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Washington State Briefing Book
for
Low-Level Radioactive Waste Management **MASTER**

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WASHINGTON STATE BRIEFING BOOK
FOR
LOW-LEVEL RADIOACTIVE WASTE MANAGEMENT

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1. INTRODUCTION

This Washington State Briefing Book for Low-Level Radioactive Waste Management has been prepared to assist in the orderly planning and implementation of providing adequate safe low-level radioactive waste disposal facilities. The Washington State Briefing Book is one of a series of briefing books being prepared that will provide background information of waste management practices in all states.

Of six commercial low-level radioactive waste disposal sites that have operated within the United States (see Table 1-1), only three are currently accepting additional wastes. Of these three, two sites have been closed intermittently because of various irregularities in disposal and shipping operations.⁽¹⁾ Table 1-2 presents the total waste volumes that have been disposed of at commercial sites during the period 1962 through 1979. In 1979, approximately 80 percent of the wastes were shipped to the South Carolina site.

Projections of total national low-level radioactive waste generation and capacity of existing commercial disposal facilities indicate that if no change in present practices or trends occur, the current disposal sites could be filled by the mid-1990s. However, recent proposed limitations of yearly burial quantities to be accepted by disposal sites located in South Carolina and Washington State will reduce the availability of burial space. South Carolina's limit on waste receipts will be reduced to 100,000 cubic feet per month by October 1981 and a Washington State initiative will restrict use of the Richland commercial disposal site after July 1, 1981. Therefore, it is possible that by the mid-1980s there would be more waste volume generated per year than could be buried.⁽¹⁾

Section 2 of this Briefing Book presents an overview of past and present low-level radioactive waste management practices within the State of Washington. Section 3 identifies those demographic and economic factors and trends that affect or can be related to the quantity and nature of low-level radioactive wastes within the State

TABLE 1-1
COMMERCIAL SHALLOW LAND BURIAL SITES⁽¹⁾

<u>Location</u>	<u>Year first licensed</u>	<u>Site operator</u>	<u>Licensing authority</u>	<u>Year closed</u>
Maxey Flats, Ky.	1962	Nuclear Engineering Company	State	1977
Beatty, Nev.	1962	Nuclear Company	State	Open
Sheffield, Ill.	1967	Nuclear Engineering Company	NRC	1978
Richland, Wash.	1965	Nuclear Engineering Company	State and NRC	Open
Barnwell, S.C.	1971	Chem-Nuclear Systems, Inc.	State and NRC	Open
West Valley, N.Y.	1963	Nuclear Fuel Services	State and NRC	1975

TABLE 1-2

TOTAL U.S. WASTE VOLUME BURIED AT
COMMERCIAL BURIAL SITES (CUBIC METERS) (1)

Year	Burial Site						National annual total
	Kentucky	Nevada	South Carolina	Illinois	New York	Washington	
1962	-	1,861	-	-	-	-	1,861
1963	2,206	3,512	-	-	522	-	6,240
1964	3,872	2,836	-	-	6,388	-	13,096
1965	5,751	1,988	-	-	4,717	668	13,124
1966	5,556	3,533	-	-	4,697	2,402	16,188
1967	7,820	3,206	-	2,527	4,946	870	19,369
1968	8,177	3,576	-	2,713	4,505	669	19,640
1969	10,353	4,282	-	2,012	4,274	438	21,359
1970	12,520	4,131	-	2,825	5,096	423	24,995
1971	13,171	3,584	1,171	4,430	6,362	584	29,302
1972	15,577	4,301	3,757	5,956	7,054	654	37,299
1973	10,072	4,076	15,839	8,524	7,497	1,033	47,041
1974	8,897	4,103	18,244	12,373	8,574	1,411	53,602
1975	17,109	4,943	18,072	14,116	1,889*	1,500	57,629
1976	13,783	3,864	40,227	13,480	*	2,867	74,221
1977	423**	4,742	46,563	17,643	*	2,718	72,089
1978	**	8,827	61,566	102***	*	7,422	77,917
1979 (2)	**	6,491	63,433	***	*	9,980	79,914
Total	135,287	73,856	268,882	86,701	66,521	33,639	664,886

*Receipt and burial of wastes were suspended by Nuclear Fuel Services on 3/11/75.

**Receipt and burial of wastes were suspended on 12/27/77.

***Receipt and burial of wastes were suspended on 4/8/78.

of Washington. Section 4 presents an overview of Washington's state government and identifies the government institutions and agencies with statutory or other responsibilities affecting the generation, handling, and disposal of radioactive wastes within the state. The identities and attitudes of state officials and other organizations impinging on this issue are presented in the text and, where possible, in available representative print media. Section 5 presents the methodology employed for conducting a direct mail survey of radioactive material licensees within the state to obtain basic information on disposal practices. The results of this survey are presented in Section 6 for that information dealing with wastes shipped to commercial disposal facilities.

REFERENCE

1. William F. Holcomb, Inventory (1962-1978) and Projections (to 2000) of Shallow Land Burial of Radioactive Wastes at Commercial Sites: An Update, Nuclear Safety, Vol. 21, No. 3, May-June 1980.
2. NUS Corporation, The 1979 State-by-State Assessment of Low-Level Radioactive Wastes Shipped to Commercial Burial Grounds, NUS 3440, Revision 1, November 1980.

2. OVERVIEW OF LOW-LEVEL RADIOACTIVE WASTE MANAGEMENT

Historically, the generation of low-level radioactive waste and the requisite disposal practices of licensees have received little focus from regulatory agencies, interest groups, and the facilities themselves. These wastes, including their creation and environmental impact, were judged to be less than paramount in light of the waste volumes and activities produced by irradiated reactor fuel and other high-level sources. Although commercial nuclear power reactors contribute a significant portion of low-level radioactive waste, other major categories of waste generators include medical, educational, and industrial facilities.

The State of Washington is an Agreement State whereby all radioactive material licenses and waste disposal practices are under the conditions and regulations established by the state government. The specific controls and operational criteria follow, at minimum, those instituted by the federal government.

There are presently no operational commercial power reactors located within the State of Washington. The Washington Public Power Supply System has five nuclear units scheduled for commercial operation within ten to twelve years. Two additional reactors of joint utility ownership, Skagit 1 and 2, are scheduled for operation in 1987 and 1989, respectively.

The Hanford Reservation, initiated in 1944, is a major U.S. Government facility encompassing 570 square miles in the southeastern part of Washington. The facility is composed of a variety of nuclear installations, including a number of commercially owned power reactors under construction, weapons program related installations, engineering and research facilities, and the Richland low-level radioactive waste burial site. (1,2)

The Hanford Reservation is divided into five major areas. The 100 area is in the north and includes the plutonium production reactors. The 200 area is in about the center of the reservation and is the location for all fuel and waste processing and most waste storage. The 300 area in the south contains research facilities and a fuel fabrication plant. The 400 area is the site of the fast flux test reactor

under construction. The 600 area refers to the thousands of acres not included in the other four areas. (1,2)

Wastes generated by the Department of Energy facilities at Hanford can be categorized as high level, intermediate level, and low level. Most of these wastes are stored or disposed of in the 200 area. Two types of low-level radioactive waste are generated in the 200 area at Hanford: liquid wastes, such as cooling water and steam condensates; and solid wastes, such as tools, clothing, and laboratory supplies. The liquid wastes are discharged to 30 surface ponds and ditches, while solid wastes are buried within the 200 area. (1,2)

A variety of trench designs, packaging practices, and backfilling alternatives have been employed at Hanford since operations began. The specific parameters used depend on the available technology, waste volumes, and transuranic content of the wastes. As of April 1979, the Hanford site contained 7.16 million cubic feet of buried low-level radioactive waste. (1,2)

The Richland low-level radioactive waste burial site is a commercial facility located in an arid area approximately 25 miles north of Richland. The site is operated by the Nuclear Engineering Company on federal land which is leased to the State of Washington and subleased to Nuclear Engineering Company. Located on the Department of Energy Hanford Reservation, the site has received approximately 1.2 million cubic feet (to January 1980) of low-level radioactive waste making it one of the smallest (volume) commercial burial sites. (1,2,3)

Burial trenches at Richland are approximately 153 meters in length, 6 to 12 meters deep, and 18 meters wide. Nuclear Engineering Company anticipates the lengthening of trenches to 240 meters. (1,2)

The trenches are constructed with a bulldozer and a crane equipped with a dragline. No measures are taken at this site to collect trench drainage or to divert surface run-off. One trench is opened at a time to its full length. Waste drums and packages are dumped randomly into the trenches. Bulk liquid wastes are stored in underground tanks, and evaporated and solidified prior to burial. (1,2)

Backfilling at the Richland site generally occurs on a daily basis. About 1.2 meters of soil is placed on top of the wastes during this backfilling. No further capping or trench finishing is done at this site due to the low precipitation there (approximately 7.6 inches/year).^(1,2)

The Puget Sound Naval Shipyard, located in Bremerton, Washington, is a support facility for U.S. Naval nuclear-powered ships. Since no solid radioactive waste materials have been dumped at sea since 1970, the waste generated at this facility (approximately 85 cubic meters in 1979) is disposed of by shipment to burial sites licensed by the U.S. Nuclear Regulatory Commission or a state under agreement with the U.S. Nuclear Regulatory Commission.⁽⁴⁾

Throughout the state, prior to the late 1960s and early 1970s, low-level radioactive waste disposal practices typically consisted of onsite storage. In accordance with existing federal regulations, wastes were generally stored in above-ground buildings or buried in shallow trenches. Present trends in waste disposal include onsite storage and eventual release to sewer systems and combination with common refuse after appropriate decay to exempt concentrations. Exempt concentrations, at minimum, follow parameters outlined in the Code of Federal Regulations, Section 10, Part 20.

The use of radioisotopes in medical diagnostic and therapeutic applications has increased as a result of relatively recent new applications and techniques in the medical field. Due to the short half-life of nuclides normally used for these purposes, the decay and release disposal method is frequently practiced. Other major facilities often select this mode of low-level radioactive waste disposal, if this option is feasible. As the availability of commercial low-level waste disposal facilities become limited and economically prohibitive parameters impact the shipment of low-level radioactive waste, onsite decay is practiced with increased incidence.

The economics of waste shipment to distant repositories is dictating an efficient management program with regard to volumes generated by each facility. Trends by generator facilities appear to be channeled towards volume reduction. Evaluations are ongoing by numerous facilities to effectively reduce the volume and subsequently the number of requisite annual shipments of waste. These methods include the

application of compaction, liquid evaporation, and waste solidification and incineration.

A total of 310 radioactive material licenses are in effect in Washington. Information on disposal practices was solicited from each license holder by a written questionnaire (see Section 5.0). Appendix A presents the name and address of each license holder, the degree of response to the questionnaire, the type of facility, and whether they ship waste to a commercial disposal site. The degree of response was classified as follows:

N indicates that no response to the written questionnaire was received.

1 indicates the licensee did respond and provided all appropriate information.

2 indicates the licensee did respond but provided only information on type of facility, disposal method, and quantity of waste.

3 indicates the licensee did respond but provided only information on type of facility and disposal method.

The type of facility was classified as either Medical, Educational, Industrial, Power Reactor, or Governmental according to Part 1 of the survey form shown in Figure 5-4. It should be noted that the Medical classification includes both medical education facilities and governmental medical facilities, that the Educational classification excludes medical education facilities, and that the Governmental classification excludes both medical and educational facilities. A service unit, such as a laboratory, was classified according to the type of facility to which it provides the service. In addition to these license holders, two government facilities (Hanford Reservation and Puget Sound Naval Shipyard) are included in the tabulation. Data for these facilities are included in all tabulations; however, these data were obtained from existing published sources rather than from the survey.

Of the 312 radioactive material users, contact was made with 169, of which 20 indicated they ship waste to commercial disposal facilities. Table 2-1 presents a

breakdown of license holders by type of facility, response to questionnaire, and number of facilities using commercial disposal facilities. The "percent of all respondents" was calculated as the number of respondents shipping waste divided by the total number of respondents times 100. The "percent of facility" respondents was calculated as the number of respondents shipping waste divided by the total number of respondents in a facility classification times 100.

Table 2-2 presents the waste disposal practices employed, including disposal method other than shipment to commercial disposal facilities. In this table, the total of "number using" exceeds the total number of respondents due to use of several disposal practices by some facilities. It is believed that many facilities reported only the major disposal method used rather than all methods used and the data should be viewed with this qualification in mind. The "percent of all respondents" value was calculated as the number of respondents in a "type of facility" classification reporting use of a method divided by the total number of respondents times 100.

Table 2-3 presents the source of the radioactivity which eventually requires use of some disposal method.

TABLE 2-1
USE OF COMMERCIAL LOW-LEVEL WASTE FACILITIES

Type of facility	Number of licensees	Number of respondents	Percent response	Respondents using a commercial facility		
				Number	Percent of all respondents	Percent of facility respondents
Medical	108	54	50.0	6	3.6	11.1
Educational	21	13	61.9	5	3.0	38.5
Industrial	139	73	52.5	7	4.1	9.6
Power Reactor	0	0	-	-	-	-
Governmental	39	29	74.4	2	1.2	6.9
Unknown	5	-	-	-	-	-
TOTAL	312	169	54.2	20	11.8	-

TABLE 2-2

DISPOSAL PRACTICES USED FOR LOW-LEVEL RADIOACTIVE WASTES

Type of Facility	Number of respondents	Ship to Commercial Repository		Release to Sewer		Combine with Refuse		Vent to Atmosphere		Return to Vendor		Distribute in Product Form		No Waste Generated		Bury on Site	
		Number* using	Percent of all respondents	Number* using	Percent of all respondents	Number* using	Percent of all respondents	Number* using	Percent of all respondents	Number* using	Percent of all respondents	Number* using	Percent of all respondents	Number* using	Percent of all respondents	Number* using	Percent of all respondents
Medical	54	6	3.6	27	100	29	17.2	2	1.2	16	9.5	0	0.0	13	7.7	1	0.6
Educational	13	5	3.0	1	0.6	1	0.6	0	0.0	4	2.4	0	0.0	4	2.4	1	0.6
Industrial	73	7	4.1	3	1.8	2	1.2	0	0.0	28	16.6	1	0.6	35	20.7	1	0.6
Power Reactor	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Governmental	29	2	1.2	0	0.0	1	0.6	1	0.6	6	3.6	0	0.0	19	11.2	1	0.6
TOTAL	169	20	11.8	31	18.3	33	19.5	3	1.8	54	32.0	1	0.6	71	42.0	4	2.4

*The total of "number using" exceeds the total number of respondents due to use of several practices at each facility

TABLE 2-3

SOURCES OF RADIOACTIVITY REQUIRING DISPOSAL

Type of facility	Number of respondents	Nuclear reactor		Sealed sources		Unsealed radioactive material		Ores		Neutron generator		Cyclotron	
		Number of sources	Percent of all respondents	Number of sources*	Percent of all respondents	Number of sources*	Percent of all respondents	Number of sources*	Percent of all respondents	Number of sources*	Percent of all respondents	Number of sources*	Percent of all respondents
Medical	13	0	0.0	4	11.1	10	27.8	0	0.0	0	0.0	0	0.0
Educational	5	1	2.8	1	2.8	4	11.1	0	0.0	1	2.8	0	0.0
Industrial	14	0	0.0	6	16.7	8	22.2	1	2.8	0	0.0	0	0.0
Power Reactor	0	-	-	-	-	-	-	-	-	-	-	-	-
Governmental	4	2	5.6	2	5.6	2	5.6	0	0.0	1	2.8	1	2.8
TOTAL	36	3	8.3	13	36.1	24	66.7	1	2.8	2	5.6	1	2.8

*The total of "number of sources" exceeds the total number of respondents due to facilities generating waste from several sources

REFERENCES

1. NUS Corporation, Status of Low Level Radioactive Waste Burial in the United States and Canada Environmental Monitoring Practices, NUS-3508, 1980.
2. U.S. Energy Research and Development Administration, Final Environmental Impact Statement - Waste Management Operations Hanford Reservation, ERDA-1538, December 1975.
3. NUS Corporation, The 1979 State-by-State Assessment of Low-Level Radioactive Waste Shipped to Commercial Burial Grounds, NUS 3440, Revision 1, November 1980.
4. Department of the Navy, Environmental Monitoring and Disposal of Radioactive Wastes From U.S. Naval Nuclear Powered Ships and Their Support Facilities, NT-80-1, March 1980.

3. DEMOGRAPHY

This section identifies those demographic and economic factors and trends that affect or can be related to the quantity and nature of low-level radioactive wastes within the State of Washington, to assist with an assessment of the state as a potential producer of radioactive wastes. It also identifies those institutions, including hospitals, colleges, universities, and national laboratories, that are major users of radionuclides that may ultimately be radioactive wastes.

3.1 LOCATION

Washington is one of the northwestern coastal states of the United States. It is bounded on the north by the Canadian province of British Columbia and the Strait of de Fuca; on the east by the State of Idaho; on the south by the State of Oregon and the Columbia River; and on the west by the Pacific Ocean.

3.2 POPULATION

Population trends offer a broad-gauge measure of isotope utilization in medicine, educational and research activities, and industry. A trend revealing an increase in a state's population may imply increasing isotope use and in turn, waste generation.

Washington ranks as the twenty-first most populous state in the nation and had a population density of approximately 53 persons per square mile in 1975.^(1,2) The state's 1977 population of 3,681,000 persons represents a 7.9 percent increase over the 1970 population of 3,413,244 persons. In 1978, Washington's population totaled 3,774,000 persons, or an annual increase of 0.25 percent. Natural population increases, accompanied by an immigration of persons, were responsible for Washington's population growth. Between 1970 and 1977, there were 379,000 births as compared to 218,000 deaths. The state also experienced a net immigration of 3.1 percent during the 7-year time period, which shows a greater immigration of persons than outmigration. In 1977, the birth rate was 15.6 births per 1,000 persons, or approximately 57,237 births in contrast to 29,831 deaths or a mortality rate of 8.2 deaths per 1,000. In 1978, the state's birth rate was 15.5 births per 1,000 and the

death rate was 8.1 per 1,000.^(3,4,5) (The 1978 figure represents a provisional sample of all deaths in Washington. A final figure is currently unavailable.)

Washington's major population centers are the state's six Standard Metropolitan Statistical Areas (SMSA) of Portland; Richland-Kennewick-Pasco; Seattle-Everett; Spokane; Tacoma; and Yakima. The population of these areas comprised 71.1 percent of the state's total population in 1978. Of the six SMSAs, the largest is the Seattle-Everett SMSA with a 1978 population of 1,467,600 persons and Richland-Kennewick-Pasco is the smallest SMSA with a 1978 population of 128,000 persons. Between 1970 and 1977, all the SMSAs underwent population increases. Of these, the Portland SMSA increased the most (28.3 percent) and the Seattle-Everett SMSA increased the least (0.9 percent).⁽³⁾ Figures 3-1 and 3-2 depict the location of Washington's counties and SMSAs. Table 3-1 lists the 1970, 1977, and 1978 population of the SMSAs, and Figure 3-3 presents the state's 1975 population density.

Washington's population is expected to increase. The projected population of 4,834,100 persons in 1990 will represent a 20.0 percent increase over the 1980 population of 4,031,000 persons. It is further estimated that between 1990 and the year 2000, the population will increase 10.0 percent and reach 5,333,300 persons by the year 2000.⁽⁶⁾

3.3 ECONOMY

3.3.1 Major Business Sectors

Washington's economy is basically built upon forestry, agriculture, and hydroelectricity. Although virgin forests have been largely depleted, much forest wealth remains and is now utilized on a sustained yield basis. Washington's agriculture is quite diversified, producing wheat and other field crops, horticultural products, livestock, poultry, dairy products, and herbs and seeds. With the development of hydroelectricity, the electrochemical and electrometallurgical industries have been attracted to the state, most notably the aluminum smelting and refining business. Another major sector in the state's economy is the industry and employment associated with the commercial aircraft and aerospace industry. Overall, Washington's major economic sectors are manufacturing, retail trade,

FIGURE 3-1
COUNTIES OF THE STATE OF WASHINGTON (3)

FIGURE 3-2
STANDARD METROPOLITAN STATISTICAL AREAS IN WASHINGTON (3)

TABLE 3-1
STANDARD METROPOLITAN STATISTICAL AREAS
IN THE STATE OF WASHINGTON (3)

<u>SMSA</u>	<u>POPULATION</u>		
	<u>1970</u>	<u>1977</u>	<u>1978</u>
Portland (Wash. portion)	128,454	164,800	171,500
Richland-Kennewick-Pasco	93,356	119,100	128,000
Seattle-Everett	1,424,605	1,437,300	1,467,600
Spokane	287,487	313,100	319,600
Tacoma	412,344	426,200	436,900
Yakima	145,212	158,300	159,300
State Total	3,413,244	3,681,000	3,774,000

FIGURE 3-3
POPULATION DENSITY BY COUNTY: WASHINGTON, 1975 (2)

services, and government. These sectors collectively employed 1,133,400 workers in 1978. This figure represented 24.0 percent of Washington's total nonagricultural work force for that year.^(7,8) Table 3-2 inventories the major economic activities of each county in the state.

3.3.2 Employment and Per Capita Income

There were 1,754,000 persons in Washington's labor force in 1978, of which 1,032,000 were male and 722,000 were female. This represented a total labor force participation rate of 64.0 percent, slightly above the 1978 national rate of 63.2 percent. Additionally, the state's male (78.2 percent) and female (50.8 percent) participation rates were slightly above the 1978 national male and female participation rates of 77.9 and 50.0 percent, respectively.⁽¹⁾

During the same year, per capita income in Washington was \$8,450, approximately 8.0 percent above the 1978 U.S. average of \$7,810, and there were about 299,000 persons in Washington living below the poverty level in 1975. This represented 8.5 percent of Washington's 1975 population as compared with 11.4 percent of the 1975 United States population.⁽¹⁾ Tables 3-3, 3-4, and 3-5 present an overview of Washington's and the nation's labor force, per capita income, and persons living below the poverty level.

3.3.3 Gross State Product

Washington's gross state product (GSP) by industry has been estimated by first obtaining the gross national product (GNP) and U.S. employee compensation shown in Table 3-6. The ratio of these two measures was then computed and multiplied by the figures for employee compensation for the state. Table 3-7 presents both employee compensation and the estimated Washington GSP by industry for the years 1976, 1977, and 1978. During this period, the state's GSP rose from \$28.2 million to \$27.3 million, whereas the GNP rose from \$1.6 trillion to \$2.0 trillion. As such, Washington's GSP was 1.7 percent of the GNP in 1976 and 1.8 percent of the GNP in 1978.^(9,10,11) During the same 3-year period, personal income in Washington rose from \$18.7 million (1.8 percent of U.S. income) to \$24.7 million (1.9 percent of U.S. income) in current dollars.⁽¹²⁾

TABLE 3-2

MAJOR ECONOMIC ACTIVITIES
IN WASHINGTON BY COUNTY (7)

<u>Counties</u>	<u>Major Economic Activities</u>
Clallam, Jefferson, Mason, Grays Harbor, Pacific, Cowlitz, Wahkiakum, Lewis, Skamania, Ferry, Stevens, Pen Oreille, Whatcom	Forestry
Yakima, Walla Walla, Columbia, Garfield, Asotin, Lincoln, Adams, Whitman, Douglas, Grant	Agriculture
Klickitat, Okanogan, Chelan	Agricluture, Forestry
Skagit	Forestry, Petrochemical
Spokane	Trade, Service, Agriculture
San Juan Island	Service, Trade, Agriculture, Tourism
Thurston	Government, Forestry
Kitsap, Pierce, Kittitas	Military
Snohomish, King	Aerospace
Benton, Franklin	Atomic Energy Facilities
Clark	Manufacturing

TABLE 3-3
U.S. AND WASHINGTON LABOR FORCES (THOUSANDS),
1976, 1978 (1)

	1976			1978		
	<u>Total</u>	<u>Male</u>	<u>Female</u>	<u>Total</u>	<u>Male</u>	<u>Female</u>
U.S.	94,773	56,359	38,414	100,420	58,542	41,878
Washington	1.587	934	653	1,754	1,032	722
Percent of U.S.	1.67	1.66	1.70	1.75	1.76	1.72

TABLE 3-4
PER CAPITA INCOME (CURRENT DOLLARS)
IN THE U.S. AND WASHINGTON FOR SELECTED YEARS (1)

<u>Year</u>	<u>U.S.</u>	<u>Washington</u>	<u>Rank</u>	<u>Percent of U.S.</u>
1960	2,201	2,352	10	107
1970	3,893	3,997	13	103
1975	5,861	6,298	11	107
1978	7,810	8,450	9	108

TABLE 3-5
PERSONS BELOW THE POVERTY LEVEL (THOUSANDS)
IN THE U.S. AND WASHINGTON, 1969, 1975 (1)

<u>Year</u>	<u>U.S.</u>		<u>Washington</u>	
	<u>Number</u>	<u>Percent</u>	<u>Number</u>	<u>Percent</u>
1969	27,125	13.7	336	10.2
1975	23,991	11.4	299	8.5

TABLE 3-6

GROSS NATIONAL PRODUCT, U.S. EMPLOYEE COMPENSATION AND RATIO OF PRODUCT
TO COMPENSATION (BILLIONS OF DOLLARS) BY INDUSTRY (9,10,11)

Industry	1976			1977			1978		
	Product	Compensation	Ratio	Product	Compensation	Ratio	Product	Compensation	Ratio
1. Farms	46.4	18.682	2.4837	49.2	19.759	2.4900	59.5	27.880	2.1341
2. Agricultural services, forestry & fisheries	5.0	3.919	1.2758	5.9	4.568	1.2916	7.1	5.426	1.3085
3. Mining	42.5	15.756	2.6974	48.2	17.556	2.7455	55.1	20.552	2.6810
4. Construction	74.5	61.301	1.2153	83.5	68.885	1.2121	95.3	79.777	1.1946
5. Nondurable goods	166.5	100.031	1.6645	181.9	110.347	1.6484	196.5	121.450	1.6179
6. Durable goods	236.7	171.593	1.3794	274.1	196.235	1.3968	312.6	223.969	1.3957
7. Transportation	62.6	43.494	1.4393	70.4	49.560	1.4205	81.4	56.013	1.4532
8. Communication	45.2	21.701	2.0829	49.5	24.318	2.0355	55.9	27.953	1.9999
9. Electric, gas, sanitary services	43.3	13.280	3.2605	48.4	14.852	3.2588	53.5	16.682	3.2070
10. Wholesale and retail trade	296.7	177.385	1.6726	323.1	193.985	1.6656	360.5	217.952	1.6540

TABLE 3-6 (concluded)

GROSS NATIONAL PRODUCT, U.S. EMPLOYEE COMPENSATION AND RATIO OF PRODUCT
TO COMPENSATION (BILLIONS OF DOLLARS) BY INDUSTRY (9,10,11)

Industry	1976			1977			1978		
	Product	Compensation	Ratio	Product	Compensation	Ratio	Product	Compensation	Ratio
11. FIRE*	235.2	57.308	4.1041	267.8	66.548	4.0242	298.7	76.165	3.9217
12. Services	207.4	173.153	1.1978	234.8	194.692	1.2060	268.7	221.939	1.2107
13. Federal Gov.	57.6	63.425	0.9087	59.0	67.148	0.8790	62.4	72.097	0.8656
14. State and Local Gov.	127.9	123.092	1.0392	138.1	133.026	1.0380	149.9	144.364	1.0380
TOTAL	1,647.6	1,044.120		1,833.9	1,161.480		2,057.1	1,312.219	

