

QUARTERLY TECHNICAL REPORT

79-C

on

Earthquake Monitoring of the Hanford Region, Eastern Washington

July 1 through September 30 1979

Geophysics Program

University of Washington

Seattle, Washington

This report was prepared as an account of work sponsored by the United States Government. Neither the United States nor the Department of Energy, nor any of their employees, nor any of their contractors, subcontractors, or their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness or usefulness of any information, apparatus, product or process disclosed, or represents that its use would not infringe privately-owned rights.

By acceptance of this article, the publisher and/or recipient acknowledges the U.S. Government's right to retain a non-exclusive, royalty-free license in and to any copyright covering this paper.

PREPARED FOR THE U.S. DEPARTMENT OF ENERGY  
UNDER CONTRACT NO. EY-76-S-06-2225  
TASK AGREEMENT NO. 39

and

WASHINGTON PUBLIC POWER SUPPLY SYSTEM  
CONTRACT NO. C-10976

October 31, 1979

## Operations

There are thirty-nine stations presently operating in the eastern Washington seismic network. This includes the five new stations in the Ellensburg area, those in Goldendale, Rockport, and Newport, and the 32 regular stations which have been in operation over the past several years. All of the pertinent station information for this network, including stations which have been shut down, are listed in Table I. We are presently in the process of relocating the station "IRG" because of the bad seismic conditions on the south bank of the Columbia river. We are also in the process of installing a locally-recording, short period station at Whitman College in Walla-Walla. Over the next few months several additional stations will be added to the network in the southern Cascades. We are presently waiting on the radios which are being provided by the USGS.

## Data

The seismic activity during this quarter has been lower than usual, particularly in the north. There were only 6 earthquakes in the Lake Chelan region, which is less than half the usual number. There have been many more explosions than the ones reported in the catalog (Table II), though most were in known explosion sites and therefore have not been timed and located. There were only two events which we think are explosions but could not confirm for sure.

October 31, 1979

Of some considerable interest is the new swarm area on the north flank of Rattlesnake Mountain. This swarm started on Aug 2 with a magnitude 1.1 event and has continued at least through Sept 9. The largest event was a magnitude 2.4 earthquake on Aug 9. Thus far there have been 10 located earthquakes and several other events have been observed but are too small to be located. This swarm occurs in an area without any known previous swarms and is the first new swarm area to develop in several years. If the swarm continues into the future we plan to deploy several portable instruments to study it.

#### Special Studies

The broadband study is proceeding with data acquisition with three stations running continuously at the present. A new station was installed near Walla-Walla in August, and several earthquakes have been recorded on it since then. We anticipate operating these stations for several more months.

The downhole experiment is moving forward nicely now with the acquisition and testing of a new bore hole three-component seismometer. We have built low output impedance preamps for this unit to drive the long cable used for borehole recording and have tested the complete system with digital event recorders. We are presently waiting on some well head equipment, to be provided by Rockwell.

There is little change in the status of the online com-

puter recording system. We still have received no software from the USGS. We will be attending a meeting in Menlo Park in early November, at which time we are supposed to receive the beginning of the online routines. We are also beginning to develop our own in case there is additional delay in obtaining them from elsewhere.

