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Analytical data and sample locality map for phosphate rocks from the East and West Palisades Roadless Areas, Idaho and Wyoming

By

J. M. Motooka, W. R. Willson, S. E. Church,

and A. L. Gruzensky

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CONTENTS

ILLUSTRATIONS

TABLES

STUDIES RELATED TO WILDERNESS

The Wilderness Act (Public Law 88-577, September 3, 1964) and related acts require the U.S. Geological Survey and the U.S. Bureau of Mines to survey certain areas on Federal lands to determine their mineral resource potential. Results must be made available to the public and be submitted to the President and the Congress. This report presents analytical data for rock samples collected in the West and East Palisades Roadless Areas in the Bridger-Teton and the Targhee National Forests, Teton and Bonneville Counties, Idaho, and Teton and Lincoln Counties, Wyoming. The East and West Palisades areas were classified as further planning areas during the Second Roadless Area Review and Evaluation (RARE II) by the U.S. Forest Service, January 1979.

INTRODUCTION

In July, 1981 the U.S. Bureau of Mines collected samples of phosphate rock from trenches through the geologic section from the East and West Palisades Roadless Areas, Teton and Bonneville Counties, Idaho and Teton and Lincoln Counties, Wyoming. This report presents major and trace element data from the rock samples collected from the trenches.

The Palisades Roadless Areas are located in eastern Idaho and western Wyoming in Targhee National Forest. They are bounded on three sides by the Snake River Valley west of Jackson, Wyoming.

Within this area, the Permian phosphate deposits of the Phosphoria Formation, a marine deposit of phosphate rock interbedded with phosphatic shales, siltstones, limestone, and chert crop out. The Phosphoria Formation is widespread, cropping out in Montana, Idaho, Utah and Wyoming. It is part of the cordilleran miogeosyncline and is intensely compressed and folded with dips of 0° to 90°; some beds are overturned (Service and Popoff, 1964).

The Phosphoria Formation has three members. The youngest of these is the Rex Chert member consisting of interbedded chert, cherty mudstone and limestone. This is underlain by the Meade Peak member, a phosphatic shale and the member richest in phosphate. The third and lowest member is the Wells Limestone member consisting of interbedded limestone and sandstone, (Gardner, 1944).

METHODS OF STUDY

Sample Collection

In 1981, 364 phosphate rock samples were collected in the Palisades Roadless area by John Benham of the Bureau of Mines. The Meade Peak Member of the Phosphoria Formation was sampled extensively from thirteen stratigraphic sections within the roadless areas. Trenches were dug, to a depth of eight feet where necessary, to reach undisturbed bedrock. Samples were taken across every lithological subunit within the section exposed in the trench. Sample localities are given in Figure 1 and Table 1.

Digestion Procedure

One-half gram of phosphate rock sample (minus-80 mesh) was weighed on a top-loading, electronic balance having a weighing precision of ±2 percent (limited by the two-digit decimal readout of the electronic balance). Samples were transferred to a 50 mL pyrex beaker for digestion. The sample was first

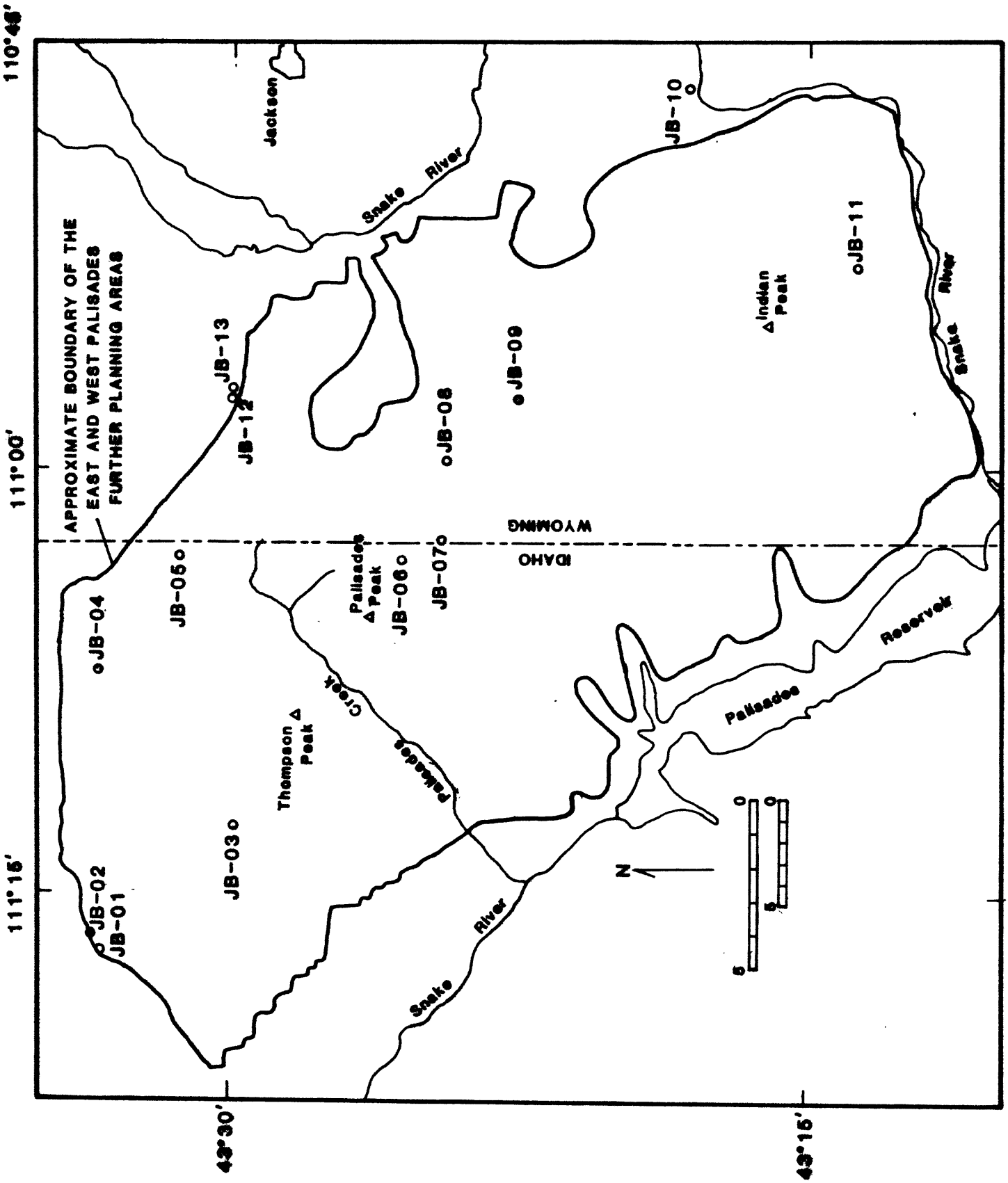

Figure 1.--Location map of the phosphate trenches, West and East Palisades Roadless Areas, Idaho and Wyoming.

wetted with 10 percent HCl to react with any carbonate present. Following the completion of this reaction, 15 mL of aqua regia (1:3; HNO_3:HCl, freshly prepared) was added to each sample. The initial oxidation of the nonsilicate phases present in the sample usually occurred as a vigorous reaction, often before, or as soon as the sample was placed on the hot plate. The reaction was contained by quenching with distilled water from a squirt bottle. Following the initial oxidation process (the vigorous reaction is complete after about ten minutes), the sample was moved to a second hot plate. Solution temperature was maintained at 76°C; the aqua regia leach continued to oxidize the sample as the solution was taken slowly to dryness overnight. The low temperature is necessary to prevent spattering of the samples during the evaporating process.

The following morning, about 5 mL of 6M HCl was added to each sample and the sample was gently heated until the acid-soluble residue was dissolved. The acid-soluble portion was decanted into a pyrex graduated cylinder, and the sample residue was washed with 6M HCl to give a final volume of 10 ± 0.5 mL. A total of three rinses of each sample residue was made during the sample transfer process. The samples were filtered through Whatman #41 filter paper that had been equilibrated with a 10-percent HCl solution. (The solution was brought to 25 mL volume with distilled water.) The final solution used for analysis was a 20-percent HCl solution (V/V).

ICP Analysis

The ICP instrumentation used during this study is a commercially available ICPQ Model-137000 from Applied Research Laboratories (Ajhar and others, 1976). The instrumental array is given in table 2. Lower limits of determination are variable and are indicated after the less than carat (<) in table 3. All data are in parts per million. Corrections made for spectral interferences were determined using the procedure described by Church (1981b). Analytical results are calculated in real time using a dedicated PDP-11 computer, and the results are stored on a disk. Data transfer to the Multics computer was done from a modem to the HP-1000 computer in the Branch of Exploration Geochemistry. Data were read from the disk drive associated with the PDP-11 computer by an interactive program from the HP system. A data tape was made, and the tape read into the Honeywell computer system (Bigelow, 1982). All data were rounded to two significant figures.

ROCK ANALYSIS STORAGE SYSTEM

Upon completion of all analytical work, the analytical results were entered into a computer-based file called RASS (Rock Analysis Storage System). This RASS file contains both descriptive geological information and analytical data. Any or all of this information may be retrieved and converted to a standard form (STATPAC) for computerized statistical analysis or publication (VanTrump and Miesch, 1976).

