone. Shale locally at base.
	ORDOVICIAN	Ou	WHITEWOOD (RED RIVER) FORMATION	0-60	Buff dolomite and limestone.
			WINNIPEG FORMATION	0-100	Green shale with siltstone.
	CAMBRIAN	O€d	DEADWOOD FORMATION	[2]0-500	Massive to thin-bedded buff to purple sandstone. Greenish glauconitic shale flaggy dolomite and flatpebble limestone conglomerate. Sandstone, with conglomerate locally at the base.
PRECAMBRIAN		p€u	UNDIFFERENTIATED METAMORPHIC AND IGNEOUS ROCKS		Schist, slate, quartzite, and arkosic grit. Intruded by diorite, metamorphosed to amphibolite, and by granite and pegmatite.

[1] Also may include intrusive igneous rocks

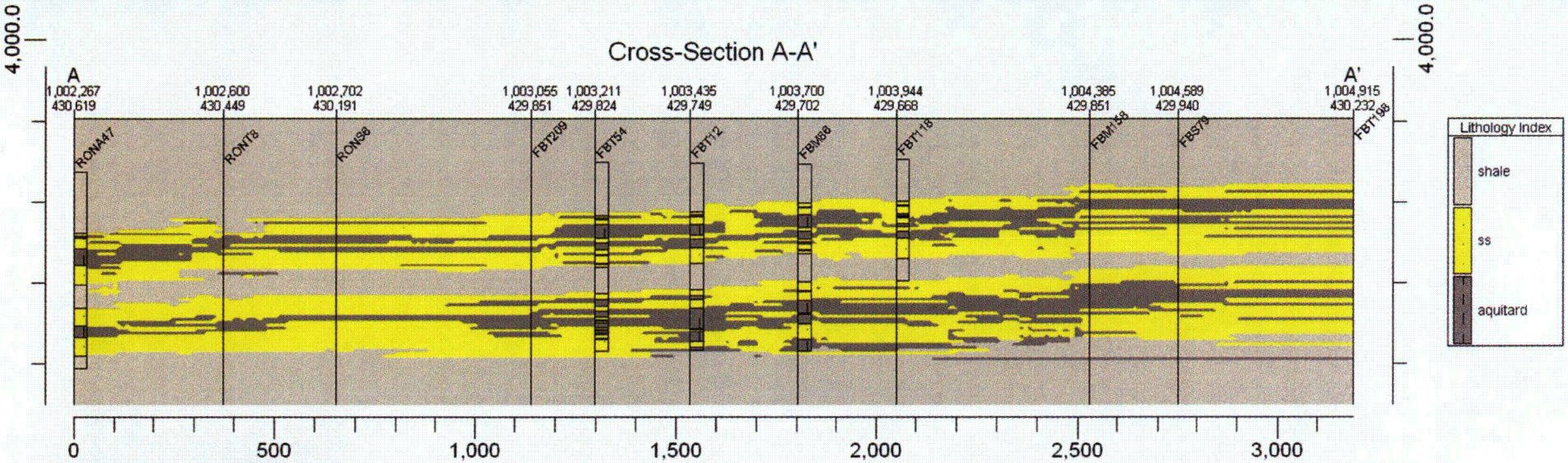
[2] Modified based on drill-hole data

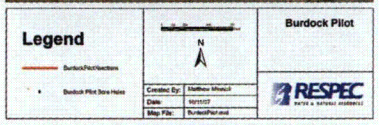
Modified from information furnished by the Department of Geology and Geological Engineering, South Dakota School of Mines and Technology (written commun., January 1994)

