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HW-89073
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REGIONAL SURVEY MONTHLIES 1947

H.J. Paas and W.C. Berlin, Jr.

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CIR 122

To - J W Healy

July 30 - 1947

From - H. J. Pass & W. C. Berlin

Report From Site Survey For
Month of July - 1947

The attached report was compiled from the following number of surveys & data

<u>Water</u> - Drinking	192
Test Well	11
River	105
Waste	114
Rain	18

<u>Air</u> - Air Filters	39
Detachable Chambers	742
Hand Pump	2
Film Packets	92

<u>Land</u> - Vegetation On Area	307
Vegetation Off Area	191
Solids - (mud, lint, soil)	30
	12

Total Samples 1857

This report does not contain the results of the Hybrid Special sampling program carried out the past month on the Columbia River water. This data is currently being evaluated and a special report ~~on~~ will be issued upon completion.

Observations made during the past month indicate that the pattern of the stack effluent is shifting from the southeast to the east. This fact is evaluated in the summation of the data which follows.

The monthly survey of the pot holes along the waste lines in East & West give no indication of ^{increase} ~~increase~~ the previous month.

William J. Lee
over 3000

July 1947

Vegetation

There were 307 routine samples taken during the month of July 1947. The general trend of contamination has decreased from the June average, however there is a slight increase ESE and East of the separation areas and some high-individual samples taken in the 200 West area and to the SW, the maximum being 11.34 $\mu\text{C}/\text{kg}$ taken 1500 ft SW of the 291-T Stack.

Table III

Location	Maximum $\mu\text{C}/\text{kg}$	Average $\mu\text{C}/\text{kg}$	Previous Month Average $\mu\text{C}/\text{kg}$
North of the 200 Areas	0.26	0.05	0.07
Near the 200 Areas	4.50	0.42	0.51
South of the 200 Areas	1.13	0.13	0.12
Richland	0.20	0.04	0.07
Pasco	0.13	0.04	0.04
Kennesaw	0.09	< 0.04	0.05
Benton City	0.06	< 0.04	< 0.04
Richland "Y"	0.06	< 0.04	0.13
Harford	0.27	0.09	0.05

Inside Separation Areas

Location	Maximum $\mu\text{C}/\text{kg}$	Average $\mu\text{C}/\text{kg}$	Previous Month
200 West	11.34	1.19	0.50

Vegetation (cont.)

Ground Contamination Measured with Portable G.M. Meter

200 W - A maximum reading of 1300 c/m was obtained
500 and 1000 feet ESE of the 291-T stack.

200 E - A maximum reading of 1000 c/m was obtained
1000 feet ESE of the 291-B stack.

Off-Area

31 samples were taken at the Patrol Posts on Rattlesnake Mountain. The average reading obtained was 0.05 $\mu\text{Ci/kg}$. The maximum recorded was 0.16 $\mu\text{Ci/kg}$ at Post 4 and 5 which are located approximately 4 miles south of 200 East area.

A survey of the Wahluke plateau was completed

this month and will be submitted at a later date.

160 samples of vegetation were taken in an area around Spokane, Washington. This survey was made to locate any possible source of contamination within a 20 mile radius of the city. The results were negative.

W. I. Clark

10/1/67

July 1947

Water

Drinking

192 samples of drinking water were surveyed this report period with the following results:

Location	* Alpha dis/min/l	Beta Gamma mcl/l	Date
Benton City	2.52 ± 1.2	< 5X10 ⁻⁵	6/25/47
"	2.8 ± 1.6	< 5X10 ⁻⁵	7/16/47
Headgate	2.0 ± 1.2	< 5X10 ⁻⁵	6/23/47
Pistol Range	2.24 ± 1.2	< 5X10 ⁻⁵	7/22/47
Columbia Camp	2.12 ± 1.2	< 5X10 ⁻⁵	6/30/47
Richland Div. #13	54.2 ± 6.4 *	9X10 ⁻⁵ *	6/24/47
"	2 ± 1.2	< 5X10 ⁻⁵	6/26/47

* Resample and subsequent samples have not verified this reading and it can be reasonably assumed that the sample was contaminated

in the counting process.

On the basis of the Alpha indications at Benton City, together

with the fact that this portion of well supplies water to some 30

homes and business locations within the city, samples are collected bi-weekly and processed in duplicate.

The samples of Well #1 & 2 and Sanitary water from the 300

area are included in the above total but the sampling results

a listed separately as follows:

Location	Maximum		Maximum Sample Date	Average	
	* Alpha dis/min/L	Beta Gamma uc/L		* Alpha dis/min/L	Beta Gamma uc/L
300 #1	68.0 ± 8.0	< 5 × 10 ⁻⁵	6/24/47	37.9 ± 5.9	< 5 × 10 ⁻⁵
300 #2	52.0 ± 8.0	< 5 × 10 ⁻⁵	6/25/47	35.1 ± 5.6	< 5 × 10 ⁻⁵
Sanitary Water.	80.0 ± 8.0	< 5 × 10 ⁻⁵	6/25/47	41.8 ± 5.6	< 5 × 10 ⁻⁵

Although the July average of contamination exceeds that of June, the trend for the latter part of July is reducing by approximately

* ^{one-half} not corrected for self absorption in the solid residue.
Test Wells

11 samples of water from Test Wells were taken during this period show no evidence of contamination.

Rivers

85 samples of Columbia River water were taken during

this report period with results as follows:

Location	No of samples	Alpha dis/min/L		Table A	Beta Gamma uc/L	
		Maximum	Average		Maximum	Average
181-B	5	2.64 ± 1.6	< 2	5	5 × 10⁻⁵	< 5 × 10⁻⁵
181-D	5	2.64 ± 1.6	< 2	5	5 × 10 ⁻⁵	< 5 × 10 ⁻⁵
181-F	5	< 2	< 2	5	7 × 10 ⁻⁵	< 5 × 10 ⁻⁵
Hanford	14	< 2	< 2	5	33 × 10 ⁻⁵	12 × 10 ⁻⁵
300 Area	5	< 2	< 2	5	10 × 10 ⁻⁵	< 5 × 10 ⁻⁵
Richland	15	3.2 ± 1.6	< 2	5	18 × 10 ⁻⁵	7 × 10 ⁻⁵
Above 100-B	3	< 2	< 2	5	< 5 × 10 ⁻⁵	< 5 × 10 ⁻⁵
Hanford Special	38	< 2	< 2	5	36 × 10 ⁻⁵	15 × 10 ⁻⁵

River (cont.)

The Columbia River flow data in gallons per second for

this report period are as follows.

July 2 1947	2,025,000
July 9 1947	1,875,000
July 14, 1947	1,740,000
July 22, 1947	1,575,000
July 28, 1947	1,440,000

Yakima River

20 samples of water from the Yakima River were

taken during this period and no evidence of contamination

was found.

107 Effluent

18 samples of 107 Effluent water were taken with

the following results.

Location	No of samples	Alpha dis/min/L Maximum	Average	Beta Gamma uc/L Maximum	Average
107-D	6	< 2	< 2	0.21 3.1X10 ⁻⁵	0.23 3.3X10 ⁻⁵
107-F	7	< 2	< 2	0.30 3.0X10 ⁻⁵	0.16 1.6X10 ⁻⁵
1904-B	5	2.52±16	< 2	7X10 ⁻⁵	< 5X10 ⁻⁵

Waste Contamination

200 West

Waste Solutions

* Alpha dis/min/L (Max)

Beta Gamma uCi/kg (Max)

Locations

T-Swamp - Inlet

100 ± 20

5 X 10⁻⁵

- W. Side

960 ± 40

10 X 10⁻⁵

- S. Side

345 ± 25

5 X 10⁻⁵

U-Swamp - Inlet

155 ± 25

10 X 10⁻⁵

- W. Side

158 ± 25

10 X 10⁻⁵

Laundry Ditch - Inlet

430 ± 45

35 X 10⁻⁵

- 600'

120 ± 25

65 X 10⁻⁵

231 Ditch - Inlet

< 40

10 X 10⁻⁵

- lot Underpass

190 ± 10

5 X 10⁻⁵

Waste Solids

* Alpha dis/min/gr. (Max)

Beta Gamma uCi/kg (Max)

Location

T-Swamp - W. Side

60 ± 5

.5

- S. Side

120 ± 10

1.5

Laundry Inlet

95 ± 5

.4

* Not corrected for self absorption in the solid residue

Portable G M Meter Surveys

The maximum reading obtained in this area was .300 c/m

on mud at the Laundry Ditch inlet and T-Swamp South side

Waste Contamination (cont)

200 East

Portable G.M. Meter Surveys

The maximum reading obtained in this area was 800 c/m on mud at the end Underpass of the B-ditch.