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TABLE 1.--Localities of analyzed sections collected by the U.S. Bureau of Mines

Section no.	Section name	Latitude	Longitude
JB-01	Pine Creek no. 1	43° 33' 17"	111° 17' 14"
JB-02	Pine Creek no. 2	43° 33' 34"	111° 16' 41"
JB-03	N. Fork Rainey Cr.	43° 29' 36"	111° 12' 35"
JB-04	Pole Canyon	43° 33' 08"	111° 07' 14"
JB-05	Oliver Peak	43° 31' 09"	111° 03' 14"
JB-06	Neeley Cove	43° 25' 28"	111° 03' 38"
JB-07	Siddoway Fork	43° 24' 29"	111° 02' 37"
JB-08	Smokey Hollow	43° 23' 59"	110° 59' 52"
JB-09	N. Fork Big Elk Cr.	43° 22' 46"	110° 58' 01"
JB-10	Astoria Hot Springs	43° 18' 09"	110° 46' 44"
JB-11	Wolf Creek	43° 13' 50"	110° 53' 07"
JB-12	Teton Pass-west	43° 30' 00"	110° 57' 38"
JB-13	Teton Pass-east	43° 30' 06"	110° 57' 42"

Phosphate trench samples and locations courtesy of John R. Benham, U.S. Bureau of Mines, Spokane, Washington

TABLE 2.--ICP Instrument Array

Element	Wavelength (nm)	Element	Wavelength (nm)
Y	371.0	Ti	334.9
Mn	257.6	Ce	418.6
Ag	328.0	B	249.7
As	193.7	Mo	287.1
Au	242.8	Nb	309.4
Ba	455.4	Ni	231.6
Be	313.0	P	213.6
Bi	306.7	Pb	220.3
Mg	279.0	Sb	217.5
Cd	226.5	Sn	189.9
Co	345.3	Sr	407.7
Cr	283.5	Ca	422.6
Cu	324.7	Al	396.1
Fe	259.9	V	311.0
Ge	303.9	W	239.7
La	398.8	Zn	202.5

Table 3. ICP analytical data from aqua-regia leaches of phosphate rocks from the Palisades Roadless Areas.

[The following qualifiers are used in reporting ICP analytical data: --, no determination made; <, not detected at concentration given; L, detected, but data are qualitative only.]

Pine Creek no. 1 section

Sample	AG	AL	AS	AU	B	BA	BE	BI	CA	CD	CE	CO	CR	CU	FE	GE	LA
WR445	<.75	940	27.0	--	<.4	600	L.31	<15	29,000	<.75	22	<7.1	75	52	18,000	--	69
WR446	L1.10	5,400	<7.8	--	<.4	41	.85	L19	200,000	2.00	78	L10.0	180	32	15,000	--	260
WR447	L1.50	16,000	<18.0	--	<.4	190	1.80	<15	28,000	2.00	52	24.0	170	130	52,000	--	84
WR448	<.75	12,000	<15.0	--	<.4	230	.98	<15	170,000	<.75	38	<7.1	180	40	27,000	--	84
WR3489	<.75	3,500	49.0	--	<.4	31	L.42	<15	60,000	<.75	23	<7.1	<5	13	17,000	--	12

Sample	MG	MN	MO	NB	NI	P	PB	SB	SN	SR	TI	V	W	Y	ZN
WR445	290	140	8.0	<1.2	24	14,000	19	<13	<10	73	32	18.0	<7.5	94.0	99
WR446	920	45	6.3	<1.2	28	98,000	250	<13	<10	410	100	49.0	<7.5	340.0	2,100
WR447	1,900	570	23.0	<1.2	120	25,000	140	<13	<10	97	95	36.0	<7.5	130.0	570
WR448	9,300	1,800	15.0	<1.2	83	76,000	94	<13	<10	230	150	35.0	<7.5	120.0	1,500
WR3489	30,000	2,800	<1.9	<1.2	17	1,100	19	<13	<10	38	29	7.2	<7.5	9.8	110

Table 3. ICP analytical data from aqua-regia leaches of phosphate rocks from the Palisades Roadless Areas.

Pine Creek no. 2 section

Sample	AG	AL	AS	AU	B	BA	BE	BI	CA	CD	CE	CO	CR	CU	FE	GE
WR0432	16.00	11,000	L42.0	--	<.4	97	1.70	<15	110,000	100.00	44.0	L9.7	680	230	22,000	--
WR0433	17.00	7,700	<20.0	--	<.4	52	1.50	L16	170,000	200.00	39.0	L14.0	720	190	10,000	--
WR0434	4.30	2,800	L26.0	--	<.4	23	.50	L18	150,000	97.00	18.0	<7.1	180	61	7,900	--
WR435	17.00	7,900	<23.0	--	<.4	58	1.50	L20	200,000	270.00	30.0	L16.0	850	190	11,000	--
WR436	<.75	630	L23.0	--	<.4	11	L.23	L17	180,000	3.70	<6.5	<7.1	77	15	4,900	--
WR437	9.40	8,900	L43.0	--	<.4	66	1.40	L16	130,000	120.00	45.0	L9.9	740	140	20,000	--
WR438	16.00	8,600	L33.0	--	<.4	68	1.80	L17	120,000	93.00	63.0	L13.0	900	200	17,000	--
WR439	L1.40	4,800	60.0	--	<.4	27	.56	<15	69,000	28.00	41.0	<7.1	110	37	20,000	--
WR440	8.60	8,000	42.0	--	<.4	66	1.10	<15	18,000	87.00	26.0	<7.1	190	100	25,000	--
WR441	2.30	2,900	<7.8	--	21.0	82	1.10	L17	230,000	<.75	110.0	L15.0	210	24	7,900	--
WR442	<.75	1,500	42.0	--	<.4	13	<.20	<15	75,000	<.75	L12.0	<7.1	56	49	20,000	--
WR443	<.75	340	20.0	--	<.4	13	<.20	<15	8,700	<.75	<6.5	<7.1	19	120	29,000	--
WR444	L.90	5,400	L33.0	--	<.4	33	.53	L16	100,000	<.75	32.0	<7.1	160	28	14,000	--

Sample	LA	MG	MN	MO	NB	NI	P	PB	SB	SN	SR	TI	V	W	Y	ZN
WR0432	110.0	5,100	310	48.0	<1.2	300	42,000	19.0	L19	<10	300	170	860.0	<7.5	170.0	1,600
WR0433	160.0	14,000	62	56.0	<1.2	240	66,000	20.0	35	<10	430	160	1,500.0	<7.5	220.0	1,600
WR0434	33.0	68,000	140	31.0	<1.2	89	7,900	<7.5	<13	<10	120	43	430.0	<7.5	45.0	690
WR435	120.0	9,400	81	96.0	<1.2	220	78,000	21.0	36	<10	580	180	2,200.0	<7.5	190.0	2,200
WR436	7.3	100,000	240	9.7	<1.2	43	920	<7.5	<13	<10	85	25	230.0	<7.5	8.8	230
WR437	140.0	7,800	87	110.0	<1.2	140	53,000	22.0	L22	<10	270	180	750.0	<7.5	190.0	900
WR438	220.0	3,900	64	53.0	<1.2	280	50,000	20.0	L16	<10	290	220	780.0	<7.5	310.0	1,100
WR439	41.0	26,000	210	20.0	<1.2	77	11,000	L9.7	<13	<10	68	72	310.0	<7.5	46.0	450
WR440	34.0	1,900	130	110.0	<1.2	160	6,400	L16.0	L13	L20	41	90	1,100.0	<7.5	42.0	1,100
WR441	410.0	6,100	140	7.5	<1.2	24	100,000	L9.4	<13	<10	800	65	46.0	<7.5	580.0	270
WR442	27.0	32,000	580	12.0	<1.2	36	7,100	<7.5	<13	<10	68	21	14.0	<7.5	42.0	180
WR443	12.0	760	230	13.0	<1.2	38	2,800	<7.5	<13	<10	25	L13	8.3	<7.5	15.0	36
WR444	81.0	14,000	630	7.3	<1.2	59	31,000	<7.5	<13	<10	220	74	63.0	<7.5	130.0	430

Table 3. ICP analytical data from aqua-regia leaches of phosphate rocks from the Palisades Roadless Areas.

North Fork Rainey Creek section

Sample	AG	AL	AS	AU	B	BA	BE	BI	CA	CD	CE	CO	CR	CU	FE	GE
WR499	<.75	850	<7.8	--	<.40	11.00	<.20	<15	1,200	L1.50	<6.5	<7.1	L5.8	26.00	10,000	--
WR500	<.75	2,100	<7.8	--	<.40	14.00	L.20	<15	370,000	<.75	<6.5	<7.1	L6.9	6.50	2,500	--
WR501	<.75	1,200	<7.8	--	L.99	7.10	<.20	<15	380,000	<.75	<6.5	<7.1	<5.0	3.20	1,200	--
WR502	<.75	57	L7.9	--	6.00	.69	<.20	<15	5,000	<.75	<6.5	<7.1	<5.0	L.73	L21	--
WR503	<.75	1,500	<7.8	--	<.40	7.60	<.20	<15	380,000	<.75	<6.5	<7.1	<5.0	4.00	1,400	--
WR504	<.75	530	<7.8	--	<.40	4.60	<.20	L17	280,000	<.75	<6.5	<7.1	<5.0	3.00	680	--
WR505	<.75	920	<7.8	--	<.40	6.10	<.20	<15	330,000	<.75	<6.5	<7.1	<5.0	2.70	1,100	--
WR506	<.75	750	<7.8	--	<.40	4.80	<.20	<15	360,000	<.75	<6.5	<7.1	<5.0	2.30	930	--
WR507	<.75	1,500	<7.8	--	<.40	8.90	<.20	<15	350,000	<.75	L7.0	<7.1	<5.0	4.00	1,800	--
WR508	<.75	1,600	<7.8	--	<.40	9.50	L.22	<15	300,000	<.75	L8.5	<7.1	<5.0	5.80	4,600	--
WR509	<.75	2,400	<7.8	--	<.40	7.20	<.20	<15	350,000	<.75	L7.9	<7.1	<5.0	5.20	4,600	--
WR510	<.75	2,000	<7.8	--	<.40	6.50	L.21	<15	340,000	<.75	L8.2	<7.1	L6.9	5.90	4,700	--
WR511	<.75	500	<7.8	--	1.60	3.80	<.20	<15	390,000	<.75	<6.5	<7.1	<5.0	3.10	920	--
WR512	<.75	450	<7.8	--	L.69	3.60	<.20	<15	320,000	<.75	<6.5	<7.1	<5.0	2.50	870	--
WR513	<.75	490	<7.8	--	<.40	3.90	<.20	<15	310,000	<.75	<6.5	<7.1	<5.0	2.40	1,100	--
WR515	<.75	310	<7.8	--	2.20	3.90	<.20	<15	390,000	<.75	<6.5	<7.1	<5.0	4.60	710	--
WR516	<.75	590	<7.8	--	1.50	4.60	<.20	<15	380,000	<.75	<6.5	<7.1	<5.0	3.30	890	--
WR1323	<.75	400	<7.8	--	2.30	130.00	<.20	L17	240,000	<.75	<6.5	<7.1	<5.0	9.80	750	--
WR1324	<.75	470	<7.8	--	2.70	37.00	<.20	L23	360,000	<.75	<6.5	<7.1	<5.0	5.00	900	--
WR1325	<.75	440	<7.8	--	2.60	24.00	<.20	L21	370,000	<.75	<6.5	<7.1	<5.0	9.40	750	--
WR1326	<.75	6,800	<7.8	--	<.40	32.00	L.44	<15	230,000	<.75	L15.0	<7.1	L8.2	13.00	11,000	--
WR1327	<.75	2,700	<7.8	--	<.40	25.00	L.21	<15	260,000	<.75	L9.1	<7.1	<5.0	11.00	6,300	--

Table 3. ICP analytical data from aqua-regia leaches of phosphate rocks from the Palisades Roadless Areas.