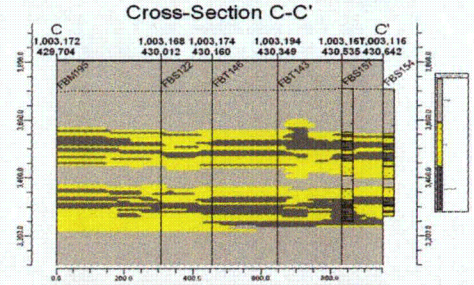


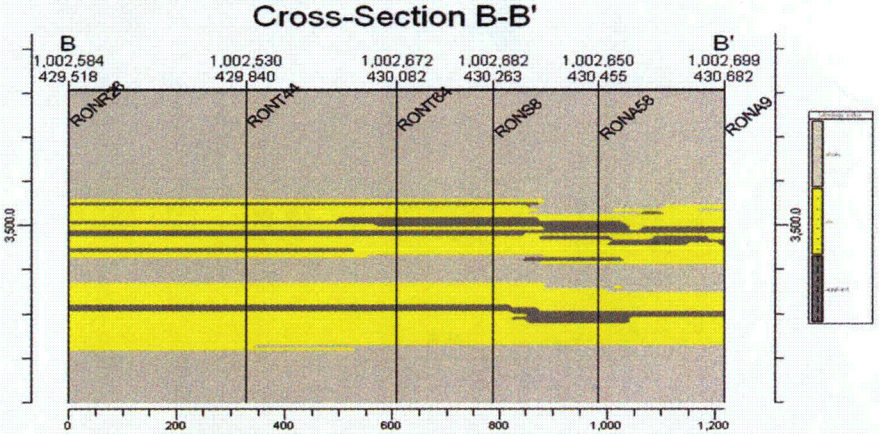
Diagrammatic cross section of the Inyan Kara across part of the southern Black Hills, South Dakota (from Gott, Wolcott, and Bowles, 1974).

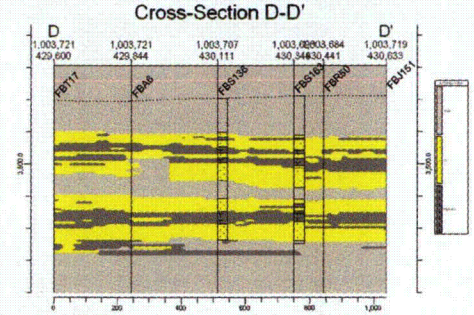
Burdock Pilot Lithology

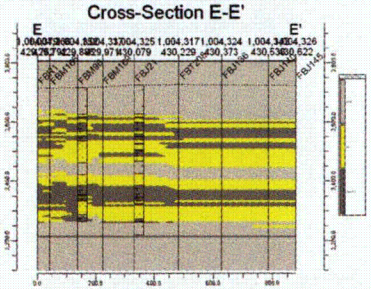


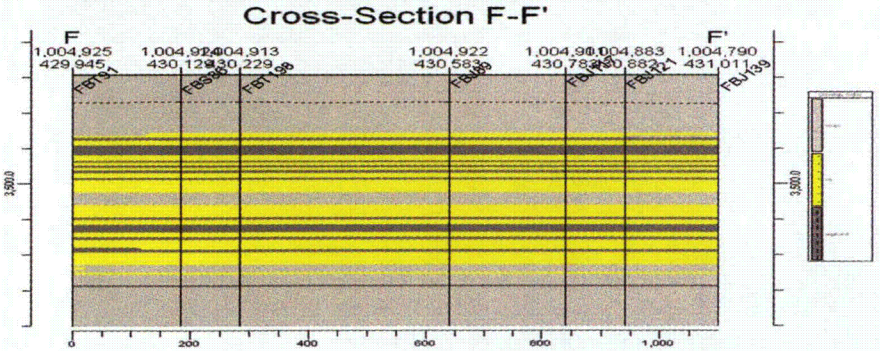












Permit Boundary
2 km Buffer
Sections
Ore Bodies
Roads
Streams

Well Use

Use
- Domestic
- Stock
- Monitor or Pump Test
- Abandoned
- Unknown

Aquifer

Aquifer
- Alluvium
- Fall River
- Fuson Shale
- Lakota
- Inyan Kara
- Sundance
- Madison
- Unknown