300 Area

Waste Solutions - 300 Area pond

No of Samples	* Alpha dis/min/L		Beta & Gamma μ /L	
	Max	Average	Max	Average
12	4332 $\pm$ 68	690 $\pm$ 20	6.90 $\times 10^{-6}$	105 $\times 10^{-6}$

Waste Solids - 300 Area pond

No of Samples	* Alpha dis/min/gr		Beta & Gamma μ /kg	
	Max	Average	Max	Average
12	476 $\pm$ 14	161 $\pm$ 6.6	1.8	.8

* not corrected for self-absorption in the solids

Portable GM Meter Survey

The maximum reading obtained in the area was 650 c/m on mud at the inlet to the 300 Area pond.

200 North Waste Survey

Location	Maximum Readings
'N' Ditch	* 50.0 Mrep/hr and 25.0 MR/hr - Beckman
'P' Ditch -	9.0 " " " 6.0 " " - "
'O' - "	" " " " " " - "

*Note: The basin in the 212 Bldg was drained and flushed during this period, which accounts for the high readings obtained from the "N" ditch.

Air Monitoring

Integrations: Results obtained at the

atmospheric monitoring stations as compared to the previous month are as follows:

Location: ¹⁰⁰⁰ Average Dose mrem/24 hours

0.6

1.4

0.5

1.3

0.8

3.7

0.5

1.8

0.8

0.6

0.6

0.4

100 B

100 D

100 F

200 N

200 E

Riverland

Hartford

300 Area

700 Area

Kennebuck

Pasco

Benton City

1.0

0.1

0.8

0.5

0.1

2.0

0.5

3.0

0.8

1.3

0.5

1.4

0.6

Integration results compare favorably to the previous month. The only noticeable increase occurring at 100 D where the average dose increased by about a factor of two.

A total of 838 hours were lost this month, as compared to 876 hours last month. Last time is quite

of warm weather which dries the ink supply on the pens causes about 70% of the down time and can only be remedied by servicing the units more often, or replacing the pens by point wheels at a cost of \$1.50 per unit.

"C" Chambers - A summation of "C" chamber data as compared to those readings obtained last month are as follows - (figures represent average dosage in Mrep/24hrs)

<u>Location</u>	<u>Tablet</u>	<u>June</u>
100 B	0.2	0.2
100 D	0.3	0.3
100 F	0.3	0.3
200 E	0.6	0.7
200 W	0.4	0.3
300 Area	0.4	0.4

The "C" chamber levels are in very good agreement with the previous data & remain in the general magnitude one would normally expect.

Film Packets : - Film packets indicated the levels to be less than 5.0 mrep/24 hours at all monitoring stations on & nearby the reservation.

Detachable Chambers - Average dosage readings obtained with detachable chambers as compared to the previous month are as follows - (all readings are average Mrep/hour).

Location	July	June
100 Area & Environs		
Route 1 mile 8	.02	.02
Route 2 mile 10	.02	.02
Route 2N mile 5	.02	.03
Route 11A mile 1	.03	.03
Route 1 & Route 4N	.02	.03
Within 5 miles 200 East		
Route 4S mile 6	.05	.04
Route 11A mile 6	.03	.03
Route 3 mile 1	.05	.03
Meteorology 200'	* .08	.04
Gable Mountain Summit.	* .08	.03
Within 10 miles 200 East		
Route 4S mile 10	.04	.04
Route 10 mile 1	.04	.03
Route 10 mile 3	.03	.04
Route 2S mile 4	* .08	.03
Near 300 Area		

Route 45 mile 22

*.05

.03

*Significant increases by a factor of 2 to 3 are observed at four locations which are generally to the east quadrant from the stacks. This is consistent with increasing levels in vegetation contamination in this vicinity. The general stack pattern is apparently shifting from the due southeast to the east in this period. ^{can this be shown by plotting data}

Constant Iodine Monitoring - Four C.I. units were in operation in this period - I^{131} concentrations were found to be as follows: Table B

Location	Maximum Eight Hour Conc.	Mean Ave Concentration daily	Mean Ave Concentration / mo
200 ESE	$8.4 \times 10^{-7} \mu\text{g/L}$	$1.2 \times 10^{-8} \mu\text{g/L}$	$3.7 \times 10^{-9} \mu\text{g/L}$
200 E Ten th	$6.0 \times 10^{-7} \mu\text{g/L}$	$8.9 \times 10^{-9} \mu\text{g/L}$	$1.0 \times 10^{-8} \mu\text{g/L}$
Gable Mountain	$4.0 \times 10^{-7} \mu\text{g/L}$	$2.1 \times 10^{-9} \mu\text{g/L}$	$2.9 \times 10^{-9} \mu\text{g/L}$
Richland	$4.0 \times 10^{-7} \mu\text{g/L}$	$4.3 \times 10^{-10} \mu\text{g/L}$	$8.5 \times 10^{-10} \mu\text{g/L}$

The I^{131} concentration increased considerably at 200 ESE, however it remains about the same at other locations.

The C.I. unit at Benton City was removed this month and replaced with a little sucker unit.

Air Filters - The average iodine concentration at the air filter locations was as follows:

<u>location</u>	<u>July Average</u>	<u>June</u>
Pasco	8.3×10^{-10} ucfh	1.7×10^{-10} ucfh
300 Area	8.8×10^{-10} ucfh	5.4×10^{-10} ucfh
200 E Tur #18	7.2×10^{-9} ucfh	3.5×10^{-9} ucfh
200 W gate house	7.0×10^{-9} ucfh	1.6×10^{-9} ucfh
100 D	1.5×10^{-9} ucfh	

A twofold increase at Tur #18 in this period is about the same magnitude as the increase at 200 E SE Q I filter. Looping of the stack effluent is more prevalent in this period and evidently accounts for the higher concentrations in the area.

An air filter station at 200 W gate house has been in operation this month and the concentration is found to average 7.0×10^{-9} ucfh. This unit will be operated continuously in the future & will be included with the routine data.

Rain Samples Sixteen rain samples were collected from the rain of 7/10 & 7/14. Total rainfall was .12 inches accompanied by a trace of hail. This was the only rainfall in this period. Results obtained from these samples are as follows:

Table D

<u>Location</u>	<u>Maximum mep/h</u>	<u>Average mep/h</u>
Within 200 E Area	7.6×10^{-2}	1.9×10^{-2}
Within 200 W Area	0.29	0.20
100 Area & Environs	1.3×10^{-3}	9.0×10^{-4}
Intermediate on Area	1.2×10^{-2}	5.4×10^{-3}
Outlying off Area	1.1×10^{-4}	1.1×10^{-4}

241 BX Construction Area.

In addition to the CI data above, the air monitoring in this zone indicates the average baseline rate to be decreasing. The average for July was 0.04 mep/hr as compared to 0.05 mep/hr in June & 0.06 mep/hr in May.

The averages at each station were ^{where are} stations?

<u>Station #</u>	<u>mep/hr</u>	<u>Station #</u>	<u>mep/hr</u>
1	0.03	7	0.04
3	0.03	8	0.03
4	0.06	9	0.03
6	0.03	10	0.04

Rain sampling in the construction zone results in a concentration of 1.8×10^{-3} mep/h which is considerably lower than the results obtained in the

Equipment & Monitoring Changes

1. The ionization chamber monitoring station at Goble Mountain has been discontinued as the rough condition of the road resulted in excessive abuse to the portable trimmer used to read the station.
2. The Benton City constant iodine unit has been replaced with a little sucker unit. The EI was given to the survey group in 200 W.
3. Recent motor air failure was investigated and the failure was attributed to the sensitivity of the Trumble overload switch to atmospheric temperatures. These switches have been replaced with G.E. "auto switches" which the relays are located at the opposite end of the motor. To date it appears that this change has corrected the situation.
4. A little sucker air filter has been installed at 200 W EC 614 bldg. & will be serviced on a routine weekly basis.