North Fork Rainey Creek section

Sample	LA	MG	MN	MO	NB	NI	P	PB	SB	SN	SR	TI	V	W	Y	ZN
WR499	L1.9	310	110.00	L4.0	<1.2	19.0	250	<7.5	<13	<10	2.5	18.0	7.30	<7.5	1.1	52
WR500	4.2	5,900	68.00	<1.9	<1.2	16.0	1,400	<7.5	<13	<10	180.0	70.0	16.00	<7.5	9.0	120
WR501	<1.5	3,200	37.00	<1.9	<1.2	L7.7	430	<7.5	<13	<10	230.0	29.0	5.80	<7.5	4.5	120
WR502	<1.5	L49	L.62	<1.9	<1.2	<3.6	<14	<7.5	<13	<10	3.1	<6.9	<.85	<7.5	<.2	590
WR503	<1.5	12,000	46.00	<1.9	<1.2	12.0	330	<7.5	<13	<10	140.0	35.0	8.80	<7.5	3.5	83
WR504	<1.5	80,000	37.00	<1.9	L1.5	L6.2	210	<7.5	<13	<10	100.0	18.0	6.20	<7.5	2.8	44
WR505	L2.4	39,000	64.00	<1.9	<1.2	12.0	140	<7.5	<13	<10	93.0	20.0	6.10	<7.5	3.2	100
WR506	L2.2	12,000	54.00	<1.9	<1.2	L4.8	130	<7.5	<13	<10	91.0	27.0	7.90	<7.5	2.9	160
WR507	L3.5	16,000	76.00	<1.9	<1.2	13.0	530	<7.5	<13	<10	95.0	43.0	12.00	<7.5	5.1	120
WR508	4.1	40,000	100.00	<1.9	<1.2	26.0	230	<7.5	<13	<10	82.0	26.0	17.00	<7.5	4.1	150
WR509	L2.6	3,000	73.00	<1.9	<1.2	21.0	220	<7.5	<13	<10	77.0	34.0	18.00	<7.5	2.7	230
WR510	L2.9	3,400	82.00	<1.9	<1.2	31.0	280	<7.5	<13	<10	82.0	27.0	27.00	<7.5	3.4	140
WR511	<1.5	5,700	33.00	<1.9	<1.2	L8.5	170	<7.5	<13	<10	160.0	23.0	4.90	<7.5	2.9	240
WR512	<1.5	53,000	36.00	<1.9	L1.5	L5.7	110	<7.5	<13	<10	110.0	17.0	5.10	<7.5	1.7	140
WR513	<1.5	47,000	81.00	<1.9	L1.3	L3.6	140	<7.5	<13	<10	71.0	L15.0	5.50	<7.5	2.1	39
WR515	<1.5	4,000	52.00	<1.9	<1.2	<3.6	170	<7.5	<13	<10	150.0	19.0	9.60	<7.5	2.4	150
WR516	<1.5	2,800	57.00	<1.9	<1.2	<3.6	360	L12.0	<13	<10	170.0	29.0	6.80	<7.5	4.0	240
WR1323	<1.5	92,000	110.00	<1.9	<1.2	L6.4	270	L7.5	<13	<10	120.0	18.0	5.10	<7.5	2.3	170
WR1324	<1.5	3,000	86.00	<1.9	<1.2	<3.6	280	L9.1	<13	<10	120.0	16.0	4.80	<7.5	2.6	67
WR1325	<1.5	2,800	63.00	<1.9	<1.2	11.0	470	<7.5	<13	<10	150.0	22.0	7.30	<7.5	3.1	38
WR1326	6.9	13,000	140.00	<1.9	<1.2	34.0	1,100	L7.7	<13	<10	67.0	48.0	36.00	<7.5	7.6	270
WR1327	L2.7	5,100	110.00	<1.9	<1.2	16.0	290	L9.9	<13	<10	60.0	26.0	18.00	<7.5	4.8	70

Table 3. ICP analytical data from aqua-regia leaches of phosphate rocks from the Palisades Roadless Areas.

Pole Canyon section

Sample	AG	AL	AS	AU	B	BA	BE	BI	CA	CD	CE	CO	CR	CU	FE	GE	LA
WR1663	<.75	660	<13.0	--	<.4	7.1	<.20	<15	190,000	<.75	L8.7	<7.1	30	13.0	6,700	--	6.0
WR1664	<.75	380	<8.3	--	<.4	6.7	<.20	<15	200,000	<.75	<6.5	<7.1	25	11.0	6,600	--	4.3
WR1665	<.75	3,100	41.0	--	<.4	25.0	.57	<15	60,000	<.75	38.0	L8.5	120	29.0	18,000	--	100.0
WR1666	<.75	470	<7.8	--	<.4	10.0	<.20	L17	210,000	<.75	<6.5	<7.1	22	9.4	6,600	--	3.8
WR1667	<.75	3,400	L31.0	--	<.4	46.0	1.20	<15	120,000	<.75	48.0	L9.4	190	15.0	15,000	--	170.0
WR1668	<.75	5,900	32.0	--	<.4	47.0	.60	<15	45,000	<.75	41.0	<7.1	86	27.0	20,000	--	84.0
WR1669	<.75	2,100	<11.0	--	<.4	40.0	1.10	<15	200,000	<.75	32.0	<7.1	170	36.0	25,000	--	140.0

Sample	MG	MN	MO	NB	NI	P	PB	SB	SN	SR	TI	V	W	Y	ZN
WR1663	110,000	450	<2.0	<1.2	10.0	2,900	L8.4	<13	<10	72	25	16	<7.5	11	7.5
WR1664	110,000	600	<1.9	<1.2	9.7	3,100	<7.5	<13	<10	71	29	18	<7.5	9	6.9
WR1665	1,100	220	9.3	<1.2	37.0	26,000	42.0	<13	<10	190	77	27	<7.5	140	100.0
WR1666	120,000	1,100	<1.9	<1.2	10.0	2,100	<7.5	<13	<10	85	30	15	<7.5	7	11.0
WR1667	1,700	270	5.6	<1.2	21.0	56,000	43.0	<13	<10	420	110	36	<7.5	240	76.0
WR1668	3,500	2,100	5.2	<1.2	26.0	20,000	20.0	<13	<10	140	93	26	<7.5	100	49.0
WR1669	4,900	300	9.2	<1.2	29.0	62,000	24.0	<13	<10	550	76	31	<7.5	200	78.0

Table 3. ICP analytical data from aqua-regia leaches of phosphate rocks from the Palisades Roadless Areas.

Oliver Peak section

Sample	AG	AL	AS	AU	B	BA	BE	BI	CA	CD	CE	CO	CR	CU	FE	GE
WR1377	1.90	3,900	42.0	--	<.4	31.0	L.42	<15	43,000	17.00	38.0	<7.1	77	28.0	16,000	--
WR1378	L1.80	3,300	<15.0	--	<.4	84.0	.96	<15	180,000	15.00	79.0	<7.1	120	23.0	11,000	--
WR1379	10.00	7,400	<9.1	--	<.4	110.0	1.90	<15	260,000	83.00	23.0	L12.0	760	190.0	11,000	--
WR1380	3.10	2,000	<7.8	--	<.4	15.0	L.45	<15	210,000	29.00	<6.5	<7.1	78	29.0	4,600	--
WR1381	3.90	1,800	<7.8	--	150.0	100.0	1.80	<15	330,000	35.00	28.0	L16.0	230	60.0	2,500	--
WR1382	L1.90	890	<7.8	--	2.3	17.0	L.45	<15	240,000	78.00	L7.3	L7.6	200	44.0	1,200	--
WR1383	15.00	5,500	<15.0	--	4.6	88.0	1.80	L18	270,000	160.00	26.0	18.0	700	220.0	7,400	--
WR1384	L.96	4,100	56.0	--	<.4	52.0	.57	<15	72,000	48.00	25.0	<7.1	74	38.0	17,000	--
WR1385	<.75	1,300	L23.0	--	<.4	12.0	L.27	<15	170,000	36.00	L11.0	<7.1	35	9.9	8,900	--
WR1386	<.75	4,300	40.0	--	<.4	56.0	.61	<15	16,000	46.00	28.0	<7.1	110	70.0	27,000	--
WR1387	<.75	540	26.0	--	<.4	89.0	<.20	<15	11,000	13.00	L8.2	<7.1	42	78.0	35,000	--
WR1388	L1.10	5,200	59.0	--	<.4	49.0	.83	<15	39,000	74.00	33.0	L7.1	260	83.0	18,000	--
WR1389	5.80	7,000	<7.8	--	1.5	130.0	1.70	L23	270,000	80.00	38.0	18.0	830	110.0	7,800	--
WR1390	L1.20	3,900	36.0	--	<.4	32.0	.53	<15	4,100	24.00	39.0	L9.8	52	28.0	27,000	--
WR1391	2.60	13,000	L35.0	--	<.4	80.0	1.40	<15	88,000	29.00	54.0	L8.2	260	47.0	20,000	--
WR1392	14.00	3,100	<7.8	--	44.0	100.0	1.90	L20	320,000	87.00	100.0	32.0	480	71.0	4,700	--
WR1393	L1.50	1,600	<7.8	--	86.0	33.0	.55	<15	330,000	11.00	44.0	L13.0	180	32.0	2,800	--
WR1394	<.75	250	<7.8	--	1.5	21.0	<.20	L20	310,000	<.75	<6.5	<7.1	25	1.8	1,100	--
WR1395	<.75	2,200	<13.0	--	9.9	67.0	.91	L18	250,000	17.00	83.0	L13.0	190	15.0	4,000	--
WR1396	<.75	230	<7.8	--	<.4	5.1	<.20	<15	270,000	<.75	<6.5	<7.1	L7	2.0	1,500	--