*Finance, Insurance, Real Estate

TABLE 3-7

EMPLOYEE COMPENSATION AND ESTIMATED GROSS
STATE PRODUCT (MILLIONS OF DOLLARS)
BY INDUSTRY FOR WASHINGTON (10,11)

Industry	1976		1977		1978	
	Compensation	GSP	Compensation	GSP	Compensation	GSP
1. Farms	534.5	1,327.5	468.6	1,166.8	912.1	1,946.5
2. Agricultural services	150.0	191.4	206.0	266.1	236.0	308.8
3. Mining	40.0	107.9	45.0	123.5	59.0	158.2
4. Construction	1,317.0	1,600.6	1,588.0	1,924.8	2,009.0	2,400.0
5. Nondurable goods	1,151.0	1,915.8	1,300.0	2,142.9	1,383.0	2,237.6
6. Durable goods	2,903.0	4,004.4	3,286.0	4,589.9	4,022.0	5,613.5
7. Transportation	885.0	1,273.8	996.0	1,414.8	1,129.0	1,640.7
8. Communication	350.0	729.0	408.0	830.5	476.0	952.0
9. Electricity, gas, san. serv.	113.0	368.4	122.0	397.6	141.0	452.2
10. Wholesale and retail trade	3,355.0	5,511.6	3,752.0	6,249.3	4,314.0	7,118.8
11. FIRE*	904.0	3,710.1	1,134.0	4,563.4	1,359.0	5,329.6
12. Services	2,901.0	3,474.8	3,341.0	4,029.2	3,884.0	4,702.4
13. Federal Government	1,533.0	1,593.0	1,614.0	1,418.7	1,736.0	1,502.7
14. State and Local Government	2,403.0	2,497.2	2,632.0	2,732.0	2,901.0	3,011.2
TOTAL	18,539.5	28,205.5	20,892.6	31,849.5	24,561.1	37,374.4
Percent of U.S.	1.8	1.7	1.8	1.7	1.9	1.8

*Finance, Insurance, Real Estate

Figure 3-4 portrays percent of gross product by industry for the United States and Washington in 1978. During this time, the state differed from the nation in several areas. Farming and construction for example, were one and a half times as important in Washington as they were in the nation, and agriculture was two times as important in Washington. In contrast, nondurable goods represented 9.55 percent of the U.S. output and 5.99 percent of Washington's output; electricity, gas and sanitation represented 2.60 percent of the nation's output and 1.21 percent of the state's; and mining represented 2.68 of the U.S. output compared to 0.42 percent of the output in Washington. (9,10,11)

3.4 AGRICULTURE

Washington's agricultural sector produced 12,252,000 tons of grain, forage, and miscellaneous field crops; 1,458,130 tons of fruit and nut crops; 654,850 tons of vegetables; 28,575 tons of seed crops; and 27,469 tons of berries in 1977. The following year, every sector experienced an increase in production except the berry crop, which decreased 6.2 percent. The 1978 production figures are as follows: 14,719,000 tons of grain, forage, and miscellaneous field crops; 1,626,630 tons of fruit and nuts; 740,400 tons of vegetables; 40,137 tons of seed crops; and 25,777 tons of berries. The value of all crops produced in Washington was \$1,247,294,000 in 1977 and \$1,549,935,000 in 1978. (13)

Washington's cattle and calves production in 1978 totaled 370,140,000 pounds, down 7.9 percent from the 1977 total of 399,525,000 pounds. Hog production also decreased from 23,183,000 pounds in 1977 to 20,597,000 pounds in 1978. In contrast, sheep and lamb production increased 51.1 percent during this period from 2,223,000 pounds to 3,358,000 pounds and chicken production increased from 86,163 pounds to 89,806 pounds. The value of all livestock produced in the state increased from \$486,663,000 in 1977 to \$572,459,000 the following year. (13)

Washington is the eleventh largest producer of milk in the nation. Milk production in the state totaled 2,546,000,000 pounds in 1977 and 2,682,000,000 pounds in 1978. The total value of milk production in the state was \$255.618,000 in 1977 and \$292,338,000 the following year, representing a 14.4 percent annual increase. (13)

Table 3-8 inventories Washington's principal agricultural commodities and presents the state's rank in the nation's agriculture.

FIGURE 3-4
PERCENT OF GROSS PRODUCT BY INDUSTRY:
UNITED STATES AND WASHINGTON, 1978 (9,10,11)

TABLE 3-8

WASHINGTON'S RANK IN THE NATION'S AGRICULTURE, 1978(1,13)

<u>Commodity</u>	<u>Rank Among States</u>	<u>Production as a Percent of U.S. Totals</u>
Crops:		
Apples	1	28.4
Dry Edible Beans	1	58.3
Green Peas (for processing)	1	25.7
Hops	1	72.7
Sweet Cherries	1	39.2
Asparagus	2	36.8
Carrots (for processing)	2	19.4
Irish Potatoes	2	13.9
Pears	2	33.8
Grapes	3	4.1
Winter Wheat	3	9.8
Cranberries	4	5.7
Sweet Corn (for processing)	4	12.7
Dairy Products:		
Milk	11	2.14

3.5 SCHOOLS, HOSPITALS, AND NATIONAL LABORATORIES

Several institutions in Washington are potential sources of radioactive wastes through the use of radionuclides. Colleges and universities are such potential sources; Washington has 51 universities and colleges with a total enrollment of 275,299 students in the fall of 1978. This represents a 4.7 percent increase over the 1977 fall enrollment of 262,961 students.^(14,15) In 1977, 11 institutions had enrollments of fewer than 2,500 students; 20 had student populations numbering between 2,500 and 4,999; an additional 17 had between 5,000 and 9,999 students; and 3 had enrollments of 10,000 or more students.⁽¹⁴⁾

In addition to schools, Washington had 128 hospitals with a total of 16,138 beds in 1978. Approximately 112 of these institutions had fewer than 250 beds, 13 had between 250 and 499 beds, and another 3 had more than 499 beds.⁽¹⁶⁾ In 1974, Washington had 131 hospitals with a total of 16,588 beds.⁽¹⁷⁾ In 1976, there were 130 hospitals in Washington with a total of 16,290 beds. The decrease in the number of hospitals, a national trend since 1967, is explained by the American Hospital Association as due to the loss of specialty hospitals, predominantly the closing of tuberculosis hospitals and the loss of beds in psychiatric hospitals.⁽¹⁸⁾

There are no national laboratories in the State of Washington. The Department of Energy, however, has two laboratories in Richland, Washington: the Pacific Northwest Laboratory and the Hanford Engineering Development Laboratory. The Pacific Northwest Laboratory employed approximately 2,600 persons in 1979 and projections concerning future employment in the laboratory are currently unavailable.⁽¹⁹⁾ During the same year, approximately 3,000 persons were employed in the Hanford Engineering Development Laboratory and the laboratory's labor force is expected to experience limited growth over the next 5 years.⁽²⁰⁾

REFERENCES

1. U.S. Department of Commerce, Bureau of the Census, Statistical Abstract of the United States, 1979, 100th edition. U.S. Government Printing Office, Washington, D.C., 1979.
2. U.S. Department of Commerce, Bureau of the Census, County and City Data Book, 1977. U.S. Government Printing Office, Washington, D.C., 1977.
3. U.S. Department of Commerce, Bureau of the Census, Current Population Reports: Population Estimates and Projections, Series P-26, Estimate of the Population of Washington Counties and Metropolitan Areas. U.S. Government Printing Office, Washington, D.C., July 1979.
4. Personal communication with Joan Keemer, National Center for Health Statistics, Division of Vital Statistics, August 6, 1980.
5. Personal communication with Thelma Tassel, National Center for Health Statistics, Division of Vital Statistics, August 6, 1980.
6. Personal communication with Beulah Land, Census Bureau, October 15, 1979.
7. U.S. Department of Commerce, Bureau of the Census, County Business Patterns, 1977. U.S. Government Printing Office, Washington, D.C., 1979.
8. Employment Security Department, State of Washington, "Labor Force and Employment in Washington State," Memorandum. April 1979.
9. U.S. Department of Commerce, Bureau of Economic Analysis, Survey of Current Business, Volume 59, Number 7. U.S. Government Printing Office, Washington, D.C., July 1979.
10. U.S. Department of Commerce, Bureau of Economic Analysis, Survey of Current Business, Volume 59, Number 8, Part II. U.S. Government Printing Office, Washington, D.C., August 1979.

11. Personal communication with Andy Weiser, Bureau of Economic Analysis, Economic Measurements Division, June 1, 1980.
12. Personal communication with Stewart Schwartz, Bureau of Economic Analysis, Economic Measurements Division, August 5, 1980.
13. Washington Crop and Livestock Reporting Service, Washington Agricultural Statistics, 1978. U.S. Department of Agriculture, Washington Department of Agriculture, Seattle, Washington, 1978.
14. Arthur Poddsy and Carolyn R. Smith, Education Directory, Colleges and Universities, 1977-1978. U.S. Department of Health, Education and Welfare, National Center for Education Statistics, Washington, D.C., 1978.
15. Personal communication with Vance Grant, U.S. Department of Health, Education and Welfare, Department of Education, Statistics Division, November 19, 1979.
16. American Hospital Association, Guide to the Health Care Field. American Hospital Association, Chicago, Illinois, 1978.
17. National Center for Health Statistics, Public Health Service, Hospitals: A County and Metropolitan Area Data Book, 1974. U.S. Department of Health, Education and Welfare, Washington, D.C., 1978.
18. National Center for Health Statistics, Office of Health Research Statistics and Technology, Public Health Service, Health Resource Statistics, 1976-1977 edition. U.S. Department of Health, Education and Welfare, Washington, D.C., 1977.
19. Personal communication with Cherie Smith, Hanford Engineering Development Laboratory, August 18, 1980.
20. Personal communication with Wayne Meisinger, Department of Personnel, Pacific Northwest Laboratory, August 18, 1980.

4. GOVERNMENT

This section presents an overview of Washington's state government and identifies the government institutions and agencies with statutory or other responsibilities affecting the generation, handling, and disposal of radioactive wastes within the state. The identities and attitudes of state officials and other organizations impinging on this issue are presented in the text, and where possible in available representative print media.

4.1 MAJOR POLITICAL PARTIES

All Washington legislators are currently affiliated with either the Democratic or the Republican Party. In the Washington Senate, the Republicans hold 25 seats and the Democrats hold 24. Of the 98 seats in the Washington House of Representatives, the Republicans hold 56 seats and the Democrats 42. Both of Washington's United States Senators and five of its seven United States Congressional Representatives are Democrats.⁽¹⁾

4.2 CONGRESSIONAL REPRESENTATIVES

Washington's two United States Senators are Slade Gorton (Republican) and Henry M. Jackson (Democrat).⁽¹⁾ Senator Jackson is interested in the continued operation of existing nuclear facilities and the construction of those previously planned. In addition, he is interested in an energy program that provides for a mixture of fossil and nuclear fueled electric generating facilities. As a member of three subcommittees of the Committee on Armed Services, Senator Jackson is involved in the national security aspects of nuclear energy. He is also Chairman of the Committee on Energy and Natural Resources which is responsible for all proposed legislation, messages, memorials, and petitions relating to energy policy, energy regulations, energy research and development, and the nonmilitary development of nuclear energy. As a member of the Committee on Governmental Affairs, Subcommittee on Energy, Nuclear Proliferation and Federal Services, Senator Jackson is involved in the committee's responsibility for organizing and managing the nation's nuclear export policy.^(2,3)

As a member of two subcommittees on the Committee of Commerce, Science, and Transportation, Senator Gorton may become involved in issues concerning the transportation of nuclear wastes because the committee is responsible for regulating interstate carriers and highway safety throughout the nation.⁽³⁾

Washington is also represented in the United States Congress by seven Representatives, who are presented in Table 4-1 in conjunction with Washington's Senators.⁽¹⁾ The table also indicates the congressional committees the Senators and Representatives serve on and their length of service. Additionally, Figure 4-1 indicates the location of Washington's congressional districts.

4.3 STATE GOVERNMENT

The Washington government is divided into three branches as regulated by the Washington Constitution (adopted in 1889) and numerous federal and state statutes. The specified branches are the Executive, Legislative, and Judicial.⁽⁵⁾

4.3.1 Executive Branch

The executive branch, under the Governor, carries on the business of the government and executes the laws enacted by the state legislature. The elected officials of the executive branch include the Governor, the Lieutenant Governor, the Secretary of State, the Treasurer, the Auditor, the Attorney General, the Superintendent of Public Instruction, and the Commissioner of Public Lands.⁽⁵⁾

Governor

The present Governor, John Spellman (Republican), was elected in 1980.⁽¹⁾ The Governor exercises administrative power over the government by the appointment of numerous members of state departments, agencies, and institutions. Additionally, certain positions outside the executive branch, such as supreme court judges, are initially filled by gubernatorial

TABLE 4-1

WASHINGTON MEMBERS OF THE UNITED STATES CONGRESS(3,4)

<u>State Delegate</u>	<u>District</u>	<u>Political Affiliation</u>	<u>Beginning of Present Service</u>	<u>Congressional Committees</u>
Senators:				
Henry M. Jackson	Entire state	Democrat	1953	Committee on Armed Services - Subcommittee on Military Construction - Subcommittee on Strategic and Theater Nuclear Forces - Subcommittee on Preparedness - Committee on Energy and Natural Resources - Ex officio member of all subcommittees Committee on Governmental Affairs - Permanent Subcommittee on Investigations - Subcommittee on Energy, Nuclear Proliferation, and Government Processes - Subcommittee on Federal Expenditures, Research, and Rules Select Committee on Intelligence - Subcommittee on Budget - Subcommittee on Analysis and Production, Vice Chairman - Subcommittee on Collection and Foreign Operations
Slade Gorton	Entire state	Republican	1981	Committee on the Budget Committee on Commerce, Science and Transportation - Subcommittee on Science, Technology, and Space - Subcommittee on Surface Transportation

TABLE 4-1 (continued)

WASHINGTON MEMBERS OF THE UNITED STATES CONGRESS^(3,4)

<u>State Delegate</u>	<u>District</u>	<u>Political Affiliation</u>	<u>Beginning of Present Service</u>	<u>Congressional Committees</u>
Representatives:				
Joel Pritchard	First	Republican	1973	Committee on Foreign Affairs - Subcommittee on Asian and Pacific Affairs - Subcommittee on Human Rights and International Organization - Subcommittee on International Operations Committee on Merchant Marines and Fisheries - Subcommittee on Fisheries, Wildlife Conservation and the Environment - Subcommittee on Oceanography
Al Swift	Second	Democrat	1979	Committee on House Administration - Subcommittee on Accounts - Subcommittee on Office Systems Committee on Energy and Commerce - Subcommittee on Energy Conservation and Power - Subcommittee on Fossil and Synthetic Fuels - Subcommittee on Telecommunications, Consumer Protection and Finance Joint Committee on the Libraries
Don Bonker	Third	Democrat	1975	Committee on Foreign Affairs - Subcommittee on Human Rights and International Organizations, Chairman - Subcommittee on International Economic Policy and Trade

TABLE 4-1 (continued)

WASHINGTON MEMBERS OF THE UNITED STATES CONGRESS(3,4)

<u>State Delegate</u>	<u>District</u>	<u>Political Affiliation</u>	<u>Beginning of Present Service</u>	<u>Congressional Committees</u>
Sid Morrison	Fourth	Republican	1981	Committee on Agriculture - Subcommittee on Cotton, Rice, and Sugar - Subcommittee on Conservation, Credit, and World Development - Subcommittee on Forests, Family Farms, and Energy
Thomas S. Foley	Fifth	Democrat	1965	Committee on Agriculture - Subcommittee on Wheat, Soybeans, and Feed Grains, Chairman - Subcommittee on Cotton, Rice, and Sugar - Subcommittee on Department Operations, Research, and Foreign Agriculture - Subcommittee on Domestic Marketing, Consumer Relations and Nutrition - Subcommittee on Forests, Family Farms, and Energy
Norm D. Dicks	Sixth	Democrat	1977	Committee on Appropriations - Subcommittee on Defense - Subcommittee on Interior - Subcommittee on Legislative
Mike Lowry	Seventh	Democrat	1979	Committee on Banking, Finance and Urban Affairs - Subcommittee on Housing and Community Development

TABLE 4-1 (continued)

WASHINGTON MEMBERS OF THE UNITED STATES CONGRESS(3,4)

<u>State Delegate</u>	<u>District</u>	<u>Political Affiliation</u>	<u>Beginning of Present Service</u>	<u>Congressional Committees</u>
Representative Lowry (con't)				<ul style="list-style-type: none"> - Subcommittee on International Development, Institutions, and Finance - Subcommittee on International Trade, Investment and Monetary Policy Committee on Merchant Marines and Fisheries - Subcommittee on Coast Guard Navigation - Subcommittee on Fisheries, Wildlife Conservation and the Environment - Subcommittee on Panama Canal and Outer Continental Shelf

FIGURE 4-1
WASHINGTON CONGRESSIONAL DISTRICTS (6)

appointment. The Governor influences the legislative process by submitting recommendations and an annual budget to the legislature, by calling special legislative sessions and by exercising his power to approve or veto legislation. As Governor, John Spellman is also Commander-in-Chief of Washington's military forces and the state constitution vests the pardoning power in the Governor, subject to regulations and restrictions prescribed by law.⁽⁵⁾

When Governor Spellman assumed office in mid-January 1981, he identified as one of his priorities the creation of a regional compact among the northwest states to deal with the issue of low-level radioactive wastes. The Governor strongly supports states providing the primary leadership in solving this aspect of the nuclear waste problem. The Washington legislature responded by adopting the compact language, and through similar action taken in Idaho and Oregon, the compact was achieved.⁽⁶⁾

Lieutenant Governor

The present Lieutenant Governor, John A. Cherberg (Democrat), was elected in 1976 and his term also ends in 1985.⁽¹⁾ As Lieutenant Governor, Mr. Cherberg serves as president of the Senate "and shall discharge such other duties as may be prescribed by law." In addition, Lieutenant Governor Cherberg assumes the responsibilities of the Chief Executive in the event of the removal, resignation, death, or disability of the Governor.⁽⁵⁾

Secretary of State

Ralph Munro (Republican) is Washington's current Secretary of State and his term will end in 1985.⁽¹⁾ The Secretary of State is responsible for keeping a record of all official acts of the executive department and the legislature, and for "performing such other duties as shall be assigned by law."⁽⁵⁾

Attorney General

The present Attorney General, Kenneth O. Eikenberry (Republican), was elected in 1980. As Attorney General, he is Washington's chief legal advisor and

provides legal counsel to executive officials, members of the legislature, and to the prosecuting attorneys of the state's 39 counties. He also represents in court, the officers, departments, boards, commissions, and other institutions of the state government.^(1,7)

Other Elected Officials

Other major elected state officials include: Robert S. O'Brien, State Treasurer; Robert V. Graham, State Auditor; Frank Brouillet, Superintendent of Public Instruction; Brian Boyle, Commissioner of Public Lands; and Richard G. Marquardt, Insurance Commissioner.⁽¹⁾

State Agencies

The Washington Department of Social and Health Services, Radioactive Materials Control Unit, is responsible for radiation control in Washington, which includes regulating the transportation and disposal of nuclear materials. Since Washington is an Agreement State, the state is virtually free to regulate activities within its borders, provided the state upholds the guidelines of the Nuclear Regulatory Commission.^(6,8)

In addition to the Department of Social and Health Services, other state agencies such as the Department of Natural Resources, the State Energy Office, the Department of Ecology, or the Office of Fiscal Management may become involved in nuclear energy or radioactive waste disposal issues because of interest or jurisdiction in the areas of land-use planning and environmental management or protection. Figure 4-2 inventories Washington's state agencies.

4.3.2 Legislative Branch

The legislative power of the state is vested in the State Senate and the House of Representatives. The Washington Constitution provides for the state to be divided into 49 legislative districts. One senator is elected from each of the 49 districts, 2 representatives from each of 48 districts, and 3 representatives from 1 district.⁽⁵⁾

FIGURE 4-2
LIST OF STATE AGENCIES(9)

WASHINGTON

ADJUTANT GENERAL

George E. Coates, The Adjutant General
Washington National Guard
Camp Murray
Tacoma, WA 98430
(206) 964-6201

ADMINISTRATION

Keith A. Angier, Director
Department of General Administration
218 General Administration Bldg.
Mail Stop AX-22
Olympia, WA 98504
(206) 753-5434

AERONAUTICS

W. H. Hamilton, Assistant Secretary
for Aeronautics
Division of Aeronautics
Department of Transportation
Boeing Field
8600 Perimeter Rd.
Seattle, WA 98108
(206) 764-4131

AGING

Charles E. Reed, Director
Bureau of Aging and Adult Services
Department of Social and Health
Services
Mail Stop OB-43G
Olympia, WA 98504
(206) 753-2502

AGRICULTURAL

M. Keith Ellis, Director
Department of Agriculture
406 General Administration Bldg.
Olympia, WA 98504
(206) 753-5050

AIR POLLUTION CONTROL

Peter W. Hildebrandt, Assistant
Director
Office of Air Programs
Department of Ecology
Mail Stop PV-11
Olympia, WA 98504
(206) 753-2821

ALCOHOLISM

Everett L. Atkins, Jr., Chief
Office of Alcoholism
Bureau of Social Services
Department of Social and Health
Services
Office Bldg. 2
Mail Stop OB-44W
Olympia, WA 98504
(706) 753-5866

ARCHIVES AND RECORDS

Sidney McAlpin, State Archivist
Archives and Records Management
Department of General
Administration
12th and Washington Sts.
Olympia, WA 98501
(206) 753-5468

ARTS AND HUMANITIES

Michael A. Croman, Executive
Director
Arts Commission
Mail Stop GH-11
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(206) 753-3860

William H. Oliver, Executive
Director
Washington Commission for the
Humanities
c/o Evergreen State College
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(206) 866-6510

ATTORNEY GENERAL

Kenneth O. Eikenberry, Attorney
General
Temple of Justice
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(206) 753-2550

AUDIT

Robert V. Graham, State Auditor
Office of State Auditor
Legislative Bldg.
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BANKING

Michael Edwards, Supervisor of
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BUDGET

Joe A. Taller, Director
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CHILD WELFARE

Leila Todorovick, Director
Bureau of Children Services
Department of Social and Health
Services
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CLERK OF THE HOUSE

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CONSUMER AFFAIRS

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CORRECTIONS

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COURT ADMINISTRATION

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Temple of Justice
Olympia, WA 98504
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DATA PROCESSING

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WASHINGTON

DRUG ABUSE

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Bureau of Alcohol and Substance
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ECONOMIC DEVELOPMENT

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ECONOMIC OPPORTUNITY

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Olympia, WA 98504
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EDUCATION (higher)

Gail Norris, Executive Coordinator
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Olympia, WA 98504
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EDUCATION (primary, secondary, and vocational)

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Superintendent of Public
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7510 Armstrong St. S.W.
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ELECTIONS

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EMPLOYMENT SECURITY

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FINANCE

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FISH AND GAME

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(206) 753-6623

Frank R. Lockard, Director
Department of Game
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Olympia, WA 98504
(206) 753-5710

FOOD AND DRUG

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Director
Dairy and Food Division
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Olympia, WA 98504
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WASHINGTON

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GEOLOGY

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HEALTH

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HIGHWAY SAFETY

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HISTORIC PRESERVATION

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Preservation
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Olympia, WA 98504
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HUMAN RIGHTS

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INSURANCE

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JUVENILE DELINQUENCY

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WASHINGTON

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Business and Professions
Administration
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MASS TRANSIT

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MENTAL RETARDATION

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Department of Social and Health
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WASHINGTON

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PARKS

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PERSONNEL

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PLANNING

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POLICE

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(206) 753-6540

PRINTING AND PUBLISHING

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Olympia, WA 98504
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PROBATION AND PAROLE

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PUBLIC WORKS

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Department of General
Administration
218 General Administration Bldg.
Olympia, WA 98504
(206) 753-3151

PURCHASING

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Division of State Purchasing
Department of General
Administration
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Olympia, WA 98504
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RAILROADS

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Transportation Division
Utilities and Transportation
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RETIREMENT

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SECRETARY OF STATE

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SECRETARY OF THE SENATE

Sid Snyder, Secretary
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TOURISM

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Travel Development Division
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Health Services Division
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Airdustrial Park
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WATER RESOURCES

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Division
Office of Water Programs
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WELFARE

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Olympia, WA 98504
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WORKMEN'S COMPENSATION

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Insurance
Department of Labor and
Industries
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Olympia, WA 98504
(206) 753-6308

State senators are elected for 4-year terms. Approximately half of them are chosen at each of the biennial elections held in even-numbered years concurrently with the national general elections. All representatives are elected for 2-year terms. The regular sessions of the legislature convene on the second Monday in January in odd-numbered years and are limited by the constitution to not more than 60 days. Special or extraordinary legislative sessions may be called by the Governor.⁽⁵⁾

Both the State Senate and House of Representatives have formed energy committees to research the problems of energy in Washington. An initiative (383) was voted upon in November 1980 and passed. This legislation bans the disposal of all out-of-state radioactive wastes (except medical wastes) in the State of Washington, unless Washington has a compact with the shipping state. Other than initiative 383, only minor, unsubstantial changes have been made to state regulations concerning the disposal and transportation of radioactive materials.⁽⁶⁾

4.3.3 Judicial Branch

The Washington Constitution provides for one state supreme court and a superior court in each county. The Supreme Court of Washington consists of nine judges elected on a nonpartisan ballot; three every two years for a 6-year term. The court hears appeals from lower courts and may exercise original jurisdiction in certain cases. The supreme court also has the power to issue writs of review, prohibition, and all other writs necessary to fulfill its appellate and revisory jurisdiction.⁽⁵⁾

There are 39 superior courts in Washington (one for each county) and 27 judicial districts. Superior court judges are elected in a general election for a 4-year term, and may serve in any of the 39 courts. The total number of superior court judges is determined by population. The superior courts have original jurisdiction in all cases involving the title or possession of property, or the legality of any tax, assessment toll or municipal fine in which the demand exceeds \$1,000. The court also has jurisdiction on all cases of misdemeanor, criminal cases amounting to felony, all matters of divorce or annulment of marriage, all actions of forceable entry and of actions to prevent or abate a nuisance.⁽⁵⁾

The constitution also provides for justice courts (held by a justice of the peace), and a Washington Court of Appeals. The justices of the peace have original jurisdiction in cases where the demand of value does not exceed \$1,000 and the court of appeals has the authority to review superior court actions.⁽⁵⁾

4.3.4 Statutory Regulations

The Nuclear Energy and Radioactive Legislation, Chapter 70.98 RCW, establishes the radiation control program in the State of Washington and is presented in Appendix B. This legislation designates the Department of Social and Health Services as the state radiation control agency, created the Advisory Council on Nuclear Energy and Radiation, and assigned the Department of Commerce and Economic Development, Office of Nuclear Energy Development, the responsibility of nuclear energy research, development, and education in the state. In addition, the legislation establishes the procedure and requirements for the licensing and inspections of sources of ionizing radiation, as well as the establishment of training programs and administrative procedure for personnel who work with sources of ionizing radiation.^(6,8)

4.4 FEDERAL ACTIVITIES IN THE STATE OF WASHINGTON

Apart from the Nuclear Regulatory Commission's inspection of the Nuclear Engineering Radioactive Waste Disposal Facility, federal activities in the State of Washington currently center on the thermodynamic studies conducted at Hanford. This research concerns the possible disposal of high-level nuclear waste in lava rock.⁽⁶⁾

4.5 INTEREST GROUPS

Many interest groups concerned with nuclear issues and radioactive wastes have offices in Washington. In addition, there are many groups generally concerned with the environment who may become actively involved in nuclear energy and waste management issues if they view the issues as detrimental to their environmental interests. Following is a list of some of the major energy and environmental organizations located in Washington and their specific areas of concern.^(10,11,12)

Friends of the Earth: Committed to the "preservation, restoration and rational use of the earth." Some of their interests concern the issues of nuclear power safety, strip mining, energy conservation, and water pollution.

