



Smith Ranch - Highland  
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February 27, 2003

**ATTN: Document Control Desk**  
Mr. Dan Gillen, Chief  
Fuel Cycle Licensing Branch, NMSS  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

RE: Smith Ranch Facility  
NRC License SUA-1548, Docket No. 40-8964  
Semi-Annual Effluent and Environmental Monitoring Report, July 1– December 31, 2002

Dear Mr. Gillen:

In accordance with 10 CFR 40.65 and License Condition No. 11.1 of License SUA-1548, please find enclosed the Semi-Annual Effluent and Environmental Monitoring Report for the Smith Ranch Facility. This report covers the period July 1 through December 31, 2002. A copy of this report is also being forwarded to Mr. Dwight Chamberlain, Director DRSS, Region IV.

If you have any questions regarding the report, please contact me at (307) 358-6541, ext. 62.

Sincerely,

A handwritten signature in black ink, appearing to read 'W.F. Kearney by [illegible]', is written over the typed name.

W.F. Kearney  
Manager-Health, Safety  
& Environmental Affairs

WFK/mjh

Enclosure

cc: Mr. Dwight Chamberlain, Director DRSS, Region IV, USNRC  
J. Lusher, USNRC Headquarters, (Addressee Only)  
S.P. Collings w/atta  
R. Knode w/o atta  
M.J. Hagar w/o atta  
File SR 4.6.4.1

NMSS01



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**POWER RESOURCES, INC.  
SEMI-ANNUAL EFFLUENT MONITORING REPORT  
SMITH RANCH FACILITY  
JULY 1 THROUGH DECEMBER 31, 2002**

**NRC - LICENSE SUA-1548, DOCKET 40-8964**

**POWER RESOURCES, INC.- SMITH RANCH FACILITY  
SEMI-ANNUAL EFFLUENT MONITORING REPORT  
JULY 1 THROUGH DECEMBER 31, 2002**

**EFFLUENT MONITOR REPORT**

The Smith Ranch license, specifically License Condition 11.1, describes the information required to be submitted to the NRC for the effluent and environmental monitoring program for the facility. Accordingly, pursuant to 10 CFR §40.65, License Condition 11.1, and the parameters from Table 5.3 from the March 31, 1988, license application as amended, the effluent and monitoring results for this semi-annual period are herein provided.

**I. Commercial Operation Data-Injection Rates, Recovery Rates, Pipeline Pressures, and Injection Manifold Pressures**

Presented in the tables below are the average injection rates, recovery rates, pipeline pressures, and injection manifold pressures as required by Condition 11.1.

**Injection and Recovery Rates  
(average gallons per minute)**

MONTH	WF#1 PC FLOW	WF#1 IC FLOW	WF#3 PC FLOW	WF#3 IC FLOW	WF#4 PC FLOW	WF#4 IC FLOW	WF#4A PC FLOW	WF#4A IC FLOW
July	250.29	249.03	2397.08	2372.69	1304.44	1297.88	1804.66	1795.58
Aug.	252.79	250.19	2542.80	2533.10	1526.05	1510.33	1799.50	1780.95
Sept.	196.70	194.66	2190.36	2179.91	1379.23	1364.91	1514.10	1498.38
Oct.	211.77	209.52	2316.34	2307.33	1473.53	1457.81	1672.72	1654.88
Nov.	194.42	192.66	2168.44	2158.23	1364.93	1352.57	1644.16	1629.27
Dec.	209.60	208.40	2201.31	2191.37	1474.14	1465.66	1670.92	1661.32

**Pipeline Pressures  
(pounds per square inch)**

MONTH	CPP PC PRESSURE	CPP IC PRESSURE	SAT PC PRESSURE	SAT IC PRESSURE
July	76	163	95	63
Aug.	81	167	104	77
Sept.	80	166	108	82
Oct.	82	168	121	90
Nov.	81	162	116	88
Dec.	81	160	117	97

### Injection Manifold Pressures (pounds per square inch)

MONTH	WF#1 INJECTION PRESSURE	WF#3 INJECTION PRESSURE	WF#4 INJECTION PRESSURE	WF#4A INJECTION PRESSURE
July	92	95	122	137
Aug.	88	114	111	137
Sept.	92	116	114	139
Oct.	95	123	118	138
Nov.	90	117	120	140
Dec.	89	121	123	138

\*This is the injection pressure at the manifold. Injection pressure at the individual wellhead is less due to pressure loss through manifold system, pipelines and filters.

## II. Air Sampling

### A. Particulates

Pursuant to License Condition 11.1 and as defined by Table 5.3, air particulates monitoring is performed by continuous air samplers at the nearest downwind residence (Vollman Ranch), downwind of the restricted area boundary (Fence Line), and an upwind "background" location (Dave's Water Well). Monitoring is required to be conducted quarterly. The results from this quarterly monitoring are presented Table 1.