Sample	LA	MG	MN	MO	NB	NI	P	PB	SB	SN	SR	TI	V	W	Y	ZN
WR1377	31.0	1,000	120	22.0	<1.2	58.0	19,000	86.0	<13	<10	140	72	120	<7.5	27.0	1,300
WR1378	130.0	890	110	14.0	<1.2	32.0	84,000	250.0	<13	<10	570	62	130	<7.5	140.0	710
WR1379	73.0	2,300	140	43.0	<1.2	130.0	120,000	38.0	L17	<10	920	180	580	<7.5	110.0	1,400
WR1380	11.0	110,000	140	42.0	<1.2	64.0	10,000	<7.5	<13	<10	160	48	390	<7.5	21.0	620
WR1381	120.0	1,700	26	12.0	<1.2	36.0	160,000	L13.0	<13	<10	1,200	78	400	L7.6	190.0	520
WR1382	34.0	95,000	200	10.0	<1.2	69.0	30,000	<7.5	<13	<10	260	35	230	<7.5	59.0	780
WR1383	100.0	3,000	120	94.0	<1.2	310.0	120,000	19.0	33	<10	1,000	120	540	<7.5	150.0	2,500
WR1384	16.0	40,000	140	24.0	<1.2	56.0	2,100	<7.5	<13	<10	70	54	180	<7.5	15.0	890
WR1385	5.5	100,000	300	23.0	<1.2	53.0	720	<7.5	<13	<10	81	30	72	<7.5	4.8	980
WR1386	32.0	740	140	79.0	<1.2	120.0	6,200	L11.0	<13	<10	70	60	150	<7.5	33.0	1,000
WR1387	18.0	190	170	36.0	<1.2	80.0	4,600	<7.5	<13	<10	72	28	46	<7.5	16.0	270
WR1388	41.0	7,800	180	70.0	<1.2	140.0	11,000	L14.0	<13	<10	98	81	280	<7.5	40.0	1,800
WR1389	140.0	1,900	43	47.0	<1.2	110.0	120,000	21.0	L21	<10	810	190	330	<7.5	180.0	1,000
WR1390	22.0	390	77	31.0	<1.2	120.0	1,600	L16.0	<13	<10	22	30	130	<7.5	12.0	1,200
WR1391	120.0	1,800	57	18.0	<1.2	120.0	40,000	L17.0	<13	<10	290	170	250	<7.5	130.0	1,000
WR1392	370.0	1,100	22	10.0	<1.2	120.0	140,000	31.0	<13	<10	880	88	360	L8.2	500.0	920
WR1393	210.0	2,100	25	L3.1	<1.2	59.0	150,000	L6.7	<13	<10	980	35	90	<7.5	290.0	310
WR1394	L2.6	42,000	61	<1.9	<1.2	L5.6	860	<7.5	<13	<10	470	27	34	<7.5	5.2	29
WR1395	340.0	21,000	120	L4.1	<1.2	27.0	63,000	L8.6	<13	<10	370	78	85	<7.5	440.0	510
WR1396	<1.5	66,000	270	<1.9	L1.2	17.0	830	<7.5	<13	<10	45	26	19	<7.5	3.5	49

Table 3. ICP analytical data from aqua-regia leaches of phosphate rocks from the Palisades Roadless Areas.

Neeley Cove section

Sample	AG	AL	AS	AU	B	BA	BE	BI	CA	CD	CE	CO	CR	CU	FE	GE
WR1328	<.75	820	L17	--	<.4	16	<.20	L21	190,000	<.75	<6.5	<7.1	53	7.1	5,100	--
WR1329	7.90	6,500	51	--	<.4	40	1.20	L21	12,000	70.00	30.0	<7.1	140	75.0	30,000	--
WR1330	8.90	8,500	49	--	<.4	41	1.20	L18	19,000	100.00	29.0	L7.3	180	80.0	30,000	--
WR1331	8.20	9,200	55	--	<.4	58	1.10	<15	32,000	130.00	38.0	<7.1	290	120.0	25,000	--
WR1332	3.30	6,900	64	--	<.4	87	.74	<15	33,000	19.00	54.0	<7.1	150	69.0	30,000	--
WR1333	L.78	3,800	60	--	<.4	25	.56	L19	90,000	89.00	34.0	L7.4	59	34.0	13,000	--
WR1334	<.75	1,300	L28	--	<.4	13	L.23	<15	170,000	9.30	L15.0	<7.1	33	11.0	5,400	--
WR1335	2.80	2,500	26	--	<.4	28	L.29	<15	12,000	8.90	19.0	<7.1	24	13.0	9,700	--
WR1336	2.60	6,000	61	--	<.4	30	.62	<15	82,000	41.00	57.0	<7.1	140	57.0	18,000	--
WR1337	2.30	4,600	38	--	<.4	44	L.48	<15	13,000	13.00	33.0	<7.1	59	27.0	16,000	--
WR1338	4.80	9,700	58	--	<.4	27	1.10	<15	73,000	69.00	41.0	<7.1	300	85.0	21,000	--
WR1339	4.20	9,000	57	--	<.4	51	1.10	L20	76,000	34.00	74.0	L7.2	350	95.0	21,000	--
WR1340	4.50	7,600	59	--	<.4	68	.84	L16	46,000	33.00	68.0	<7.1	250	50.0	22,000	--
WR1341	<.75	2,300	L41	--	<.4	18	L.30	<15	130,000	10.00	20.0	<7.1	46	16.0	9,100	--
WR1342	18.00	9,400	L56	--	<.4	40	1.60	L16	130,000	200.00	44.0	<7.1	820	160.0	17,000	--
WR1343	4.40	2,300	L26	--	<.4	13	L.40	<15	180,000	41.00	19.0	<7.1	160	37.0	6,200	--
WR1344	19.00	8,200	L62	--	<.4	40	1.90	L23	160,000	270.00	35.0	L9.1	980	210.0	14,000	--
WR1345	L1.60	1,000	L20	--	<.4	10	L.28	L27	180,000	35.00	L9.1	<7.1	150	22.0	4,500	--
WR1346	31.00	11,000	L56	--	<.4	61	2.50	L23	120,000	250.00	52.0	L9.0	1,300	320.0	20,000	--
WR1347	23.00	6,000	69	--	<.4	37	1.40	L19	94,000	210.00	36.0	<7.1	550	200.0	19,000	--
WR1348	3.50	1,600	<17	--	1.1	20	.52	<15	210,000	67.00	L15.0	<7.1	230	47.0	2,500	--
WR1349	22.00	9,700	L38	--	<.4	46	1.80	L21	170,000	160.00	47.0	L8.7	910	210.0	14,000	--

Table 3. ICP analytical data from aqua-regia leaches of phosphate rocks from the Palisades Roadless Areas.

Neeley Cove section

Sample	LA	MG	MN	MO	NB	NI	P	PB	SB	SN	SR	TI	V	W	Y	ZN
WR1328	8.1	96,000	1,900	<1.9	<1.2	13	2,500	<7.5	<13	<10	58	31	29	<7.5	15.0	270
WR1329	18.0	2,500	230	190.0	<1.2	110	1,700	L16.0	L16	<10	18	53	1,500	<7.5	15.0	1,300
WR1330	31.0	2,800	170	230.0	<1.2	120	6,700	L16.0	L22	<10	42	81	1,400	<7.5	38.0	1,200
WR1331	46.0	3,100	130	180.0	<1.2	120	13,000	L18.0	L20	<10	67	99	1,500	<7.5	57.0	1,300
WR1332	60.0	1,900	100	46.0	<1.2	50	17,000	L14.0	<13	<10	72	60	310	<7.5	68.0	610
WR1333	27.0	47,000	510	20.0	<1.2	97	5,500	<7.5	<13	<10	57	29	220	<7.5	27.0	710
WR1334	11.0	99,000	380	L4.9	<1.2	25	1,900	<7.5	<13	<10	66	28	110	<7.5	11.0	310
WR1335	12.0	2,900	29	25.0	<1.2	30	1,100	L11.0	<13	<10	43	L15	48	<7.5	3.6	420
WR1336	72.0	30,000	210	34.0	<1.2	51	18,000	L9.5	<13	<10	100	60	220	<7.5	83.0	370
WR1337	22.0	1,700	30	27.0	<1.2	42	5,100	40.0	<13	<10	51	32	110	<7.5	20.0	180
WR1338	73.0	11,000	140	120.0	<1.2	140	27,000	L16.0	L16	<10	130	140	910	<7.5	87.0	850
WR1339	150.0	5,400	54	55.0	<1.2	85	37,000	22.0	<13	<10	170	130	320	<7.5	160.0	370
WR1340	95.0	2,900	39	49.0	<1.2	67	23,000	L16.0	<13	<10	120	85	250	<7.5	110.0	450
WR1341	16.0	73,000	290	13.0	<1.2	38	2,800	<7.5	<13	<10	70	24	110	<7.5	16.0	230
WR1342	130.0	19,000	77	120.0	<1.2	130	47,000	22.0	L26	<10	300	200	1,200	<7.5	160.0	570
WR1343	33.0	87,000	150	26.0	<1.2	49	15,000	L8.3	<13	<10	180	46	390	<7.5	39.0	350
WR1344	110.0	19,000	100	220.0	<1.2	250	56,000	22.0	47	<10	500	200	1,500	<7.5	160.0	1,700
WR1345	8.3	110,000	160	29.0	<1.2	61	1,600	<7.5	<13	<10	94	27	370	<7.5	9.9	330
WR1346	190.0	5,300	69	280.0	<1.2	290	52,000	30.0	L31	<10	470	260	1,600	<7.5	230.0	1,500
WR1347	86.0	33,000	110	190.0	<1.2	240	16,000	23.0	L21	<10	170	140	1,200	<7.5	110.0	1,400
WR1348	73.0	86,000	110	24.0	<1.2	82	34,000	<7.5	<13	<10	410	53	360	<7.5	98.0	470
WR1349	170.0	4,200	50	110.0	<1.2	240	79,000	21.0	L21	<10	700	180	1,400	<7.5	210.0	1,600

Table 3. ICP analytical data from aqua-regia leaches of phosphate rocks from the Palisades Roadless Areas.