Mercer Island Environmental Council: Concerned with the impact of modern man's civilization and technology upon his environment, and encourages the protection and restoration of man's ecological, natural, and historical heritage through creative planning and education.

Northwest Fund for the Environment: Interested in pursuing environmental quality through research, publicity, education, and litigation on a regional basis.

Pacific County Environmental Council: Concerned with the environmental problems of Pacific County; reviews environmental impact statements and advises county and state officials on environmental issues.

The People/Natural Resources Research Council: Concerned with increasing an understanding of the interrelationship between Man and his environment and in improving natural resource management policies.

Protect the Peninsula's Future: Concerned with land use on the North Olympic Peninsula, and actively opposed proposals for a nuclear plant and an oil superport on the Peninsula.

Save Skagit Bay: Opposes construction of a nuclear facility on Skagit Island, Skagit County. In general, the group is concerned with preserving the residential, agricultural and recreational activities adjacent to Skagit Bay.

Sierra Club, Pacific Northwest Chapter: The Sierra Club's Energy Committee advocates a moratorium on the further construction of nuclear plants. In general, the club is concerned with the natural environment and protecting it from the adverse impacts of Man and his society.

Skagitarians Concerned About Nuclear Plants (SCANP): Actively opposes the construction of a nuclear facility in Skagit County.

Tri Cities Nuclear Council: Local agency interested in nuclear activities occurring in the Hanford region of Washington.

Washington Environmental Council, Inc.: Interested in promoting citizen, legislative, and administrative action toward providing a better environment.

Washington Environmental Health Association: A group of professionals interested in radiological health, air and water pollution control, solid waste management, community planning, and industrial hygiene.

4.6 PRINTED MEDIA

The 25 newspaper articles presented in Appendix C represent a 2-week search of 2 major newspapers in the State of Washington. This search was not intended to be all-encompassing nor representative of the major issues of concern in Washington. The issues reviewed produced nine articles specifically related to low-level waste disposal, whereas the remaining articles deal with the broad subject of nuclear power. Together, the articles are intended to present a general indication of the coverage of radiation issues by printed media in the state.

In addition to the articles in Appendix C, both newspapers have printed editorials concerning nuclear energy and nuclear wastes, which may further indicate the media's coverage of these issues in Washington. Within the last year, the Spokane Review has printed 4 editorials and the Seattle Times has printed approximately 16 editorials pertaining to these two topics. Neither newspaper, however, has recently conducted a poll or survey concerning nuclear power or radiation issues. (13,14,15)

REFERENCES

1. "Telephone Directory and Committee Assignments of the Senate and House of Representatives," State of Washington, 47th Legislature, Olympia, Washington, 1981.
2. Personal communication with Wilson Smith, member of Senator Henry Jackson's staff, November 30, 1979.
3. Standing Committee of the House of Representatives of the United States, Ninety-Seventh Congress. U.S. Government Printing Office, Washington, D.C., 1980.
4. List of Standing Committees of the Senate of the United States for the Ninety-Seventh Congress. U.S. Government Printing Office, Washington, D.C., 1980.
5. "The Constitution of the State of Washington as Amended." Office of Secretary of State, State of Washington, Olympia, Washington, undated.
6. Personal communication with David Stephens, member of Governor John Spellman's staff, September 18, 1981.
7. "Office of the Attorney General." Office of the Attorney General, State of Washington, Olympia, Washington, 1973.
8. "Nuclear Energy and Radiation Legislation, Chapter 70.98 RCW." Washington Department of Social and Health Services, Radioactive Materials Control Unit, Olympia, Washington, undated.
9. The National Directory of State Agencies, 1978-1979. Information Resources Press, Washington, D.C., 1978.
10. Thaddeus, C. Tryna and Sally R. Osberg, Environmental Protection Directory. Marques Academic Press, Chicago, Illinois, 1975.

11. Onyx Group, Inc., Environment U.S.A., A Guide to Agencies, People, and Resources. R. P. Bowker Co., New York, N.Y., 1974.
12. Center for California Public Affairs, Directory of Consumer Protection and Environmental Agencies. Academic Press, Orange, New Jersey, 1973.
13. Personal communication with Beverly Russell, Seattle Times, August 26, 1980.
14. Personal communication with Bill Young, GMA Research Inc., August 27, 1980.
15. Personal communication with Sarah Lindgren, Spokane Review, August 26, 1980.

5. SURVEY METHODOLOGY

A direct mail survey was conducted during September 1979 of all Radioactive Material License holders in the State of Washington. Names of license holders were obtained from the Washington Radioactive Materials Control Unit. The questionnaire used is presented in Figure 5-1. This "free form" questionnaire was developed to solicit basic information necessary to generally characterize the low-level radioactive waste management practices. Questions asked were limited to those which have a direct bearing on the overall characterization of practices within the state, rather than on a detailed characterization of each facility.

Each questionnaire was sent with a transmittal letter (see Figure 5-2), general instructions (see Figure 5-3), and a return envelope. Responses were first evaluated to determine the information presented in Appendix A, List of Radioactive Material Licensees. If a response was not received, classification of "type of facility" was determined from the licensee name, if possible; if not, they were classified as "unknown." The responses received were then transposed onto a "fixed form" survey form (see Figure 5-4) which was developed based on analysis of the "free form" responses given in Figure 5-1. The information provided by the licensees was then tabulated in the formats presented in Sections 2 and 6 of this briefing book.

FIGURE 5-1
NUS RADIOACTIVE WASTE SURVEY

FACILITY NAME:
STREET ADDRESS:
CITY/STATE/ZIP:
TELEPHONE NO:
PERSON CONTACTED/TITLE:

TYPE OF FACILITY:

☐ ACADEMIC

☐ MEDICAL

☐ INDUSTRIAL

☐ OTHER DESCRIBE _____

SIZE OF FACILITY:

_____ STUDENTS

_____ BEDS

_____ EMPLOYEES

PROCESS(ES) WHICH GENERATE WASTE:

IS WASTE TREATED BEFORE PACKAGING?

HOW?

HOW IS WASTE PACKAGED?

WHAT IS PRINCIPAL CHEMICAL & PHYSICAL COMPOSITION OF WASTE?

HOW MANY WASTE SHIPMENTS DID YOU MAKE IN:

1978 -

1977 -

1976 -

DO YOU EXPECT INCREASE OR DECREASE IN WASTE VOLUME?

PLEASE QUANTIFY WASTE DISPOSED OF IN CALENDAR YEARS 1978, 1977, 1976 ON REVERSE SIDE OF FORM. IF MORE SPACE WILL BE REQUIRED THAN IS AVAILABLE ON FORM, PLEASE PROVIDE IN SAME FORMAT ON BLANK SHEET OF PAPER.

FIGURE 5-1 (Concluded)

YEAR	ISOTOPE	ACTIVITY (CURIES)	VOLUME DISPOSED/METHOD

ADDITIONAL COMMENTS:

FIGURE 5-2

TRANSMITTAL LETTER

September 11, 1979
BDG-PE-275

St. Judith's Hospital
600 Beauregard Avenue
Danville, Illinois 61832

Attn: Dr. J. M. Wilson

Subject: Survey of Low Level Radioactive Waste Disposal

Dear Dr. Wilson:

Maintaining free access to proper low level radioactive waste disposal sites is becoming more difficult as individual state and local jurisdictions seek to impose control upon or eliminate such activity.

NUS Corporation is conducting a survey of nuclear material licensees for EG&G Idaho and the Department of Energy to ascertain the volume and nature of waste they generate. At the present time there is not an available data base for the long range projections necessary for proper planning of future low level waste disposal facilities.

Completion of the attached survey form will enable NUS to generate such a data base for the U.S. Government. Your cooperation will assist both your organization and other users of radioactive materials in maintaining continued access to appropriate waste disposal facilities.

If you have any questions on the attached survey form or its use, please feel free to contact me at 301/948-7010.

Sincerely,

Bruce D. Guilbeault
Project Manager

BDG:dg

Enclosure

FIGURE 5-3

GENERAL INSTRUCTIONS

1. The enclosed Radioactive Waste Survey from us is self-explanatory. The following instructions provide general guidelines. If you have any specific concerns, please call Bruce Guilbeault or Don Hill on
301-948-7010
2. If possible, all quantitative data should be taken directly from shipment records. If this is not practical, please estimate answers as accurately as possible.
3. Please explain or specify answers (where requested) as completely as possible. If additional space is needed, please use the "Additional Comments" section on the last page of this questionnaire.
4. When you have completed this questionnaire, please return it in the enclosed stamped, self-addressed envelope.
5. If your facility does not dispose of Radioactive Materials by use of the commercial radioactive material disposal sites, please fill out the survey form with the amount of material received in each year and where those Radioactive Materials received were disposed (e.g. Isotopes used in patient treatment residues decayed to background, disposed in trash, or shipped out in finished products.)

THANK YOU VERY MUCH FOR YOUR CO-OPERATION

FIGURE 5-4

FORM USED FOR TABULATION

LICENSEE NAME _____
NAME OF FACILITY _____
STREET ADDRESS _____
CITY/STATE/ZIP _____
TELEPHONE NO. _____
PERSON SUPPLYING INFORMATION _____
TITLE _____

PART I - TYPE OF FACILITY

(CHECK THE ONE CATEGORY WHICH IS MOST APPLICABLE)

MEDICAL

- ☐ HOSPITAL
- ☐ PHARMACEUTICAL MANUFACTURER
- ☐ MEDICAL RESEARCH/EDUCATION
- ☐ OTHER (SPECIFY) _____

INDUSTRIAL

- ☐ INCORPORATES RADIOACTIVITY INTO PRODUCTS
- ☐ USES RADIOACTIVITY IN PROCESS CONTROL
- ☐ COMMERCIAL POWER REACTOR
- ☐ OTHER (SPECIFY) _____

EDUCATIONAL

- ☐ UNIVERSITY
- ☐ HIGH SCHOOL
- ☐ OTHER (SPECIFY) _____

GOVERNMENTAL (NON-MEDICAL OR EDUCATIONAL)

- ☐ FEDERAL
- ☐ MILITARY
- ☐ STATE
- ☐ LOCAL

PART II - DISPOSAL METHOD

CHECK EACH DISPOSAL METHOD WHICH YOU DO EMPLOY

- ☐ SHIP TO COMMERCIAL REPOSITORY
- ☐ RELEASE TO SEWER
- ☐ COMBINE WITH COMMON REFUSE
- ☐ VENT TO ATMOSPHERE
- ☐ BURY ON-SITE
- ☐ RETURN TO VENDOR
- ☐ DISTRIBUTE IN PRODUCT FORM
- ☐ NO WASTE GENERATED
- ☐ OTHER (SPECIFY) _____

FIGURE 5-4 (Continued)

PART III - SOURCE OF RADIOACTIVE WASTE

(CHECK EACH SOURCE OF YOUR POTENTIAL RADIOACTIVE WASTE AND, IF YOU SHIP, INDICATE THE PERCENTAGE OF YOUR TOTAL SHIPPED WASTE VOLUME ORIGINATING FROM EACH SOURCE CATEGORY)

SOURCE OF RADIOACTIVITY	<u>PERCENT OF WASTE VOLUME SHIPPED</u>
☐ NUCLEAR REACTOR	_____
☐ NEUTRON GENERATOR	_____
☐ CYCLOTRON OR SYNCHROTRON	_____
☐ SEALED SOURCE	_____
☐ UNSEALED RADIOACTIVE MATERIAL	_____
☐ NATURAL ORES OR MILL TAILINGS	_____
☐ OTHER (SPECIFY) _____	_____
	<u>100%</u>

IF YOU DO NOT SHIP RADIOACTIVE WASTES, YOU HAVE COMPLETED THE QUESTIONNAIRE. THANK YOU. IF YOU DO SHIP, PLEASE CONTINUE WITH THE FOLLOWING QUESTIONS.

PART IV - PHYSICAL FORM OF SHIPPED WASTES

(CHECK EACH FORM OF WASTE WHICH YOU SHIP AND INDICATE THE PERCENTAGE OF YOUR TOTAL SHIPPED WASTE VOLUME REPRESENTING EACH FORM)

	<u>PERCENT OF WASTE VOLUME SHIPPED</u>
☐ DRY SOLIDS, TRASH, IRRADIATED COMPONENTS	_____
☐ SOLIDIFIED OR ABSORBED LIQUIDS, SOLID SLUDGES, SPENT RESINS, FILTER SLUDGES OR EVAPORATOR BOTTOMS	_____
☐ ANIMAL CARCASSES OR OTHER BIOLOGICAL WASTE	_____
☐ SEALED SOURCES	_____
☐ OTHER (SPECIFY) _____	_____
	<u>100%</u>

DOES WASTE CONTAIN ANY MATERIAL WHICH IS POTENTIALLY:

<u>YES</u>	<u>NO</u>	
☐	☐	COMBUSTIBLE
☐	☐	EXPLOSIVE
☐	☐	CHEMICALLY TOXIC

WHAT SHIPPING CONTAINERS DO YOU USE?

☐ 55 GALLON STEEL DRUMS
☐ 30 GALLON STEEL DRUMS
☐ OTHER (SPECIFY) _____

WHAT ON-SITE PROCESSING OF WASTE DO YOU EMPLOY?

☐ NONE
☐ MECHANICAL COMPACTION
☐ INCINERATION
☐ SOLIDIFICATION OR EVAPORATION OF LIQUIDS
☐ ABSORPTION OF LIQUIDS
☐ OTHER (SPECIFY) _____

FIGURE 5-4 (Concluded)

PART V - WASTE QUANTITY

INDICATE TOTAL YEARLY VOLUME (IN CUBIC FEET) OF WASTE SHIPPED TO A COMMERCIAL DISPOSAL FACILITY.

CUBIC FEET SHIPPED

ACTUAL SHIPPED IN 1977

ACTUAL SHIPPED IN 1978

ACTUAL SHIPPED IN 1979

INDICATE TOTAL YEARLY VOLUME (IN CUBIC FEET) OF WASTE PROJECTED TO BE GENERATED WHICH WILL BE SHIPPED.

CUBIC FEET GENERATED

ESTIMATED GENERATION IN 1980

ESTIMATED GENERATION IN 1985

ESTIMATED GENERATION in 1990

INDICATE THE QUANTITY OF RADIOACTIVITY (IN CURIES) SHIPPED TO A COMMERCIAL FACILITY IN THE YEARS 1977, 1978 AND 1979.

ISOTOPE	QUANTITY SHIPPED (CURIES) IN:		
	1977	1978	1979

6.0 USE OF COMMERCIAL LOW-LEVEL WASTE DISPOSAL FACILITIES

In the State of Washington, a total of 312 potential shippers of low-level radioactive waste were identified. These potential shippers were sent, by direct mail, questionnaires concerning their waste management practices. The respondent was identified as either a medical, educational, industrial, power reactor, or governmental type facility. All but five of the potential shippers identified for the State of Washington were able to be grouped into one of these classifications of facilities. Section 2.0 presents the number of respondents using various disposal methods and the source of radioactivity used at facilities. Table 2-1 indicates that 11.8 percent (20 facilities) of the respondents use commercial low-level waste facilities. The following subsections present a summary of the characteristics and quantity of wastes disposed of by these 20 facilities.

6.1 RESPONSE TO SURVEY

Table 6-1 presents, by facility type, the number of potential shippers surveyed, the total number and percentage of responses obtained, and a breakdown of responses by degree of response. If a facility provided at least the facility type and method of disposal, the answers were considered a response. If no information was obtained, the type of facility was determined by the facility name. The responses were further categorized by degree of response into three groups. Group 1 responses were responses in which all appropriate information requested was provided (see Figure 5-1). Group 2 responses provided only information on the type of facility, disposal method, and quantity of waste. Group 3 responses included only information on the type of facility and the disposal method.

Fifty-four percent of all potential shippers identified provided some degree of response. There was no great disparity in percent of response between type of facility, with the range being 50.0 percent for medical facilities to 74.4 percent for government facilities. Of the respondents, only 10.0 percent provided all requested information.

It should be noted that of the 143 potential shippers (out of 312) which did not provide any information, many of these may in fact be shippers. A decline to return the questionnaire can be reasonably assumed to indicate that they in fact do

ship wastes, since the only response and effort required if they do not ship wastes is to answer "no." Accordingly, there is a high potential that the percent response to the survey from shippers may be as low as 12 percent (20 shipper respondents out of a total of 163 shippers or nonrespondents) rather than the 54 percent response from all potential shippers.

6.2 SOURCES OF SHIPPED WASTE

6.2.1 Distribution by Type of Facilities Shipping Wastes

Table 6-2 presents the distribution of numbers of facilities shipping wastes by major type of facility and by subgroup within each major type. In terms of number of facilities shipping wastes, medical, educational, and industrial facilities account for about 30 percent each of all shippers, with governmental facilities comprising 10 percent of all shippers.

6.2.2 Origin of Radioactivity Resulting in Shipped Wastes

The origin of radioactivity resulting in shipped waste was grouped into four categories: nuclear reactor operation, purchased as sealed sources, purchased as unsealed radioactivity, and produced by a neutron generator. Table 6-3 presents the distribution of number of facilities shipping wastes according to type of facility and origin of radioactivity. It should be noted that more than one origin may be appropriate for a given facility. Therefore, the total number of origins presented in Table 6-3 is greater than the total number of shippers of low-level waste. Over 90 percent of the facilities shipping waste obtain the radioactivity as unsealed radioactive material.

6.3 VOLUME OF SHIPPED WASTE

Volumes of low-level wastes shipped to commercial disposal facilities were provided by 13 facilities of the 20 respondents that indicated they shipped wastes. These 13 facilities represent 8 percent of the 163 potential shippers within the state (20 respondents and 143 non-respondents). Table 6-4 presents volumes of shipped wastes for the years 1976, 1977, and 1978 for each type of facility.

Table 6-5 shows the number of facilities that expect to increase, decrease, or not change the volume of shipped waste. These data indicate that a small increase with time might be expected.

6.4 ACTIVITY OF SHIPPED WASTE

Table 6-6 presents quantity of activity in the waste shipped for the years 1976, 1977, and 1978 for each type of facility.

Table 6-7 presents the distribution of activity by shipped radionuclide.

6.5 PHYSICAL CHARACTERISTICS OF SHIPPED WASTE

Onsite processing of low-level waste may be performed to either reduce the volume of the waste (compaction, incineration) or to remove free liquid (solidification, evaporation, absorption). Table 6-8 shows the number of facilities using these methods. Only two of the 17 respondents indicated they used mechanical compaction or incineration for volume reduction. Over half of the facilities use absorption to handle free liquids.

Table 6-9 presents the type of shipping container used onsite to package waste for transport to disposal facilities. Most facilities use either 55-gallon or 30-gallon steel drums. However, 50 percent of the facilities (shown under "other" column) use simply cardboard boxes for small volumes of waste which are packaged in drums by the transporter.

Shipped waste was categorized as either dry, moist, biological, sealed, or other. Table 6-10 presents the number of facilities shipping waste in any of these categories.

TABLE 6-1

RESPONSE TO DIRECT MAIL SURVEY

Type of facility	Number of licenses	Number of respondents	Percent response	Degree of Response								
				Group 1			Group 2			Group 3		
				Number	Percent of licenses	Percent of respondents	Number	Percent of licenses	Percent of respondents	Number	Percent of licenses	Percent of respondents
Medical	108	54	50.0	9	2.9	5.3	41	13.1	24.3	4	1.3	2.4
Educational	21	13	61.9	3	1.0	1.8	8	2.6	4.7	2	0.6	1.2
Industrial	139	73	52.5	13	4.2	7.7	60	19.2	35.5	0	0.0	0.0
Power Reactor	0	-	-	-	-	-	-	-	-	-	-	-
Governmental	39	29	74.4	3	0.6	1.2	26	8.3	15.4	1	0.3	0.6
Unknown	5	-	-	-	-	-	-	-	-	-	-	-
TOTAL	312	169	54.2	27	8.7	10.0	135	43.3	79.9	7	2.2	4.1

TABLE 6-2

TYPE OF FACILITIES SHIPPING LOW-LEVEL WASTE

Type of Facility		Number of facilities shipping	Percent of all shippers	Percent of facilities type
Facility	Subgroup			
Medical	Hospital	2	10.0	33.3
	Pharmaceutical	0	0.0	0.0
	Research/Education	3	15.0	50.0
	Other	<u>1</u>	<u>5.0</u>	<u>16.7</u>
	Total	6	30.0	100.0
Educational	University	5	25.0	100.0
	High School	0	0.0	0.0
	Other	<u>0</u>	<u>0.0</u>	<u>0.0</u>
	Total	5	25.0	100.0
Industrial	Product Use	2	10.0	28.6
	Process Control	3	15.0	42.9
	Other	<u>2</u>	<u>10.0</u>	<u>28.6</u>
	Total	7	35.0	100.0
Power Reactor	Total	0	-	-
Governmental	Federal	0	0.0	0.0
	Military	1	5.0	50.0
	State	1	5.0	50.0
	Local	<u>0</u>	<u>0.0</u>	<u>0.0</u>
	Total	2	10.0	100.0
TOTAL		20	100.0	100.0

TABLE 6-3

ORIGIN OF RADIOACTIVITY RESULTING IN SHIPPED WASTES

Type of facility	Number of respondents	Nuclear reactor		Sealed sources		Unsealed radioactive material		Neutron generator	
		Number of sources*	Percent of all shippers	Number of sources*	Percent of all shippers	Number of sources*	Percent of all shippers	Number of sources*	Percent of all shippers
Medical	6	0	0.0	1	5.0	6	30.0	0	0.0
Educational	5	1	5.0	1	5.0	4	20.0		
Industrial	7	0	0.0	1	5.0	7	35.0	1	5.0
Power Reactor	0	-	-	-	-	-	-	-	-
Governmental	2	1	5.0	0	0.0	1	5.0	0	0.0
TOTAL	20	2	10.0	3	15.0	18	90.0	1	5.0

*The total of "number of sources" exceeds the total number of respondents due to facilities generating waste from several sources.

TABLE 6-4

VOLUME OF SHIPPED WASTE

Type of Facility	Number of respondents	Volume Shipped					
		1976		1977		1978	
		Cubic meters	Percent of total	Cubic meters	Percent of total	Cubic meters	Percent of total
Medical	2	0.0	0.0	0.4	0.1	1.4	0.2
Educational	3	125.8	16.6	151.2	24.2	184.5	25.3
Industrial	7	473.0	61.37	274.3	43.9	459.6	62.9
Power Reactor	0	-	-	-	-	-	-
Governmental	1	169.9	22.1	198.2	31.8	85.0	11.6
TOTAL	13	770.6	100.00	624.1	100.0	730.4	100.0

TABLE 6-5

PROJECTED CHANGE IN VOLUME OF SHIPPED WASTE

Type of Facility	Number of respondents	Projected Change in Volume					
		Increase		No Change		Decrease	
		Number of facilities	Percent of total respondents	Number of facilities	Percent of total respondents	Number of facilities	Percent of total respondents
Medical	4	2	13.3	2	13.3	0	-
Educational	3	0	-	2	13.3	1	6.7
Industrial	8	6	40.0	2	13.3	0	-
Power Reactor	-	-	-	-	-	-	-
Governmental	0	-	-	-	-	-	-
TOTAL	15	8	53.3	6	40.0	1	6.7

TABLE 6-6
ACTIVITY OF SHIPPED WASTE

Type of Facility	Number of respondents	Activity Shipped					
		1976		1977		1978	
		Curies	Percent of total	Curies	Percent of total	Curies	Percent of total
Medical	2	0.0	0.0	9.0E-3	0.1	2.6E-2	0.0
Educational	4	7.0E-3	0.0	5.0E-3	0.1	6.6E+2	29.8
Industrial	7	4.2E+3	99.8	6.2E+0	55.4	1.6E+3	70.1
Power Reactor	0	-	-	-	-	-	-
Governmental	1	1.0E+1	0.2	5.0E+0	44.4	3.0E+0	0.1
TOTAL	14	4.2E+3	100.0	1.1E+1	100.0	2.2E+3	100.0

Table 6-7

RADIONUCLIDES IN SHIPPED WASTES

Activity (curies)															
Isotope	Total			Medical			Educational			Industrial			Governmental		
	1976	1977	1978	1976	1977	1978	1976	1977	1978	1976	1977	1978	1976	1977	1978
B-3	4.2E+3	1.2E+0	2.2E+3	0.0	1.0E-3	2.4E-2	4.0E-3	4.0E-3	6.5E+2	4.2E+3	1.2E+0	1.6E+3	0.0	0.0	0.0
C-14	0.0	1.1E-2	1.5E-2	0.0	2.0E-5	0.0	0.0	0.0	0.0	0.0	1.1E-2	1.5E-2	0.0	0.0	0.0
P-32	0.0	0.0	5.0E-4	0.0	0.0	5.0E-4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cl-36	0.0	8.3E-5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.0E-6	0.0	0.0	0.0	0.0
Cr-51	4.0E+0	4.0E+0	5.6E+0	0.0	0.0	0.0	0.0	0.0	0.0	4.0E+0	4.0E+0	5.6E+0	0.0	0.0	0.0
Mn-54	0.0	0.0	2.0E-6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0E-6	0.0	0.0	0.0
Co-60	5.3E-2	5.0E-2	2.0E-2	0.0	0.0	0.0	3.0E-3	0.0	0.0	5.0E-2	5.0E-2	2.0E-2	0.0	0.0	0.0
Zn-65	0.0	0.0	2.0E-6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0E-6	0.0	0.0	0.0
Kr-85	0.0	0.0	5.8E-1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.8E-1	0.0	0.0	0.0
Br-90	0.0	0.0	1.1E-5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1E-5	0.0	0.0	0.0
Tc-99m	0.0	0.0	1.0E-6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0E-6	0.0	0.0	0.0
Rh-106	0.0	0.0	1.1E-5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1E-5	0.0	0.0	0.0
Cd-109	0.0	0.0	4.9E-4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.9E-4	0.0	0.0	0.0
Sr-113	0.0	0.0	2.0E-6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0E-6	0.0	0.0	0.0
Sb-125	0.0	0.0	1.0E-6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0E-6	0.0	0.0	0.0
Te-121	0.0	0.0	1.1E-7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1E-7	0.0	0.0	0.0
I-125	0.0	3.0E-1	5.0E-1	0.0	2.0E-3	1.0E-3	0.0	0.0	0.0	0.0	3.0E-1	5.0E-1	0.0	0.0	0.0
I-131	1.0E-1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0E-2	0.0	0.0	0.0	0.0	0.0
Co-137	5.0E-2	5.0E-2	2.0E-2	0.0	0.0	0.0	0.0	0.0	0.0	5.0E-2	5.0E-2	2.0E-2	0.0	0.0	0.0
Pm-147	0.0	0.0	9.0E-4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.0E-4	0.0	0.0	0.0
Ta-182	0.0	0.0	1.0E-6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0E-6	0.0	0.0	0.0
Tl-204	0.0	0.0	5.8E-5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.8E-5	0.0	0.0	0.0
Bi-210	0.0	0.0	1.0E-6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0E-6	0.0	0.0	0.0
Po-210	2.3E-5	0.0	4.0E-6	0.0	0.0	0.0	0.0	0.0	0.0	2.3E-5	0.0	4.0E-6	0.0	0.0	0.0
Ra-226	5.0E-3	0.0	1.0E-3	0.0	0.0	0.0	0.0	0.0	0.0	5.0E-3	0.0	1.0E-3	0.0	0.0	0.0
U-235	8.1E-1	4.6E-1	2.4E+0	0.0	0.0	0.0	0.0	0.0	0.0	8.1E-1	4.6E-1	2.4E+0	0.0	0.0	0.0
U-Depl.	4.9E-2	3.4E-3	8.3E-4	0.0	0.0	0.0	0.0	0.0	0.0	4.9E-2	3.4E-3	8.3E-4	0.0	0.0	0.0
U-Nat.	0.0	1.1E-5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1E-5	0.0	0.0	0.0	0.0
Pu-239	0.0	0.0	1.0E-6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0E-6	0.0	0.0	0.0
Am-241	2.5E-3	0.0	8.3E-1	0.0	0.0	0.0	0.0	0.0	0.0	2.5E-3	0.0	8.3E-1	0.0	0.0	0.0
Mixtures	1.0E+1	5.1E+0	9.6E+0	0.0	0.0	0.0	0.0	1.0E-3	6.4E+0	2.0E-3	1.0E-1	1.1E-1	1.0E+1	5.0E+0	3.0E+0
TOTAL	4.2E+3	1.1E+1	2.2E+3	0.0	9.0E-3	2.6E-2	7.0E-3	5.0E-3	6.6E+2	4.2E+3	6.2E+0	1.6E+3	1.0E+1	5.0E+0	3.0E+0

TABLE 6-8

ONSITE PROCESSING OF SHIPPED WASTE

Type of Facility	Number of respondents	Mechanical Compaction		Solidification/ Evaporation		Absorption	
		Number* using	Percent of total respondents	Number* using	Percent of total respondents	Number* using	Percent of total respondents
Medical	6	0	0.0	4	23.5	2	11.8
Educational	4	1	5.9	3	17.6	1	5.9
Industrial	5	0	0.0	3	17.6	5	29.4
Power Reactor	0	-	-	-	-	-	-
Governmental	2	1	5.9	1	5.9	1	5.9
TOTAL	17	2	11.8	11	64.7	9	52.9

*The total of "number using" exceeds the total number of respondents due to the use of several practices at each facility.