## III. Water

### A. Groundwater

The groundwater monitoring program requires operating livestock or domestic wells within 1 kilometer of operating wellfields be sampled quarterly for natural uranium and radium-226. Vollman's Pond and Smith Windmill #1 are within 1 kilometer of Wellfield #1 and Smith's Windmill #2 and the Solar Pump are within 1 kilometer of Wellfield #3. There are no livestock or domestic wells within 1 kilometer of Wellfield #4. The results of the quarterly samples for the operating livestock wells are presented in Table 2.

### B. Surface Water

The surface water monitoring program requires two (2) samples from Sage Creek and one (1) sample from the outfall of the Treatment Plant. Each is on a quarterly basis. The outfall from the Treatment Plant is not sampled as this facility has not been used for many years. The Sage Creek samples are to be taken upstream and downstream from the restricted areas when flow is available in the creek. During the report period, there was no flow in Sage Creek and therefore, no analytical results are available. There was no flow "Above the Restricted Area" during either quarter.

#### IV. Soil

Soil sampling is conducted annually at the downwind air sampling station (Fence Line). The soil sample was obtained on August 28, 2002 and is comparable to background soil levels and is consistent with previous data.

##### Soil Sample Result

Location	$U_{nat}$ pCi/g	$Ra_{226}$ pCi/g	$Pb_{210}$ pCi/g
Downwind Air Sampling Station (Fence Line)	0.48	1.0	NOT DETECTED

#### V. Vegetation

Vegetation sampling is performed annually at the downwind air-sampling site (Fence Line). The vegetation sample was obtained on August 28, 2002 and is comparable to background vegetation levels and is consistent with previous data.

##### Vegetation Sample Result

Location	$U_{\mu}Ci/Kg$	$Ra_{226\mu}Ci/Kg$	$Th_{230\mu}Ci/Kg$	$Pb_{210\mu}Ci/Kg$
Downwind Air Sampling Station (Fence Line)	8.2E-4	1.2E-4	1.9E-3	8.0E-4

#### VI. Direct Radiation

Direct radiation readings are measured on a quarterly basis at the three (3) air monitoring stations, downwind of the evaporation pond, and at each wellfield using dosimeter badges. Provided in the Table 3 are the results from those measurements.

**TABLE 1**  
**SMITH RANCH FACILITY**  
**AIR SAMPLING DATA - 2002**  
**ENVIRONMENTAL MONITORING SITES**  
**3RD & 4TH QUARTERS**

<b>SAMPLE LOCATION</b>	<b>SAMPLE PERIOD</b>	<b>RADIONUCLIDE (<math>\mu\text{Ci}/\text{ml}</math>)</b>	<b>CONCENTRATION (<math>\mu\text{Ci}/\text{ml}</math>)</b>	<b>ERROR EST. +/- (<math>\mu\text{Ci}/\text{ml}</math>)</b>	<b>L.L.D. (<math>\mu\text{Ci}/\text{ml}</math>)</b>	<b>EFF. CONC. LIMIT (<math>\mu\text{Ci}/\text{ml}</math>)</b>	<b>% EFF. CONC. LIMIT %</b>
<b>FENCE LINE</b> Air Station Restricted Area Boundary	3rd Quarter	U-Nat	4.44E-16	N/A	1.00E-16	3.00E-12	0.0
		Th-230	<1.00E-16	N/A	1.00E-16	2.00E-14	0.0
		Ra-226	<1.00E-16	N/A	1.00E-16	9.00E-13	0.0
		Pb-210	1.2E-14	2.25E-16	2.00E-15	6.00E-13	2.0
		Rn-222	2.3E-09	N/A	3.00E-10	1.00E-08	23.0
	4th Quarter	U-Nat	1.96E-16	N/A	1.00E-16	3.00E-12	0.0
		Th-230	<1.00E-16	N/A	1.00E-16	2.00E-14	0.0
		Ra-226	<1.00E-16	N/A	1.00E-16	9.00E-13	0.0
		Pb-210	3.3E-15	7.40E-17	2.00E-15	6.00E-13	0.6
		Rn-222	1.6E-09	N/A	3.00E-10	1.00E-08	16.0
<b>VOLLMAN RANCH</b> Air Station Downwind Nearest Residence	3rd Quarter	U-Nat	<1.00E-16	N/A	1.00E-16	3.00E-12	0.0
		Th-230	<1.00E-16	N/A	1.00E-16	2.00E-14	0.0
		Ra-226	<1.00E-16	N/A	1.00E-16	9.00E-13	0.0
		Pb-210	9.1E-15	1.71E-16	2.00E-15	6.00E-13	1.5
		Rn-222	1.3E-09	N/A	3.00E-10	1.00E-08	13.0
	4th Quarter	U-Nat	1.51E-16	N/A	1.00E-16	3.00E-12	0.0
		Th-230	<1.00E-16	N/A	1.00E-16	2.00E-14	0.0
		Ra-226	<1.00E-16	N/A	1.00E-16	9.00E-13	0.0
		Pb-210	7.0E-15	1.01E-16	2.00E-15	6.00E-13	1.2
		Rn-222	1.20E-09	N/A	3.00E-10	1.00E-08	12.0
<b>DAVE'S WATER WELL</b> Air Station Background Site	3rd Quarter	U-Nat	<1.00E-16	N/A	1.00E-16	3.00E-12	0.0
		Th-230	<1.00E-16	N/A	1.00E-16	2.00E-14	0.0
		Ra-226	<1.00E-16	N/A	1.00E-16	9.00E-13	0.0
		Pb-210	1.1E-14	2.50E-16	2.00E-15	6.00E-13	1.9
		Rn-222	1.5E-09	N/A	3.00E-10	1.00E-08	15.0
	4th Quarter	U-Nat	1.40E-16	N/A	1.00E-16	3.00E-12	0.0
		Th-230	<1.00E-16	N/A	1.00E-16	2.00E-14	0.0
		Ra-226	<1.00E-16	N/A	1.00E-16	9.00E-13	0.0
		Pb-210	4.7E-15	1.00E-16	2.00E-15	6.00E-13	0.8
		Rn-222	1.2E-09	N/A	3.00E-10	1.00E-08	12.0