To - W. Singleyich

August 29. 1947

From - H. J. Paas & W. C. Berlin

Report From Site Survey For
Month OF August 1947.

The attached report was compiled from the following
number of surveys:

Water -	Drinking	188
	Test Well	10
	River	60
	Waste	55
	Rain	44
Air	Air Filters	41
	Detachable Chambers	144
	Hand Pump	3
	Film (Packets)	92
Land	Vegetation On Area	323
	Vegetation Off Area	83
	Solids (mud. lint soil)	19
	Instrument Survey	19
MISC.	Smears	54
	Total Samples	1635

A decrease in the amount of airborne contamination on the reservation is shown by results obtained from the vegetation, air filter & chamber monitoring programs.

It is possible that this average contamination decrease is due to the low mean temperature the past month. The mean temperature Aug. 1st thru Aug 28th was 72.0°F which is the lowest ^{August mean} since operation was started. This compares to a mean of 75.4°F in July and an all time August mean of 74.1°F . The cooler atmosphere tends to prevent inversion of the effluent and thus distribute the contamination rather than deposit it locally in more concentrated amounts.

Norman J. Paul
McBurl J.

31 August 47

Vegetation

There were 282 routine samples taken during the month of August 1947. The trend of contamination has decreased from July 1947 average, with the exception of Richland which increased due to one reading of 1.01 $\mu\text{c/kg}$ obtained at Kadlee Hospital. The recount and a resample in that area showed $< 0.04 \mu\text{c/kg}$.

Table III

Location	Maximum $\mu\text{c/kg}$	Average $\mu\text{c/kg}$	Previous Month Average $\mu\text{c/kg}$
North of the 200 Areas	0.17	0.04	0.03
Ne- -ie 200 Areas	2.45	0.24	0.42
South of the 200 Areas	0.22	0.05	0.13
Richland	< 0.04	< 0.04	0.04
Paseo	0.07	< 0.04	0.04
Kennewick	0.09	< 0.04	< 0.04
Benton City	0.06	< 0.04	< 0.04
Richland Y	< 0.04	< 0.04	< 0.04
Hanford	0.12	0.06	0.09

* Recount and resample show $< 0.04 \mu\text{c/kg}$

Inside Separation Areas

Location	Maximum $\mu\text{c/kg}$	Average $\mu\text{c/kg}$	Previous Aver. $\mu\text{c/kg}$
200 West	0.26	0.06	1.19
200 East	2.35	0.45	0.59

Vegetation (cont)

Off Area

41 samples of vegetation were collected along a line north of and parallel to the south barricade fence. This course skirted the chain of sand dunes in the southern portion of the project area. An average of all samples was $0.11 \mu\text{ec/kg}$ with the maximum contamination, $0.63 \mu\text{ec/kg}$ found 2 miles SSW of the 291-T stack.

9 samples were taken on the top of Rattlesnake mountain with low average results, the maximum being $0.12 \mu\text{ec/kg}$

74 samples were taken during a survey of Benton Gap. This survey was made ^{at 50 foot changes in elevation} from the top of Rattlesnake mountain to the Yakima River and thence up the continuation of the Rattlesnake Hills to an elevation of 880 feet above sea level. 13 samples show a positive indication of contamination, the maximum being $0.09 \mu\text{ec/kg}$. This survey will be analysed statistically and comparatively and submitted as a separate report.

Ground Contamination Measured with Portable G.M. Meter

200 W. - A maximum reading of 2400 c/m was obtained

450 feet East of the 291-T stack.

200 E. - A maximum reading of 1000 c/m was obtained

- 1000 feet SE of the 291-B stack.

31 August 47

Water

Drinking

188 samples of drinking water were surveyed
this report period with the following results:

<u>Location</u>	<u>Alpha d/m/L</u>	<u>Beta & Gamma uc/l</u>	<u>Date</u>
* Benton City	5.2 ± 2.0	$< 5 \times 10^{-5}$	July 28, 1947
	4.0 ± 2.0	$< 5 \times 10^{-5}$	Aug 6 "
	2.4 ± 1.6	$< 5 \times 10^{-5}$	" 13 "
Pistol Range	11.6 ± 2.8	$< 5 \times 10^{-5}$	Aug 19, 1947
Columbia Camp	2.6 ± 1.6	$< 5 \times 10^{-5}$	Aug 4, 1947
Richland Div. #13	2.5 ± 1.4	$< 5 \times 10^{-5}$	July 30, 1947
	2.9 ± 1.1	$< 5 \times 10^{-5}$	Aug 12, 1947
3000 Area	6.4 ± 2.1	$< 5 \times 10^{-5}$	July 30, 1947
200 W Sanitary	18 ± 20 **	$< 5 \times 10^{-5}$	July 28, 1947
	21 ± 32 **	$< 5 \times 10^{-5}$	Aug 4, 1947

* A study is being made of the Benton City water ~~basin~~ ^{as} this well supplies 30 homes and buildings. When this study is completed a statement or report will be published.

** These samples were negative on recount and resample, and it is ? probable that they were contaminated in the laboratory during processing.

The samples of the 300 Area Wells and the White Bluff are included in the total above but are listed as follows:

Location	Maximum		Date	Average	
	Alpha d/m/L	Beta & Gamma		Alpha d/m/L	Beta & Gamma u/L
300 #1	26.0 ± 4.8	< 5 × 10 ⁻⁵	July 28 '47	11.5 ± 2.8	< 5 × 10 ⁻⁵
300 #2	49.0 ± 6.0	5 × 10 ⁻⁵	Aug 19 '47	15.9 ± 3.3	< 5 × 10 ⁻⁵
300 Sanitary	29.0 ± 4.8	< 5 × 10 ⁻⁵	Aug 1 '47	12.8 ± 3.1	< 5 × 10 ⁻⁵
Whit. Bluffs	4.3 ± 1.6	< 5 × 10 ⁻⁵	July 30 '47	< 2	< 5 × 10 ⁻⁵

Test Wells

10 samples of water were taken this period with the following positive results.

Location	Alpha d/m/L	Beta & Gamma u/L	Date
Spring #13	5.6 ± 2	5 × 10 ⁻⁵	Aug 5, 1947
Ranch 13	4.4 ± 2.4	< 5 × 10 ⁻⁵	Aug 5, 1947
McGee Well	17.2 ± 3.6	< 5 × 10 ⁻⁵	Aug 6, 1947
Ford Well	2.8 ± 1.6	< 5 × 10 ⁻⁵	Aug 6, 1947

These samples appear to have been contaminated in the laboratory in view of the fact that they were processed the same day as the ^{positive} 20010 Sanitary water which upon resampling later yielded consistent negative results.

All high density water samples are now being sampled in duplicate and a duplicate sample is collected and analyzed.

Rivers

48 samples of Columbia River water were taken during

this report period with results as follows:

Table A
 Location No. of Samples Alpha d/m/l Maximum Average
 Robert Conner m/l

181-B	0	0	0	0	0
181-D	4	3.3 ± 1.2	< 2	10 x 10 ⁻⁵	< 5 x 10 ⁻⁵
181-J	4	4.8 ± 1.8	< 2	113 x 10 ⁻⁵	37 x 10 ⁻⁵
Handford	12	< 2	< 2	77 x 10 ⁻⁵	7 x 10 ⁻⁵
300 Area	4	< 2	< 2	13 x 10 ⁻⁵	1 x 10 ⁻⁵
Richland	6	< 2	< 2	1 x 10 ⁻⁵	< 5 x 10 ⁻⁵
Raw Water (Export line)	10	< 2	< 2	< 5 x 10 ⁻⁵	< 5 x 10 ⁻⁵
Above 150 B	3	2.9 ± 1.6	2.1 ± 1.3	< 5 x 10 ⁻⁵	< 5 x 10 ⁻⁵

The report period is as follows:

The Columbia River flow data in gallons per second for

July 30 1947 1,403 Aug 6 1185 Aug 15 908
 Aug 1 1,358 ' 11 975 18 853
 3 1,320 13 953 19 878
 5 1,260 14 930 23 765
 27 645

17 samples of water from the Yaluma River were taken during this report period with the following results:

Location	Alpha d/m/L		Beta & Gamma uc/L	
	Maximum	Average	Maximum	Average
Yakima-Middle	2.8 ± 1.6	< 2	$< 5 \times 10^{-5}$	$< 5 \times 10^{-5}$
Yakima Horn	7.0 ± 2.4	2.2 ± 1.3	$< 5 \times 10^{-5}$	$< 5 \times 10^{-5}$

107. Effluent

11 samples of 107 effluent water were taken with the following results.