October 31, 1979

## EASTERN WASHINGTON SEISMIC STATIONS

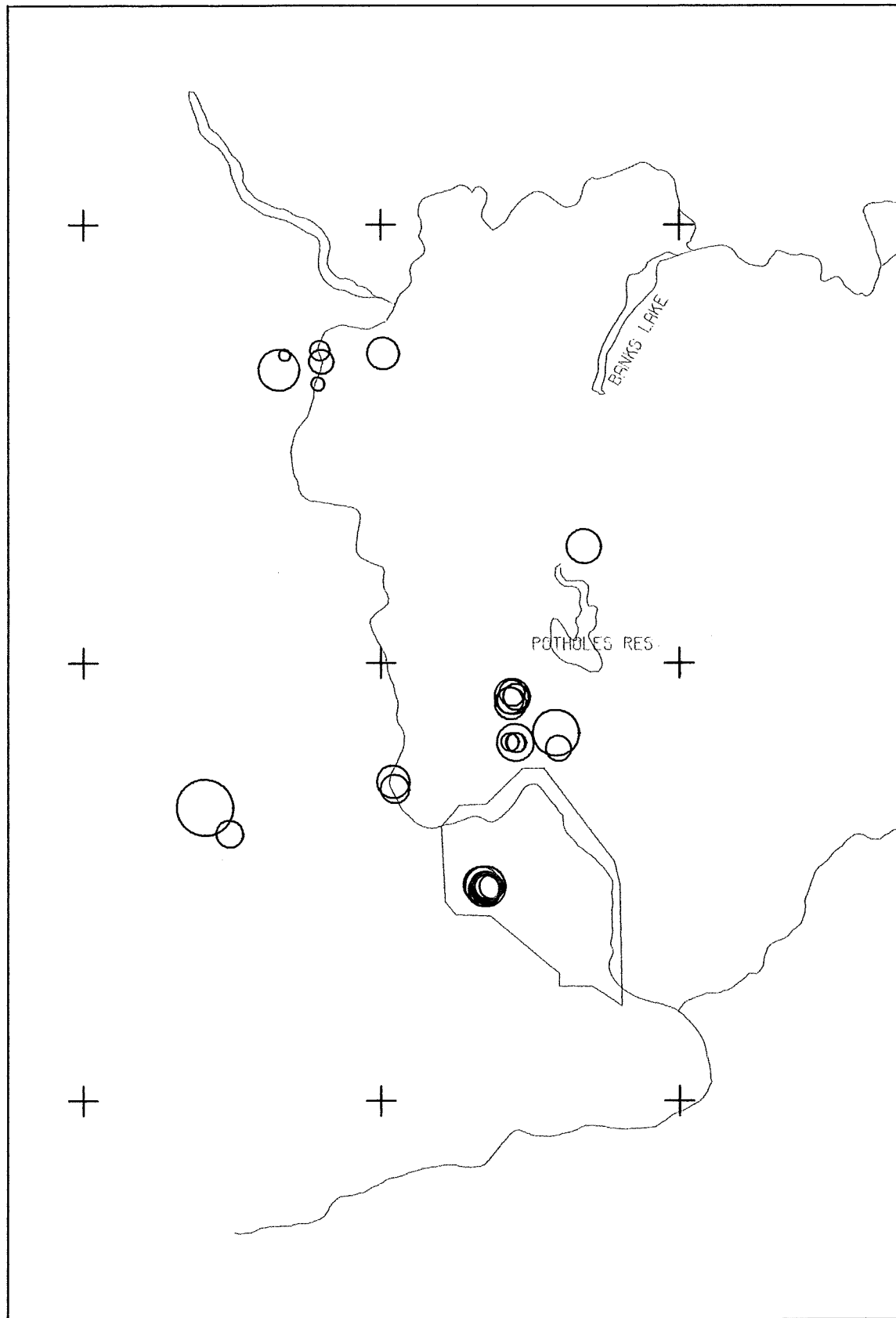
STA	LAT	LONG	ELV(km)	S. DELAY	N.DELAY	TIME	NAME	
MDW	46 36	48.00	119 45 39.00	.330	.53	7/75-	Midway	
SYR	46 51	46.80	119 37 04.20	.260	.47	7/75-	Smyrna	
OTH	46 44	20.40	119 12 59.40	.26	.39	7/75-	Othelo	
WAH	46 45	07.20	119 34 40.80	.230	.55	7/75-5/78	Wahluke	
WA2	46 45	24.20	119 33 45.50	.23	.55	5/78-	Wahluke2	
CRF	46 49	30.60	119 23 05.60	.260	.47	7/75-	Corfu	
GBL	46 35	51.60	119 27 35.40	.360	.57	7/75-	Gable	
ETP	46 27	53.40	119 03 32.40	.250	.30	7/75	Eltopia	
BDG	46 14	04.80	119 19 03.00	.410	.48	7/75-	Badger	
EUK	46 23	45.00	118 33 43.50	.400	-.10	7/75-	Eureka	
PRO	46 12	45.60	119 41 09.00	.600	.54	7/75-	Prosser	
RSW	46 23	28.20	119 35 19.20	1.130	.62	7/75	Rattlesnake	
PEN	45 36	43.20	118 45 46.50	.460	-.15	7/75-	Pendleton	
WGW	46 02	40.80	118 55 57.60	.160	.35	7/75-	Wallula Gap	
WIW	46 25	55.80	119 17 17.40	.130	.55	7/75-	Wooded Is.	
HER	45 50	08.40	119 22 51.00	.190	.47	7/75-11/77	Hermiston	
IRG	45 53	09.00	119 29 55.00	.200	.47	11/77-6/79	Irrigon	
MFW	45 54	10.80	118 24 21.00	.430	-.15	7/75-	Milton-Free.	
OMK	48 28	49.20	119 33 39.00	.450	-.12	7/75-	Omak	
DYH	47 57	37.80	119 46 09.60	.900	-.20	7/75-	Dyer Hill	
WBW	48 01	04.20	119 08 13.80	.910	-.22	7/75	Wilson B	
SAW	47 42	06.00	119 24 03.60	.800	-.25	7/75-	St. Andrews	