Siddoway Fork section

Sample	AG	AL	AS	AU	B	BA	BE	BI	CA	CD	CE	CO	CR	CU	FE	GE
WR1670	<.75	490	L18.0	--	<.4	4.2	<.20	<15	170,000	<.75	L11.0	<7.1	54	13.0	5,400	--
WR1671	<.75	530	<13.0	--	<.4	3.9	<.20	<15	190,000	<.75	L9.8	<7.1	49	8.7	4,200	--
WR1672	9.70	9,200	56.0	--	<.4	45.0	1.10	<15	80,000	20.00	72.0	L10.0	210	34.0	26,000	--
WR1673	<.75	550	L20.0	--	<.4	6.1	L.23	<15	170,000	<.75	L10.0	<7.1	33	20.0	8,700	--
WR1674	4.50	2,400	<7.8	--	57.0	41.0	.69	<15	280,000	22.00	42.0	L8.3	140	41.0	7,100	--
WR1675	6.40	1,200	<7.8	--	140.0	35.0	.72	<15	330,000	38.00	28.0	L11.0	200	49.0	2,600	--
WR1676	18.00	9,500	L32.0	--	<.4	44.0	1.80	<15	150,000	88.00	43.0	<7.1	580	260.0	20,000	--
WR1677	5.20	3,200	<8.2	--	<.4	27.0	.71	<15	270,000	20.00	21.0	<7.1	210	37.0	3,100	--
WR1678	31.00	7,600	79.0	--	<.4	62.0	1.90	<15	67,000	260.00	46.0	<7.1	630	270.0	27,000	--
WR1679	2.70	1,600	L28.0	--	<.4	12.0	L.33	<15	160,000	33.00	L16.0	<7.1	110	24.0	7,400	--
WR1680	33.00	5,200	91.0	--	<.4	85.0	1.90	<15	69,000	260.00	39.0	<7.1	540	290.0	25,000	--
WR1681	2.10	3,000	L23.0	--	<.4	20.0	L.44	<15	180,000	38.00	22.0	<7.1	82	24.0	7,300	--
WR1682	6.60	6,400	<9.6	--	<.4	100.0	2.20	<15	270,000	260.00	44.0	L15.0	550	130.0	8,200	--
WR1683	2.60	2,200	L31.0	--	<.4	13.0	L.39	<15	160,000	34.00	19.0	<7.1	59	16.0	7,500	--
WR1684	25.00	7,400	88.0	--	<.4	89.0	2.40	<15	54,000	280.00	53.0	<7.1	540	220.0	30,000	--
WR1685	3.30	1,900	L29.0	--	<.4	16.0	L.40	<15	170,000	37.00	18.0	<7.1	98	20.0	8,200	--
WR1686	30.00	7,000	87.0	--	<.4	100.0	2.40	<15	56,000	310.00	44.0	<7.1	650	340.0	31,000	--
WR1687	<.75	530	28.0	--	<.4	4.6	<.20	<15	14,000	<.75	<6.5	<7.1	26	61.0	31,000	--

Sample	LA	MG	MN	MO	NB	NI	P	PB	SB	SN	SR	TI	V	W	Y	ZN
WR1670	28	92,000	94	L5.1	<1.2	20	6,500	<7.5	<13	<10	86	29	30.0	<7.5	45	140
WR1671	21	110,000	91	7.1	<1.2	17	5,100	<7.5	<13	<10	88	34	19.0	<7.5	33	160
WR1672	130	15,000	98	36.0	<1.2	130	27,000	L12.0	<13	<10	230	120	170.0	<7.5	130	850
WR1673	23	96,000	140	5.9	<1.2	25	5,200	<7.5	<13	<10	97	37	15.0	<7.5	34	120
WR1674	180	1,300	46	24.0	<1.2	42	140,000	L9.7	<13	<10	760	63	120.0	<7.5	220	480
WR1675	130	1,000	39	14.0	<1.2	54	170,000	L11.0	<13	<10	940	41	140.0	<7.5	180	550
WR1676	110	2,600	42	140.0	<1.2	270	64,000	19.0	<13	<10	470	180	780.0	<7.5	170	1,600
WR1677	110	46,000	51	16.0	<1.2	62	84,000	<7.5	<13	<10	670	82	110.0	<7.5	150	440
WR1678	100	9,800	71	230.0	<1.2	440	21,000	27.0	L29	<10	200	100	1,100.0	<7.5	120	2,500
WR1679	12	95,000	160	54.0	<1.2	140	2,800	<7.5	<13	<10	86	18	370.0	<7.5	14	720
WR1680	96	14,000	63	200.0	<1.2	430	16,000	26.0	35	<10	170	88	1,100.0	<7.5	120	2,100
WR1681	19	91,000	170	44.0	<1.2	95	6,600	<7.5	<13	<10	120	27	470.0	<7.5	21	600
WR1682	130	2,400	32	72.0	<1.2	160	130,000	21.0	L22	<10	860	300	1,900.0	<7.5	150	1,200
WR1683	12	94,000	170	86.0	<1.2	87	3,400	<7.5	<13	<10	80	18	410.0	<7.5	13	540
WR1684	88	5,300	53	130.0	<1.2	300	20,000	24.0	L28	<10	180	88	1,200.0	<7.5	96	2,300
WR1685	12	97,000	160	130.0	<1.2	100	2,900	<7.5	<13	<10	82	20	420.0	<7.5	15	620
WR1686	100	5,600	42	190.0	<1.2	470	19,000	25.0	34	<10	200	120	1,300.0	<7.5	120	2,600
WR1687	10	3,500	200	19.0	<1.2	48	3,500	<7.5	<13	<10	25	24	7.8	<7.5	10	51

Table 3. ICP analytical data from aqua-regia leaches of phosphate rocks from the Palisades Roadless Areas.

Smokey Hollow section

Sample	AG	AL	AS	AU	B	BA	BE	BI	CA	CD	CE	CO	CR	CU	FE
WR542	<.75	22,000	<7.8	--	<.40	24.0	1.30	<15	170,000	190.00	31.0	L8.3	25	23.0	22,000
WR543	17.00	13,000	L66.0	--	<.40	120.0	2.20	<15	86,000	340.00	53.0	L11.0	1,300	220.0	27,000
WR544	<.75	2,200	45.0	--	<.40	11.0	L.27	L16	120,000	41.00	20.0	<7.1	38	18.0	11,000
WR545	6.00	3,900	L34.0	--	<.40	22.0	.65	<15	170,000	100.00	21.0	<7.1	290	81.0	9,400
WR546	L1.10	620	<7.8	--	3.90	4.5	<.20	L20	220,000	10.00	<6.5	<7.1	97	13.0	1,200
WR547	23.00	9,100	L41.0	--	<.40	55.0	1.80	L17	190,000	270.00	34.0	L10.0	1,100	280.0	16,000
WR548	L.89	500	<7.8	--	5.30	9.3	L.20	L18	220,000	18.00	<6.5	<7.1	98	16.0	2,100
WR549	25.00	11,000	L54.0	--	<.40	61.0	2.10	L27	140,000	360.00	54.0	L14.0	1,400	260.0	22,000
WR550	3.30	690	L20.0	--	<.40	9.3	L.22	L23	180,000	48.00	<6.5	<7.1	130	34.0	6,300
WR551	18.00	10,000	<29.0	--	6.60	62.0	1.90	L24	220,000	330.00	32.0	L14.0	1,200	190.0	12,000
WR552	L1.60	640	<11.0	--	6.20	8.3	L.35	L22	210,000	29.00	<6.5	<7.1	110	17.0	3,400
WR553	21.00	12,000	L46.0	--	<.40	56.0	2.30	L24	160,000	220.00	46.0	L12.0	1,400	170.0	20,000
WR554	2.70	1,400	L25.0	--	<.40	10.0	L.31	L24	180,000	18.00	L15.0	<7.1	120	25.0	7,400
WR555	<.75	290	<7.8	--	L.41	3.0	<.20	L23	240,000	<.75	<6.5	<7.1	14	5.9	2,100
WR556	<.75	880	<15.0	--	<.40	7.5	<.20	L19	200,000	15.00	<6.5	<7.1	37	11.0	5,000
WR557	17.00	12,000	L60.0	--	<.40	92.0	2.20	L17	110,000	180.00	53.0	L9.9	1,100	200.0	27,000
WR558	L1.10	3,100	52.0	--	<.40	15.0	L.35	L27	110,000	34.00	25.0	L8.1	65	30.0	12,000
WR559	15.00	10,000	L40.0	--	<.40	67.0	1.80	L25	170,000	140.00	59.0	L12.0	1,100	180.0	20,000
WR560	L1.50	2,000	61.0	--	<.40	14.0	L.31	L18	93,000	24.00	22.0	<7.1	57	19.0	14,000
WR561	4.60	6,500	67.0	--	<.40	35.0	.98	<15	100,000	120.00	51.0	L18.0	320	58.0	17,000
WR562	9.40	4,700	48.0	--	<.40	35.0	.83	<15	6,400	56.00	21.0	<7.1	140	66.0	30,000
WR563	19.00	14,000	L63.0	--	<.40	77.0	2.20	<15	97,000	320.00	52.0	L11.0	870	170.0	29,000
WR564	3.10	6,400	57.0	--	<.40	30.0	.72	<15	21,000	44.00	33.0	<7.1	120	51.0	22,000
WR565	5.30	6,500	64.0	--	<.40	33.0	.96	<15	55,000	86.00	39.0	<7.1	250	110.0	24,000
WR566	4.10	5,100	56.0	--	<.40	27.0	.81	<15	47,000	78.00	17.0	<7.1	110	76.0	21,000
WR567	15.00	14,000	L46.0	--	<.40	50.0	1.70	<15	59,000	160.00	43.0	<7.1	510	130.0	22,000
WR568	11.00	5,300	L51.0	--	<.40	31.0	1.00	<15	150,000	94.00	32.0	L7.3	460	96.0	12,000
WR569	5.70	3,500	L44.0	--	<.40	29.0	.67	L16	140,000	49.00	22.0	<7.1	250	71.0	11,000
WR570	2.40	6,500	58.0	--	<.40	39.0	.63	<15	27,000	100.00	46.0	<7.1	120	51.0	30,000
WR571	21.00	13,000	L59.0	--	<.40	56.0	2.00	<15	98,000	220.00	44.0	L12.0	1,000	210.0	20,000
WR572	L1.10	840	L37.0	--	<.40	13.0	L.29	<15	150,000	65.00	L15.0	<7.1	70	17.0	7,400
WR573	20.00	7,500	68.0	--	<.40	59.0	2.00	L26	160,000	330.00	35.0	L14.0	1,100	220.0	15,000
WR574	2.00	900	L27.0	--	<.40	8.6	L.27	L19	170,000	39.00	L10.0	<7.1	90	21.0	5,100
WR575	25.00	9,400	67.0	--	<.40	71.0	2.30	L16	120,000	270.00	42.0	<7.1	1,100	210.0	16,000
WR576	5.00	3,900	53.0	--	<.40	20.0	.58	<15	120,000	45.00	22.0	<7.1	240	64.0	13,000
WR577	5.10	2,800	47.0	--	<.40	25.0	.52	L17	130,000	45.00	22.0	<7.1	180	52.0	12,000
WR578	18.00	8,800	59.0	--	<.40	96.0	2.10	<15	79,000	150.00	50.0	<7.1	850	200.0	22,000