TABLE 6-9
SHIPPING CONTAINER USED

Type of Facility	Number of respon- dents	55-gal. drums		30-gal. drums		Others	
		Number* using	Percent of total respon- dents	Number* using	Percent of total respon- dents	Number* using	Percent of total respon- dents
Medical	5	4	22.2	0	0.0	4	22.2
Educational	5	4	22.2	0	0.0	1	5.6
Industrial	7	7	38.9	2	11.1	3	16.7
Power Reactor	0	-	-	-	-	-	-
Governmental	1	0	0.0	0	0.0	1	5.6
TOTAL	18	15	83.3	2	11.1	9	50.0

*The total of "number using" exceeds the total number of respondents due to several types of containers being used at some facilities.

TABLE 6-10

PHYSICAL FORM OF SHIPPED WASTE

Type of facility	Number of respondents	Dry		Moist/potential free liquid		Biological waste		Sealed sources		Other	
		Number of facilities	Percent of total respondents	Number of facilities	Percent of total respondents	Number of facilities	Percent of total respondents	Number of facilities	Percent of total respondents	Number of facilities	Percent of total respondents
Medical	6	3	15.8	5	26.3	2	10.5	0	0.0	2	10.5
Educational	5	3	15.8	3	15.8	3	15.8	1	5.3	1	5.3
Industrial	6	4	21.1	4	21.1	1	5.3	1	5.3	1	5.3
Power Reactor	0	-	-	-	-	-	-	-	-	-	-
Governmental	2	1	5.3	1	5.3	0	0.0	0	0.0	0	0.0
TOTAL	19	11	57.9	13	68.4	6	31.6	2	10.5	4	21.1

*The total of "number of facilities" exceeds the total number of respondents due to waste being in several forms at some facilities.

APPENDIX A
RADIOACTIVE MATERIAL LICENSEES
IN THE STATE OF WASHINGTON

EXPLANATION OF LIST OF LICENSEES

Column 1: Name and address as provided by the Washington Radioactive Materials Control Unit

Column 2: N indicates questionnaire was not delivered as evidenced by package being returned by postal service

Y indicates questionnaire was mailed and not returned by the postal service

Column 3: N indicates that no response to the written questionnaire was received

1 indicates the licensee did respond and provided all appropriate information

2 indicates the licensee did respond but provided only information on type of facility, disposal method, and quantity of waste

3 indicates the licensee did respond but provided only information on type of facility and disposal method

Column 4: M = Medical
E = Educational
I = Industrial
P = Power Reactor
G = Governmental
U = Unknown

Column 5: Y indicates the licensee ships wastes to a commercial disposal site

N indicates the licensee does not ship wastes

- indicates information not available

Licensee Name and Address	Questionnaire		Type of Facility	Ships Waste	Comments
	Delivered	Response			
ABAM Engineers, Inc. Attn: Donald C. Casad 1127 Port of Tacoma Road Tacoma, WA 98421	Y	2	I	N	
Max J. Allen, M. D. 230 Medical Center Building Spokane, WA 98202	Y	2	M	N	
Allenmore Community Hospital Attn: Kenneth E. Gross, M.D S. 19th and Union Tacoma, WA 98405	Y	2	M	N	
Altinay and Associates, Inc. Attn: Mr. S. S. Altinay 5241 South Graham Seattle, WA 98118	Y	2	I	N	No waste. Consultants.
AMFAC Foods Attn: W. R. Huaber West Industrial Tract Quincy, WA 98848	Y	N	I	-	
Am Test, Inc. Attn: Arthur D. Olsen 1450-114th Avenue S.E., Suite 120 Bellevue, WA 98004	Y	2	I	N	Source in gauges.
Anvil Chemical & Biological Testing Lab. Attn: George Griffith 1675 W. Bakerview Road Bellingham, WA 98225	Y	N	I	-	
Anvil Chemical & Biological Testing Lab. Attn: Wallace L. Rankin 1675 W. Bakerview Road Bellingham, WA 98225	Y	N	I	-	
Wm. G. Appleton, Jr., M.D. 355 N.W. Beach Road Seattle, WA 98177	Y	2	M	N	
Arvid Grant & Assoc., Inc. Attn: W. Roger Johnson 702 W. Lewis Pasco, WA 99301	N	-	I	-	
Associated Sand & Gravel Attn: John Lilly 6300 Glenwood Avenue Everett, WA 98203	Y	2	I	N	
Atlantic Richfield Company Attn: W. R. Powell P.O. Box 1127 Cherry Point Refinery Ferndale, WA 98248	Y	N	I	-	
Atlas Foundry and Machine Co. Attn: Warren Engle 3021 S. Wilkeson Street Tacoma, WA 98411	Y	2	I	N	
Auburn General Hospital Attn: Michael J. Spiger, M.D. 20 Second St., N.E. Auburn, WA 98002	Y	2	M	N	

Licensee Name and Address	Questionnaire		Type of Facility	Ship Waste	Comments
	Delivered	Response			
John D. Bagdade, M.D. Providence Hospital 500 17th Ave., Rm 664 Seattle, WA 98122	Y	3	M	Y	Waste collected through University of Washington.
John L. Bakke, M.D. 910 Boylston Seattle, WA 98104	Y	2	M	N	
Ballard Community Hospital Attn: George J. Stead, M.D. 5409 Barnes Ave., N.W. Seattle, WA 98107	Y	N	M	-	
Ralph Baltzo 3841 N.E. 87th Street Seattle, WA 98115	Y	2	I	Y	Waste broker.
L. H. Bates Voc-Technical Attn: B. L. Brainard 1101 South Yakima Avenue Tacoma, WA 98405	Y	2	E	N	
Battelle Pacific N.W. Laboratories Attn: T. W. Ambrose, Director Sequim Research Lab., Rt. 5, Box 10000 Sequim WA 98382	Y	1	I	Y	
Bellevue Radiology Consultants, Inc. Attn: Harry A. Grant, M.D. 1201 116th Avenue East Bellevue, WA 98004	Y	N	M	-	
Bellevue-Redmond Medical Lab Attn: Raymon Suen, M.D. 15690 N.E. 21st Street Bellevue, WA 98008	Y	1	M	N	
Bendix-Skagit Corporation Attn: Herb Reichert 500 Metcalf Street Sedro Woolley, WA 98284	Y	1	I	N	
Benton County Engineer Attn: Dale E. Bean, County Engineer Courthouse Annex Prosser, WA 99350	Y	N	G	-	
B.G.C., Inc. 5709 - 80th N.E. Mercer Is., WA 98040	Y	N	I	-	
Birchfield, Inc. Attn: Soren R. Johanson 1515 128th Place N.E. Bellevue, WA 98009	Y	N	I	-	
Skagit Valley Laboratories Attn: Ian Black, M.D. 1310 East Division Street Mt. Vernon, WA 98273	Y	1	I	N	
The Boeing Company Attn: W. E. Morgan Chief-Radiation Health Protection P.O. Box 3707 Seattle, WA 98124	Y	1	I	Y	

Licensee Name and Address	Questionnaire		Type of Facility	Ships Waste	Comments
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Boise-Cascade Corporation Attn: Donald Robinson Chambers Creek Road, P.O. Box W Steilacoom, WA 98358	Y	N	I	-	
Boise-Cascade Papers Attn: Ernest G. Paradis P.O. Box 500 Wallula, WA 99363	Y	2	I	N	
Bovay Engineers 808 East Sprague Avenue Spokane, WA 99202	Y	N	I	-	
Budinger Geotechnical Engineering 408 N. Pines Road Spokane, WA 99206	Y	2	I	N	
Builders Concrete, Inc. Attn: Wesley Sluys C and Maple Streets Bellingham, WA 98225	Y	2	I	N	
Burien Medical Lab. 15001 8th Avenue S.W. Seattle, WA 98166	Y	1	M	Y	Since 1978 waste disposed via Ralph Baltzo.
Cam Industries Attn: R. Clay Meyers 18250 68th Avenue South Kent, WA 98031	Y	N	I	-	
Canadian Arctic Survey Systems Attn: George S. Samchuck 108 S. Tower Avenue, Box 388 Centralia, WA 98531	Y	N	I	-	
Carborundum Company Attn: William Leiner 2550 N.W. Lower River Road, P.O. Box 291 Vancouver, WA 98660	Y	2	I	N	No waste.
Carnation Company Processed Potato Div. P.O. Box 587 Othello, WA 99344	Y	2	I	N	Sources in gauges.
Carnation Company Attn: John H. Walsh Rt. 2, Box 60C Moses Lake, WA 98837	Y	2	I	N	No waste.
Cascade Testing Lab., Inc. 14120 N.E. 21st Street Bellevue, WA 98007	Y	2	I	N	No waste.
Central Washington State College Attn: Bernard L. Martin School of Natural Science/Mathematics Ellensburg, WA 98926	Y	3	E	Y	
Chef-Reddy Foods Corporation North Broadway and Lee Roads P.O. Box 607 Othello, WA 99344	Y	2	I	N	Sources in gauges.

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Chem-Nuclear Systems, Inc. Attn: J. Stewart Corbett Yarrow Bay Office Park 10602 N.E. 38 Pl. Kirkland, WA 98033	Y	1	I	Y	They are a rad waste disposal service.
Chevron Chemical Co. Attn: G. E. Hopkins, Manager P.O. Box 6148 Kennewick, WA 99336	Y	2	I	N	No waste.
Children's Orthopedic Hospital and Medical Center Attn: Thomas G. Rudd, M.D. 4800 Sandpoint Way Seattle, WA 98105	Y	3	M	Y	Waste collected through University of Washington.
CIBA-GEIGY Corporation Attn: D. P. Ryskiewich Route 4, Box 4008-D Wapato, WA 98951	Y	2	I	N	
City of Aberdeen City Hall Aberdeen, WA 98520	Y	2	G	N	
City of Bellevue Attn: Eugene Hoffman 655-120th N.E. Bellevue, WA 98005	Y	2	G	N	
City of Bellingham Department of Public Works Attn: William J. Alexander 210 Lottie Street Bellingham, WA 98225	Y	2	G	N	
City of Kennewick Attn: Ronald B. McKinsey 210 West 6th Avenue Kennewick, WA 99336	Y	2	G	N	
City of Richland Attn: Bernie Stumbaugh 505 Swift Richland, WA 99352	Y	N	G	-	
City of Seattle, Eng. Dept. Attn: Hollis N. Phillips 707 South Plummer Seattle, WA 98134	Y	2	G	N	
City of Tacoma Attn: Lyman Ketcham 431 County-City Building Tacoma, WA 98402	Y	2	G	N	
Westside Sewage Treatment Plant Attn: Jim Highhouse 1800 Del Monte Way Vancouver, WA 98660	Y	2	G	N	
Clark County Dept. of Public Works Attn: Jan E. Rosholt, P.E. 1200 Franklin St. Vancouver, WA 98660	Y	2	G	N	
Clover Park High School Attn: Leland Weaver 11203 Gravelly Lake Drive, S.W. Tacoma, WA 98499	Y	N	E	-	

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Columbia Radiation Therapy Clinic Attn: Korth E. Bingham, M.D. 203 W. 8th Street Kennewick, WA 99336	Y	2	M	N	
Columbia River Red Cross Blood Ctr. Attn: Anthony P. Fappiano, M.D. 311 East D Street Yakima, WA 98907	Y	2	M	N	
Columbia Testing, Inc. Attn: Michael J. Shelly Port of Moses Lake Bldg. 2321 Moses Lake, WA 98837	Y	2	I	N	No waste, consultants.
Component Concepts, Inc. Attn: Howard McMahan 3229 Pine Street Everett, WA 98201	Y	3	I	N	
Converse, Davis and Assoc., Inc. Attn: Eugene R. McMaster 100 West Harrison Seattle, WA 98199	Y	N	I	-	
Cornell, Howland, Hayes & Merryfield 777 106th Avenue N.E. Bellevue, WA 98004	Y	N	I	-	
Cowlitz County Public Works Attn: James F. Thom 305 Church Street Kelso, WA 98626	Y	N	G	-	
Richard Croghan, M.D. 803 South 15th Mt. Vernon, WA 98273	Y	N	M	-	
Crown Zellerbach Corporation Attn: J. U. Kendall Pt. Angeles Mill-Ediz Hook Pt. Angeles, WA 98362	Y	N	I	-	
Crown Zellerbach Corporation Attn: Ronald E. Nowak Port Townsend Mill Pt. Townsend, WA 98368	Y	N	I	-	
Crown Zellerbach Corporation Central Research Division Camas, WA 98607	Y	2	I	N	
Dames and Moore Attn: K. H. Larson Suite 300 Northgate Exec. Bldg. Seattle, WA 97125	Y	2	I	N	No waste, consultants.
Dancontrol, Inc. Attn: D. A. Danielson 17 N.W. Alder Issaquah, WA 98027	N	-	I	-	
Davis-Sameh Laboratories, P.S. Attn: Stephen C. Erfurth, Ph.D. 120 East Birch Street, Suite 14 Walla Walla, WA 99362	Y	N	M	-	

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Dawn Mining Company Attn: Jack Thompson P.O. Box 25 Ford, WA 99013	Y	2	I	N	
Deacones Hospital Attn: Edwin E. Clizer, M.D. 800 W. 5th Avenue Spokane, WA 99210	Y	N	M	-	
J. B. Delashaw, M.D. 931 Fir Street Longview, WA 98632	Y	N	M	-	
David Derleth, M.D. 21616 76th, West Edmonds, WA 98020	Y	N	M	-	
Doctors Hospital Attn: Ralph C. Ellis, M.D. 909 University Seattle, WA 98101	Y	N	M	-	
Douglas County Road Department Attn: Richard B. Sele Courthouse at Adams & Walnut Sts. P.O. Box 100 Waterville, WA 98858	Y	2	G	N	
Eagle Construction Co. P.O. Box 195 Grand Coulee Dam Grand Coulee, WA 99116	Y	N	I	-	
Earth Consultants, Inc. Attn: Robert S. Livingston, P.E. 12893 NE 15th Place Bellevue, WA 98005	Y	2	I	N	No waste, consultants.
Eastern Washington State College Attn: Ronald J. White, Ph.D. Science Hall-Physics Department Cheney, WA 99004	Y	N	E	-	
Electrochemical Technology Corp. Attn: Theodore R. Beck, Ph.D. 3935 Leary Way N.W. Seattle, WA 98107	Y	2	I	N	
Neil J. Elger, M.D. 1221 Madison, Suite 501 Seattle, WA 98104	Y	2	M	N	
Environmental Engineering & Testing Attn: J. D. Ludwick, Ph.D. P.O. Box 1012 Richland, WA 99352	Y	2	I	N	
Evergreen State College Attn: Jacob B. Romero, Ph.D. Olympia, WA 98504	Y	N	E	-	
Exxon Nuclear Company Attn: W. S. Nechodom 2101 Horn Rapids Rd. Richland, WA 99352	Y	1	I	Y	Produces nuclear fuel.

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Exxon Company, U. S. A. 6311 E. Sharp Street Spokane, WA 99210	Y	2	I	N	
Fick Foundry Co. Attn: Theodore Fick 1005 E. "E" Tacoma, WA 98421	Y	N	I	-	
Food, Chemical and Research Labs Attn: Quinton P. Peniston 4900 9th N.W. Seattle, WA 98107	Y	N	I	-	
Fountain Veterinary Hospital Attn: Max E. Perry, D.V.M. 2430 Meridian Street Bellingham, WA 98225	Y	2	M	N	
Franklin County Road Dept. Attn: Al McCann County Courthouse Pasco, WA 99301	Y	N	G	-	
Fred Hutchinson Cancer Research Ctr. Attn: John Mills 1124 Columbia Street Seattle, WA 98104	Y	3	M	Y	Waste handled through University of Washington.
Michael A. Gass, M.D. 830 Pacific Bremerton, WA 98310	Y	N	M	-	
General Testing Laboratories 184 Jensen Way P.O. Box 1586 Poulsbo, WA 98370	Y	2	I	N	
George Maddox Associates 711 East Third Avenue Spokane, WA 99202	Y	N	I	-	
Georgia Pacific Corp. Attn: Robert N. Moore 300 Laurel Street Bellingham, WA 98225	Y	2	I	N	
Gonzaga University Attn: D. H. Thompson, Ph.D. 502 East Boone Avenue Spokane, WA 99202	Y	2	E	N	
Good Samaritan Hospital Dept. of Nuclear Medicine 407 14th Avenue, S.W. Puyallup, WA 98371	Y	2	M	N	
Grays Harbor Community Hospital Attn: Pekka Ahoniemi, M.D. 915 Anderson Drive Aberdeen, WA 98520	Y	2	M	N	
Grays Harbor Paper Company Attn: John E. McDonald, Production Super. 23rd and Railroad Hoquiam, WA 98550	Y	2	I	N	Sources in gauges.

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Griffin, McMillan, Paulsen, Griffin, & Hepworth, M.D. Attn: Arthur R. Griffin, M.D. 455 Medical/Dental Building Seattle, WA 98101	Y	N	M	-	
J. Trenholme Griffin, M.D. Providence Hospital 500-17th Avenue Seattle, WA 98122	Y	N	M	-	
Gross, Larson & Whitney, M.D.s Allenmore Medical Center 19th & Union Tacoma, WA 98405	Y	N	M	-	
Group Health Clinic & Hospital Attn: Tom W. Johnson, M.D. (2) 201 15th Avenue East Seattle, WA 98102	Y	2	M	N	
Haberman, Robertson & McNamara, M.D.s 1321 Colby Avenue Everett, WA 98201	Y	N	M	-	
Hart Crowser & Associates Attn: William R. Clevenger 1910 Fairview Ave. East Seattle, WA 98102	Y	2	I	N	
St. John's - Monticello Medical Hospital Attn: Dr. Phil H. Henderson, Jr., M.D. 790 14th Avenue Longview, WA 98632	Y	2	M	N	
Highline Community College Attn: Harold E. Brower 240th & Pacific Hwy. Midway, WA 98031	Y	N	E	-	
Evergreen General Hospital Attn: Kennan H. Hollingsworth, M.D. 1204 N.E. 128th Kirkland, WA 98033	Y	1	M	N	
Hollister-Steir Labs. Attn: John M. Rancour, Ph.D. 3525 North Regal Street Spokane, WA 99220	Y	N	I	-	
Holosonics, Inc. Attn: R. E. Wilsc 2950 George Washington Way Richland, WA 99352	N	-	I	-	
Holy Family Hospital Attn: A. G. Luris, M.D. 5633 North Lidgerwood Spokane, WA 99207	Y	2	M	N	
Hooker Chemical Co. Attn: D. J. Beardsley 605 Alexander Tacoma, WA 98422	Y	2	I	N	
Ideal Cement Company Attn: Fred Bauer 5500 W. Marginal Way Seattle, WA 98106	Y	N	I	-	

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Inco United States, Inc. Attn: Allen R. Foster 300 120th Ave., N.E., Bldg. 7, Suite 200 Bellevue, WA 98005	Y	N	I	-	
Interstate Industrial Laundry Attn: Waldo Garcia 1100 Perry Avenue Bremerton, WA 98310	Y	N	I	-	
Island Hospital 24th and M Streets Anacortes, WA 98221	Y	2	M	N	
Issaquah Group for Health and Environ. Research Attn: Ruth Shearer, Ph.D. 1595 N.W. Gillman Issaquah, WA 98027	Y	1	M	Y	Ships waste via Ralph Baltzo.
ITT-Rayonier, Inc. Attn: D. C. Robertson Pt. Angeles Division Pt. Angeles, WA 98362	Y	2	I	N	
I.T.T. Rayonier, Inc. Grays Harbor Division Attn: Dan Gatch 23rd & Railroad Hoquiam, WA 98550	Y	N	I	-	
ITT-Rayonier, Incorporated Attn: Richard J. Engen, Ph.D. Olympia Research Division Shelton, WA 98584	Y	1	I	Y	
J. A. Jones Construction Co. Attn: L. R. Thompson 801 First Street Richland, WA 99352	Y	2	I	N	
Joint Center For Graduate Studies Attn: Peter K. Shen, Ph.D. 100 Sprout Road Richland, WA 99352	Y	1	E	Y	
Kadlec Hospital Attn: Thomas D. Mahony M.D. 888 Swift Boulevard Richland, WA 99352	Y	N	M	-	
Kaiser Aluminum and Chemical Corp. Attn: Floyd Soderstrom Trenton Works Spokane, WA 99207	Y	N	I	-	
Robert A. Kallsen, M.D. 419 L, South Tacoma, WA 98405	Y	N	M	-	
King County Central Blood Bank Attn: Sherril J. Slichter, M.D. Terry at Madison Seattle, WA 98104	Y	N	M	-	
King County Dept. of Public Works Soils and Materials Lab Attn: Larry D. Bishop, Materials Engineer 7735 Leary Way N.E. Seattle, WA 98104	N	-	G	-	

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Kirk Dial and Crystal Co. Attn: Carroll Gilson 4th and Pike Bldg., Rm 625, 1424-4th Ave. Seattle, WA 98101	Y	N	I	-	
Kitsap Radiology Associates 2520 Cherry Bremerton, WA 98310	Y	2	M	N	
Kittitas County Dept. of Public Works Attn: Bob Say Kittitas County Courthouse 5th and Main Ellensburg, WA 98926	Y	2	G	N	
Lamb Weston Attn: Gordon Douthit 2013 Saint Street Richland, WA 99352	Y	2	I	N	
Lamb-Weston, Inc. Attn: David Phelps Industrial Park Connell, WA 99326	Y	2	I	N	
James D. Lambing South 19th & Union Tacoma, WA 98405	Y	N	U	-	
Latenser Engineering Great Western Building Spokane, WA 99201	Y	N	I	-	
Laucks Testing Labs. Attn: G. F. Anderson 1008 Western Avenue Seattle, WA 98104	Y	N	I	-	
John M. Leonard, M.D. 801 Broadway Seattle, WA 98122	Y	2	M	N	
The Radiology Group 555 108th Avenue N.E. Bellevue, WA 98004	Y	1	M	N	
Life Systems, Inc. Attn: W. E. Matheson 1776 Fowler Richland, WA 99352	N	-	I	-	
Lockheed Shipbuilding and Const. Co. Attn: R. A. Smith 2929 16th Avenue Seattle, WA 98134	Y	N	I	-	
Lone Star Industries, Inc. Attn: W. R. McClinton 3801 E. Marginal Way South Seattle, WA 98134	Y	1	I	N	
Longview Fiber Co. Attn: S. D. Eggleston P.O. Box 639 Longview, WA 98632	Y	2	I	N	Sources in gauges.