**TABLE 2**  
**SMITH RANCH FACILITY**  
**WATER SAMPLING DATA - 2002**  
**ENVIRONMENTAL MONITORING SITES**  
**3RD & 4TH QUARTERS**

SAMPLE LOCATION	SAMPLE DATE	RADIONUCLIDE	CONCENTRATION ( $\mu\text{Ci}/\text{ml}$ )	ERROR EST. +/- ( $\mu\text{Ci}/\text{ml}$ )	L.L.D. ( $\mu\text{Ci}/\text{ml}$ )	EFF. CONC. LIMIT ( $\mu\text{Ci}/\text{ml}$ )	% EFF. CONC. LIMIT
VOLLMAN POND	28-Aug-02	U-Nat Ra-226	DRY DRY			3 0E-07 6 0E-08	N/A N/A
	25-Nov-02	U-Nat Ra-226	DRY DRY			3 0E-07 6 0E-08	N/A N/A
SMITH POND	28-Aug-02	U-Nat Ra-226	DRY DRY			3 0E-07 6 0E-08	N/A N/A
	25-Nov-02	U-Nat Ra-226	DRY DRY			3 0E-07 6 0E-08	N/A N/A
SMITH'S WINDMILL #1	28-Aug-02	U-Nat Ra-226	3 01E-08 1 40E-09	N/A 3 00E-10	2 00E-10 2 00E-10	3 0E-07 6 0E-08	N/A 0.5
	25-Nov-02	U-Nat Ra-226	2 00E-08 7.00E-10	N/A 2 00E-10	2 00E-10 2 00E-10	3 0E-07 6 0E-08	N/A 0.3
SMITH'S WINDMILL #2	29-Aug-02	U-Nat Ra-226	5 49E-08 6 00E-10	N/A 2 00E-10	2 00E-10 2 00E-10	3 0E-07 6 0E-08	N/A 0.3
	25-Nov-02	U-Nat Ra-226	5 28E-08 4 00E-10	N/A 3 00E-10	2 00E-10 2 00E-10	3 0E-07 6 0E-08	N/A 0.5
SOLAR PUMP	28-Aug-02	U-Nat Ra-226	5 62E-09 7.00E-10	N/A 2 00E-10	2 00E-10 2 00E-10	3 0E-07 6 0E-08	N/A 0.3
	25-Nov-02	U-Nat Ra-226	DRY DRY			3 0E-07 6 0E-08	N/A N/A

**TABLE 3**  
**SMITH RANCH FACILITY**  
**DIRECT RADIATION (GAMMA) MEASUREMENT DATA - 2002**  
**ENVIRONMENTAL MONITORING SITES**  
**3RD & 4TH QUARTERS**

SAMPLE LOCATION	SAMPLE PERIOD	EXPOSURE RATE (mR/qtr)	ERROR ESTIMATE (mR/qtr)
FENCE LINE			
Air Station	3rd Quarter	45	2.2
Restricted Area	4th Quarter	40	1.1
Boundary			
VOLLMAN'S RANCH			
Air Station	3rd Quarter	49	1.6
Downwind	4th Quarter	32	1.0
Nearest Residence			
DAVE'S WATER WELL			
Air Station	3rd Quarter	38	1.9
Background	4th Quarter	34	0.8
Site			
WELLFIELD #1	3rd Quarter	46	0.9
	4th Quarter	38	2.5
WELLFIELD #3	3rd Quarter	40	0.8
	4th Quarter	37	1.5
WELLFIELD #4	3rd Quarter	38	1.6
	4th Quarter	37	1.7
WELLFIELD #4A	3rd Quarter	39	3.9
	4th Quarter	37	0.7
EVAP. POND	3rd Quarter	46	1.6
	4th Quarter	41	1.5