Table 3. ICP analytical data from aqua-regia leaches of phosphate rocks from the Palisades Roadless Areas.

Smokey Hollow section

Sample	GE	LA	MG	MN	MO	NB	NI	P	PB	SB	SN	SR	TI	V	W	Y	ZN
WR542	--	27.0	11,000	420	12.0	<1.2	300	5,600	L10.0	<13	<10	130	62	140	<7.5	21.0	1,600
WR543	--	140.0	4,900	87	65.0	<1.2	280	38,000	23.0	L16	<10	200	190	1,100	<7.5	170.0	2,900
WR544	--	15.0	69,000	410	41.0	<1.2	92	2,900	<7.5	<13	<10	59	27	270	<7.5	14.0	830
WR545	--	48.0	72,000	230	88.0	<1.2	150	18,000	<7.5	<13	<10	200	70	630	<7.5	65.0	1,200
WR546	--	9.0	120,000	130	<2.2	<1.2	20	9,300	<7.5	<13	<10	130	24	73	<7.5	14.0	170
WR547	--	130.0	5,000	30	110.0	<1.2	250	82,000	20.0	34	<10	670	180	1,300	<7.5	170.0	2,400
WR548	--	13.0	110,000	100	9.7	<1.2	33	2,900	<7.5	<13	<10	170	25	220	<7.5	19.0	220
WR549	--	180.0	6,100	55	190.0	<1.2	330	55,000	29.0	L31	<10	460	330	2,600	<7.5	230.0	2,400
WR550	--	7.1	110,000	140	68.0	<1.2	100	1,100	<7.5	<13	<10	89	29	760	<7.5	8.3	670
WR551	--	130.0	3,800	44	130.0	<1.2	250	96,000	25.0	48	<10	820	270	2,800	<7.5	170.0	2,300
WR552	--	15.0	110,000	310	12.0	<1.2	47	5,200	<7.5	<13	<10	290	40	240	<7.5	16.0	340
WR553	--	160.0	6,900	61	120.0	<1.2	210	66,000	27.0	L30	L11	440	270	1,500	<7.5	190.0	2,200
WR554	--	29.0	93,000	190	25.0	<1.2	76	7,800	<7.5	<13	<10	130	43	230	<7.5	33.0	570
WR555	--	5.5	110,000	250	<1.9	<1.2	15	260	<7.5	<13	<10	130	28	45	<7.5	6.4	120
WR556	--	5.2	110,000	250	7.6	<1.2	37	1,000	<7.5	<13	<10	100	39	84	<7.5	7.0	360
WR557	--	160.0	4,800	81	93.0	<1.2	300	45,000	24.0	L17	<10	250	240	730	<7.5	220.0	2,500
WR558	--	23.0	57,000	380	39.0	<1.2	230	5,500	<7.5	<13	<10	64	41	230	<7.5	27.0	1,000
WR559	--	220.0	3,800	85	110.0	<1.2	260	74,000	22.0	L23	<10	340	250	980	<7.5	270.0	1,900
WR560	--	12.0	46,000	280	28.0	<1.2	150	2,900	<7.5	<13	<10	60	25	170	<7.5	16.0	1,200
WR561	--	73.0	32,000	220	43.0	<1.2	130	23,000	L17.0	L13	<10	110	130	390	<7.5	94.0	1,200
WR562	--	11.0	1,700	36	190.0	<1.2	180	1,200	20.0	L22	<10	24	67	800	<7.5	5.9	1,400
WR563	--	150.0	4,600	60	140.0	<1.2	250	44,000	34.0	L30	<10	230	290	2,100	<7.5	200.0	2,200
WR564	--	27.0	1,900	44	60.0	<1.2	140	9,500	22.0	<13	<10	59	76	410	<7.5	26.0	1,000
WR565	--	44.0	21,000	350	98.0	<1.2	400	10,000	<7.5	<13	<10	76	69	470	<7.5	58.0	2,000
WR566	--	20.0	25,000	280	100.0	<1.2	250	3,600	<7.5	<13	<10	49	45	510	<7.5	26.0	1,200
WR567	--	120.0	3,700	40	210.0	<1.2	280	27,000	22.0	L25	<10	120	290	2,100	<7.5	130.0	1,900
WR568	--	84.0	42,000	170	100.0	<1.2	220	40,000	L13.0	L18	<10	280	120	730	<7.5	100.0	1,100
WR569	--	54.0	65,000	300	51.0	<1.2	160	14,000	<7.5	<13	<10	130	84	330	<7.5	81.0	940
WR570	--	43.0	4,600	130	58.0	<1.2	140	12,000	L11.0	<13	<10	63	61	510	<7.5	51.0	1,100
WR571	--	130.0	5,400	140	210.0	<1.2	480	43,000	22.0	L30	<10	370	250	1,400	<7.5	160.0	2,200
WR572	--	13.0	93,000	210	36.0	<1.2	83	3,200	<7.5	<13	<10	100	34	530	<7.5	12.0	690
WR573	--	130.0	8,500	120	270.0	<1.2	430	67,000	27.0	54	<10	590	200	2,100	<7.5	190.0	2,600
WR574	--	14.0	99,000	280	51.0	<1.2	79	6,300	<7.5	<13	<10	150	35	260	<7.5	15.0	460
WR575	--	160.0	4,500	35	150.0	<1.2	240	59,000	27.0	44	<10	370	230	1,600	<7.5	200.0	1,700
WR576	--	40.0	57,000	230	79.0	<1.2	180	12,000	<7.5	L14	<10	110	64	350	<7.5	53.0	820
WR577	--	31.0	66,000	250	61.0	<1.2	160	9,100	L7.5	<13	<10	110	56	270	<7.5	40.0	700
WR578	--	170.0	4,300	70	98.0	<1.2	240	36,000	L18.0	L16	<10	200	210	730	<7.5	220.0	1,100

Table 3. ICP analytical data from aqua-regia leaches of phosphate rocks from the Palisades Roadless Areas.

North Fork Big Elk Creek section

Sample	AG	AL	AS	AU	B	BA	BE	BI	CA	CD	CE	CO	CR	CU	FE
WR1704	<.75	280	L17.0	--	<.4	7.7	<.20	<15	180,000	64.00	<6.5	<7.1	29	12.0	4,100
WR1705	2.20	1,500	<7.8	--	110.0	32.0	.67	<15	320,000	47.00	57.0	L8.6	160	14.0	1,400
WR1706	9.50	9,900	<14.0	--	<.4	51.0	1.80	<15	250,000	90.00	34.0	<7.1	690	160.0	10,000
WR1062	11.00	10,000	L48.0	--	<.4	41.0	1.50	L23	59,000	100.00	34.0	L8.3	450	170.0	23,000
WR1063	9.00	6,500	<17.0	--	<.4	60.0	1.60	L26	240,000	110.00	37.0	L11.0	530	160.0	8,200
WR1064	L1.80	900	<8.6	--	1.5	11.0	<.20	L21	220,000	26.00	<6.5	<7.1	140	34.0	1,400
WR1065	24.00	8,200	L43.0	--	<.4	49.0	1.50	L20	190,000	190.00	26.0	L8.9	930	450.0	20,000
WR1066	18.00	7,700	L44.0	--	<.4	40.0	1.40	L18	150,000	190.00	56.0	L10.0	660	190.0	16,000
WR1067	14.00	7,300	L30.0	--	<.4	54.0	1.50	L28	210,000	260.00	56.0	L12.0	670	210.0	13,000
WR1068	2.00	790	<9.6	--	1.4	12.0	L.29	L27	230,000	59.00	L9.5	<7.1	200	35.0	1,900
WR1069	17.00	8,200	L41.0	--	<.4	41.0	1.50	L31	150,000	240.00	43.0	<7.1	850	180.0	15,000
WR1070	L1.00	510	<7.8	--	<.4	7.9	L.24	L22	210,000	60.00	<6.5	<7.1	160	24.0	2,600
WR1691	15.00	6,400	L46.0	--	<.4	48.0	1.70	<15	170,000	230.00	32.0	<7.1	740	170.0	12,000
WR1692	13.00	7,100	L34.0	--	<.4	53.0	1.60	<15	200,000	180.00	40.0	<7.1	610	130.0	13,000
WR1693	2.90	1,400	L22.0	--	<.4	9.1	L.24	<15	190,000	49.00	L11.0	<7.1	82	16.0	6,000
WR1694	19.00	13,000	<15.0	--	<.4	64.0	2.50	<15	160,000	290.00	48.0	<7.1	1,200	230.0	14,000
WR1695	3.70	1,600	L21.0	--	<.4	9.3	L.24	<15	200,000	14.00	L7.8	<7.1	100	20.0	5,600
WR1696	14.00	13,000	L52.0	--	<.4	100.0	2.00	<15	94,000	110.00	51.0	<7.1	890	210.0	25,000
WR1697	4.00	7,400	71.0	--	<.4	43.0	.66	<15	19,000	18.00	19.0	<7.1	100	47.0	32,000
WR3484	4.70	4,100	L75.0	--	<.4	63.0	.70	<15	280,000	<.75	63.0	<7.1	280	35.0	16,000
WR3485	3.40	2,500	<21.0	--	92.0	81.0	.71	<15	300,000	<.75	95.0	L8.2	230	11.0	4,000
WR3486	L1.80	1,000	<8.7	--	160.0	170.0	1.60	<15	310,000	9.00	140.0	L13.0	280	6.3	1,100
WR3487	2.30	1,500	<7.8	--	89.0	110.0	.84	<15	300,000	<.75	110.0	L12.0	300	14.0	2,500
WR3488	L.98	2,100	L35.0	--	<.4	23.0	L.25	<15	130,000	<.75	24.0	<7.1	96	25.0	7,600