Location	No of Samples	Alpha d/m/L		Beta & Gamma uc/L	
		Maximum	Average	Maximum	Average
107-D	4	< 2	< 2	1.65×10^{-4}	*
107-F	3	< 2	< 2	2.38×10^{-7}	*
1904-B-	4	2.8 ± 1.6	< 2	7×10^{-5}	$< 5 \times 10^{-5}$

* The 107-D and 107-F samples are listed as one reading because the other counts were not considered due to the fact that cannot be determined for sure that they were 500 cc samples.

Waste Contamination

200 West

Waste Solutions

300 Area

300 Area

Waste Solids

No of Samples - Max Alpha d/m/L

Max Beta Gamma uc/L

The maximum reading obtained in this area was 400 c/m on mud at the second underpass of the 200 E-B offset.

Portable GM Meter Survey

200 East

The maximum reading obtained in this area was 400 c/m on water at the west side of the T Swamp.

Portable GM Meter Surveys

Laundry Unit

< 40

.37

T Swamp S

70 ± 6

.53

T Swamp W

< 40

.12

Location

Alpha d/m/gr (Max)

Beta Gamma uc/kg (Max)

Waste Solids

231 Ditch 1st Underpass

40

< 5 X 10⁻⁵

Laundry Ditch 600'

60

11 X 10⁻⁵

U-Swamp-Inlet

< 40

11 X 10⁻⁵

Location

Alpha d/m/L (Max)

Beta Gamma uc/L (Max)

Waste Solids

<u>No of samples</u>	<u>Alpha d/m/gr</u>		<u>Beta & Gamma uc/gr</u>	
	<u>Max</u>	<u>Aver</u>	<u>Max</u>	<u>Aver</u>
8	1528 ± 24	480 ± 12	121.3	3.2

Portable G.M. Meter Surveys

The maximum reading obtained in this area was 900 c/p
on mud at the west side of the 300 area Pond.

200 North Waste Surveys

<u>Location</u>	<u>Maximum Readings</u>			
N Ditch	22	MRP/hr	and 11	MR/hr - Beckman
P Ditch	10.5	" "	7.5	" "
R Ditch	12	" "	9.5	" "

Air Monitoring

Integrations: Results obtained at the atmospheric monitoring stations as compared to the previous month are as follows:

Location	Table I Average Desc Temp/24 hrs	
	August	July
100 B	0.6	0.6
100 D	1.4	1.4
100 F	0.9	2.5
200 W	0.7	4.3
200 E	2.2	0.8
Riverland	2.5	3.0
Hanford	0.6	0.5
300 Area	2.4	2.0
700 Area	0.2	0.1
Kennewick	0.1	0.5
Pasco	0.5	0.8
Benilton City	0.2	0.1

Outlying

1.9

1.0

The air levels compare favorably with the previous month, the only significant increase occurring in the 200 East area. This higher level is not confirmed by the pocket and chamber reads. A total of 416 operating hours were lost in this period. This time loss is a 50% decrease from the previous month.

"C" Chambers - A summation of "C" chamber data as compared to those readings obtained last month are as follows: (figures represent dosage in mrep/24 hours)

		Table II	
		August	July
	Location		
	100 B	0.2	0.2
	100 D	0.3	0.3
	100 F	0.3	0.3
XX →	200 E	0.3	0.6
X →	200 W	0.4	0.4
	300 Area	0.3	0.4

C chamber data is in very good agreement with previous data. A decrease in the level in East area is contradictory to the integrator data, however the chamber data appears to be the more reliable as it is confirmed by air filter & film packet results.

Film Packets - All film packets indicated the levels to be less than 5.0 mrep/24 hrs at all monitoring stations on and adjacent to the reservation.

Detachable Chambers: Average dosage readings obtained with detachable chambers as compared to the previous month are as follows - (all readings are average ~~per day~~ ^{per day}).

<u>Location</u>	<u>July</u>	<u>August</u>
<u>100 Area & Environs</u>		
Route 1 mile 8	.01	.02
Route 2 mile 10	.01	.02
Route 2N mile 5	.01	.02
Route 11A mile 1	.05	.03
Route 1 & Route 4N	.02	.02
<u>Within 5 miles of 200 East</u>		
Route 45 mile 6	.04	.05
Route 11A mile 4	.03	.03
Route 3 mile 1	.04	.05
Metareology 200'	.05	.08
<u>Within 10 miles of 200 EAST</u>		
Route 45 mile 10	.02	.04
Route 10 mile 1	.02	.04
Route 10 mile 3	.02	.03
Route 25 mile 4	.03	.08
<u>Near 300 Area</u>		
Route 45 mile 16	.02	.02
Route 45 mile 22	.02	.05

A overall decrease in the airborne contamination levels occurred in this period. This decline is not ^{highly} significant at any individual location, however the mass decline observed at all stations makes the trend significant. This decrease of airborne activity is in very good agreement with the air filter data obtained in the same period.

Constant Iodine Monitoring - I^{131} concentrations as measured by C. I. units in the month of August were as follows -

Location	Maximum Eight Hour Conc.	Mean Ave. Concentration Aug.	Mean Ave. Concentration July
200 ESE	3.2×10^{-7}	3.0×10^{-9}	1.2×10^{-8}
200 E Turb	4.0×10^{-7}	3.9×10^{-9}	8.9×10^{-9}
Goble Mountain	2.8×10^{-7}	1.0×10^{-9}	2.1×10^{-9}
Richland	$< 1.0 \times 10^{-7}$	4.0×10^{-10}	4.3×10^{-10}

I^{131} concentrations in the atmosphere have decreased in the past month. A contributing factor to this decrease may be the fact that the mean temperature for the month of August is considerably lower than the previous month & considerably lower than any previous August since HEW operation. ^{steatmount of} A hooping of the stack gas is closely related to the temperature extremes.

Air Filters: The average iodine concentration at the air filter locations was as follows:

Location	August	July
Pasco	2.0×10^{-10} u/L	8.3×10^{-10} u/L
300 Area	2.2×10^{-9} u/L	8.8×10^{-10} "
200 E Tur #18	6.1×10^{-9} u/L	7.2×10^{-9} "
100 D	1.1×10^{-9} u/L	1.5×10^{-9} "
200 W Gate	5.5×10^{-9} u/L	7.0×10^{-9} "
Benton City	1.0×10^{-9} u/L	—

Air levels again show a general decrease, ^{according to} ~~from~~ the air monitoring data. The Benton City unit was ~~the~~ not in operation as an air filter during the month of July.

An air filter station has been established at the Hanford airport. One weeks data indicates the level to be around 2.7×10^{-10} u/L.

Rain Sampling: Forty-four rain samples were collected in this period. Results were as follows:

Location	Max. u/L	Average u/L
Within 200 E Area	1.6×10^{-2}	8.1×10^{-3}
Within 200 W Area	.32	4.8×10^{-2}
100 Areas & ESTU.	1.7×10^{-3}	5.5×10^{-4}
T-1 / L. P. Area	1.6×10^{-3}	4.6×10^{-3}

The maximum off area result was obtained in the 700 area.

An ~~an~~ unusually high result was obtained in the 200 west area, however no definite explanation of this result can be made.

Several rain samples taken in the 241 BX area indicate the level to be about 2.1×10^{-3} ucp/L in this vicinity.