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The Mason Clinic Attn: Kenneth D. Moores, M.D. 1100 9th Avenue Seattle, WA 98101	Y	N	M	-	
Mason General Hospital 2100 Sherwood Lane Shelton, WA 98584	Y	N	M	-	
Material Consultants International 211 Williams Richland, WA 99352	N	-	I	-	
Medical Center Laboratory Attn: Fredrick E. Geisert, M.D. 1114 West Spruce Yakima, WA 98902	Y	N	M	-	
Michener and Associate Attn: Gary D. Barichello 1816 N. Chase Pasco, WA 99301	Y	N	I	-	
Mid-Columbia Veterinary Clinic Attn: Jerry A. Harsch, D.V.M. 415-1/2 East Broadway Goldendale, WA 98620	Y	2	M	N	
Mid-Valley Hospital Attn: Leon T. Davis, M.D. 810 Valley Way Omak, WA 98841	Y	2	M	N	
M & M Service Corp. Attn: Terry D. Smith RSO 303 Casey Richland, WA 99352	Y	N	I	-	
Mobile Oil Corporation Attn: Stanley K. Johann Box 8 Ferndale, WA 98248	Y	2	I	N	
William E. Morgan, 6521 Beach Drive S.W. Seattle, WA 98118	Y	2	G	N	No waste. Health physics consultant.
Municipality of Metro/Seattle Attn: Roman J. Gerstner 410 West Harrison Street Seattle, WA 98119	Y	2	G	N	
MWM Nuclear Medical Services Attn: Raymond Marty, M.D. 6401 Lake Wn. Boulevard, N.E. Suite 308 Seattle, WA 98109	N	-	M	-	
NIX Testing Attn: Darrel R. Reynolds 286 Wellsian Way Richland, WA 99352	Y	N	I	-	
Northern Pacific Paper Corp. Attn: James A. Freeling Industrial Way Longview, WA 98632	Y	N	I	-	

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Northern Testing Labs, Inc. Attn: Leon Lindbloom 2200 North 4th Avenue Pasco, WA 99301	Y	2	I	N	Sources in gauges.
Northgate General Hospital Attn: Arthur K. Harris, M.D. 120 Northgate Plaza Seattle, WA 98125	Y	N	M	-	
Northwest Alloys Attn: Robert C. Geiger, R.S.O. Addy, WA 99101	Y	N	I	-	
Northwest Eye Clinic Attn: Robert F. Kaiser, M.D. 1130 Forest Bellingham, WA 98225	Y	2	M	N	
Northwest Medical Physics Center, Univ. of Washington Attn: Douglas Jones RC-08 University of Washington Seattle, WA 98105	Y	1	E	Y	
Northwest Memorial Hospital Attn: Arthur K. Harris, M.D. 1551 North 120th Seattle, WA 98133	Y	N	M	-	
Northwest Radiologists, Inc. 1800 C Street Bellingham, WA 98225	Y	2	M	N	
Northwest Steel Rolling Mills Attn: Oscar Vaskmitz 4315 9th Ave. N.W. Seattle, WA 98107	Y	N	I	-	
Nuclear Pacific, Inc. Attn: Thomas A. Beach 6701 Sixth Avenue South Seattle, WA 98108	Y	2	I	N	
N.W. Radiological Associates 411 Strander Boulevard Seattle, WA 98118	Y	N	M	-	
N.W. Washington Radiation Oncology Associates, P.C. North Puget Sound Radiation Therapy Center. 3217 Squallicum Parkway Bellingham, WA 98225	Y	1	M	N	
David D. O'Hara, M.D. 3912 Colby Avenue Everett, WA 98201	Y	N	M	-	
Olympic Anesthesia Services, Inc. Attn: Arne Dahl, M.D. 900 Sheridan Road, #109 Bremerton, WA 98310	Y	2	M	N	
Olympic Foundry Attn: Baji Bathena 5200 Airport Way S. Seattle, WA 98108	Y	N	I	-	

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Olympic Memorial Hospital Attn: K. A. Lustig, M.D. 939 Caroline Street Pt. Angeles, WA 98362	Y	N	M	-	
Olympia Radiological Associates, Inc., P.S. Attn: Henrick Stigglebout, M.D. 3525 Ensign Road Olympia, WA 98506	Y	N	M	-	
John W. Ormsby, M.D. 1200 Harvard Avenue Seattle, WA 98122	Y	2	M	N	
Our Lady of Lourdes Nuclear Medical Services Attn: Elena E. Icayan, M.D. 520 N. 4th Pasco, WA 99301	Y	2	M	N	
Overlake Memorial Hospital Attn: Douglas R. Currin, M.D. 1035 166th N.E. Bellevue, WA 98004	Y	N	M	-	
Pacific Engineering Inspection 9420 6th, S.W. Everett, WA 98020	Y	N	I	-	
Pacific Lutheran University Attn: Burton L. Nasset, Ph.D. Park and South 121st Streets Tacoma, WA 98447	Y	3	E	Y	
Pacific Northwest Labs Attn: L. A. Carter Battelle Boulevard Richland, WA 99352	Y	N	I	-	
Pacific Powder and Pipe Supply Attn: William H. Garson, Jr. Route 4, Box 265-A Olympia, WA 98502	Y	2	I	N	
Pacific Testing Labs. Attn: Robert L. Pelton 3220 17th Avenue West Seattle, WA 98119	Y	N	I	-	
Pacific Wood Treating Corporation Attn: Alan Shum 111 West Division Street Ridgfield, WA 98642	Y	1	I	N	
Pathology Associates, Inc. Attn: Larry K. Hatch, M.D. 5901 North Lidgerwood Spokane, WA 99201	Y	N	M	-	
Pathologists Central Laboratory 1100 East Union Street Seattle, WA 98122	Y	2	M	N	
Pennwalt Corporation Attn: Richard E. Carlson 2901 Taylor Way Tacoma, WA 98421	Y	1	I	Y	

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Elmer Perkin-(Thomas K. Brown) 16 So. Grady Way Renton, WA 98055	Y	N	U	-	
Peter Kiewit Son's Company Attn: Carl F. Jonasson 215 South V Street Vancouver, WA 98663	Y	N	I	-	
Airpro Equipment Inc. East 3920 Boone Avenue P.O. Box 4217 Spokane, WA 99202	Y	2	I	N	
Pierce County Public Works Attn: Richard P. Raymond 1033 County City Building 930 Tacoma Avenue, South Tacoma, WA 98402	Y	2	G	N	
Pittsburgh Testing Labs Attn: Joseph Thomas 130 North Stone Spokane, WA 99202	Y	N	I	-	
Pittsburgh Testing Labs. Attn: Kingsley Drake 826 N.W. 49th Seattle, WA 98107	Y	2	I	N	Sources in gauges.
Port of Seattle Attn: Henry Hanson Bell Street Terminal, P.O. Box 1209 Seattle, WA 98111	Y	N	G	-	
Preston L. Shephard & Assoc. Attn: Dennis J. Whitcher 801 Summitview, P.O. Box 2126 Yakima, WA 98902	Y	N	I	-	
Dr. John E. Flynn Cancer Center Attn: Herbert C. Berry, M.D. P.O. Box 1067 Everett, WA 98201	Y	1	M	N	
Providence Hospital Attn: J. Trenholme Griffin, M.D. 500 17th Avenue Seattle, WA 98122	Y	N	M	-	
Puget Sound Blood Center Attn: Sherril J. Slichter, M.D. Terry at Madiso. Seattle, WA 98104	Y	2	M	N	
Puget Sound Hospital Attn: Robert F. Kapelowitz, M.D. 215 South 36th Street Tacoma, WA 98408	Y	N	M	-	
Puget Sound Power and Light Attn: Harold Lynch 10608 N.E. 4th Bellevue, WA 98009	Y	2	I	N	
R. L. Pulliam, Jr., M.D. 1703 Hudson Longview, WA 98632	Y	N	M	-	

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Quali Cast Corporation Attn: R. O. Heilmann 102 Sears Road, P.O. Box 976 Chehalis, WA 98532	Y	N	I	-	
Radewan, M. G., M.D. 601 Douglas Wenatchee, WA 99801	Y	N	M	-	
Radiology Associates, P.S. Attn: A. G. Luris, M.D. 5901 N. Lidgerwood Spokane, WA 99207	Y	N	M	-	
Rayesco, Inc. Attn: William P. Cotter 18920 36th Avenue, West Lynnwood, WA 98036	Y	2	I	N	
Rcid and Tanner, M.D.s 1011 116th Avenue N.E. Bellevue, WA 98004	Y	2	M	N	
Reynolds Metals Co. Reduction Plant Attn: Dean Mann 4029 Industrial Way Longview, WA 98632	Y	2	I	N	
Riverton Hospital Attn: Drs. Houk, Wold, Trunkey 12844 Military Road South Seattle, WA 98168	Y	N	M	-	
Howard G. Roberts, M.D. 342 Catherine Walla Walla, WA 99362	Y	N	M	-	
Rockwood Clinic Attn: Donald A. Schmutz, M.D. 312 West 8th Spokane, WA 99202	Y	N	M	-	
Sacred Heart Hospital Attn: Henry Arguinchona, M.D. 101 West 8th Spokane, WA 99202	Y	2	M	N	
Irwin Schiller, D.O. Southcenter Professional Plaza, Suite 107 Seattle, WA 98109	Y	N	U	-	
Scientia Research Labs. Attn: Leo N. Eskinazi 429 Westlake North Seattle, WA 98109	N	-	I	-	
Scott Paper Co. Attn: F. Dale Huillet 2600 Federal Way Everett, WA 98201	Y	3	I	N	
Searle Radiographics, Inc. 2001 22nd Avenue Seattle, WA 98103	Y	2	I	N	

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Seattle Central Community College Attn: Robert Tiny, President 1705 Broadway Seattle, WA 98122	Y	2	E	N	
Seattle General Hospital Attn: John Lee, M.D. 1309 Summit Seattle, WA 98122	Y	2	M	N	
Seattle Pacific College Attn: Hugh Nutley, Ph.D. 3rd Avenue West at West Nickerson Seattle, WA 98119	Y	2	E	N	
Seattle University Attn: Gary A. Zimmerman, Ph.D. Broadway and East Madison Seattle, WA 98122	Y	1	E	Y	
Shannon and Wilson Attn: George Yamane 1105 North 38th Seattle, WA 98103	Y	2	I	N	
William E. Sherrod, D.V.M. 7616 Custer Road Tacoma, WA 98467	Y	2	M	N	
Shoreline Community College Attn: Karen Kreutzer 16101 Greenwood Ave. N. Seattle, WA 98133	Y	2	E	N	
Steve D. Sibley 1203 - 114th Avenue, S.E. Bellevue, WA 98004	Y	N	U	-	
Rodney D. Skoglund, M.D. 14249 R. Ambaum Blvd., S.W. Seattle, WA 98134	Y	N	M	-	
Gene Smith, M.D. #3 Triangle Shopping Center Longview, WA 98632	Y	2	M	N	
Snohomish County Attn: James C. Isham County Administration Building Everett, WA 98201	Y	N	G	-	
Soiltest Farm Consultants Attn: Vaughn Hundsaker, Ph.D. 2925 Wapato Drive Moses Lake, WA 98837	Y	N	I	-	
Southwest Washington Hospitals Vancouver Memorial Hospital Attn: N. M. Helgason, M.D. 3400 Main Street, P.O. Box 1657 Vancouver, WA 98663	Y	N	M	-	
Spokane and Inland Empire Blood Bank Attn: G. W. Schneider, Jr., M.D. P.O. Box 1512 Spokane, WA 99210	Y	2	M	N	

Licensee Name and Address	Questionnaire		Type of Facility	Ships Waste	Comments
	Delivered	Response			
Spokane County Engineering Dept. Attn: Angelo Roman 811 North Jefferson Spokane, WA 99201	Y	2	G	N	
Spokane Falls Community College Attn: W. T. Ardiss 3410 West Ft. George Wright Drive Spokane, WA 99201	Y	2	E	N	
Spokane Valley General Hospital Attn: Joseph A. Tedesco, M.D. 12606 East Mission Avenue Spokane, WA 99216	Y	N	M	-	
Square D. Company 9840 - 40th Avenue South Seattle, WA 98124	Y	2	I	N	
St. Elizabeth Hospital Attn: Gayle F. Brewer, M.D. 110 South 9th Yakima, WA 98901	Y	2	M	N	
St. Frances Xavier Cabrini Hospital Attn: Gordon La Zerte, M.D. Terry and Madison Seattle, WA 98104	Y	3	M	Y	
St. John Hospital Attn: William J. Elton, M.D. 15th and Kessler Longview, WA 98632	Y	2	M	N	
St. Joseph Hospital Attn: William B. Jackson, M.D. 1718 South I Tacoma, WA 98401	Y	2	M	N	
St. Luke Hospital Attn: Peter J. Horn, M.D. 711 South Cowley Street Spokane, WA 99210	Y	2	M	N	
St. Mary Community Hospital Attn: Korth E. Bingham, M.D. 401 W. Poplar Walla Walla, WA 99362	Y	N	M	-	
St. Mary Community Hospital Attn: Donald M. Roser, M.D. 401 W. Poplar Walla Walla, WA 99362	Y	N	M	-	
St. Mary Community Hospital Attn: W. B. Howard, M.D. 401 W. Poplar Walla Walla, WA 99362	Y	N	M	-	
St. Peter Hospital Attn: William J. Mikkelsen, M.D. 413 North Lilly Road Olympia, WA 98501	Y	N	M	-	
St. Regis Paper Co. Attn: H. R. Hack 801 Portland Avenue, North Tacoma, WA 98421	Y	N	I	-	

Licensee Name and Address	Questionnaire		Type of Facility	Ships Waste	Comments
	Delivered	Response			
Standard Brands, Inc. Fleischman Mfg. Division 1115 Zehnder Avenue Sumner, WA 98390	Y	2	I	N	
Stanley A. D. Association Attn: Mr. Stanley P.O. Box 2468 1313 W. Clark Street Pasco, WA 99302	Y	N	I	-	
Washington State Dept. of Ecology 4350 - 150th N.E. Redmond, WA 98052	Y	2	G	N	
Washington State Department of Transportation Attn: Robert H. Gietz 2714 Mayfair Street Spokane, WA 99207	Y	2	G	N	
State Dept. of Highways; Dist. 4 Attn: Laurence J. Gadbois 4200 Main Street Vancouver, WA 98663	Y	2	G	N	
State Dept. of Social and Health Services Attn: Albert L. Robbins 1719 Springwater Wenatchee, WA 98801	Y	N	G	-	
Stevens Memorial Hospital Attn: Arthur G. Wirtala, M.D. 21600 76th Avenue, West Edmonds, WA 98020	Y	N	M	-	
Stoneway Concrete, Inc. Attn: R. J. Corrigan P.O. Box 509 Renton, WA 98055	Y	2	I	N	
Sunnyside General Hospital Attn: Robert A. Austin, D.O. 1319 Saul Road Sunnyside, WA 98944	Y	2	M	N	
Sunstrand Data Control Corp. Attn: Milton R. Knight Overlake Industrial Park, 148 N.E. 36th Redmond, WA 98052	Y	N	I	-	
Swedish Hospital Tumor Institute Attn: Raymond Marty, M.D. 1211 Marion Seattle, WA 98104	Y	N	M	-	
Tacoma General Hospital Attn: E. K. Prentice, President 315 South K Tacoma, WA 98405	Y	2	M	N	
Technical Research Co. 13535 Monster Road South Seattle, WA 98134	Y	1	I	N	
Texaco, Inc. Attn: Douglas E. Harris Puget Sound Plant, Box 622 Anacortes, WA 98211	Y	N	I	-	

Licensee Name and Address	Questionnaire		Type of Facility	Ship Waste	Comments
	Delivered	Response			
Skagit Valley Hospital Attn: T. A. Zimmermann, M.D. 1415 Kincaid Mount Vernon, WA 98273	Y	I	M	N	
Todd Shipyards Corporation Attn: W. J. Stevens 1801 - 16th Avenue S.W. Seattle, WA 98134	Y	N	I	-	
Tree Top, Inc. Attn: Dale Johnson 102 Railroad Avenue Selah, WA 98942	Y	2	I	N	
Tree Top, Inc. P.O. Box 1300 Wenatchee, WA 98801	Y	N	I	-	
Tucci & Sons, Inc. Attn: James M. Cooper 4224 Waller Road Tacoma, WA 98443	Y	2	I	N	
Twin City Foods Attn: Chuck Ashley 1107 Stacey Avenue Prosser, WA 99350	Y	N	I	-	
U & I Incorporated Attn: Max Anderson Wheeler Road Moses Lake, WA 98837	Y	N	I	-	
U & I Incorporated Attn: Terrell R. Tovey P.O. Box 2308 Pasco, WA 99301	Y	2	I	N	
United General Hospital Attn: Nicholas S. Muff, M.D. P.O. Box 410 Sedro Woolley, WA 98284	Y	2	M	N	
United Nuclear Industries, Inc. Attn: Tom Demmitt 1201 Jadwin Ave., #205 Richland, WA 99352	N	-	I	-	
University of Puget Sound Attn: Martin E. Nelson, Ph.D. North 15th and Warner Tacoma, WA 98416	Y	N	E	-	
U.S. Gypsum Company Attn: F. G. May, Works Manager 2301 Taylor Way Tacoma, WA 98421	Y	2	I	N	
U.S. Testing Co. Attn: M. M. Lardy 2800 George Washington Way Richland, WA 99352	Y	N	I	-	
Valley General Hospital Attn: Douglas R. Currin, M.D. 400 South 43rd Renton, WA 98055	Y	N	M	-	

Licensee Name and Address	Questionnaire		Type of Facility	Ships Waste	Comments
	Delivered	Response			
Virginia Mason Research Center Attn: James L. Lundstrom 1000 Seneca Street Seattle, WA 98101	Y	N	I	-	
Waldo General Hospital Attn: Charles Johnson, D.O. 10560 5th Ave. N.E. Seattle, WA 98125	Y	N	M	-	
Walla Walla Clinic Attn: John P. Conder, M.D. 55 West Tietan, P.O. Box 1597 Walla Walla, WA 99362	Y	2	M	N	
Walla Walla College Attn: Claude E. Barnett, Ph.D. Physics Department College Place, WA 99324	Y	N	E	-	
Washington Irrigation & Dev. Co. Attn: Roger A. Paul Route 2, Box 41 1015 Big Hanford Road Centralia, WA 98531	Y	N	I	-	
Washington State Dept. of Agriculture Attn: H. Dale Antles 110 Pierce Yakima, WA 98902	Y	2	G	N	
Washington State Dept. of Emergency Services Attn: David H. Guier 4220 East Martin Way Olympia, WA 98504	Y	2	G	N	
Washington State Department of Ecology (OAQC) Attn: Eldon N. Sanborn 4350 150th, N.E. Redmond, WA 98052	Y	2	G	N	
Washington State Department of Fisheries General Administration Building, Room 115 Olympia, WA 98504	Y	3	G	Y	
Washington State Dept. of Labor & Industries Attn: Bill McArthur 308 E. Fourth Avenue Olympia, WA 98504	Y	N	G	-	
Washington State Department of Transportation Highway Materials Laboratory Attn: Ronald Schultz Olympia, WA 98504	Y	2	G	N	
Washington State Department of Transportation Attn: John D. Belling 5720 Capitol Boulevard Tumwater, WA 98501	Y	2	G	N	
Washington State Department of Transportation 2809 North Main Street Union Gap, WA 98903	Y	1	C	N	
Washington State University Attn: Roger C. Brown, Ph.D. Pullman, WA 99163	Y	N	E	-	

Licensee Name and Address	Questionnaire		Type of Facility	Ships Waste	Comments
	Delivered	Response			
WA State Highway Department Attn: Ken Whalen 450 So. Spokane Street Seattle, WA 98105	Y	N	G	-	
State of Washington Department of Transportation 1551 No. Wenatchee Avenue Wenatchee, WA 98801	Y	2	G	N	
WA State Laboratory Smith Tower Seattle, WA 98105	Y	2	G	N	
WA State Radiation Control Program Attn: Robert C. Will, Supervisor Olympia, WA 98504	Y	2	G	N	
Charles R. Watts Co. Attn: Michael R. Farrow 4121-6th Avenue N.W. Seattle, WA 98107	Y	N	I	-	
Welk Bros. Metal Products, Inc. Attn: Theodore L. Prater P.O. Box 19099 25094 South Hayford Rd. Spokane, WA 99219	Y	2	I	N	
Wenatchee Valley Clinic Attn: John T. Jenkins, M.D. 820 N. Chelan Ave. Wenatchee, WA 98801	Y	2	M	N	
West Seattle General Hospital Attn: Arthur K. Harris, M.D. 2600 S.W. Holden Street Seattle, WA 98134	Y	N	M	-	
Western Supply Co. 506 2nd Avenue, Suite 415 Seattle, WA 98104	Y	2	I	N	
Western Nuclear, Inc. Attn: George Meenech P.O. Box 392 Wellpinit, WA 99040	Y	1	I	N	
Western Washington University Attn: John Turner, Ph.D. Physics Department Bellingham, WA 98225	Y	N	E	-	
Weyerhaeuser Co. Attn: J. H. Rediske 505 North Pearl Centralia, WA 98531	Y	N	I	-	
Weyerhaeuser Co., Kraft Pulp Mill Attn: N. T. Stratton, Instr. Sup. P.O. Box 1228 Everett, WA 98206	Y	N	I	-	
Weyerhaeuser Co. Attn: Bill Wade Pulp & Paperboard Division Longview, WA 98632	Y	2	I	N	

Licensee Name and Address	Questionnaire		Type of Facility	Ships Waste	Comments
	Delivered	Response			
Weyerhaeuser Co. Snoqualmie Falls Branch Box W Snoqualmie, WA 98066	Y	2	I	N	
Weyerhaeuser Co. Attn: Howard Stidham Technology Center Tacoma, WA 98401	Y	N	I	-	
Whatcom Pathology Lab and Blood Bank Attn: Robert P. Gibbs, M.D. 1800 C Street, Suite D-10 Bellingham, WA 98225	Y	N	M	-	
Whitman College Attn: James G. Pengra Physics Department Walla Walla, WA 99362	Y	2	E	N	
Whitworth College Attn: G. P. Erickson Spokane, WA 99218	Y	2	E	N	
Charles Wilson, D.O. 504 N. Naches Avenue Yakima, WA 98901	Y	N	U	-	
Edward M. Wood, Ph.D. 1718 South I Tacoma, WA 98405	Y	N	M	-	
Woodworth & Co., Inc. 1200 East D Street Tacoma, WA 98421	Y	2	I	N	
John L. Wright, M.D. 801 Broadway Seattle, WA 98122	Y	N	M	-	
X-Ray Incorporated Attn: Lee G. Connell 7500 Perimeter Road South Seattle, WA 98108	Y	2	I	N	
Yakima County Public Works Dept. Attn: Joseph Andreotti Room 408 Courthouse Yakima, WA 98901	Y	2	G	N	
Yakima Medical Laboratory Attn: Ivan Anderson 315 Holton Avenue Yakima, WA 98902	Y	N	M	-	
Yakima Valley Memorial Hospital Attn: Patrick C. Lynch, M.D. 2811 Tieton Drive Yakima, WA 98902	Y	N	M	-	
Yang Laboratory Attn: Norman Yang, Ph.D. 13240 Northrup Way #19B Bellevue, WA 98005	Y	N	M	-	

Licensee Name and Address	Questionnaire		Type of Facility	Ships Waste	Comments
	Delivered	Response			
CH2M Hill Attn: Alfred Grimm 1500 14th Avenue Bellevue, WA 98004	Y	I	I	N	
Lakewood General Hospital Attn: Edward Yurchick 5702 100th Street, S.W. Tacoma, WA 98499	Y	I	M	N	

APPENDIX B

STATE LAWS AND REGULATIONS APPLYING
TO RADIOACTIVE WASTE MANAGEMENT IN WASHINGTON

WASHINGTON LEGISLATION
CHAPTER 70.98 RCW
ON
NUCLEAR ENERGY AND RADIATION

70.98.010 DECLARATION OF POLICY. It is the policy of the State of Washington in furtherance of its responsibility to protect the public health and safety and to encourage, insofar as consistent with this responsibility, the industrial and economic growth of the state:

(1) To institute and maintain a regulatory program for sources of ionizing radiation so as to provide for (a) compatibility with the standards and regulatory programs of the federal government, (b) a single, effective system of regulation within the state, and (c) a system consonant insofar as possible with those of other states; and

(2) To institute and maintain a program to encourage widespread participation in the development and utilization of sources of ionizing radiation and atomic energy for peaceful purposes to the maximum extent consistent with the health and safety of the public.

70.98.020 PURPOSE. It is the purpose of this chapter to effectuate the policies set forth in RCW 70.98.010 by providing for:

(1) A program of effective regulation of sources of ionizing radiation for the protection of the occupational and public health and safety;

(2) A program to promote an orderly regulatory pattern within the state, among the states and between the federal government and the state and facilitate inter-governmental cooperation with respect to use and regulation of sources of ionizing radiation to the end that duplication of regulation may be minimized;

(3) A program to establish procedures for assumption and performance of certain regulatory responsibilities with respect to byproduct, source, and special nuclear materials;

(4) A program to permit maximum utilization of sources of ionizing radiation consistent with the health and safety of the public.

70.98.030 DEFINITIONS. (1) "Byproduct material" means any radioactive material (except special nuclear material) yielded in or made radioactive by exposure to the radiation incident to the process of producing or utilizing special nuclear material.

(2) "Ionizing radiation" means gamma rays and x-rays, alpha and beta particles, high-speed electrons, neutrons, protons, and other nuclear particles; but not sound or radio waves, or visible, infrared, or ultraviolet light.

(3) (a) "General license" means a license effective pursuant to regulations promulgated by the state radiation control agency, without the filing of an application, to transfer, acquire, own, possess, or use quantities of, or devices or equipment utilizing, byproduct, source, special nuclear materials, or other radioactive material occurring naturally or produced artificially.

(b) "Specific license" means a license, issued after application to use, manufacture, produce, transfer, receive, acquire, own, or possess quantities of, or devices or equipment utilizing byproduct, source, special nuclear materials, or other radioactive materials occurring naturally or produced artificially.

(4) "Person" means any individual, corporation, partnership, firm, association, trust, estate, public or private institution, group, agency, political subdivision of this state, any other state or political subdivision or agency thereof, and any legal successor, representative, agent, or agency of the foregoing, other than the United States Atomic Energy Commission¹, or any successor thereto, and other than federal government agencies licensed by the United States Atomic Energy Commission, or any successor thereto.

(5) "Source material" means (a) uranium, thorium, or any other material which the governor declares by order to be source material after the United States Atomic Energy Commission, or any successor thereto, has determined the material to be such; or (b) ores containing one or more of the foregoing materials, in such concentration as the governor declares by order to be source material after the United States Atomic Energy Commission, or any successor thereto, has determined the material in such concentration to be source material.

(6) "Special nuclear material" means (a) plutonium, uranium 233, uranium enriched in the isotope 233 or in the isotope 235, and any other material which the governor declares by order to be special nuclear material after the United States Atomic Energy Commission, or any successor thereto, has determined the material to be such, but does not include source material; or (b) any material artificially enriched by any of the foregoing, but does not include source material.

(7) "Registration" means registration with the state department of health² by any person possessing a source of ionizing radiation in accordance with rules, regulations and standards adopted by the department of health.

(8) "Radiation source" means any type of device or substance which is capable of producing or emitting ionizing radiation.

70.98.040 NUCLEAR ENERGY PROMOTION AND DEVELOPMENT. The department of commerce and economic development through the division of nuclear energy development, known as the office of nuclear energy development, is hereby designated as the agency of state government for the promotion and development of nuclear energy in this state and shall, in addition to the powers and duties otherwise imposed by law, have the following general powers and duties:

(1) To advise the governor and the legislature with regard to the status of nuclear energy research, development, and education, and to make recommendations to the governor and the legislature designed to assure increasing progress in this field within the state.

(2) To advise and assist the governor and the legislature in developing and promoting a state policy for nuclear energy research, development, and education.

(3) To sponsor or conduct studies, collect and disseminate information, and issue periodic reports with regard to nuclear energy research, development, and education and proposals for further progress in the field of nuclear energy, and the power to acquire land and facilities for such purposes is specifically delegated to the department.

(4) To foster and support research and education relating to nuclear energy through contracts or other appropriate means of assistance.

(5) To gather, maintain, and disseminate available information concerning appropriate sites throughout the state and the advantages of locating nuclear energy industries within the state.

(6) To keep the public informed with respect to nuclear energy development within the state and the activities of the state relating thereto.

70.98.050 STATE RADIATION CONTROL AGENCY. (1) The department of social and health services is designated as the state radiation control agency, hereinafter referred to as the agency, and shall be the state agency having sole responsibility for administration of the regulatory, licensing and radiation control provisions of this chapter.

(2) The secretary of social and health services shall be director of the agency, hereinafter referred to as the secretary, who shall perform the functions vested in the agency pursuant to the provisions of this chapter.

(3) The agency shall appoint a state radiological control officer, and in accordance with the laws of the state, fix his compensation and prescribe his powers and duties.