CBW	47 48	25.50	120 01 57.60	1.290	-.30	7/75-	Chelan B	
WTP	48 28	16.20	120 14 52.20	.855		7/77-	Winthrop	
FPW	47 58	00.00	120 12 46.50	.360	-.30	7/75-	Fields Pt.	
PLN	47 47	04.80	120 37 58.20	.670	-.30	6/77-	Plain	
ETT	47 39	18.00	120 17 36.00	.930	-.30	.09	6/77-	Entiat
WEN	47 31	46.20	120 11 39.00	1.140	-.30	7/75-	Wenatchee	
EPH	47 21	07.80	119 35 46.20	.500	-.14	.20	7/75-	Ephrata
ODS	47 18	24.00	118 44 42.00	.610	-.20	.11	7/75-	Odessa
DAV	47 38	18.00	118 13 33.60	.780	-.20	.11	7/75-	Davenport
WRD	46 58	11.40	119 08 36.00	.410	-.05	.35	7/75-	Warden
WAT	47 41	55.00	119 57 15.00	.900	-.25	.04	11/76-	Waterville
ENT	47 40	44.00	120 13 48.00	.860	-.24	.07	11/76-6/77	Entiat
VTG	46 57	28.80	119 59 14.40	.210		.28	7/75	Vantage
NEW	48 15	50.00	117 07 13.00	.830			5/77-	(USGS WWSSN)
FMC	45 37	28.00	120 01 42.00	.300	-.20		1/77-	(PGE-local)
RPK	45 45	42.00	120 13 50.00	.330	-.20		1/77	(PGE-local)
ALD	45 49	10.00	120 04 00.00	.290	-.20		1/77-	(PGE-local)
GLD	45 50	19.60	120 48 51.10	.610			11/77-	Goldendale
EBW	47 00	15.00	120 40 28.20	.830			12/77-7/79	Ellensburg
NAC	46 43	59.00	120 49 28.00	.738			8/79-	Naches
ELL	46 54	35.00	120 34 06.00	.805			7/79-	Ellensburg
YAK	46 31	44.00	120 31 13.00	.619			8/79-	Yakama
EST	47 14	17.00	121 12 32.00	.756			7/79-	Easton
TBM	47 10	10.00	120 31 00.00	1.064			9/79-	Table Mt.
RPW	48 26	54.00	121 30 49.00	.850	-.20		8/77-	Rockport