241 BX Construction Area: In addition to the C.I. & Rain data reported above, the detachable chamber air monitoring in this zone indicates the level to be .03 mrep/hr. This figure is the average of eight stations which individually ranged from a minimum of .02 mrep/hr to a maximum of .05 mrep/hr.

The .03 mrep/hr average is a decrease from 104) .05 mrep/hr in July. This decrease is consistent with the general site decrease.

Mobile Equipment Survey: Fifty four smears of the site survey vehicles were taken. No alpha contamination was found, however several smears showed counting rates around 10 cpm. It is interesting to note that these positive indications were confined to the external parts of the cans, such as windshields, doors, and antennas.

Equipment & Monitoring Changes -

1. The Richland C I unit is now operating in the 700 area instrument shop. The data from same is not a true picture of the existing conditions in 700 area as the air sample is taken from previously filtered air in the 712 bldg. Also it is understood that the moto air is shut off during certain periods of the day shift.
2. A little sucker type air filter station has been established at the Hanford Airport & will be serviced on a routine basis.
3. The wells in the 3000 area have been placed on the weekly routine again, due to the increased personnel now using that area.
4. The 3000 Area was investigated as a possible air monitoring site, however no suitable location could be found.
5. The new C I probes have supplanted the old type in all locations except 700 area.

To - W. Simons

September 30, 1997

From - W.C. Berlin & H.J. Paas

Report From Site Survey For
Month of September 1997.

The attached report was compiled from the following
number of surveys:

Water	Drinking	203
	Test Well	10
	River	95
	Waste	55
	Rain	94
Air	Air Filters	55
	Detachable Chambers	660
	Hand Pump	0
	Film Packets	92
Land	Vegetation On Area	304
	Vegetation Off Area	547
	Solids (mud-lint-soil)	32
	Mobile Instrument	7
	Portable Instrument	16

Air Monitoring -

Integrations: Results obtained at the atmospheric monitoring stations as compared to the previous month are as follows: Table I

location

Average Case
September August

100 B

0.8

0.6

100 D

1.3

1.4

100 F

1.0

0.9

200 W

1.0

0.7

200 E

.8

2.2

Riverland

1.4

2.5

Hanford

.9

0.6

300 Area

1.7

2.4

700 Area

.1

0.8

0.2

Kennelick

.2

0.1

Pasco

.5

0.5

Benton City

.5

0.2

In general the air levels as monitored by the integration units compare very favorably with last months data. A significant decrease in the 200 E area is observed, however last months result in this area was abnormally high and the current level is that which one would normally expect.

"C" Chambers A summary of the "C" Chamber results for the month of September as compared to the previous month are as follows :- (figures represent dosage in mrep/24 hours)

Location	July Table	September	August
100 B		0.3	0.3
100 D		0.4	0.3
100 F		0.3	0.3
please reverse → 200 E	W.S. ?	0.3	0.3
→ 200 W		0.3	0.4
300 Area		0.4	0.3

The air levels appear to be well within the normally expected range and the results as obtained on the "C" Chambers in this period agree very closely to those obtained in previous.

Film Pockets: Results obtained from film packet monitoring show the radiation levels to be < 5.0 mrep/24 hrs at all locations. Twenty-two-packets are now in service.

Detachable Chambers: Average dosage readings obtained with detachable chambers as compared to the previous months observations are as follows - (all readings are average mmp/hour)

<u>Location</u>	<u>September</u>	<u>Table B August</u>
100 Area & Environs		
Route 1 mile 8	.01	.01
Route 2 mile 10	.01	.01
Route 2N mile 5	.02	.01
Route 11A mile 1	.02	.05
Route 1 & Route 4N	.02	.02
Within 5 Miles 200E		
Route 45 mile 6	.02	.04
Route 11A mile 6	.03	.03
Route 3 mile 1	.03	.04
Meteorology 200'	.03	.05
Within 10 Miles 200E		
Route 45 mile 10	.03	.02
Route 10 mile 1	.02	.02
Route 10 mile 3	.01	.02
Route 25 mile 4	.03	.03
Near 300 Area		
Route 45 mile 6	.02	.02
10.1. 11.1. 12.1. 13.1.		

For the second consecutive month an overall decrease is observed in the detachable chamber data. This decrease appears to be generally distributed and the current low levels are about the lowest that have existed this year.

Special detachable chambers located in the 700 Area, Hanford & Benton City indicate the levels in these locations to be .01 Mep/hour. This is in agreement with spot checks made in the past.

Constant Iodine Monitoring - I¹³¹ concentrations as measured by C.I. units in the month of September were as follows - (20/2)

Location	Maximum Eight Hour Conc.	Mean Average Concentration Aug.	Mean Average Concentration Sept.
200 ESE	3.2×10^{-7}	3.0×10^{-9}	2.7×10^{-9}
200 E Ten #11	3.2×10^{-7}	3.9×10^{-9}	2.2×10^{-9}
Gable Mount.	$< 1.0 \times 10^{-7}$	1.0×10^{-9}	4.0×10^{-10}
Richland.	2.0×10^{-7}	4.0×10^{-10}	$< 1.0 \times 10^{-10}$

The general decrease observed in chamber data is confirmed in the C.I. results. The lone exception is in the positive eight hour result (2.0×10^{-7} u/L) on 9/11/11 however the result is near

dubious as the γ -C. I observation was not confirmed from chamber data. This condition existed the shift preceding the changing of the filter & the filter was counted the next day and showed 1.4×10^{-10} ne/l which was the entire weeks accumulation. Thus it appears that the instrument was flickering at the time it recorded this reading.

Air Filters: The average iodine concentrations at the air filter locations in the month of September was as follows:

<u>Location</u>	<u>September</u>	<u>August</u>
Posco	5×10^{-10} ne/l	2×10^{-10} ne/l
300 Area	5.2×10^{-10} "	2.2×10^{-10} "
200 E Tur 18	7.7×10^{-9} "	6.1×10^{-9} "
100 D	4.6×10^{-9} "	1.1×10^{-9} "
200 W Gate	6.3×10^{-9} "	5.5×10^{-9} "
Benton City	7.2×10^{-10} "	1.0×10^{-9} "
Hanford 614	3.3×10^{-10} "	2.7×10^{-10} "

The above data shows that air concentrations of I^{131} are well within the expected range and for the most part are lower than the concentrations earlier this summer.

Rain Sampling: Eighty one rain samples were collected in this period. Results obtained are summarized as follows:

Location	Maximum Value	Average Value
Within 200 E Area	1.9 x 10 ⁻²	1.3 x 10 ⁻²
Within 200 W Area	2.1 x 10 ⁻²	1.9 x 10 ⁻³
100 feet ± from 100's	3.1 x 10 ⁻²	4.1 x 10 ⁻⁴
Intermediate Area	2.1 x 10 ⁻²	3.2 x 10 ⁻³
Collaring Off Area	1.1 x 10 ⁻³	1.1 x 10 ⁻⁴

* The maximum off area result was obtained at the Benton City City Building. There are no unusual results in the rain data. The rainfalls occurred in the period & about 20 gage were in service.

241 BX Construction Area

Defectable Chambers - The average dose rate as monitored by the defectable chambers was .03

rep/hour. This is the mean of eight locations. The maximum of the individual shifts was .041 Mepps

Rain - The average air concentration as

monitored by rain sampling was 5.3 x 10⁻³ w/L. This result was secured from 13 samples, the

Water

Water Drinking

203 samples of drinking water were surveyed this report period with the following results.