(4) The agency shall for the protection of the occupational and public health and safety:

- (a) Develop programs for evaluation of hazards associated with use of ionizing radiation;
- (b) Develop programs with due regard for compatibility with federal programs for regulation of byproduct, source, and special nuclear materials;
- (c) Formulate, adopt, promulgate, and repeal codes, rules and regulations relating to control of sources of ionizing radiation;
- (d) Advise, consult, and cooperate with other agencies of the state, the federal government, other states and interstate agencies, political subdivisions, and with groups concerned with control of sources of ionizing radiation;
- (e) Have the authority to accept and administer loans, grants, or other funds or gifts, conditional or otherwise, in furtherance of its functions, from the federal government and from other sources, public or private;
- (f) Encourage, participate in, or conduct studies, investigations, training, research, and demonstrations relating to control of sources of ionizing radiation;
- (g) Collect and disseminate information relating to control of sources of ionizing radiation; including:
 - (i) Maintenance of a file of all license applications, issuances, denials, amendments, transfers, renewals, modifications, suspensions and revocations;
 - (ii) Maintenance of a file of registrants possessing sources of ionizing radiation requiring registration under the provisions of this chapter and any administrative or judicial action pertaining thereto; and
 - (iii) Maintenance of a file of all rules and regulations relating to regulation of sources of ionizing radiation, pending or promulgated, and proceedings thereon.
- (h) In connection with any contested case as defined by RCW 34.04.010 or any other administrative proceedings as provided for in this chapter, have the power to issue subpoenas in order to compel the attendance of necessary witnesses and/or the production of records or documents.

70.98.070 ADVISORY COUNCIL ON NUCLEAR ENERGY AND RADIATION. (1) There is created an advisory council on nuclear energy and radiation, hereinafter referred to as the council, consisting of seven members appointed by the governor and serving at his pleasure. Membership on the advisory council shall include, but not be limited to, representatives from industry, labor, the healing arts, research and education. In addition

the secretary of social and health services and the directors of the department of labor and industries, department of agriculture, department of commerce and economic development, and the chairman of the inter-agency committee for outdoor recreation, or their successors, shall serve as ex officio members of the council. The governor shall designate from his appointees a member to serve as chairman of the council.

Members shall receive a compensatory per diem of twenty-five dollars for each day or portion thereof actually spent in attending their duties as members of the board and, in addition, they shall receive reimbursement for travel expenses as provided in RCW 43.03.060 as now or hereafter amended.

(2) The council shall:

(a) Review and evaluate policies and programs of the state relating to ionizing radiation.

(b) Make recommendations to the governor and furnish such advice as may be required on matters relating to development, utilization, and regulation of sources of ionizing radiation.

(c) Make an annual report to the governor.

(d) Review, after any agency, agencies, board or commission has held any public hearing required by this chapter or chapter 34.04 RCW prior to promulgation and filing with the code reviser, the proposed rules and regulations of the state radiation control agency and all other boards, agencies, and commissions of this state relating to use and control of sources of ionizing radiation to determine that such rules and regulations are consistent with rules and regulations of other agencies, boards, and commissions of the state. Proposed rules and regulations shall not be filed with the code reviser until sixty days after submission to the council unless the council waives all or any part of such sixty day period.

(e) When the council determines that any proposed rules or regulations or parts thereof are inconsistent with rules and regulations of other agencies, boards, or commissions of the state, the council will so advise the governor and the appropriate agency, agencies, boards or commissions, and consult with them in an effort to resolve any such inconsistencies.

(f) Have the power to employ, compensate, and prescribe the powers and duties of such individuals as may be necessary to properly carry out the duties of the council from whatever funds which may be made available to the council for such purpose, including the power to employ an executive secretary to perform the administrative functions of the council.

70.98.080 RULES AND REGULATIONS - LICENSING REQUIREMENTS AND PROCEDURE
- REGISTRATION OF SOURCES OF IONIZING RADIATION - EXEMPTIONS FROM REGIS-
TRATION OR LICENSING. (1) The agency shall provide by rule or regulation for general or specific licensing of byproduct, source, special nuclear materials, or devices or equipment utilizing such materials, or other radioactive material occurring naturally or produced artificially. Such rule or regulation shall provide for amendment, suspension, or revocation of licenses. Such rule or regulation shall provide that:

(a) Each application for a specific license shall be in writing and shall state such information as the agency, by rule or regulation, may determine to be necessary to decide the technical, insurance, and financial qualifications, or any other qualification of the applicant as the agency may deem reasonable and necessary to protect the occupational and public health and safety. The agency may at any time after the filing of the application, and before the expiration of the license, require further written statements and shall make such inspections as the agency deems necessary in order to determine whether the license should be granted or denied or whether the license should be modified, suspended, or revoked. In no event shall the agency grant a specific license to any applicant who has never possessed a specific license issued by a recognized state or federal authority until the agency has conducted an inspection which insures that the applicant can meet the rules, regulations and standards adopted pursuant to this chapter. All applications and statements shall be signed by the applicant or licensee. The agency may require any applications or statements to be made under oath or affirmation;

(b) Each license shall be in such form and contain such terms and conditions as the agency may by rule or regulation prescribe;

(c) No license issued under the authority of this chapter and no right to possess or utilize sources of ionizing radiation granted by any license shall be assigned or in any manner disposed of; and

(d) The terms and conditions of all licenses shall be subject to amendment, revision, or modification by rules, regulations or orders issued in accordance with the provisions of this chapter.

(2) The agency may require registration of all sources of ionizing radiation.

(3) The agency may exempt certain sources of ionizing radiation or kinds of uses or users from the registration or licensing requirements set forth in this section when the agency makes a finding after approval of the technical advisory board³ that the exemption of such sources of ionizing radiation or kinds of uses or users will not constitute a significant risk to the health and safety of the public.

(4) In promulgating rules and regulations pursuant to this chapter the agency shall, insofar as practical, strive to avoid requiring dual licensing, and shall provide for such recognition of other state or federal licenses as the agency shall deem desirable, subject to such registration requirements as the agency may prescribe.

70.98.090 INSPECTION. The agency or its duly authorized representative shall have the power to enter at all reasonable times upon any private or public property for the purpose of determining whether or not there is compliance with or violation of the provisions of this chapter and rules and regulations issued thereunder, except that entry into areas under the exclusive jurisdiction of the federal government, or security areas under the direct or indirect jurisdiction of the federal government, shall be effected only with the concurrence of the federal government or its duly designated representative.

70.98.100 RECORDS. (1) The agency shall require each person who possesses or uses a source of ionizing radiation to maintain necessary records relating to its receipt, use, storage, transfer, or disposal and such other records as the agency may require which will permit the determination of the extent of occupational and public exposure from the radiation source. Copies of these records shall be submitted to the agency on request. These requirements are subject to such exemptions as may be provided by rules.

(2) The agency may by rule and regulation establish standards requiring that personnel monitoring be provided for any employee potentially exposed to ionizing radiation and may provide for the reporting to any employee of his radiation exposure record.

70.98.110 FEDERAL-STATE AGREEMENTS - AUTHORIZED - EFFECT AS TO FEDERAL LICENSES. (1) The governor, on behalf of this state, is authorized to enter into agreements with the federal government providing for discontinuance of certain of the federal government's responsibilities with respect to sources of ionizing radiation and the assumption thereof by this state pursuant to this chapter.

(2) Any person who, on the effective date of an agreement under subsection (1) above, possesses a license issued by the federal government shall be deemed to possess the same pursuant to a license issued under this chapter which shall expire either ninety days after the receipt from the state radiation control agency of a notice of expiration of such license or on the date of expiration specified in the federal license, whichever is earlier.

70.98.120 INSPECTION AGREEMENTS AND TRAINING PROGRAMS. (1) The agency is authorized to enter into an agreement or agreements with the federal government, other states, or interstate agencies, whereby this state will perform on a cooperative basis with the federal government, other states, or interstate agencies, inspections or other functions relating to control of sources of ionizing radiation.

(2) The agency may institute training programs for the purpose of qualifying personnel to carry out the provisions of this chapter and may make said personnel available for participation in any program or programs of the federal government, other states, or interstate agencies in furtherance of the purposes of this chapter.

70.98.130 ADMINISTRATIVE PROCEDURE. In any proceeding under this chapter for the issuance or modification or repeal of rules and regulations relating to control of sources of ionizing radiation, the agency shall comply with the requirements of RCW 34.04.020.

Notwithstanding any other provision of this chapter, whenever the agency finds that an emergency exists requiring immediate action to protect the public health; safety, or general welfare, the agency may, in accordance with RCW 34.04.030 without notice or hearing, issue a regulation or order reciting the existence of such emergency and require that such action be taken as is necessary to meet the emergency. As specified in RCW 34.04.030, such regulations or orders shall be effective immediately.

70.98.140 INJUNCTION PROCEEDINGS. Notwithstanding the existence or use of any other remedy, whenever any person has engaged in, or is about to engage in, any acts or practices which constitute or will constitute a violation of any provision of this chapter, or any rule, regulation, or order issued thereunder, the attorney general upon the request of the agency, after notice to such person and opportunity to comply, may make application to the appropriate court for an order enjoining such acts or practices, or for an order directing compliance, and upon a showing by the agency that such person has engaged in, or is about to engage in, any such acts or practices, a permanent or temporary injunction, restraining order, or other order may be granted.

70.98.150 PROHIBITED USES. It shall be unlawful for any person to use, manufacture, produce, transport, transfer, receive, acquire, own, or possess any source of ionizing radiation unless licensed by or registered with, or exempted by the agency in accordance with the provisions of this chapter.

70.98.160 IMPOUNDING OF MATERIALS. The agency shall have the authority in the event of an emergency to impound or order the impounding of sources of ionizing radiation in the possession of any person who is not equipped to observe or fails to observe the provisions of this chapter or any rules or regulations issued thereunder.

70.98.170 PROHIBITION - FLUOROSCOPIC X-RAY SHOE FITTING DEVICES. The operation or maintenance of any x-ray, fluoroscopic, or other equipment or apparatus employing roentgen rays, in the fitting of shoes or other footwear or in the viewing of bones in the feet is prohibited. This prohibition does not apply to any licensed physician, surgeon, podiatrist, or any person practicing a licensed healing art, or any technician working under the direct and immediate supervision of such persons.

70.98.180 EXEMPTIONS. This chapter shall not apply to the following sources or conditions:

(1) Radiation machines during process of manufacture, or in storage or transit: *PROVIDED*, That this exclusion shall not apply to functional testing of such machines.

(2) Any radioactive material while being transported in conformity with regulations adopted by any federal agency having jurisdiction therein, and specifically applicable to the transportation of such radioactive materials.

(3) No exemptions under this section are granted for those quantities or types of activities which do not comply with the established rules and regulations promulgated by the Atomic Energy Commission, or any successor thereto.

70.98.190 PROFESSIONAL USES. Nothing in this chapter shall be construed to limit the kind or amount of radiation that may be intentionally applied to a person for diagnostic or therapeutic purposes by or under the immediate direction of a licensed practitioner of the healing arts acting within the scope of his professional license.

70.98.200 PENALTIES. Any person who violates any of the provisions of this chapter or rules, regulations, or orders in effect pursuant thereto shall be guilty of a gross misdemeanor.

70.98.210 RECOMMENDED LEGISLATION. The agency and the council shall study, formulate, and recommend to the legislature from time to time specific recommendations to further the purposes of this chapter.

70.98.900 SEVERABILITY - 1961 c 207. If any part, or parts, of this act shall be held unconstitutional, the remaining provisions shall be given full force and effect, as completely as if the part held unconstitutional had not been included herein, if any such remaining part or parts can then be administered for the declared purposes of this act.

70.98.910 EFFECTIVE DATE - 1961 c 207. The provisions of this act relating to the control of byproduct, source and special nuclear materials shall become effective on the effective date of the agreement between the federal government and this state as authorized in RCW 70.98.110. All other provisions of this act shall become effective on the 30th day of June, 1961.

70.98.920 SECTION HEADINGS NOT PART OF LAW. Section headings as used in this chapter do not constitute any part of the law.

APPENDIX C

REPRESENTATIVE LOCAL NEWSPAPER ARTICLES RELATED TO
RADIATION ISSUES AND RADIOACTIVE WASTE MANAGEMENT

The Seattle Times
Seattle, Washington
October 12, 1979

N-plant advisory ballot is illegal, says utility suit

by BOB LANE
Times staff reporter

Skagit County commissioners acted illegally in placing an advisory measure on nuclear-power plants on the November 6 general-election ballot, Puget Sound Power & Light Co. said yesterday.

The company, which wants to build two nuclear-power plants near Sedro Woolley, asked the Skagit County Superior Court to remove the proposition from the ballot.

If that cannot be done, the company said, the results of the voting should not be revealed until after the county's Board of Commissioners has acted on a company petition to renew a zoning contract for the site.

"The only effect of such a ballot proposition would be to give opportunity for more legal delays of the (nuclear) project," said John Ellis, Puget Power president.

"We have already spent almost six years at the process. The suit was filed to protect all of our customers. Each additional day this vitally needed resource is delayed means \$1 million to consumers for the cost of replacement power."

In documents filed with the court yesterday, the company said the commissioners' action in scheduling the advisory vote was illegal because the commissioners have no authority to call an advisory election.

The company also said that taking an advisory vote at a time when commissioners are required to judge the nuclear project "could prejudice their decision."

And, Puget Power said, "certain board actions constitute procedural irregularities and improprieties which violate the constitutional guarantee of due process."

Skagit County nearly five years ago approved a rezoning contract for the nuclear-power plants. It required the company to begin construction before the five-year contract expired at the end of this year.

Puget Power has not begun work. It has said it hopes to receive a limited work authorization from the Nuclear Regulatory Commission some time this fall, which would permit work to begin before the end of the year.

The regulatory commission's Atomic Safety and Licensing Board will reconvene a hearing on the Puget Power license request later this month. The session is expected to be prolonged because of debate over whether a plant-damaging earthquake could occur at or near the site.

The Spokesman-Review
Spokane, Washington
October 12, 1979

Legislators hear N-waste views

By ROBERT HARPER

Spokane-Review Climate Service

C-3
RICHLAND, Wash. — Sitting of a permanent resting place for highly radioactive nuclear wastes will be as much a political decision as a scientific one.

That was the assessment given Thursday to 62 Washington legislators by Dr. John Bredehoeft, U.S. Geological Survey geologist, at the first Legislative Workshop on Nuclear Waste Disposal Management.

Bredehoeft was one of 13 national and regional experts who sometimes disagreed sharply in the workshop sessions at the Joint Center for Graduate Studies about national nuclear waste policy.

While scientific research has attempted to examine the many questions about the long term disposal of radioactive wastes, Bredehoeft said questions always will exist about the best disposal process.

The role of the political system then will be to weigh the risks and select the most acceptable alternative, he said.

But Dr. Peter Montague, an environmental activist and fellow at the Princeton University Center for Energy and Environmental Studies, contended the federal government was moving much too fast to attempt to locate a permanent high level radioactive nuclear waste storage site.

Current federal plans indicate construction of a permanent high level nuclear waste storage site, which primarily would store extremely radioactive nuclear power plant fuel rods, would start about 1983 with completion by about 1993, said Dr. Raul A. Deju, director of the Rockwell Hanford Operations Basalt Waste Isolation Program.

Hanford currently stores high level nuclear waste resulting from the reservation's military weapons production and nuclear power plant operations. The reservation also has a Nuclear Engineering Co. Inc. commercial nuclear waste disposal site, now closed, which handles hazardous but low level radioactive waste such as paper, rags and clothing.

Montague said that the construction timetable for a permanent high level

nuclear waste storage site has been laid down before the U.S. Nuclear Regulatory Commission has established the radiation safety standards.

He went on to complain that Rockwell has been asked by the federal government to submit a feasibility report on a possible permanent high level nuclear waste storage site in basalt beneath the Hanford Reservation by 1981.

These deadlines do "not seem justified by the large gaps of knowledge that exist" about the long term storage of highly radioactive nuclear fuel rods, he said.

Montague asserted the timetables seem to represent an attempt to respond to the California law requiring a demonstration of the nuclear waste disposal system before a new nuclear power plant can be licensed in California.

Gene Cramer, Southern California Edison nuclear engineer, suggested that Washington legislators employ their own consultant to analyze the effectiveness of the Rockwell studies for the feasibility of a Hanford high level nuclear waste disposal site.

Another N-waste leak found in truck cargo

By ROBERT HARPER

Spokesman-Review Olympia Bureau

RICHLAND, Wash. — Another small leak of low level radioactive waste cargo destined for disposal at Hanford has been detected by state inspectors at the Interstate 90 entry point near Spokane.

The disclosure came as state agencies commented Friday on their responsibilities for nuclear waste management to 78 legislators attending the final day of the first Legislative Workshop on Nuclear Waste Disposal Management.

Washington State Patrol troopers have

manned the Spokane and Plymouth, Wash., entry points to inspect all truckloads of low level radioactive waste destined for Hanford for disposal after three trucks arrived at Hanford's commercial nuclear waste site earlier this month with defective equipment or leaking radioactive shipments.

The discovery of the three shipments prompted Gov. Dixy Lee Ray to indefinitely close the Nuclear Engineering Co. Inc. commercial low level nuclear waste site at Hanford and order inspections of all trucks entering the state with low level waste to be stored at the NECO site.

Capt. Larry Hart, commander of the WSP's weight control section, said troopers at the

Spokane entry point found a defective barrel Wednesday in a truckload of low level waste en route from Illinois to the NECO dump.

Inspection determined a liquid from the barrel had leaked out of the truck but had dried by the time the truck was examined at the Interstate 90 checkpoint just west of the Washington-Idaho border, said Terry Strong, head of the Department of Social and Health Services radiation and occupation health section.

Strong said the material in the defective barrel was radioactive pharmaceutical supplies but added that the dry salt left by the

N-waste

(Continued from page 1)

leaking liquid had such a low radiation level that state officials could not measure it.

The liquid "had apparently dried across the country" en route to Washington said Strong.

"We sent it on to Hanford and we buried it."

Hart said that 18 of the estimated 21 truckloads of low level radioactive waste enroute to Washington when the NECO site closed had entered the state.

Eleven of these 18 trucks had defective equipment, primarily defective brakes, he said.

Hart also said that the Tri-State Motor Transit Co., Joplin, Mo., one of the main haulers of low level radioactive waste, had halted a few shipments in Idaho to repair their trucks before they enter Washington and are inspected.

Some lawmakers on a tour of the NECO site Friday also sharply questioned the present handling of transuranics, nuclear waste which has very small concentrations of material which may remain in a radioactive state for thousands of years.

Rep. Dick Nelson, D-Seattle, asked NECO officials why such transuranics are not placed in the dump so that they could be retrieved to be reprocessed or placed in a more secure storage site.

Thomas Baer, NECO vice-president and chief safety officer, replied that the federal government had failed to supply requested information about the procedure and cost to retrieve transuranic nuclear waste, which federal officials ultimately want to store in a manner like high level waste resulting from weapons production and spent nuclear power plant fuel rods.

Alex G. Fremling, manager of the U.S. Department of Energy's Richland Operations Office which oversees the entire Hanford

Reservation, added that state officials were concerned that it would not be adequately paid to establish a retrievable process for transuranics at the NECO site.

Baer said the federal government has established no official policy on how to handle storage of transuranic waste or its possible cost.

In an earlier workshop discussion Friday on possible additional state legislation to control nuclear waste shipments and storage, Sen. R. Ted Bottiger, D-Tacoma, Senate Energy Committee chairman, said he wants his panel to examine the costs of waste storage and the de-commissioning of nuclear power plants.

Rep. John Martinis, D-Everett, House Transportation Committee co-chairman, said he wanted his committee to consider again a proposal to extend State Utilities and Transportation Commission regulations to private truck carriers which do not offer their services to all potential shippers.

N-waste at Hanford: The future may be now

The Seattle Times
Seattle, Washington
October 14, 1979

By HILL WILLIAMS
Times science reporter

There is a definite possibility, growing stronger each month, that a Hanford site will be selected as one of several permanent repositories for the nation's high-level nuclear waste.

If that happened, it would completely change within about 20 years the role Hanford plays in helping dispose of the nation's radioactive waste.

Today, Hanford is one of three sites in the nation for low-level waste. This material, typically large in volume but low in radioactivity, is buried in shallow trenches at Hanford. (The site was closed by Gov. Dixy Lee Ray because of violations in packaging and shipping regulations, but presumably will reopen eventually.)

But if Hanford becomes a permanent repository for high-level commercial waste, those low-level shipments would be supplemented by shipments of comparatively small volumes of material of extremely high radioactivity.

The waste would be formed into long-lasting glass or ceramic material, sealed in stainless steel and carried by rail in massive, shielded casks.

There could be thousands of shipments a year. And the Hanford area's economy would continue to boom with the resulting new jobs.

WITH THAT backdrop, 74 members of the Legislature attended a workshop in Richland Thursday and Friday for intensive briefings to prepare them for decisions on nuclear waste years in the future.

It was described as an effort unprecedented by any Legislature to gather information on such technical problems so far down the road.

When else has a legislative body faced decisions on a project that must be so long-lasting that another ice age must be considered likely? Or that a new geological episode of mountain building, or a meteorite impact, must be at least considered?

Yet, on the other hand, if Hanford finally passes all the tests now under way and is selected for a waste repository, the Legislature would be dealing with federal agencies with such an erratic and self-contradictory record in nuclear power over the past 20 years that it is difficult to find a five-year period that didn't see a major policy switch.

In general, the legislators listened carefully and asked penetrating questions. Only occasionally did frustration with the technicalities show.

During one exchange involving such terms as nanocuries and millirems (measures of radiation), the biosphere and background radiation, one legislator complained: "Does anyone here speak English?"

Material presented at the workshop generally was a rehash of a dispute that has split the nation over nuclear waste for a decade:

Has the federal government finally decided where it is going and does it know what it is doing in the difficult waste-management field? Or, stung by criticism that it has failed in 40 years to solve the nuclear-waste dilemma, is it merely on another zig of its zigzag path of past years?

TUNNELS mined out of solid rock in Gable Mountain near the center of the Hanford reservation have been completed, and testing will begin next spring to study the effects of heat and radiation on the rock.

The Department of Energy plans to decide by late 1981 whether it would be possible to bury wastes permanently in similar rock thousands of feet underground at Hanford. If the answer is yes, and no problems have been found yet, construction could begin by the mid-1990s.

But Dr. Peter Montague of Princeton University argued that the feasibility of the Hanford site could not possibly be determined by 1981.

"I am worried that the Hanford program is not driven by scientific investigation but by a law in California," Montague said.

California law prohibits further building of power reactors in that state until the nuclear-waste problem is solved.

"The (rock investigation) work at Hanford is good, but just starting," Montague said.

But most legislators, particularly those with technical backgrounds, seemed impressed with what they heard and saw of the rock studies. They were bused to Gable Mountain and walked down a long, sloping mine shaft to a hollowed-out room, which echoed with their voices but will soon be filled with instruments for testing.

A FREQUENT question by legislators was: "How would a repository at Hanford affect my constituents?"

John Burnham, a Battelle-Northwest scientist, gave them some numbers to chew on.

The biggest impact on the community, he said, would be during construction. Statistics indicate that 38 workers would lose their lives, one on the surface and 37 during mining.

Traffic accidents, mainly automobiles hit by waste shipments at railroad crossings, could be expected to kill five persons in the first 1,000 years of operation, Burnham said. The risk from radiation to the public from repository operations would be 5 to 10 times smaller than the traffic risk.

The real impact, he said, would be on city services to the new people and businesses that moved in. Another would be the dust involved in removing huge quantities of earth and rock from the mine.

"More dust is the last thing we need over here," Burnham said.

Despite the dust, Burnham said, he thought Richland residents, if convinced that adequate planning had been done, would accept a repository. He added that repository effects would be almost zero for persons — voters — more than 50 miles away.

MONTAGUE WARNED that considering nation-wide political opposition, "if the government succeeds in siting a deep repository, it would become the only one. I think there would be great difficulty in siting four or so repositories."

Todd LaPort, a political scientist from Berkeley, warned the legislators to think about the third or fourth generation down the road.

"If experience with a repository has been good for generations, it will be hard for people to realize the importance of being careful," he said. "Human follow-through is a big imponderable."

But federal planners say a repository, once filled and sealed, would require no care or maintenance, only measures to keep people from drilling into it inadvertently.

Critics of federal nuclear programs are not always flat-out opponents of nuclear power. Montague told legislators his interest in nuclear waste stems from his wife's cure from cancer.

To make sure that the disease has not recurred, he said, she must periodically take radioactive material so strong that the law requires that her excrement be collected, packaged and disposed of in special sites.

"I am not against nuclear technology," Montague said softly. "I am against its careless development."

Mitch Miller, flat tops, bologna — nuke

Nuclear Energy, age 35, hovered near death at Washboard Willie's beer tavern a few nights back.

Known affectionately as "Nukes" by friends, the once robust source of American technological pride was stricken at the tavern with an often fatal bug, Out-of-Fashion Fever.

Out-of-Fashion Fever has claimed other victims.

Mitch Miller, flat tops, bologna and banana sandwiches succumbed to the ailment, as, of course, did the Vietnam War.

Still, the fever's appearance at Washboard Willie's in Spokane surprised Nukes' friends.

Few states have treated Nukes better than Washington. Nukes brought prosperity to the region.

Even after taking ill at Three Mile Island, Washington Gov. Dixy Lee Ray has made Nukes feel at home in Washington — until now.

In the last few months grassroots carriers of anti-Nuke fever have infiltrated even nurse Ray's Eastern Washington ward.

Walla Walla's Nuclear Awareness Group recently picketed the Hanford atomic waste repository.

Protesters from Students Against Nuclear Energy demonstrated against the governor herself in Spokane.

A formal debate on the pros and cons of nuclear energy developed at a Whitworth College dorm only a few days ago.

Nukes' recovery room in Washington state has taken on the look of a terminal ward.

And nowhere was the fever more symbolic than at Washboard Willie's this week. It seems Out-of-Fashion Fever had trickled down to even the tavern-goers and cowboys.

A band called Wet Paint played Willie's. They sang some good tunes but only one brought the crowd to its feet. The song was "No Nukes is Good Nukes." It goes like this:

No Nukes is good nukes,
We don't want no meltdowns in our town;

TMI was a nice place,
Now it's spoiled for the human race;
Hershey's chocolate glows in the dark,

Radiation will find its mark;
Dixy Lee says its OK
But don't forget her last name is Ray;

There are two other verses along the same line but you get the idea. It was rock 'n' roll politics like the days of the 1960s and the "Fixin' To Die Rag" by Country Joe and the Fish.

When rock 'n' roll bands start talking no Nukes it's not science, it's culture.

Rock 'n' roll songs about nuclear energy means Out-of-Fashion Fever has grabbed people who have no idea of the difference between fission and fishin'. The arrival of "No Nukes is Good Nukes" signals that people in

even smaller cities have begun looking around and seeing who is for Nukes, who is against Nukes and lining up accordingly.

The lines are forming all around the country.

Missoula, Mont., last fall approved an ordinance banning any nuclear power plant from ever being built.

Golden, Colo., had a little pro-nuclear demonstration and voters in Texas said they didn't mind nuclear that much in 1978.

Rock musicians James Taylor, Carly Simon and Jackson Brown raised \$500,000 this September in what they called Concerts for a Non-Nuclear Future. Rolling Stone, Newsweek, Time and every paper in the country carried stories recently on the no-nuke work of Jane Fonda and Tom Hayden. They are names from People magazine and America can relate to that.

The frantic footwork of politicians from Jerry Brown on down wanting to lead the non-nuclear parade also illustrates how widespread the fever has become.

Washington House Co-speaker John Bagnariol is a prime example.

His office took a poll in June that suggested residents in the Evergreen State were becoming increasingly concerned about nuclear wastes accumulating at Hanford.

Once the poll showed which way the wind was blowing, Bagnariol called for a ban on further nuclear waste shipments into the state.