Table 3. ICP analytical data from aqua-regia leaches of phosphate rocks from the Palisades Roadless Areas.

North Fork Big Elk Creek section

Sample	GE	LA	MG	MN	MO	NB	NI	P	PB	SB	SN	SR	TI	V	W	Y	ZN
WR1704	--	16.0	100,000	110	L5.1	<1.2	27	5,900	<7.5	<13	<10	72	34	22	<7.5	26	280
WR1705	--	220.0	890	16	11.0	<1.2	25	170,000	L14.0	<13	<10	660	71	160	<7.5	270	700
WR1706	--	130.0	2,700	29	79.0	<1.2	200	120,000	19.0	<13	<10	500	220	860	<7.5	160	1,500
WR1062	--	52.0	3,300	87	270.0	<1.2	300	23,000	26.0	<13	<10	180	230	1,500	<7.5	72	2,000
WR1063	--	140.0	3,600	46	86.0	<1.2	160	110,000	L14.0	<13	<10	750	140	490	<7.5	200	1,400
WR1064	--	19.0	110,000	110	11.0	<1.2	42	17,000	<7.5	<13	<10	150	32	120	<7.5	27	440
WR1065	--	97.0	3,000	42	230.0	<1.2	690	82,000	L18.0	39	<10	760	120	700	<7.5	150	3,000
WR1066	--	180.0	2,300	77	140.0	<1.2	500	65,000	21.0	<13	<10	510	140	540	<7.5	230	2,100
WR1067	--	240.0	2,500	82	130.0	<1.2	430	93,000	29.0	L14	<10	680	120	490	<7.5	320	1,800
WR1068	--	48.0	99,000	110	22.0	<1.2	85	15,000	<7.5	<13	<10	290	29	160	<7.5	67	450
WR1069	--	150.0	40,000	110	200.0	<1.2	340	34,000	22.0	L17	<10	310	160	1,000	<7.5	200	1,300
WR1070	--	31.0	110,000	150	10.0	<1.2	47	7,500	<7.5	<13	<10	180	24	220	<7.5	44	220
WR1691	--	110.0	26,000	100	230.0	<1.2	320	55,000	L18.0	37	<10	460	140	660	<7.5	160	1,500
WR1692	--	130.0	18,000	96	140.0	<1.2	260	76,000	L16.0	L22	<10	510	140	560	<7.5	150	1,200
WR1693	--	9.7	110,000	120	26.0	<1.2	85	4,900	<7.5	<13	<10	110	26	230	<7.5	11	410
WR1694	--	150.0	4,400	60	98.0	<1.2	220	71,000	24.0	38	<10	430	280	1,300	<7.5	170	1,200
WR1695	--	9.6	96,000	120	19.0	<1.2	72	3,000	<7.5	<13	<10	120	27	160	<7.5	12	330
WR1696	--	140.0	4,000	80	150.0	<1.2	370	39,000	L17.0	L30	<10	220	180	630	<7.5	190	1,400
WR1697	--	32.0	1,700	120	93.0	<1.2	150	7,700	L17.0	<13	<10	63	59	250	<7.5	29	1,200
WR3484	--	220.0	1,300	57	79.0	<1.2	97	150,000	29.0	L14	<10	600	110	190	<7.5	210	760
WR3485	--	330.0	1,400	36	32.0	<1.2	32	160,000	L15.0	<13	<10	840	69	62	<7.5	330	540
WR3486	--	520.0	2,000	44	11.0	<1.2	14	160,000	L13.0	<13	<10	1,200	53	27	<7.5	520	530
WR3487	--	370.0	1,700	35	19.0	<1.2	20	150,000	L14.0	<13	<10	880	76	48	<7.5	410	400
WR3488	--	61.0	2,600	96	8.9	<1.2	22	55,000	L9.2	<13	<10	240	66	41	<7.5	110	87

Table 3. ICP analytical data from aqua-regia leaches of phosphate rocks from the Palisades Roadless Areas.

Astoria Hot Springs section

Sample	AG	AL	AS	AU	B	BA	BE	BI	CA	CD	CE	CO	CR	CU	FE	GE
WR451	15.00	5,700	520.0	--	<.4	39.0	1.50	L32	150,000	120	38.0	L14.0	980	230	18,000	--
WR452	12.00	7,100	340.0	--	<.4	52.0	.99	L19	38,000	110	L13.0	<7.1	220	130	45,000	--
WR454	6.90	9,200	150.0	--	<.4	67.0	1.80	<15	140,000	68	100.0	L12.0	960	240	21,000	--
WR455	2.20	5,300	84.0	--	<.4	68.0	.63	<15	41,000	69	28.0	L7.6	70	58	32,000	--
WR456	3.40	9,000	L67.0	--	<.4	120.0	2.30	L20	210,000	89	130.0	L14.0	500	140	16,000	--
WR457	<.75	3,000	65.0	--	<.4	28.0	L.47	<15	110,000	18	36.0	<7.1	57	66	28,000	--
WR458	5.20	12,000	78.0	--	<.4	95.0	1.90	<15	91,000	69	130.0	L12.0	410	94	33,000	--
WR459	L1.10	4,100	150.0	--	<.4	32.0	L.38	<15	11,000	49	28.0	<7.1	42	72	34,000	--
WR460	4.80	6,600	<17.0	--	<.4	70.0	2.20	L18	260,000	97	86.0	L14.0	530	95	11,000	--
WR461	L1.50	3,800	56.0	--	<.4	33.0	L.44	<15	140,000	17	17.0	<7.1	77	46	19,000	--
WR462	9.80	12,000	L37.0	--	<.4	91.0	2.40	<15	160,000	170	79.0	L11.0	760	140	23,000	--
WR463	5.70	5,400	150.0	--	<.4	27.0	.67	<15	40,000	61	31.0	<7.1	150	65	32,000	--
WR464	13.00	9,800	110.0	--	<.4	83.0	2.40	<15	210,000	220	47.0	L13.0	890	180	18,000	--
WR465	5.40	5,400	120.0	--	<.4	54.0	.89	L19	190,000	64	28.0	<7.1	220	64	12,000	--
WR466	17.00	14,000	L44.0	--	<.4	110.0	2.20	L20	160,000	200	43.0	L9.0	940	160	23,000	--
WR467	15.00	10,000	L46.0	--	<.4	77.0	2.00	L22	230,000	220	31.0	L12.0	790	130	14,000	--
WR468	3.00	1,000	<19.0	--	<.4	19.0	L.44	L16	230,000	33	<6.5	<7.1	240	43	3,000	--
WR469	19.00	6,800	170.0	--	<.8	37.0	1.80	L47	190,000	660	33.0	L22.0	860	210	14,000	--
WR470	21.00	8,100	240.0	--	<1.6	110.0	L1.80	<60	190,000	440	L28.0	<28.0	860	210	18,000	--
WR471	17.00	7,700	140.0	--	<.8	73.0	1.50	<30	170,000	400	L27.0	L22.0	840	170	16,000	--
WR472	17.00	7,800	120.0	--	<.4	84.0	1.50	L22	40,000	300	33.0	L18.0	780	210	43,000	--
WR473	L1.50	420	<7.8	--	<.4	6.5	L.24	L17	240,000	12	<6.5	<7.1	150	22	2,900	--
WR474	24.00	6,100	160.0	--	<.4	34.0	1.70	L33	120,000	370	44.0	L13.0	890	260	17,000	--
WR475	L1.80	450	<17.0	--	<.4	9.7	L.27	L22	240,000	24	<6.5	<7.1	260	36	2,200	--
WR476	18.00	7,200	120.0	--	<.4	29.0	1.80	L29	200,000	220	33.0	L18.0	780	180	13,000	--
WR477	17.00	5,700	210.0	--	3.7	43.0	2.00	L25	260,000	160	23.0	19.0	930	780	8,700	--
WR478	L1.80	1,600	150.0	--	7.3	15.0	.72	L20	270,000	47	L9.5	<7.1	210	45	1,800	--
WR479	8.00	11,000	650.0	--	<.4	51.0	1.60	L19	240,000	64	20.0	L11.0	280	76	8,700	--

Table 3. ICP analytical data from aqua-regia leaches of phosphate rocks from the Palisades Roadless Areas.