Location	Alpha d/m/L *	Beta & Gamma uc/L	Date
Kennewick	18.4 ± 3.6 L 2	5.2 x 10⁻⁵ 3.7 x 10⁻⁵ **	8/27
Riverland	2.9 ± 1.6 11	< 5 x 10 ⁻⁵	9/10
Midway	5.2 ± 2.0 11	< 5 x 10 ⁻⁵	9/24
Pistol Range	4.0 ± 1.6 11	< 5 x 10 ⁻⁵	9/2
Richland Dur. #13	7.0 ± 1.6 11	< 5 x 10 ⁻⁵	8/25
" " "	2.4 ± 1.6 11	< 5 x 10 ⁻⁵	9/22
3000 Area Dur #1	5.2 ± 2.0 11	< 5 x 10 ⁻⁵	9/22

* In all cases arecount the same day and resamples show 22 d/m/L

** On 8/27/47 a sample of water from Kennewick 614 building gave a C/m of 7 on Beta & Gamma. This location was resampled along with samples from other locations and the results were the same at the 614 building while all other samples were zero. An investigation has shown that there are two water systems in Kennewick. The area north and east of the Columbia Irrigation District Canal is supplied by the Pacific Gas & Electric Co. from two wells located in the east section of town. The remaining area west and south of the Canal which includes the 614 building, is supplied by the Kennewick Irrigation District with water pumped from the Columbia

②

River at Smitty's Garage. A survey of the Columbia River and the Kennowick District system was made and it was found the contamination can be attributed to sodium. The results obtained are far below the tolerance level for radioactive sodium. A further study is being made of this condition.

The samples of the 300 Area wells and White Bluffs are included in the total for drinking water but are listed separately as follows:

<u>Location</u>	<u>Maximum</u>		<u>Date</u>	<u>Average</u>	
	<u>Alpha d/m/L</u>	<u>B+G uc/L</u>		<u>Alpha d/m/L</u>	<u>B+G uc/L</u>
300 #1	6.1 ± 2.0	$< 5 \times 10^{-5}$	9/9/47	$3.3 \pm .4$	$< 5 \times 10^{-5}$
300 #2	7.6 ± 2.4	$< 5 \times 10^{-5}$	8/29/47	$6.7 \pm .6$	$< 5 \times 10^{-5}$
300 Sandoy	5.6 ± 2.0	$< 5 \times 10^{-5}$	9/4/47	$3.7 \pm .4$	$< 5 \times 10^{-5}$
White Bluffs	2.0 ± 1.2	$< 5 \times 10^{-5}$	8/29/47	$.92 \pm .12$	$< 5 \times 10^{-5}$

Test Wells

10 samples of water were taken this period with the following positive results:

<u>Location</u>	<u>Alpha d/m/L</u>	<u>Beta & Gamma uc/L</u>	<u>Date</u>
Ranch 13	$4.4 \pm .28$	$< 5 \times 10^{-5}$	9/9/47

Two recounts of the above sample were < 2 d/m/L Alpha.

Rivers

78 samples of Columbia River water were taken during this report period with results as follows:

Location	No of Samples	Alpha d/m/L		Beta & Gamma m/c	
		Maximum	Average	Maximum	Average
181 B	0	< 2	< 2	< 5X10 ⁻⁵	< 5X10 ⁻⁵
181 D	5	< 2	< 2	76X10 ⁻⁵	45X10 ⁻⁵
181 F	5	< 2	< 2	102X10 ⁻⁵	45X10 ⁻⁵
Hanford	15	< 2	< 2	20X10 ⁻⁵	10X10 ⁻⁵
800 Area	15	< 2	< 2	16X10 ⁻⁵	13X10 ⁻⁵
Richland	14	< 2	< 2	< 5X10 ⁻⁵	< 5X10 ⁻⁵
Paw Water (export line)	25	< 2	< 2	< 5X10 ⁻⁵	< 5X10 ⁻⁵
Above 100 B	1	< 2	< 2	9X10 ⁻⁵	5X10 ⁻⁵
Below Richland (to Sacajawea Park)	9	< 2	< 2		

The Columbia River flow data in thousand gallons per second for this period is as follows:

August 29 1947	645,000	gallons.
September 3 "	638,000	"
" 9 "	570,000	"
" 12 "	578,000	"
" 17 "	570,000	"
" 24 "	540,000	"

17 samples of water from the Yakima River were taken during this period. There were no positive indications of contaminations.

107 Effluent

15 samples of the effluent water from the 107 basins were taken with the following results:

Location	No. of Samples	Alpha d/m/l		Beta & Gamma d/c/l	
		Maximum	Average	Maximum	Average
1904-B	5 (4 counted)*	< 2	< 2	1.4×10^{-3}	3.7×10^{-3}
107-D	5 (4 counted)*	2.2 ± 3.2	< 2	1.3	.58
107-F	5 (3 counted)*	< 2	< 2	1.3	.41

* Samples not considered because of excessive time between sampling and counting.

NOTE: The computations for all Water and Waste samples do not include a self-absorption factor.

Waste Contamination

200 West

Waste Solutions

<u>Location</u>	<u>Alpha dis/min/L (Max)</u>	<u>Beta & Gamma $\mu\text{Ci/L}$ (Max)</u>
T-Swamp Inlet	< 40	20×10^{-5}
" " W. Side	< 40	15×10^{-5}
" " S. Side	170 ± 25	35×10^{-5}
U. Swamp W. Side	100 ± 20	10×10^{-5}
Laundry Ditch 600'	165 ± 25	$< 5 \times 10^{-5}$

Waste Solids

<u>Location</u>	<u>Alpha d/m/gr (Max)</u>	<u>Beta & Gamma $\mu\text{Ci/gr}$ (Max)</u>
T-Swamp W. side	< 40	.12
" " S. Side	700 ± 5	.55
Laundry Lint	75 ± 10	.24

Portable GM Meter Survey

The maximum reading obtained in this area was 550 c/m on mud at the inlet of the Laundry and T-Ditch.

200 East

Portable GM Meter Surveys

There were no surveys of this area during the period reported upon.

300 Area

Waste Solutions

<u>No of Samples</u>	<u>Alpha d/m/L</u>		<u>Beta & Gamma uc/L</u>	
	<u>Max</u>	<u>Aver.</u>	<u>Max</u>	<u>Aver.</u>
8	12955 ± 176	2095 ± 15	1068 × 10 ⁻⁵	200 × 10 ⁻⁵

Waste Solids

<u>No of Samples</u>	<u>Alpha d/m/gr</u>		<u>Beta & Gamma uc/kg</u>	
	<u>Max</u>	<u>Aver.</u>	<u>Max</u>	<u>Aver.</u>
10	265 ± 10	135 ± 3.7	2.0	1.0

Portable G M Surveys

The maximum reading obtained in this area was 1800 c/m on water at the N.W. Corner of the 300 Area Pond.

200 North Waste Surveys

<u>Location</u>	<u>Maximum Reading</u>			
'N' Ditch	11.0	Mrep/hr	and	4.0 MR/hr
'P' Ditch	14.0	" "	12.5	" "
'R' Ditch	11.5	" "	8.0	" "

611

To - W. Singley

October 30, 1947

From - W. C. Berlin & H. J. Pass

Report From Site Survey
For Month of October 1947.

The attached report was compiled from the following
number of surveys:

Water	Drinking	205
	Test Well	10
	River	73
	Waste	68
	Rain	38
Air	Air Filters	23
	Detachable Chambers	494
	Hand Pump	0
	Film Packets	92
Land	Vegetation On Area	285
	Vegetation Off Area	46
	Solids (mud lint soil)	25
	Mobile Instrument	10
	Portable Instrument	15

Isolation of Contaminated Particles

A survey has been set up by this section in an effort to determine the source and range of contaminated particles which have been found adjacent to the stacks in the separation areas.

The purpose of this survey is to determine:

- (1) The source of the particles
- (2) The frequency of origin
- (3) The range or extent of travel.
- (4) The method of transportation, if applicable.

Areas of 20 sq ft have been staked in 200 West and 200 East. The areas are located at the corners of the perimeter fences at the T and B plants and at the corners of the 200 West and 200 East Area fence. These areas will be surveyed weekly.

The staked areas are supplemented by 2' x 2' pieces of Masonite bolted to stakes at a 15° angle and 2 to 4½ feet off of the ground. The surface is covered with a layer of Petrolatum. These stands are located between each of the staked plots and a number placed down wind from the 291 T and B stacks. Several will be located outside

②

Initial surveys within the 200 East area have located two particles outside the B plant. Both were located about 500 ft east south east of the stack. The particles were located with a G.M. Meter. The first read 15000 c/m. and the second 12000 c/m. The soil surrounding these particles after they are removed count about 5000 c/m.