Out-of-Fashion Fever works fast and somewhat illogically. It gains legions who haven't studied the point being debated yet still join a side based on the perceptions of what their heroes and cultural leaders are doing.

Paul Klein of Wet Paint wrote "No Nukes is Good Nukes" in 10 minutes.

But that song has politicized more people than any 10 speeches by a politician.

In this regard, science is no match for Out-of-Fashion Fever. If the choice is rock stars or nuclear physicists, it will be no contest. People will rock on.

This irrational herding frustrates the pro-nuke crowd. They see Out-of-Fashion Fever as a hyped-up frenzy brought on by media.

But the germ really begins with a friendly environment.

Flat tops looked ridiculous. Bologna and banana sandwiches tasted bad. The Vietnam War was poorly received.

And nuclear power wouldn't be stricken by Out-of-Fashion Fever if Three Mile Island had not happened and if the promises of low-cost nuclear energy could be fulfilled.

The fever is rising now, carried on by a cultural momentum that threatens to make support of nuclear energy as square as a Kraft Caramel.

Nukes, ol' boy, do you have any last words?

Doubt over nuclear power rises in Soviet Union, too

MOSCOW (AP) — After years of little but praise for nuclear power in the Soviet Union, two top energy specialists have voiced serious doubts over the scope, safety and environmental consequences of this country's ambitious atomic power program.

Unless the program is radically altered, they say, more densely populated areas of European Russia may soon reach the limits of their "ecological capacity" to cope with new nuclear power stations.

They also caution it would be wrong to assume that safe and economical technologies have been developed for all aspects of the complex uranium-plutonium "fuel cycle."

Mikolai A. Dollezhal and Yuri Koryakin sounded the warning in an authoritative article published in last week's edition of Kommunist, the Soviet Communist Party's leading theoretical journal. Koryakin is an economist and Dollezhal is chief of a department of the Soviet Academy of Sciences that deals with energy production.

Western scientific sources in Moscow said they were astonished at the critical frankness of the article, which contrasted sharply with the upbeat tone typical of most nuclear power coverage in the government-controlled news media.

Although Soviet scientists have been known to express personal misgivings over atomic power privately, there is nothing in this country resembling an organized, public anti-nuclear lobby.

Soviet officials and the news media have tended to ascribe the anti-nuclear movement in the West to misinformed hysteria or

machinations by oil monopolies worried about a potential threat to their profits.

The Soviet Union's overall nuclear-fueled power capacity currently amounts to about one-quarter of the 50,000 megawatts of electricity that can be generated by atomic power stations in the United States.

But the Soviet press reports that at least 10 large nuclear plants are now under construction, with a projected capacity of more than 25,000 megawatts. Upon completion by the mid-1990s, they will boost total Soviet nuclear generating capacity above 35,000 megawatts, more than 10 percent of all electric power produced in this country.

In U.S. terms, that is enough electricity to power about 50 cities the size of Boston or St. Louis.

In their detailed 6,000-word article, Koryakin and Dollezhal balanced both praise and criticism of nuclear power.

They said modern atomic stations can produce power more economically than conventionally fired plants, reduce the expensive transporting of fossil fuels from distant sources to European Russia, and pollute the air less than plants burning coal or oil. And they asserted that in view of declining fossil-fuel reserves, "constructing the energy base of developed socialism is impossible without nuclear power."

At the same time, however, they raised a number of serious problems.

Delays in the development of "fast breeder" reactors, which produce more plutonium nuclear fuel than they consume but require complex fuel reprocessing facilities. "The previously forecast data for

creation of powerful, commercial-scale breeder reactor stations — the start of the 1980s — has been postponed, according to current estimations, until the end of this century," they said.

Technical reliability and safety. "It is obviously wrong to believe that guaranteed, reliable, economical, advanced and time-tested technologies have been created for all

production aspects of the external fuel cycle," including reprocessing.

The Seattle Times
Seattle, Washington
October 17, 1979

More Trojan N-plant opponents arrested

SALEM, Ore. — Five more members of the Trojan Decommissioning Alliance didn't have any more luck yesterday trying to get the Trojan nuclear power plant shut down permanently than did four of their cohorts the day before.

And all nine of them ended up in jail for their trouble.

The latest arrests came as the members again refused to leave a state office (the governor's) when business hours ended.

Four other members of the Trojan Decommissioning Alliance were arrested Monday when they refused to leave the offices of the state's Department of Energy.

The Seattle Times
Seattle, Washington
October 17, 1979

Hanford site closed till at least Nov. 6 — Ray

by LYLE BURT
Times Olympia bureau

OLYMPIA — Despite a federal offer to step up safety inspections of nuclear-waste shipments, the Hanford disposal site will not be reopened at least until November 6, Gov. Dixy Lee Ray said yesterday.

The closure will continue to apply to both out-of-state shipments and radioactive waste generated within the state, she said.

"I don't think it would be appropriate to open the site piecemeal," the governor said.

Her statements came after a two hour meeting with officials of the Nuclear Regulatory Commission, the federal Department of Transportation and the University of Washington.

One of the principal problems, Governor Ray said, is that in about half of the states, the N.R.C. does not have jurisdiction over the handling of nuclear waste.

She said a procedure is being developed with Govs. Richard Riley of South Carolina and Robert List of Nevada by which the three states, which have the only low-level waste-disposal facilities in the nation, could exercise control of waste shipments from those states.

The procedure, expected to be worked out within a few days, would require those states to sign

certificates of compliance guaranteeing that their shipments meet federal safety regulations.

It will be discussed when the three governors meet with N.R.C. officials in Washington, D.C., November 6, Governor Ray said.

William Dirks, director of nuclear material, safety and safeguards for the N.R.C., said his agency recently had expanded its authority.

"We are prepared to step up our inspections for proper packaging," he said.

"We talked about the governor providing us with definite information on where violations are occurring, and then we'll take action," he said of yesterday's meeting.

"We have enough authority to take action against states with N.R.C. agreements."

Governor Ray shut down the privately operated Hanford site October 4 because three trucks carrying out-of-state nuclear waste were found to have either defective equipment or leaking containers.

Governor Ray said yesterday's discussions centered on how waste shipments are packaged and made, where enforcement authority lies and what the various agencies can do to assure proper packaging and shipment. The officials also discussed the new contract the state is negotiating with Nu-

clear Engineering Co., operator of the Hanford site.

"We received assurance from N.R.C. of assistance."

Asked about the radioactive waste that is accumulating at the University of Washington Hospital, the Hutchinson Cancer Research Center and other facilities in the state, the chief executive replied:

"I understand there is some inconvenience, but I believe the situation is not truly critical. Most places where they use radioactive materials have some facilities for keeping the waste on site."

She said the field of medicine is most seriously affected by the Hanford closure.

Dr. Wil B. Nelp, head of the division of nuclear medicine at the U.W., said that the Hutchinson Center has a storage problem.

"But, I think it is of no danger to health," Dr. Nelp said.

"I think the medical community is supportive of the governor's position," Dr. Nelp said, adding that the profession can live with the November 6 date.

Dr. Nelp said the discussions were preliminary and no firm conclusions were reached.

"We talked about what the federal agencies can do and what the state can do to help with the (waste) transportation problem," he said.

(Earlier story, D 7)

The Spokesman-Review
Spokane, Washington
October 17, 1979

Cream, sugar, nuclear power

By RICK BONINO

Spokesman-Review staff writer

This Thursday evening, Judy Long and about 20 of her friends and neighbors will get together at her Spokane home, drink some coffee and talk about nuclear power.

That's hardly a typical topic for a coffee klatch. But the scene will be repeated thousands of times across the country as Nuclear Energy Women sponsor their first Nuclear Energy Education Day.

The day's scheduled events range from a mass relay race in California to a Washington, D.C., luncheon for congressional wives at which Margaret McCormack, wife of Eastern Washington Democrat Mike McCormack, will be hostess.

Still, most of the sessions will consist of informal discussions in private homes such as Mrs. Long's. And Mrs. Long, a Washing-

ton Water Power Co. public relations person, expects her gathering will be the only one this side of McCormack's home in Richland, Wash.

It seems a lot of people don't care one way or the other about nuclear power. While she's worked for WWP for three years, Mrs. Long hasn't paid that much attention to it herself until just recently.

"I'm still very, very, very new at this," she said Tuesday. "Now, I almost feel like a sponge, soaking up information wherever I can."

She soaked up a lot last month at the annual conference of Nuclear Energy Women in Richland, where she first contacted the women's group and then toured the nuclear power plant there.

Seeing how much power could be generated, the amount of waste produced compared to other sources,

it was very impressive," Mrs. Long said of her visit to the Hanford reservation.

"Sometimes, doesn't it just seem like everything is hopeless?" she continued. "It seemed like here was some hope."

Ever since, she's been climbing higher on the nuclear power bandwagon, joking that her family is "bored stiff" with her discoveries.

But Mrs. Long thinks the nation's energy future is nothing to yawn about.

"I like to go to the light switch, turn it on and have the light go on," she said.

National NEW Chairwoman Ruth Faulkner puts the problem in a perspective more meaningful to women, one Mrs. Long heartily supports.

"The use of electricity in the home has been one of the principal factors in liberating women, allowing them to develop their own interests and lifestyles," Ms. Faulkner said.

There'll be at least one man at Mrs. Long's home Thursday, a former Hanford employee named Bob Mansfield who now works at WWP. She said Mansfield will provide some basic information.

"We believe the decision (on nuclear power) should be based on facts, not hysteria," Mrs. Long said.

Test-ban treaty could close Nevada nuclear test site

LAS VEGAS — (AP) — From a passing car, clues are few. Craters gape here and there. An occasional sign, prominently posted on a fence, warns of radioactivity.

It is the desolate Nevada Test Site, a scant two-hour drive from the bustling Las Vegas Strip and the scene of some of the world's most awesome displays of military might.

Sprawled over 1,350 square miles of arid, sage-dotted desert and rugged mountains — an area roughly the size of Rhode Island — the test site since 1951 has been jarred, shaken and battered by 543 of the 670 nuclear tests announced by the government. Not all tests are announced.

The power unleashed in 28 years of nuclear tests is beyond comprehension. At least four of the warheads have been in the 1-megaton range — equivalent to a million tons of high explosive.

The total high-explosive yield from the rest of the shots is between 11 million tons and 30 million tons. The exact figure is classified. When the Department of Energy announces a test now, it usually says only that the warhead had a yield of 20-150 kilotons.

BY COMPARISON, a single Soviet atmospheric test on October 30, 1961, had a yield of 58 megatons — 58 million tons of high explosive, the largest nuclear test ever conducted.

Nuclear blasts here would come to a halt if accord is reached in the ongoing test-ban negotiations among the United States, the So-

viet Union and Britain. But Mahlon Gates — the former Army brigadier general who heads the test site — says it will be kept ready.

The Department of Energy would have "to maintain a capability for returning to underground tests" even if a comprehensive test-ban treaty is approved, Gates said.

"We would be required to return just as a precaution if the other side, for example, violated the treaty and returned to testing," he said. "And I presume that there are other scenarios that one could develop that might cause the United States, for its own best interests, to return to nuclear testing."

Gates believes chances of approval of a test ban will improve if the embattled strategic-arms-limitation treaty is ratified.

"I think the prospects of reaching an agreement with Russia are relatively high if the Senate ratifies SALT II," he said. "Failure of ratification of SALT II, I would say, would cast some doubt on the probability of reaching an accord on a comprehensive test-ban treaty."

The test shots are conducted for a variety of reasons, Gates said in an interview. While a "tremendous amount of work" is done in laboratories to perfect nuclear devices, "the bottom line still must be carried out — and that is the actual test. One does not have sufficient confidence yet in simulated testing to preclude the necessity for actual testing."

All the tests are expensive, he

said, ranging from a low of \$1.5 million to as much as \$50 million. "There is no average," he added.

Gates administers a \$225 million budget and heads a work force of more than 5,000 persons, ranging from nuclear physicists to the well drillers and hard-rock miners who bury the warheads deep underground.

Gates said that if nuclear testing is banned it would cost 800 to 1,200 jobs.

Gates said the job gaps left by a test ban might be filled by other projects, such as the "nuclear-garbage dump" for low-level radioactive waste now operated at the site by the Energy Department. The waste, from various government facilities, is buried in trenches.

THE TEST SITE also is under consideration as a site for disposing of high-level radioactive waste — spent fuel rods from power plants. A research project aimed at determining the best methods of storing the rods is now under way at the site.

Since 1962, all tests have been conducted underground. Earlier atmospheric tests, chiefly those conducted in the mid-1950s, sent

radioactive fallout drifting across Southern Nevada, Southern Utah and Northern Arizona. About 600 claims have been filed by families of persons stricken with various forms of cancer possibly linked to the fallout.

The underground tests boast a relatively clean safety record. However, 21 shots have accidentally "vented" radioactivity. One federal lawsuit, reporting two test-site workers died of cancer due to radiation from one such incident, was tried earlier this year and has been taken under submission by a judge.

Gates said a "containment evaluation panel" considers all upcoming underground tests to gauge the chances for an escape of radioactive gas. "We wouldn't detonate unless that . . . panel recommends that we do detonate," he said.

Ray keeps N-waste site closed

By ROBERT HARPER

Spokesman-Review Olympia Bureau

OLYMPIA — Hanford's low level commercial nuclear waste disposal site likely will remain closed until at least Nov. 6, Gov. Dixy Lee Ray said Tuesday.

Ray made the comment after talking privately for about two hours with federal officials about stricter enforcement of the transportation and packaging of low-level nuclear wastes.

The governor closed the Hanford disposal site, which is one of three commercial disposal grounds in the country, last Oct. 4 after inspections found three waste shipments which had leaked or had been transported in defective truck equipment.

Ray said there was no possibility that the Hanford disposal site, which is operated under state license by the Nuclear Engineering Co. Inc., could reopen before her Nov. 6 Washington, D.C., meeting with the U.S. Nuclear Regulatory Commission.

This November meeting also will include the governors of South Carolina and Nevada, where the nation's two other commercial low level nuclear waste sites are located.

"We are moving as quickly as we can," said Ray of (state) proposals to improve inspections of low-level nuclear waste shipments.

"My guess is that we should have the (state's) certification plan (for low level nuclear waste shipments) pretty well worked out in the next few days," the governor said.

She added that she did not consider it appropriate to open the Hanford commercial nuclear disposal site on a "piecemeal" basis to allow Washington State producers of nuclear waste to use the Hanford site before out-of-state producers could do so.

Dr. Wil Nelt, head of the University of Washington nuclear medicine division, said the Hanford commercial dump site closure was an inconvenience but that Nov. 6 would be "an ideal date" for its reopening.

He said that a long term closure of the Hanford disposal site would present a problem of the storage of nuclear wastes at a facility such as Seattle's Fred Hutchinson Cancer Research Center.

(Continued on page 2)

Hanford

(Continued from page 1)

But he added that a number of persons in the medical field in the state "are very supportive" of the governor's effort to obtain stricter enforcement of nuclear waste transportation and packaging.

William Dirks, NRC director of nuclear materials safety and safeguards, said the agency had expanded its regulatory power recently by assuming joint authority with the U.S. Department of Transportation for enforcement of DOT's nuclear waste packaging rules.

Dirks said that the agency had added 11 persons to its enforcement section to bring its total number of NRC nuclear waste shipment inspectors to about 70. More inspectors are requested in next year's federal budget.

While these inspectors must oversee

about 9,000 entities licensed to package and ship low level nuclear waste, Dirks said there are only about 200 to 300 major nuclear waste packagers and shippers.

He said the governor presented to NRC and DOT officials Tuesday a plan calling for state enforcement and inspection of low level nuclear waste shipments and for a waiver of a shipper's federal rights to permit state enforcement to be carried out beyond Washington boundaries.

But Dirks pointed out that it would be difficult for the federal government to try to enforce Washington citations for improper nuclear waste packaging and transportation outside of the state.

NRC, however, plans to step up its inspections of nuclear waste shippers

and producers whose packaging of nuclear waste had been found deficient by Washington officials, he said.

A nuclear waste shipper-producer found in violation of federal regulations by Washington officials would be "high on the list of (NRC) inspections," said Dirks.

He said the NRC already can make enforcement changes in the 25 states where the commission directly supervises nuclear waste packaging and shipping.

But Dirks added that NRC officials plan to present a proposal at the Nov. 6 meeting in Washington, D.C., to tighten supervision of nuclear waste packaging and shipping in the 25 states, which conduct their own enforcement of nuclear waste handling regulations under federal agreements.

The Spokesman-Review
Spokane, Washington
October 17, 1979

N-sabotage brings conviction

SURRY, Va. (AP) - Two self-professed saboteurs were convicted Tuesday of damaging a nuclear power plant in what was believed to be the first trial in the nation involving the sabotage of a nuclear facility.

The jury returned guilty verdicts against the former Surry nuclear plant employees after deliberating for about three hours. The two men had admitted pouring a caustic chemical on fuel rods at the plant, saying they wanted to draw attention to what they said are lax safety standards.

Virginia Electric & Power Co. has estimated damage to the plant at \$1 million.

Convicted on single felony counts of damaging a public utility were William Kuykendall, 26, of Newport News, and James Merrill, 24, of Hampton.

The jury recommended the minimum sentence - two years in prison - but the judge need not accept the jury recommendation. The maximum sentence for the offense is 10 years in prison.

Kuykendall and Merrill, former control room operator trainees at the nuclear plant, admitted they

sabotaged the fuel rods April 27. They said they did so to dramatize what they regarded as lax security and unsafe working conditions at the plant.

The trial before Judge Ligon Jones began Thursday in this rural Virginia community.

Earlier, Ligon dismissed ~~but~~ other charges against Kuykendall and Merrill. He also ruled that they could testify as to their state of mind at the time of the sabotage, but said they could not discuss safety conditions at the nuclear plant.

The Seattle Times
Seattle, Washington
October 19, 1979

Power rationing in 2 to 3 years?

by LYLE BURT
Times Olympia bureau

OLYMPIA — Electric energy will have to be rationed in Washington two to three years if the demand for it continues at the present rate, Jack Wood, state energy director, predicted yesterday.

"We haven't brought enough new power plants on line and we haven't done anything to dampen the demand," Wood said.

Contending that conservation still is the key to the electricity problem, Wood said:

"For the long range we have to look at other energy forms for space and water-heating, perhaps for pumps used to drive irrigation systems and other uses.

If Washington's growth rate continues at the present 3.9 per cent a year, "in 18 years every source of generating electricity will have to be doubled," he said.

Even if construction of the Washington Public Power Supply System's nuclear plants proceeds with no further problems, Wood said, "by the time the plants are built the total electric-power supply will be inadequate to meet the increased demand."

Wood's statements came on the heels of a request from the Puget Power and Light Co. for the State Utilities and Transportation Commission to provide guidelines for rationing electricity.

John Ellis, Puget Power's president, said his company faces an electricity shortage in the next decade. He said the state should begin making decisions on how to curtail use of energy, or ration it.

THE UTILITIES and Transportation Commission issued a direc-

tive to Puget Power yesterday to produce justification within 60 days for its request for public hearings on the predicted electric-energy crunch.

Commission Chairman Robert Bailey said by the time that justification is received and public notice of hearings is given, it will be close to the end of the year or after before hearings can be scheduled.

Although Wood said it is not yet "time to panic" over a possible electricity shortage next year, because of inadequate rainfall, he warned Wednesday that the state could face shortages next year.

A SIMILAR, but even stronger warning, was issued at Portland yesterday by Herschel Jones, Seattle economist and president of a consulting firm.

"There is not going to be enough power in the Pacific Northwest to serve all the customers in the region," Jones told the Portland chapter of the National Association of Business Economists.

"There may not be enough power to serve all of the loads next month, next year and possibly never again," Jones said, as United Press International reported.

Wood said some of the problems plaguing this area include the inability of Washington to purchase surplus power any longer from California in periods of low demand in that state, and the tendency of home builders in suburban or rural areas to install electricity for all home utilities.

The latter problem, he said, stems from the rapidly increasing price of fuel oil and the lack of natural-gas distribution systems in many suburban and rural areas.

by SUSAN GILMORE

Times staff reporter

Against the backdrop of a needed upward turn in a key presidential-popularity poll, Rosalynn Carter told supporters here yesterday that her husband intends to run for re-election and intends to win.

It was the same message, in many of the same words, that she carried to Democrats in Portland and Spokane.

The Seattle visit, hastily planned over a three-week period, ended a two-day Northwest fundraising swing for the First Lady. She returned to Washington D.C., this morning.

Evan Dobelle, chairman of the Carter-Mondale re-election committee, commented on a poll by Associated Press and NBC-TV, disclosed last night, showing the President gaining in popularity. "Things are going the other way ... there's a dramatic change in the polls," he told some 75 Carter supporters at a dinner at the Olympic Hotel.

Mrs. Carter's remarks were concise — she is stumping for the President, is not concerned about the low public-opinion polls and is confident her husband can defeat any Democratic challenger for the nomination.

JUST FOUR days ago, several prominent area Democratic politicians and labor and minority leaders announced a Senator Edward Kennedy for President campaign.

Mrs. Carter said the timing of that announcement had nothing to do with her trip. "It's immaterial to me ... who else runs," she said. "If (Kennedy) chooses to run, we'll beat him."

She said challengers have helped "coalesce" the Carter campaign, and that more excitement has been generated "since Kennedy made his move. Everybody is ready to go out and fight."

When asked whether certain congressmen may need to ride Kennedy's coattails to victory next year, she said they had "better stick with the President."

N-waste disposal 'frustrating'

SEATTLE (AP) - The disposal of nuclear wastes appears to be "readily solvable" but at the moment "is a matter of considerable frustration to much of the scientific community," an energy expert and University of Washington physics professor said Thursday.

Dr. David Bodansky, an internationally noted expert on energy, said it's up to the federal government to devise a clear program for atomic waste disposal. But he also said it would be "particular folly" to abandon nuclear power when, despite problems, it shows "great promise as a safe, clean, and economical energy source."

Bodansky said that until the government makes a decision as to which of several acceptable nuclear disposal paths to pursue, "it is fair to say that we have no plan for the disposal of wastes."

Politics should be removed from the equation, he said.

Nuclear waste disposal "should be addressed with greater administrative vigor and with a willingness to have our program be determined by sound technical and scientific judgment, rather than by political expediency," he said.

Washington Gov. Dixy Lee Ray recently closed the private low-level nuclear waste disposal site at Hanford because trucks were found to be carrying improperly packaged nuclear waste cargo.

Bodansky also noted that coal has its own waste-disposal problems, particularly what to do with carbon dioxide which forms in the combustion of fossil fuels.

"The (carbon dioxide) problem has raised a cloud over future heavy reliance

on fossil fuels, and particularly on coal because there is so much of it," he said. "Thus, while the United States could embark on a substantial expansion of coal usage, such a policy could prove to be dangerous if emulated worldwide, or

continued for many decades," he said.

Bodansky said America should pursue all energy options into the 21st Century - including conservation, renewable resources, synthetic fuels, coal and nuclear power.

He spoke to the Puget Sound Energy and Utilities Committee. An organization called Nuclear Energy Woman, representing a number of women in nuclear industry, designated Thursday as "Nuclear Education Day" nationwide.

The Seattle Times
Seattle, Washington
October 20, 1979

Councilmen differ over nuclear study

by BOB LANE
Times staff reporter

The City Council Energy Committee divided yesterday over doing a study comparing the cost effectiveness of three nuclear-power plants with other energy sources.

The committee also could not agree whether environmental studies should continue for a proposed dam and powerhouse at Copper Creek on the Skagit River while geologists search for earthquake faults which could prevent the project.

The full Council will decide both questions, probably October 29.

Councilman Randy Revelle, committee chairman, and Councilman Michael Hildt, spent the long session in disagreement.

Revelle, City Council President John Miller and Mayor Charles Royer last summer asked City Light Supt. Robert Murray to prepare a plan for an independent analysis of the cost effectiveness of three nuclear plants being built by the Washington Public Power Supply System, and of alternate energy sources.

Members of the Light Brigade and other groups have said they hope the studies would lead Seattle to abandon participation in the nuclear projects.

Yesterday, Revelle said that for the study to be accepted by other utility officials in the region, it would have to involve the supply system and the Bonneville Power Administration.

He proposed Murray be given two months to negotiate a study agreement; if he is unable to do that, the Council then would consider whether the city should do

the work itself.

Revelle said there is no way for Seattle to withdraw individually from the construction project. If the plants are to be abandoned, it must be the decision of the utilities which make up the supply system, he said.

Hildt, critical of the "conventional wisdom which has brought us to this point," said that if Seattle did the study well, it could go the supply system board. "We would be in a good position to convince others," he said.

Hildt argued for a commitment to do the study now and said Murray should be given a month to arrange a cooperative research project.

Murray said the study would cost about \$175,000. Most of the work would be done by a consulting firm.

The controversy over Copper Creek began a few weeks ago when City Light consultants said they had found that active ground faults may exist near the dam site, 10 miles upstream from Marblemount.

An active fault could cause an earthquake and probably would prevent construction of the dam.

The City Council then told City Light to do additional geologic work to determine if seismic conditions would prevent construction. But it could not agree whether City Light should continue work on an environmental-impact statement for Copper Creek.

Revelle yesterday agreed with Mayor Royer and Tim Walsh of the City Council staff in recommending that environmental work continue. Hildt said "I vote no" because geologic information "strongly indicates that we will not build the dam."

The Seattle Times
Seattle, Washington
October 20, 1979

Training plan for N-plant inspectors OK'd

MOSES LAKE — A new apprenticeship program for quality-control inspectors, most of whom work at nuclear projects, was approved yesterday.

The Washington State Apprenticeship & Training Council approved a program developed by Pasco Local 598, Plumbers & Steamfitters, who recently have organized 460 inspectors into the union at Hanford and Satsop.

Before approval could be granted, however, other unions raised jurisdictional questions, contending that the plumbers' union

should not be the only craft training inspectors. Boilermakers, Sheet Metal Workers and Electricians unions all said they, too, represented inspectors.

Inspectors check work of all crafts at any one construction site.

Ray McKnight, business manager of Pasco Local 598, resolved the dispute by amending the apprenticeship request so that other crafts also could request training programs.

Members of the state agency said that was not the place to

have jurisdictional arguments. In fact, Robert Dilger, executive secretary of the Washington State Building & Construction Trades Council, asked the unions to quit the dispute before the public agency.

Named as employer representatives on the Joint Labor-Management Apprenticeship Committee for the inspectors were representatives of the J.A. Jones Construction Services Co., J.A. Jones energy division and Bovee & Grail, all of Richland, and of the Boeicon Corp. of Renton.

McKnight told other unions to go ahead and organize them. Other trades admitted McKnight got the jump on trying to organize inspectors.

"We won't stand in your way," he said. He called the argument a "phony jurisdictional issue," saying the inspectors do not do craft work but document its quality.

The training program for inspectors will be separated from any of the other Local 598 apprenticeship programs and a separate on-the-job and classroom-training curriculum was outlined.

Ray hears citizens on N-waste, prisons and oil ports

by SUSAN GILMORE
Times staff reporter

Western Washington residents are concerned about nuclear wastes being buried at Hanford, the proposed 500-bed prison near Puyallup, and the state's role in deciding whether an oil port will be built near Port Angeles.

That was the message broadcast to Gov. Dixy Lee Ray yesterday as she fielded questions from the public during a telephone call-in show on KIRO Radio.

The radio conference was the first time this year Governor Ray has participated in a live call-in broadcast.