0 0.5 1 2 Miles

N

Created By:	C.M. Hocking
Date:	01/11/08
Map File:	Wells

Dewey-Burdock Ground Water Wells

RESPEC
WATER & NATURAL RESOURCES

Monitor Well Coordinates and Description

HydroID	Location	SD State Plane x	SD State Plane y	Elevation ft msl	Aquifer	Depth ft	Artesian	Casing in	Use	Sampling
2	SE 1/4 SE 1/4 Sec. 16, T. 7S, R. 1E	995122.6159	423922.589	3554	Lakota	640	yes		domestic	Water Quality
4	SE 1/4 SE 1/4 Sec. 15, T. 7S, R. 1E	1000756.744	423397.1507	3580	Fall River	2264	yes		stock	Water Level
7	NW 1/4 NW 1/4 Sec. 23, T. 7S, R. 1E	1001702.774	422416.855	3574	Fall River	200		6	domestic	Water Quality
8	SW 1/4 SE 1/4 Sec. 23, T. 7S, R. 1E	1004451.179	418618.3001	3558	Fall River	240	yes		domestic	Water Quality and Level
12	SE 1/4 SE 1/4 Sec. 4, T. 7S, R. 1E	995218.5289	434695.0501	3641	Lakota	805	yes	3	stock	Water Level
13	NE 1/4 NE 1/4 Sec. 4, T. 7S, R. 1E	996758.8703	438470.3951	3673	Lakota	500	no		domestic	Water Quality
16	NE 1/4 SW 1/4 Sec. 1, T. 7S, R. 1E	1009827.637	434446.9008	3869	Lakota	330	no		domestic	Water Quality
18	SW 1/4 SW 1/4 Sec. 9, T. 7S, R. 1E	991210.5573	428960.1458	3566	Fall River	527	yes		domestic	Water Quality
38	NW 1/4 NW 1/4 Sec. 33, T. 7S, R. 1E	992568.6234	442606.1311	3634	Lakota	550	yes	4	stock	Water Level
42	SW 1/4 NE 1/4 Sec. 5, T. 7S, R. 1E	989542.8678	436481.4222	3596	Lakota	600	yes		domestic	Water Quality
49	NW 1/4 NW 1/4 Sec. 32, T. 6S, R. 1E	987323.7901	444024.1856	3628	Fall River	600	yes	4	stock	Water Level
607	SW 1/4 NW 1/4 Sec. 30, T. 7S, R. 1E	980061.1758	416694.1547	3611	Fall River		no	1	piezometer	Water Level
609	NW 1/4 NE 1/4 Sec. 29, T. 6S, R. 1E	989975.0551	448124.8522	3702	Lakota	1000	no	1	piezometer	Water Level
610	NW 1/4 NE 1/4 Sec. 29, T. 6S, R. 1E	989839.7719	448286.1042	3704	Fall River	680	no	1	piezometer	Water Level
613	NW 1/4 NE 1/4 Sec. 20, T. 6S, R. 1E	990365.0904	454092.3305	3738	Fall River	580	no	4	piezometer	Water Level
614	NW 1/4 NE 1/4 Sec. 20, T. 6S, R. 1E	990425.5495	454086.693	3739	Fuson	620	no	4	piezometer	Water Level
615	NW 1/4 NE 1/4 Sec. 20, T. 6S, R. 1E	990412.7212	454025.4126	3738	Lakota	800	no	4	piezometer	Water Level
619	NW 1/4 NW 1/4 Sec 2, T. 7S, R. 1E	1003106.85	437045.9068	3701	Lakota	280	no	4	stock	Water Quality and Level
628	SE 1/4 SE 1/4 Sec. 20, T. 6S, R. 1E	990894.6654	449719.1889	3737	Inyan Kara		no		stock	Water Quality and Level
631	SW 1/4 SW 1/4 Sec. 23, T. 6S, R. 1E	1002575.729	449309.7752	3744	Fall River		no	5	stock	Water Quality and Level
635	NE 1/4 NW 1/4 Sec. 14, T. 7S, R. 1E	1004084.632	427130.8303	3643	Sundance		yes		stock	Water Quality
650	SE 1/4 SE 1/4 Sec. 1, T. 7S, R. 1E	1012180.495	433331.3695	3820	Lakota		no	4	stock	Water Quality and Level
668	NW 1/4 NE 1/4 Sec. 15, T. 7S, R. 1E	999269.8868	427870.3016	3622	Inyan Kara	574	yes	12	pump test well	Water Level
675	SE 1/4 SE 1/4 Sec. 31, T. 7S, R. 2E	1015340.264	406352.2188	3492	Alluvial	14.4	no	2	piezometer	Water Quality and Level
676	SE 1/4 SW 1/4 Sec. 34, T. 6S, R. 1E	999245.0312	439891.6372	3662	Alluvial	22.5	no	2	piezometer	Water Quality and Level
677	SW 1/4 SW 1/4 Sec. 4, T. 7S, R. 1E	991947.2888	434035.9092	3562	Alluvial	14.5	no	2	piezometer	Water Quality and Level
678	SW 1/4 NE 1/4 Sec. 9, T. 7S. R. 1E	995023.389	431834.9363	3595	Alluvial	14.5	no	2	piezometer	Water Quality and Level
679	NW 1/4 SE 1/4 Sec. 27, T. 6S, R. 1E	1000303.045	446248.309	3715	Alluvial	39	no	2	piezometer	Water Quality and Level
4002	NW 1/4 SW 1/4 Sec. 30, T. 6S, R. 1E	981812.8541	446932.2402	3621	Inyan Kara		yes	6	domestic	Water Quality
7002	NW 1/4 NW 1/4 Sec. 23, T. 7S, R. 1E	1001731.47	422034.2576	3571	Fall River	500	yes	6	stock	Water Quality
8002	NW 1/4 SE 1/4 Sec. 23, T. 7S, R. 1E	1004493.247	418872.9513	3550	Lakota	500	yes	6	stock	Water Level