Astoria Hot Springs section

Sample	LA	MG	MN	MO	NB	NI	P	PB	SB	SN	SR	TI	V	W	Y	ZN
WR451	110.0	32,000	89	340	<1.2	280	46,000	25.0	47	<10	740	100	650	<7.5	190.0	1,300
WR452	20.0	13,000	200	340	<1.2	570	4,800	L15.0	<13	<10	230	140	1,700	<7.5	25.0	2,400
WR454	200.0	2,600	130	100	<1.2	320	67,000	L18.0	37	<10	420	130	440	<7.5	290.0	1,900
WR455	26.0	14,000	220	41	<1.2	250	7,500	L13.0	<13	<10	68	50	200	<7.5	26.0	1,700
WR456	230.0	3,400	110	50	<1.2	180	98,000	L16.0	<13	<10	650	100	300	<7.5	280.0	1,600
WR457	30.0	60,000	460	33	<1.2	84	7,600	<7.5	<13	<10	95	57	100	<7.5	36.0	650
WR458	120.0	2,600	120	84	<1.2	91	40,000	L17.0	<13	<10	330	190	310	<7.5	160.0	480
WR459	16.0	4,700	180	41	<1.2	120	1,500	L12.0	<13	<10	33	28	110	<7.5	9.9	1,300
WR460	300.0	12,000	76	69	<1.2	150	110,000	L16.0	<13	<10	690	130	460	<7.5	410.0	920
WR461	15.0	81,000	290	27	<1.2	95	2,500	<7.5	<13	<10	94	64	150	<7.5	15.0	750
WR462	170.0	2,500	73	160	<1.2	150	72,000	21.0	<13	<10	610	210	580	<7.5	200.0	1,300
WR463	30.0	16,000	230	63	<1.2	180	5,400	L9.0	<13	<10	110	46	280	<7.5	27.0	1,400
WR464	180.0	2,400	62	120	<1.2	200	94,000	21.0	L17	<10	660	170	620	<7.5	220.0	1,700
WR465	46.0	66,000	160	29	<1.2	120	33,000	L11.0	<13	<10	340	75	270	<7.5	52.0	1,400
WR466	93.0	4,100	74	170	<1.2	250	74,000	22.0	<13	<10	700	270	1,100	<7.5	86.0	2,300
WR467	110.0	12,000	100	190	<1.2	290	84,000	L17.0	L16	<10	800	160	990	<7.5	140.0	2,600
WR468	12.0	130,000	130	45	<1.2	120	8,300	<7.5	<13	<10	210	36	490	<7.5	20.0	1,200
WR469	100.0	14,000	77	480	<2.3	600	65,000	L25.0	L60	<20	630	130	1,900	<15.0	160.0	8,700
WR470	71.0	26,000	110	290	<4.6	700	53,000	<30.0	L70	<40	590	170	2,100	<30.0	91.0	14,000
WR471	58.0	27,000	110	250	<2.3	520	43,000	L18.0	L49	<20	520	180	2,100	<15.0	67.0	11,000
WR472	37.0	8,000	200	530	<1.2	1,000	6,500	29.0	47	<10	140	260	3,000	<7.5	40.0	9,800
WR473	4.2	110,000	130	18	<1.2	76	660	<7.5	<13	<10	200	29	310	<7.5	5.9	640
WR474	140.0	22,000	110	360	<1.2	700	25,000	26.0	L26	<10	440	190	1,800	<7.5	200.0	4,100
WR475	19.0	110,000	130	15	<1.2	120	7,700	L9.1	<13	<10	290	23	410	<7.5	31.0	1,000
WR476	100.0	2,700	61	270	<1.2	540	77,000	25.0	L23	<10	830	150	1,400	<7.5	140.0	3,100
WR477	80.0	1,900	85	190	<1.2	530	96,000	20.0	43	<10	1,500	97	840	<7.5	150.0	3,500
WR478	46.0	83,000	130	20	<1.2	180	51,000	L7.5	<13	<10	400	38	330	<7.5	84.0	2,600
WR479	79.0	2,000	49	150	<1.2	70	110,000	23.0	L17	<10	1,800	190	1,400	<7.5	100.0	550

Table 3. ICP analytical data from aqua-regia leaches of phosphate rocks from the Palisades Roadless Areas.

Wolf Creek section

Sample	AG	AL	AS	AU	B	BA	BE	BI	CA	CD	CE	CO	CR	CU	FE	GE	LA
WR1359	L.85	5,100	L34	--	<.4	63	.96	L21	220,000	<.75	48	L12.0	210	20	20,000	--	140
WR1360	<.75	4,100	L29	--	9.7	37	.80	<15	240,000	<.75	55	L8.6	170	14	20,000	--	160
WR1361	L1.00	5,000	L28	--	<.4	42	.69	<15	260,000	<.75	65	L9.0	190	17	19,000	--	180
WR1362	2.90	3,900	L50	--	<.4	68	.72	<15	240,000	23.00	80	L9.0	130	14	75,000	--	260
WR1363	L1.00	5,700	L32	--	<.4	36	.91	<15	240,000	<.75	55	L11.0	180	19	23,000	--	150
WR1364	L.87	6,300	L43	--	<.4	32	1.30	<15	110,000	<.75	53	L12.0	260	24	23,000	--	160
WR1365	L.79	5,700	L39	--	<.4	30	1.10	<15	93,000	L.97	44	L10.0	210	27	21,000	--	140
WR1366	<.75	4,200	37	--	<.4	26	.80	<15	73,000	3.40	35	L8.4	160	19	16,000	--	110
WR1367	<.75	4,700	L24	--	<.4	37	.71	<15	250,000	<.75	51	L9.6	170	21	18,000	--	150
WR1368	<.75	5,200	<21	--	<.4	29	.62	<15	250,000	<.75	57	L9.9	190	19	16,000	--	160
WR1369	3.10	7,800	<23	--	<.4	50	1.40	<15	270,000	<.75	90	L15.0	380	41	25,000	--	320
WR1370	2.20	10,000	<21	--	<.4	54	1.40	<15	250,000	<.75	85	L15.0	420	49	23,000	--	290
WR1371	4.20	9,600	L41	--	<.4	180	1.20	<15	33,000	<.75	42	<7.1	420	90	54,000	--	100
WR1372	3.10	11,000	L31	--	<.4	110	1.20	<15	54,000	<.75	44	<7.1	450	100	47,000	--	110
WR1373	3.60	14,000	L28	--	<.4	120	1.40	<15	68,000	<.75	46	<7.1	570	92	44,000	--	120
WR1374	L.84	10,000	L39	--	<.4	52	1.20	<15	38,000	<.75	35	L7.5	190	54	42,000	--	52
WR1375	<.75	10,000	L38	--	<.4	140	.78	<15	75,000	<.75	67	L14.0	55	35	27,000	--	68
WR1376	<.75	5,600	41	--	<.4	27	.62	<15	34,000	<.75	21	L12.0	<5	30	26,000	--	11

Sample	MG	MN	MO	NB	NI	P	PB	SB	SN	SR	TI	V	W	Y	ZN
WR1359	1,000	60	7.6	<1.2	23	120,000	140	<13	<10	340	190	170.0	<7.5	170.0	470
WR1360	850	57	6.6	<1.2	27	130,000	140	<13	<10	390	150	130.0	<7.5	190.0	810
WR1361	820	50	6.0	<1.2	22	150,000	150	<13	<10	410	110	78.0	<7.5	220.0	900
WR1362	660	100	7.0	<1.2	52	140,000	1,200	<13	<10	430	82	39.0	<7.5	350.0	3,000
WR1363	1,000	49	8.8	<1.2	29	130,000	150	<13	<10	360	150	120.0	<7.5	190.0	1,000
WR1364	1,400	53	9.5	<1.2	33	53,000	98	<13	<10	260	130	120.0	<7.5	240.0	700
WR1365	1,200	69	9.3	<1.2	34	43,000	77	<13	<10	220	120	110.0	<7.5	200.0	590
WR1366	870	88	9.7	<1.2	30	33,000	54	<13	<10	160	95	87.0	<7.5	170.0	480
WR1367	780	52	7.6	<1.2	24	130,000	100	<13	<10	350	130	110.0	<7.5	180.0	580
WR1368	750	65	6.3	<1.2	27	130,000	98	<13	<10	360	100	71.0	<7.5	200.0	760
WR1369	1,600	120	7.0	<1.2	41	140,000	180	<13	<10	540	160	43.0	<7.5	440.0	1,400
WR1370	1,700	210	7.6	<1.2	46	120,000	150	<13	<10	500	180	47.0	<7.5	410.0	1,300
WR1371	2,400	93	17.0	<1.2	100	24,000	290	<13	<10	140	130	73.0	<7.5	140.0	320
WR1372	2,700	110	16.0	<1.2	100	28,000	250	<13	<10	170	130	77.0	<7.5	140.0	370
WR1373	3,400	100	12.0	<1.2	100	33,000	240	<13	<10	210	170	86.0	<7.5	160.0	360
WR1374	2,500	550	9.2	<1.2	120	16,000	140	<13	<10	100	160	51.0	<7.5	64.0	350
WR1375	1,900	640	4.9	<1.2	38	34,000	53	<13	<10	190	88	29.0	<7.5	110.0	170
WR1376	7,000	970	L3.0	<1.2	30	660	20	<13	<10	30	23	9.7	<7.5	6.2	45

Table 3. ICP analytical data from aqua-regia leaches of phosphate rocks from the Palisades Roadless Areas.

Teton Pass-west section

Sample	AG	AL	AS	AU	B	BA	BE	BI	CA	CD	CE	CO	CR	CU	FE	GE	LA
WR481	3.7	27,000	<7.8	--	<.4	770	1.7	60	500,000	<.75	56	47	150	99	34,000	--	130
WR482	12.0	2,000	<7.8	--	130.0	72	1.3	<15	360,000	160.00	36	23	330	33	2,500	--	170
WR483	7.7	3,300	70.0	--	<.4	110	.7	<15	29,000	250.00	20	L15	330	170	37,000	--	43

Sample	MG	MN	MO	NB	NI	P	PB	SB	SN	SR	TI	V	W	Y	ZN
WR481	81,000	590	31.0	<1.2	180	44,000	37	L16	<10	800	180	310	<7.5	170	790
WR482	830	27	9.1	<1.2	24	170,000	270	L16	<10	670	62	550	<7.5	220	1,100
WR483	1,200	170	46.0	<1.2	130	10,000	67	L16	<10	70	80	570	<7.5	49	2,200