Questions on nuclear-waste disposal and location of the new prison dominated the hour-long show, and Governor Ray said later that the reaction was predictable.

Several Puyallup residents were angered over Tuesday's announcement that a 280-acre tract of state-owned land near Puyallup, known as Red Bluff, and a 560-acre parcel, also near Puyallup, had been selected as the top two choices for the site of a 500-bed medium-security prison.

The third choice, selected by the Department of Social and Health Services, is a 320-acre site in Kitsap County about 14 miles north of the Tacoma Narrows Bridge.

Construction of the \$3 million prison was authorized by the Legislature during the last session.

"I wasn't surprised we heard from the people in Puyallup," Governor Ray said after the broadcast. "Wherever (the prison) is built, someone is going to object. But it has to be somewhere."

She told callers that they should demand their questions about security and community impact be answered when D.S.H.S. holds public hearings at the three finalist sites.

"There are no funds in the budget specifically identified as impact," Governor Ray told Gary Weber, a Puyallup resident. "That's a question that should be put toward officials at the hearing."

The criteria in selecting the new prison site required that it be on state-owned land within 50 miles of a city of more than 50,000

west of the Cascade Mountains and east of Hood Canal.

She said a final decision on where the prison will be built should come in about six months.

Governor Ray also assured worried callers, who mentioned the recent disappearance of a patient at Western State Hospital at Steilacoom, that the new prison will be built "with safety and security in mind. We learned a great deal over the last year . . . and I know that can be a very deep community concern."

The majority of telephone calls concerned the disposal of nuclear wastes at Hanford, and Governor Ray repeated her support for nuclear energy and her determination to keep Hanford closed to low-level shipments until at least November 6.

She plans to meet then with the Nuclear Regulatory Commission to examine some of the government's criteria regulating the packaging and shipping of nuclear wastes.

Governor Ray said there is "no hope" the Hanford repository would be reopened before November 6, but she did not say when her closure order may be lifted.

The governor closed the Hanford site October 4 after three out-of-state trucks carrying wastes were found to be in violation of state and federal regulations.

In issuing the proclamation, Governor Ray said that the site would be shut down until the state has assurance from the N.R.C. that radioactive material coming into the state for disposal is properly packaged and handled.

The state is renegotiating its lease with the Nuclear Engineering Co., which manages the Hanford storage, and Governor Ray said the new lease will "probably be a little tougher."

Although she wouldn't disclose provisions, she said the lease will probably include an increase in the amount Nuclear Engineering pays for disposing the waste it accepts from hospitals, laboratories and nuclear plants.

Only three areas in the country accept low-level waste — Hanford, Beatty, Nev., and Barnwell, S.C. — and Governor Ray said Washington charges the lowest rates.

She said Hanford is not a money-making venture for the state,

but the new lease will try to standardize the rates at the three sites.

She said she supports pending congressional legislation that would create about 10 new waste-disposal sites, and possibly lower the amount trucked into Washington State.

Governor Ray told callers that Hanford receives about 8,000 tons of low-level nuclear waste each year from the University of Washington and its affiliated hospitals alone, and that 80 to 85 per cent of all low-level waste goes to South Carolina. Of the remaining amount, she said two thirds is buried at Hanford.

"The amount of material (buried) is very slight," she said, adding that 99 per cent of all radioactivity goes into the person and most of the remaining waste — from hypodermic needles, bottles, rubber gloves and other surgical materials — will decay.

When asked whether there was any danger of radioactive waste leaking into the nearby Columbia River, the governor said that 90 per cent of all wastes decay within the first few months or years of burial, and studies of the migration rate of radioactive materials show it would take 18,000 years before they would reach the Columbia or the water table.

In answer to other questions:

— Governor Ray assured Norma Turner, an opponent to an Olympic Peninsula oil port, that she would examine whether there is sufficient oil from Alaska to warrant construction of an oil terminal.

— The governor said the state probably won't cut payments to nursing homes. She said a final decision would be announced "in a few days."

— She repeated her support for President Carter, but hinted she could be ready to support another nominee.

In her weekly television message, aired later yesterday on KIRO, Governor Ray said growth studies conducted by the Departments of Community and Economic Development and Labor and Industries show 47 businesses have made recent commitments to come to Washington State.

Hanford: Still at war, but with new enemy

RICHLAND, Wash. (AP) — Paul Dunigan came to Hanford in 1943 to help make the atomic bombs which ended World War II.

He stayed through the Cold War era of more nuclear plant construction and through the Cold War thaw, when all but one of Hanford's nine reactors were closed.

Today Dunigan says he is fighting a different sort of war — a war, he says, against power shortages.

As the lingering national argument over nuclear power continues with its own themes and variations, Hanford officials feel that one battle in the energy war will be won when the \$647 million Fast Flux Test Facility starts up in late January.

The white-domed Fast Flux is a progenitor of "fast breeder reactors," which produce more fuel than they consume.

The worrisome side, opponents say, is that the fuel used and produced is plutonium, which can be used to make atomic bombs.

Unlimited power: The breeder holds the possibility of virtually unlimited nuclear power and would free the nuclear industry from use of uranium, which is growing more scarce and expensive.

It also attracts some of the fiercest opposition from anti-nuclear people. Not only does it present problems of controlling the spread of bomb-grade plutonium, critics say it carries a potential for catastrophe and contamination much greater than conventional uranium reactors.

Government and industry officials consider the Fast Flux the most sophisticated nuclear facility in the world. They say its safety systems are totally adequate and dependable.

The Department of Energy plans to spend \$250 million in startup, construction and support expenses for the Fast Flux in 1980.

A few miles away from the Fast Flux, Washington Public Power Supply System is building \$5 billion worth of nuclear power plants with the capacity to serve the needs of a population five times the size of Seattle.

In another corner of the 570 square miles of sand and sagebrush at Hanford, miners are boring into a mountain of basalt in search of an answer to another question mark which hangs over the nuclear power industry — what to do with the wastes.

But Hanford does not have all its energy eggs in the nuclear basket.

Laboratories: Dunigan, for example, is in charge of a complex of laboratories. He and other scientists are investigating solar, geothermal, wind, wave and fusion power.

A large power plant, furnishing steam to the radioactive waste-management area, burns wood chips in an experiment to see if forest waste can be an economical fuel.

"We're just getting started," said Dunigan of Hanford's energy role. "The energy business is going to expand."

In contrast to today's air of scientific research, in Hanford's early days technicians plunged more or less blindly into the nuclear age.

They were spurred on by fears that Hitler and the Germans might develop atomic weapons first.

Dunigan recalls it took an army of about 50,000 construction workers less than two years and \$350 million to build the first three reactors — then called "piles" — their associated chemical reprocessing plants and 4,000 homes for people disgorged by trainloads on the sleepy farming village which was then Richland.

Those early reactors, built with crossed fingers and incomplete plans, have about as much resemblance to today's power producers as a DC-3 has to a Boeing 747, officials say.

Looking back at those war-time reactors, Dunigan said, "It's amazing how well they did, considering how new technology was."

Problems: Even so, the hasty methods of the early days have left a legacy of problems at Hanford.

The most troublesome has been management of radioactive wastes. Hanford has 75 percent of the nation's entire inventory of such waste.

The debate over the handling nuclear wastes flared up in an unrelated way early this month when Gov. Dixy Lee Ray closed a low-level radioactive waste dump operated by a commercial firm at Hanford.

The governor said she took the action not because of faulty operation of the facility, but because arriving wastes were improperly packaged on two trucks and mechanical defects were found on a third.

In the early days, the attitude was to produce

plutonium for bombs and worry about the wastes later — an attitude that carried through most of the Cold War years.

Highly radioactive wastes were poured into "temporary" single-walled storage tanks.

Billions of gallons of low-radiation wastes were poured into open pools and trenches. Radioactive tritium is now leaking into the Columbia River, though it is so diluted by river water it is not measurable, officials say.

And storage tanks have leaked. The worst was T106 Tank leak of 1973,

which lost 115,000 gallons of liquid waste over a 47 day period.

No one at Hanford today defends the crude practices of the past, although officials maintain those practices have not, and will not, endanger the public.

The Department of Energy is transferring wastes to double-walled tanks, a kind that has never leaked, and solidifying them as the agency seeks a more permanent disposal solution.

Federal officials are spending more than \$300 million over the next six years to study Hanford basalts as a permanent storage repository for the nation's radioactive wastes.

Part of that effort is the Gable Mountain drilling. When the shafts are completed, electric heaters will be installed to simulate effects the heat of decaying nuclear waste has on basalt.

Monday: A look at attempts to attract more nuclear plants to Hanford.

The Spokesman-Review
Spokane, Washington
October 23, 1979

Report says Utility lacked nuke expertise

New York Times

WASHINGTON — The President's Commission on the Accident at Three Mile Island has concluded in its final draft report that the utility that operated the reactor "did not have sufficient knowledge, expertise and personnel to operate the plant or maintain it adequately."

At the same time, it was learned from two commission members that, because of procedural rules adopted over the weekend, the presidential panel did not adopt a recommendation to halt the construction of new reactors even though the step won the support of a majority of those voting on the question.

The major findings and conclusions of the commission report, a version of which, dated Thursday, Oct. 17, has been obtained by The New York Times, also charged that the government agency responsible for regulating nuclear energy was preoccupied with licensing reactors, not assuring their safety, and lacked an overall system "to measure and improve the quality of safety regulations."

The recommendation for a moratorium, the two commission members said, was supported in a closed weekend meeting by six commissioners and opposed by three or four. The same number supported a moratorium last week.

But the proposal did not become a formal recommendation because of a rule adopted last Saturday that such recommendations would require an absolute majority of seven of the 12 commissioners. The rule, the two commissioners said, was proposed by the chairman of the commission, John G. Kemeny.

Barbara Jorgenson, the commission's director of public relations, did not deny that the moratorium proposal had not been approved even though supported by a majority of those voting. But she said that the debate within the commission had been highly complicated and "a serious injustice" might be done the commission and individual commissioners if the story about the moratorium vote was told without reading the full transcript of the commission debate.

The final meetings of the commission, which is scheduled to submit its report to President Carter early next week, have been closed to the public, and the transcripts will not be available for some time.

'Safe' radiation level defies consensus view

Editor's note: This is the third installment of a four-part series examining the Hanford Nuclear Reservation. The articles were written by Tri-City Herald reporters Jim Duleaty and Todd Crowell.

RICHLAND, Wash. (AP) — Gary Carter believes Hanford health regulations are so strict, sunburns are a greater radiation problem to Hanford workers than radioactive materials. Herbert M. Parker, who officials say helped establish radiation exposure limits at Hanford, and for the entire nuclear industry, now says those limits should be reduced tenfold.

The Department of Energy employs 88 persons and spends \$2.75 million annually to protect the health of Hanford workers.

That doesn't include the \$8 million that has been spent over the past 14 years studying worker health statistics.

Despite this expenditure, researchers can't agree whether low-level radiation harms nuclear workers.

There is considerable debate among scientists whether there is any safe level of absorption — and over the safety of repeated low doses of radiation.

Nuclear critics point to a 1976 Department of Energy study made by Thomas Mancuso which claimed to show Hanford workers suffered higher than normal cancer deaths. Other experts disputed his findings. Mancuso studied Hanford health statistics from 1964 to 1976.

A White House task force recently recommended that to improve credibility, future radiation health research should be done by a government agency other than the Energy Department.

Carter, a Battelle Northwest Laboratories senior technician, has been working since 1962 with radiation at Hanford.

"We're probably overprotected because they're (Energy Department) trying to eliminate any possibility of harm to us or the public," Carter says.

Parker, a Battelle consultant, says that with a few exceptions he favors a tenfold reduction in the amount of radiation a worker can receive annually.

The government limit, devised by Parker, is five rems annually.

A rem is the standard unit of measurement of absorbed radiation in living tissue, adjusted for different kinds of radiation so that one rem of any radiation will produce the same biological effect.

A tenfold reduction would establish a limit of 0.5 rem.

A person receives .02 to .03 rem in a normal chest X-ray.

Each American, on average, receives 0.1 to 0.2 rem of radiation a year from natural "background" sources such as cosmic rays and man-made sources such as diagnostic X-rays.

Hanford contractors today voluntarily limit workers to a maximum of three rems.

A top Hanford official says a tenfold reduction would seriously hamper operations at Hanford and would shut down many nuclear power reactors in the country, including the N Reactor and many other plants at Hanford.

Parker says his old arbitrary formula was established at a time when he and others were too optimistic about the effects of radiation.

"I'm not happy with that. If you use

a (National Academy of Sciences) standard with my formula you would have a 30 percent increase in a person's cancer risk.

"I would not want to recommend that to a worker."

Of the 6,928 employees who worked in radiation areas, two received three and four rems, and none got more than four.

Of the rest, eight percent, or 527, received 1 to 2 rems. Three percent, or 231, received two to three rems. The rest (89 percent) received one rem or less.

Jerry Yesberger, a Hanford health physicist, says Hanford's health record is one of the finest in the industry. Since 1944, only two persons have received radiation injuries.

In 1965 a man lost the tips of two fingers after overexposure from an X-ray machine.

On Aug. 30, 1976, Harold McCluskey was injured in a chemical explosion at the Z plant. It was considered the worst contamination accident in U.S. nuclear history.

Today, nearly three years after the accident, McCluskey carries radiation several hundred times what is usually considered "safe."

McCluskey's surviving such a massive dose for so long without showing signs of such common radiation illnesses as cancer or loss of hair might be interpreted as one indication that radiation is not as lethal as is popularly believed.

But McCluskey was 64 at the time of the accident, and it may be he was too old to develop cancers that some scientists believe are associated with radiation, says his physician, Bryce Breitenstein, head of the Hanford Environmental Health Foundation.

Yesberger says only 16 workers

since 1944 have received radiation exposures above the three rem limit now imposed (limits were not as strict in earlier days).

An additional seven have some small part of their body exposed to radiation above the limit.

The Hanford foundation runs the Emergency Decontamination Facility built about 10 years ago in Richland. When a worker with no previous experience in radiation comes to Hanford, he receives a course in radiation protection.

When he goes on the job, one radiation monitor is stationed with every five workers.

Each worker must wear a dosimeter badge and a "self-reading" pencil, both of which monitor radiation.

The pencil records the amount received during the day. The amount is recorded in a daily log book.

When workers go into high radiation zones, they take a large monitor that beeps when they've received their limit.

Each worker must have a physical examination before being employed at Hanford, and they must have annual examinations.

When leaving radiation zones, workers must be "checked out" on machines which show radiation on feet and hands. In addition, the body is surveyed by a hand-held counter.

Protective clothing is worn appropriate to the level of radiation expected. In high radiation zones a worker is covered head-to-toe with several layers of clothing.

Wednesday: The non-nuclear side of Hanford.

The Seattle Times
Seattle, Washington
October 24, 1979

Nuclear dump in Nevada stays closed

CARSON CITY, Nev. — (UPI) — Gov. Robert List says he is going ahead with his order closing a nuclear dump in Nevada despite mounting pleas from hospitals and research centers across the nation to keep it open.

"Nevada is a gambling state but I'm not taking a gamble with our citizens," List said yesterday.

The governor criticized President Carter, saying he was more interested in politics than in developing a national policy for the disposal of nuclear garbage.

George Kolbenschiag, assistant to the president for the Nuclear Engineering Co., which operates the dump, said the shutdown could limit such things as cancer research.

List, who is Western chairman of the American Cancer Society, said he knew the value of using radiation in treating the disease.

"The calls and letters coming in here are from legitimate organizations who are legitimately concerned as to what it is going to do with cancer therapy and research," he said.

"What they are going to do is to turn their wrath on Washington to see that this problem is addressed."

The Seattle Times
Seattle, Washington
October 24, 1979

More faults at Hanford reactor

RICHLAND — (AP) — Between 10 per cent and 40 per cent of the welds on the 1,000-ton sacrificial shield around the reactor at the Hanford No. 2 nuclear power plant are "visually defective," the Nuclear Regulatory Commission says.

Some welds are missing on the reactor, which is under construction.

The defects were discovered five months ago and an inspection is still under way, but the extent of the problem was revealed this week.

Voids were found in what was supposed to be the 2-foot-thick solid concrete center of the shield, and water was found accumulating in the concrete, said R.F. Nowakowski, a spokesman for the Washington Public Power Supply System, which is building the plant.

Documentation is also missing on the 2-inch steel which encases the concrete, he added.

It will take at least another month to complete the inspection, determine the type and cost of repairs and estimate delay time, Nowakowski said. The \$8 million sacrificial shield, built by the Leckenby Co. of Seattle, was completed two years ago.

The project manager, Art Kohler, said, "We anticipate the outcome of the engineering review now under way will be that the flaws are tolerable; that they won't weaken the vessel."

But the N.R.C. would have to approve, and a commission inspector, Tom Bishop, said that as the reactor now sits it could not

be licensed.

Kohler said it is possible that during startup instruments could be placed outside the sacrificial shield to see where voids might be allowing radiation through. Possibly leaks could be stopped with patches on the outside of the shield, he said.

The biggest problem will be adding the missing welds, Kohler said.

"I knew they were going to have trouble," a former Leckenby employee said.

He said he told officials "they weren't building a tank in the boondocks. That this was critical work."

The former employee said that when he rejected some welds the company fired him and "brought in someone to highball the job."

David Paup, Leckenby construction manager, said, "We did precisely what the engineer, the owner and our contract indicated. We wouldn't highball a project like this."

The No. 2 site has been plagued by problems since construction started in 1972. It will cost about \$6 million to repair incorrectly installed pipe hangers. Two years and \$2.25 million worth of repairs are nearly complete on faulty welds on beams attached to the shield.

Although the power system has vowed to hold contractors liable for faulty work, much of the work was done by subcontractors to Bovee-Crail, whose contract on No. 2 was canceled by the system and with whom the utility is now in multimillion-dollar litigation.

The Spokesman-Review
Spokane, Washington
October 24, 1979

Hanford's shield defective

RICHLAND, Wash. (AP) - Serious defects have been found in the massive concrete and steel shield around the reactor at the Hanford No. 2 nuclear power plant, Washington Public Power Supply System officials confirmed Tuesday.

Although the defects were discovered about five months ago and an inspection has been under way since, the probable extent of the problem was not released until this week, explained WPPSS spokesman R.F. Nowakowski.

Between 10 and 40 percent of the welds on the 1,000-ton sacrificial shield are "visually defective," and some welds are missing all together, the Nuclear Regulatory Commission reported.

Voids have been found in what was supposed to be the two-foot-thick solid concrete center of the shield. Water was found ponding in the concrete, Nowakowski confirmed.

In addition, documentation on the two-inch steel which encases the concrete is missing.

Nowakowski said it will take another month to complete the inspection, determine the type and cost of repairs and estimate delay time.

The sacrificial shield was completed two years ago,

under an \$8,384,000 contract with Leckenby Co. of Seattle.

Repairs will be complicated because the reactor vessel now sits inside the shield, which in turn is inside a containment vessel. There is only a four-inch work space between the reactor and shield.

But Art Kohler, project manager, said he doesn't expect the welds will have to be redone. "We anticipate the outcome of the engineering review now under way will be that the flaws are tolerable; that they won't weaken the vessel."

But the NRC would have to approve of that, and NRC inspector Tom Bishop said that as the reactor now sits,

it could not be licensed.

Kohler said it's possible that during startup, now scheduled for 1983, instruments could be placed outside the sacrificial shield to see where voids might be allowing radiation through.

It is hoped radiation leaks could then be stopped with patches applied to the outside of the shield, he said.

The biggest problem will be adding the missing welds, Kohler said.

One man, employed by Leckenby when the shield was built, said, "I knew they were going to have trouble." He claimed he told Leckenby officials, "that they weren't building a tank in the boondocks. That this was critical work."

He said the welding was bad, but when he rejected some of the welds, they got rid of him "and brought in someone to highball the job."

David Paup, Leckenby construction manager, said his firm was unaware of any problems. "We did precisely what the engineer, the owner and our contract indicated. We wouldn't highball a project like this. We pride ourselves on being a competent contractor."

HANFORD

Unique energy role cited

Editor's note: This is the final installment of a series examining the Hanford Nuclear Reservation. The articles were written by Tri-City Herald reporters Jim Dullenty and Todd Crowell

RICHLAND, Wash. (AP) - There is a non-nuclear side to Hanford that makes people like Kirk Drumheller sometimes feel like the odd man out.

The Battelle Northwest Laboratories scientist is in charge of solar energy research at the 570-square-mile Hanford nuclear reservation.

Hanford has cadres of scientists working on problems of nuclear power, to be sure, but many also are at work on alternative energy sources.

Last August Sen. Warren Magnuson, D-Wash., said he wants to see Hanford become a regional energy

center, not only for nuclear plants but for solar, wind, synthetic fuel, coal and gasohol production.

Hanford and the Tri-Cities "have a uniquely important role to play in our region's energy future," said Magnuson, chairman of the Senate Appropriations Committee, in a speech to the Tri-City Nuclear Industrial Council.

"You have a combination of facilities and talent," including experience with nuclear energy, semi-isolation, broad public support and strong federal support, the senator said.

In all, the Department of Energy, which runs Hanford, will spend about \$70 million there in fiscal 1980 on non-nuclear research. The total Hanford budget is about \$665 million.

Drumheller's \$7.5 million budget includes research into renewal

sources of energy such as wind, solar and forest wastes.

This figure may seem small, but only a few years ago it was a flat nothing, he said.

Hanford scientists are working on ways to improve solar collectors and on more efficient ways to produce energy from solar cells, which convert sunlight directly into electricity.

Scientists also are working on new ways to make synthetic fuels from wood chips at costs they hope will be comparable to foreign oil.

The Energy Department is experimenting with wood pellets, rather than coal, for Hanford boilers.

Hanford could be the largest industrial user of wood waste in the inland Pacific Northwest, officials say.

Hanford also is the site for a
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Hanford

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proposed \$80 million laboratory to test materials going into future fusion power plants.

Drumheller says Hanford is a good place for research into alternative fuels because of its abundant sunlight, access to agricultural and forest products and collection of energy experts.

"The guy who is working on, say, heat transfer properties in nuclear energy is instantly transferable to similar kind of solar work," he said.

Other scientists are investigating possible health problems of current energy practices.

The Battelle laboratory, for example, is part of a network in the United States collecting and analyzing data on "acid rain," a form of pollution caused by chemical reactions of sulfur and nitrogen oxides in the atmosphere.

Others have been studying the biological effects of large electrical fields on animals, trying to discover if very high voltage power lines might be a health hazard.

There are others at Hanford more concerned with geese than geiger counters, with plants rather than plutonium and with salmon and steelhead rather than shielding around nuclear reactors.

Nine reactors, of which only one, the N Reactor, is in operation today, line the 60-mile-long Hanford

Reach, a stretch of the Columbia River above Richland.

It is prized by environmentalists as the last free-flowing part of the Columbia - long closed for security reasons, it was recently opened to the public, though boaters are still prohibited from landing at Hanford - and as a unique wildlife refuge.

This stretch supports one of the river's largest spawning grounds for steelhead and salmon.

It is also a protected breeding area for wild geese, ducks, eagles and mule deer.

Some scientists are studying the behavior of the great blue heron, which nests on the reservation, and the effects of potential radiation or pesticide contamination.

Most of the animals have access to swamps, ponds and trenches at Hanford where low-level radioactive wastes have been disposed.

Scientists at Battelle regularly take samples of all species.

In some cases, measurable amounts of radiation are found in the animals - although in quantities too low to harm man if the animals were killed and eaten, the scientists say.

While hunting on the reservation is prohibited, several of the animals are game species and travel to other areas.

Hanford has been the subject of a stange-bedfellows alliance between

the local Sierra Club and the strongly pro-nuclear Tri-City nuclear council.

Both have been fighting the proposed Ben Franklin Dam.

The Interior department says it would destroy much of Hanford's wildlife. The Army Corps of Engineers and other proponents say a dam is needed to produce power.

The Sierra Club opposes the environmental damage the dam would cause. The nuclear council fears that rising ground waters might make Hanford less desirable as a future energy park.

The dam would flood the old Hanford reactors and 60 radioactively contaminated areas of the reservation. This could result in increased radioactivity in the Columbia, Battelle scientists said in a report prepared for the Energy Department.

Despite its support of the atom, the nuclear council has long been aware of Hanford's unhealthy reliance on one industry and has sought ways to diversify the economy of the Tri-Cities of Richland, Kennewick and Pasco.

It was largely through the council's work that Hanford, unique among the operations created by the World War II atomic bomb project, today hosts a variety of private companies rather than a single contractor.

States will be asked to provide nuclear waste dumps

WASHINGTON (AP) — With two of the country's three low-level nuclear waste dumps closed, the government is planning to ask governors to provide temporary storage sites for radioactive waste produced in their own states, officials said Thursday.

That could mean establishment of temporary storage sites in at least a dozen states in which nearly 70 percent of the country's low-level nuclear waste is produced.

Two of the three U.S. sites for disposal of nuclear waste were closed this month. A dump in Washington state was closed because improperly packaged wastes were being delivered to the site. Another site, in Nevada, was closed after radioactive waste was discovered outside dump boundaries.

The third site, in South Carolina, remained open Thursday, but officials said none of the wastes that would normally go to Nevada or Washington could be sent there.

Government officials and spokesmen for the medical community have said hospitals, research facilities and some nuclear power plants will face serious problems within weeks because they will have nowhere to ship their radioactive wastes.

In an attempt to head off that problem, the Nuclear Regulatory Commission and the Energy Department will urge governors in the states where the wastes are produced to establish interim above-ground storage facilities, administration officials said.

Asked how hard the NRC would push the governors to adopt such a plan, NRC spokesman Frank Ingram said: "To the extent that we can. We can't order them to do it."

Richard Cunningham, whose NRC office licenses operations that produce low-level nuclear wastes, said the proposal to get states to provide temporary storage was discussed Wednesday at a hastily called meeting of federal officials and others involved in the issue.

A spokesman for the National Governor's Association, which also had a representative at the meeting, said such

a plan was sure to provoke controversy and that some governors and state legislators would oppose it.

"We recognize the wastes have to be put somewhere, but you can't leave it up to the 50 governors," said Joe McLaughlin of the governor's association.

Meanwhile, Govs. Dixy Lee Ray of Washington and Robert List of Nevada were described by federal officials as remaining adamant in keeping the waste dumps in their states shut until a national policy is worked out.

South Carolina Gov. Dick Riley, who barred any of the wastes from being diverted from Washington and Nevada to his state, said the amount of material now moving into the South Carolina dump will be cut next week.

Among those who attended Wednesday's meeting were representatives of the NRC, the Energy Department, the Transportation Department, the American Medical Association, the Society of Nuclear Medicine, and the governor's association.

The group, according to Cunningham, also discussed the possibility of opening federal storage sites to commercial use. But one Energy Department source said the department and the NRC prefer storage of the wastes in the states where they are produced.

Low-level radioactive wastes are generated in almost every state, with the largest amounts produced in California, Illinois and the Northeast — where there are concentrations of hospitals, research facilities and nuclear power stations.

A 1978 government survey showed that 12 states produced nearly 70 percent of the wastes, which include byproducts from nuclear power stations as well as radioisotopes used in medicine.

The 12 states producing the most wastes and the percentage of the national total each produces are: New York, California and Illinois, 8 percent each; Pennsylvania and North Carolina, 7 percent each; South Carolina, 6 percent; Florida 5 percent; and New Jersey, Connecticut, Massachusetts, Alabama and Michigan, 4 percent each.