Results will be reported under separate cover.

Vegetation.

There were 285 routine samples taken during the month of October 1947. The trend of contamination has remained ~~the same~~ the same. ~~Near the 200 Areas,~~

~~South of 200 Areas, and Kennewick increased~~

~~slightly~~ *not significantly*

Table III

Location	Maximum uc/Kg	Average uc/Kg	Previous Month Average uc/Kg
N. of the 200 Areas	0.13	<0.04	<0.04
Near the 200 Areas	2.76	0.20	0.19
South of the 200 Areas	0.86	0.05	<0.04
Richland	0.07	<0.04	<0.04
Pasco	0.11	<0.04	<0.04
Kennewick	0.16	0.04	<0.04
Benton City	0.11	<0.04	0.05
Richland "Y"	0.04	<0.04	<0.04
Hanford	0.13	0.06	0.07

Inside Separation Areas.

Location	Maximum uc/Kg	Average uc/Kg	Previous Aver. uc/Kg
200 West	0.21	<0.04	<0.04
200 East	0.80	0.24	0.39

Vegetation (con't.)

Off Area

46 samples of vegetation were collected during a survey of Rattlesnake Mt. area. A sample was collected at each of the M.P. Posts and 14 samples collected down the side of Rattlesnake. The attached map identifies the location of sampling and gives the values in $\mu\text{C/Kg}$ for these locations. The highest value of .22 $\mu\text{C/Kg}$ was obtained at M.P. Post 24. The average for the entire survey was .08 $\mu\text{C/Kg}$.

from the ground in vegetation

Ground Contamination Measured with Portable G.M. Meter

200W - A Maximum reading of 1400 c/m was obtained 700 feet E of the 291-T Stack.

200 E - A Maximum reading of 2200 c/m was obtained 2000 feet S of the 291-B Stack.

A special survey was made along the east side of B area fence in 200 E area on 10/9/47. One spot 500 ft. Southeast of stack was found to have a reading of 29000 c/m. The soil sample was taken and quartered until one particle was isolated which gave a reading of 15,000 c/m. The soil and particle

Water

Drinking

205 samples of drinking water were surveyed this period with the following results.

Location	Alpha d/m/L*	Beta & Gamma uc/L	Date
Benton City	2.4 ± 1.6	< 5 × 10⁻⁵	9/29/97
" "	2.4 ± 1.6	< 5 × 10⁻⁵	10/15/97
Richland Dur #12	2.8 ± 1.7	< 5 × 10 ⁻⁵	10/23/97

* In all cases the samples listed were recounted and resampled.

Benton City recounts show < 2 d/m/L. Richland Durand #12 was recounted and counted 2.4 ± 1.4 d/m/L Alpha. A 5 gallon sample is being analyzed.

All drinking water is ^{to be} sampled by 2 1/2 gallon samples at ^{Periodic} intervals.

The 300 Area Wells and White Bluff well samples are included in the above total but are listed separately as follows:

Location	Alpha d/m/L ^{Maximum}	Beta & Gamma uc/L	Date	Alpha d/m/L* ^{Average}	BtG uc/L
300 #1	14.4 ± 3.6	< 5 × 10 ⁻⁵		3.4 ± .4	< 5 × 10 ⁻⁵
300 #2	6.4 ± 2.4	< 5 × 10 ⁻⁵		5.1 ± .5	< 5 × 10 ⁻⁵
300 Sanctuary	8.0 ± 2.4	< 5 × 10 ⁻⁵		3.8 ± .4	< 5 × 10 ⁻⁵
White Bluffs	< 2	< 5 × 10 ⁻⁵		.9 ± .2	< 5 × 10 ⁻⁵

* The probable error limits used with these values are based on assumption that only error is due to counting time alone.

Test Wells

TO samples of water were taken this period with ~~the~~ no indication of contamination present.

Rivers

61 samples of Columbia River Water were taken during this report period with results as follows:

Location	No of Samples	Alpha d/m/l		Table A-B-G	
		Maximum	Average	Maximum	Average
181 B	0	—	—		
181 D	4	< 2	< 2	$< 5 \times 10^{-5}$	$< 5 \times 10^{-5}$
181 F	4	< 2	< 2	2.5×10^{-4}	1.5×10^{-4}
Hanford	12	< 2	< 2	1.05×10^{-3}	5.0×10^{-4}
300 Area	4	2.7 ± 1.6	< 2	2.5×10^{-4}	1.0×10^{-4}
Richland	8	8.3 ± 2.7	< 2	1.3×10^{-4}	1.5×10^{-5}
Raw Water (Export Line)	20	< 2	< 2	$< 5 \times 10^{-5}$	$< 5 \times 10^{-5}$
Above 100 B	2	< 2	< 2	$< 5 \times 10^{-5}$	$< 5 \times 10^{-5}$
Pasco H+R Depot	7	< 2	< 2	1.5×10^{-4}	1.2×10^{-4}

* Probably contaminated since sample was run next to a waste sample. Sample from Pasco next day gave no positive res.

Columbia River Flow (Thousands of gallons per second)

Oct 1 1947	473,000
" 8 1947	480,000
" 16 1947	638,000
Oct 21, 1947	833,000

12 Samples of water from the Yakima River were taken during this period. There is no evidence of contamination indicated.

107 Effluent

16 samples of the effluent water from the 107 basin were taken with the following results.

Location	No of Samples	Alpha d/m/l		B+C	
		Maximum	Average	Maximum	Average
1904-B	4	< 2	< 2	3.8×10^{-2}	8×10^{-2}
107-D	6	$2.8 \pm .4$	< 2	0.22	0.15
107-F	6	$2.6 \pm .4$	< 2	0.23	0.14

Note: The computations for all water and waste samples do not include an ^{self} absorption ^{loss} factor.

Waste Contamination

200 West

Waste Solutions

<u>Location</u>	<u>Alpha dis/min/L (Max)</u>	<u>Beta & Gamma uc/L (Max)</u>
T Swamp-West S.	5.3 ± 1.6	5×10^{-5}
" " - S. Side	< 40	25×10^{-5}
U Swamp Inlet	48 ± 14	7×10^{-5}
" " W. Side	92 ± 18	9×10^{-5}
Laundry Ditch-Inlet	50 ± 16	7×10^{-5}
" " 600'	114 ± 16	13×10^{-5}
231 Ditch 1st Underpass	134 ± 24 *	$< 5 \times 10^{-5}$

* A complete survey of this ditch and swamp has been made but results are not yet available.

Waste Solids

<u>Location</u>	<u>Alpha dis/min/gr (Max)</u>	<u>Beta & Gamma uc/kg (Max)</u>
T Swamp-W Side	100 ± 6 (500 ± 100)	$.41$ (0.75)
" " S Side	147 ± 8 (735 ± 140)	$.57$ (1.02)
Laundry Inlet	336 ± 14	1.7 (3.1)

Figures in () have been corrected for self-absorption by using 20% yield on α and 65% on beta
Portable GM Meter Survey

The maximum reading obtained in this Area was 550 c/m on mud at the 500' on the T Ditch and also at the inlet of the Laundry Ditch.

200 East

Portable GM Meter Survey

The maximum reading obtained this area was 850 c/m on mud 1000' from inlet of the of the B ditch.

300 Area

Waste Solutions

<u>No of Samples</u>	<u>Alpha dis/mi/L</u>		<u>Rate, Counts/hr</u>	
	<u>Max</u>	<u>Aver.</u>	<u>Max</u>	<u>Average</u>
8	1020 ± 28	337 ± 12	7.1 x 10 ⁻³	4.0 x 10 ⁻⁴

Waste Solids

<u>No of Samples</u>	<u>Alpha dis/hr/gm</u>		<u>Rate, Counts/hr</u>	
	<u>Max</u>	<u>Aver.</u>	<u>Max</u>	<u>Aver.</u>
8	1099 ± 34	500 ± 10	8.7 (15.8)	8.6 (15.1)

Figures in () have been corrected for self-absorption by using 20% yield for α and 55% for beta.

Portable GM Meter Surveys

The maximum reading obtained in this area was 2500 c/m on mud at the Inlet of 300 Area pond.