TABLE II  
EASTERN WASHINGTON EARTHQUAKES 1979 - C

DATE	DAY	TIME	LAT	LONG	DEPTH	MAG	#	Q	TYPE
7/ 3/79	184	1949:40.7	46-31.27	119-57.64	1.6	2.0	5	D	P
7/ 6/79	187	1810:32.4	47-40.07	120-20.60	4.7	2.5	12	B	
7/ 8/79	189	852:32.7	46-28.91	119-39.22	3.0	1.7	9	C	
7/13/79	194	939: 6.8	46-48.33	119-24.27	3.6	1.2	6	B	
7/16/79	197	1933:27.4	47-42.12	120-19.41	3.0	0.1	7	C	
7/21/79	202	420:21.1	47-42.74	120-12.30	3.0	0.7	8	B	
7/22/79	203	1525:55.9	46-50.46	119-24.76	0.5	2.9	14	A	
7/28/79	209	219: 6.9	46-40.22	120-35.48	0.1	3.7	14	C	
7/28/79	209	2043:36.6	46-49.20	119-34.04	5.2	0.6	6	B	
7/29/79	210	1012: 1.2	46-36.62	120-30.55	8.7	1.3	6	D	
7/31/79	212	129:53.3	47-15.96	119-19.16	11.5	1.9	12	B	
8/ 2/79	214	740:35.0	46-29.41	119-37.83	3.0	1.1	7	C	
8/ 2/79	214	827:46.8	47-41.21	120-12.04	6.8	1.1	9	B	
8/ 4/79	216	412:24.8	46-43.75	119-57.56	5.1	1.8	13	D	
8/15/79	227	1934: 0.8	46-49.12	119-32.90	0.8	0.7	5	C	
8/18/79	230	1217:27.1	46-42.78	119-57.22	5.0	1.4	8	C	
8/20/79	232	1558:26.7	47-42.35	119-59.53	3.0	1.7	12	A	
8/28/79	240	1623:12.7	48- 7.68	119-11.63	0.1	1.6	7	D	P
9/ 4/79	247	6 3:46.7	46-49.13	119-32.95	2.1	2.2	8	B	
9/ 4/79	247	810:27.6	46-49.12	119-32.71	2.4	0.7	5	C	
9/ 5/79	248	227:18.1	46-29.33	119-38.75	2.6	1.5	6	C	
9/ 5/79	248	1317:50.9	46-55.39	119-32.83	4.4	1.3	6	C	
9/ 5/79	248	21 3:34.5	47- 6.70	118-54.63	1.5	2.1	8	C	P
9/ 8/79	251	621:59.4	46-29.45	119-39.07	2.8	2.4	10	B	
9/ 8/79	251	643: 1.8	46-29.34	119-38.66	4.3	1.2	6	B	
9/ 8/79	251	726:11.0	46-29.12	119-38.94	3.7	1.4	6	B	
9/ 8/79	251	845:33.7	46-29.26	119-38.92	3.3	1.8	9	B	
9/ 8/79	251	854:16.1	46-29.44	119-39.01	3.8	1.6	8	B	

TABLE II

DATE	DAY	TIME	LAT	LONG	DEPTH	MAG	#	Q	TYPE
9/ 8/79	251	855:25.8	46-29.46	119-38.57	3.2	1.3	6	B	
9/ 8/79	251	925:41.3	46-29.42	119-38.74	1.4	1.4	8	C	
9/ 9/79	252	15 1: 8.9	46-29.66	119-39.86	2.5	2.1	12	B	
9/11/79	254	1523:29.3	47-38.16	120-12.68	8.4	0.2	6	B	
9/16/79	259	2210:33.5	46-54.48	119-33.95	1.5	1.7	5	C	
9/23/79	266	1921:59.1	46-55.44	119-33.59	2.2	2.0	13	B	
9/23/79	266	1935:10.3	46-55.92	119-33.62	2.1	1.2	6	D	
9/28/79	271	622:17.7	46-54.86	119-33.97	3.8	1.3	7	C	



EASTERN WASHINGTON EARTHQUAKES JAN. - MARCH, 1979  
 CENTER OF MAP IS 47.00 N 119.75 W

MAGNITUDE KEY    ○ 0.0    ○ 1.3    ○ 2.7    ○ 4.0