200 North Waste Surveys

<u>Location</u>	<u>Maximum Reading</u>	
"N" Ditch	2 Mrep/hr	1.5 MR/hr
"P" Ditch	17 " "	12.5 " "

Monthly Report October 1944 - H. J. P.

Air Monitoring -

Integrations - Results obtained at the atmospheric monitoring stations as compared to the previous month are as follows -

Table I

Average Dose In mrep/4 hrs.

<u>Location</u>	<u>October</u>	<u>September</u>
100 B	0.5	0.8
100 D	0.5	1.0
100 F	2.1	1.0
200 W	0.4	1.0
200 E	0.8	0.8
Riverland	3.3	1.4
Hanford	1.8	0.9
300 Area	2.5	1.7
700 Area	0.5	0.1
Kennebec	0.5	0.2
Pasco	<0.1	0.5
Benton City	0.2	0.5

8.9

1.3

The instruments at the 100 F, Riverland & 300 area do not appear to be operating properly in this period. The data lends evidence of drift. All other locations are within the generally expected magnitude of contamination.

"C" Chambers: A summary of the "C" Chamber results for the month of October as compared to the previous month are as follows: (figures represent dosage in Mrep/24 hours) Table II

<u>Location</u>	<u>October</u>	<u>September</u>
100 B	0.3	0.3
100 D	0.4	0.4
100 F	0.4	0.4
200 E	0.4	0.3
200 W	0.4	0.4
300 Area	0.3	0.3

The air levels as monitored by "C" Chambers compares very favorably with the levels last month. -

Film Packets: Results obtained from film packet data monitoring show the radiation levels to be ≤ 5.0 Mrep/24 hours at all locations. Twenty-two packets were in service.

Detachable Chambers: Average dosage readings obtained with detachable chambers as compared to the previous months observations are as follows - (all readings are average Mrag/hour).

Location	September	Table B October
100 Area & Environs		
Route 1 mile 8	.01	.02
Route 2 mile 10	.01	.01
Route 2N mile 5	.02	.03
Route 11A mile 1	.02	.02
Route 1 & Route 4N	.02	.02
Within 5 miles 200 E		
Route 45 mile 6	.02	.03
Route 11A mile 6	.03	.03
Route 3 mile 1	.03	.10
Meteorology 200'	.03	.03
Within 10 miles 200 E		
Route 45 mile 10	.03	.01
Route 10 mile 1	.02	.03
Route 10 mile 3	.01	.05
Route 25 mile 4	.03	.05
Near 300 Area		
Route 45 mile 16	.02	.02

Observations made at Route 3 Mile 1 indicate a threefold increase in airborne contamination; however other locations remain about the same.

Constant Iodine Monitoring - I^{131} concentrations as measured by C.I. units in the month of October were as follows - (all in $\mu\text{Ci/liter}$)

Location	Maximum Eight hour concentration	Mean Average Conc for October
200 ESE	1.6×10^{-7}	2.1×10^{-9}
200 E Tur #11	Inst. out of order	2.0×10^{-9}
Gable Mountain	$< 1.0 \times 10^{-7}$	5.0×10^{-10}
Richland	$< 1.0 \times 10^{-7}$	3.7×10^{-10}

The low levels of airborne I^{131} are in very good agreement with results observed the previous month. The extended cooling period is the reason levels are low, as about 35 curies are being liberated per dissolving at this time.

Air Filters - The average I^{131} concentrations at various locations during the month of October was as follows:

<u>Locations</u>	<u>October</u>	<u>September</u>
Pasco	5.0×10^{-10} u/L	5.1×10^{-10} u/L
300 Area	6.0×10^{-10} "	5.2×10^{-10} "
200 E TW #18	4.9×10^{-9} "	7.7×10^{-9} "
100 D	3.0×10^{-9} "	4.1×10^{-9} "
200 W Gate	3.0×10^{-9} "	6.3×10^{-10} "
Benton City	1.1×10^{-9} "	7.2×10^{-10} "
Hanford City	4.0×10^{-10} "	3.3×10^{-10} "

Again, this data indicates the air contamination concentrations to be very low. This again, is attributed to the small number of I^{131} liberated per dissolving of the present long cooling periods.

Rain Sampling :- Twenty-eight rain samples were collected in this period. Results obtained were summarized as follows - Table E

<u>Location</u>	<u>Maximum u/L</u>	<u>Average u/L</u>
Within 200 E Area	4.4×10^{-2} u/L	4.2×10^{-4} u/L
Within 200 W Area	No samples collected	

Rain - cont'd

Intermediate on Area 1.4×10^{-3} u/L 4.5×10^{-3} u/L

Outlying Off Area 1.4×10^{-3} u/L 6.6×10^{-4} u/L

The maximum off area sample was collected at Benton City.

241 BX Construction Area:

Detachable Chambers - The average discharge as monitored by detachable chambers was 0.03 in/hr. This is the mean of eight locations and the local is the same as the previous month. The maximum at an individual station was 0.04 in/hr.

Rain - Several rain samples were collected. The maximum result was 4.8×10^{-2} u/L whereas the average was 1.2×10^{-2} u/L. This compares to the general level in the 200 east area.

+1pRa

B.C. 2.4 ± 1.6

2.3 ± 1.6

recruits < 2 g/m² (why recruit?)

recruits on 300 + rec. & Ireland
alpha recruits?

solids g/m²/gK²

Where are 300 area water levels?
solid

50%
B
x

50% yield - 1 m²

multiply x 5

crustle

25 Sept 1947

+ (2) (unlabeled)

Location

There were 304 routine samples taken during the month of September 1947. The trend of contamination has decreased from August 1947 average, with the exception of Benton City and Hanford which increased slightly.

Location	Maximum ug/kg	Average ug/kg	Previous Month Average ug/kg
----------	---------------	---------------	------------------------------

Area of the 500 Areas

0.11

< 0.04

0.04

Area of the 200 Areas

3.07

0.19

0.24

Area of the 100 Areas

0.17

< 0.04

0.05

Richland

0.09

< 0.04

0.09

Passo

0.05

< 0.04

< 0.04

Hanford

0.11

< 0.04

< 0.04

Benton

0.05

0.05

< 0.04

Richland

0.09

< 0.04

< 0.04

Hanford

0.05

0.07

0.06

Inside Separation Areas

Location

Maximum ug/kg

Average ug/kg

Previous Average ug/kg

200 West

0.84

< 0.04

0.06

200 East

2.01

0.39

0.45

Vegetation (con't)

Off Area

538 Samples of Vegetation were collected during a survey in an area within a 200 Mile radius of the separation area. The attached map identifies the location of sampling and gives the maximum and average values in $\mu\text{C/Kg}$ for these locations.

4 samples of vegetation were taken at the edge of the 300 area pond. 3 of the samples taken at the N.W. corner were less than $0.04 \mu\text{C/Kg}$. However, one sample taken at the pond inlet, 6 inches from the water edge showed $1.52 \mu\text{C/Kg}$.

5 samples of vegetation were taken on highway 11A between the YAKIMA barricade and the city of YAKIMA. The Average being less than $0.04 \mu\text{C/Kg}$ and maximum of $0.07 \mu\text{C/Kg}$ was found at Moxee city.

Ground Contamination Measured with Portable G.M. Meter

200 W - A maximum reading of 4000 c/m was obtained 600 feet S.E. of the 291-T stack.

200 E - A maximum reading of 1050 c/m was obtained 2000 feet SE of the 291-B stack.

611

CIC-12751

HW-89073

To - W. Singlevich

November 30, 1947

From - W.C. Berlin Jr. and H.J. Paas

Report from Site Survey for the month of
November, 1947

The attached report was compiled from the following
number of surveys:

Water, Drinking	234
Test Well	9
River	79
Waste	62
Rain	98
Air, Air Filters	58
Detachable Chambers	563
Hand Pump	0
Film Packets	92
Land, Vegetation on Area	324
Vegetation off Area	3
Solids (mud-lint-soil)	20
Mobile Instruments	10
Portable Instruments	17

Total Surveys - 1335

Vegetation

There were 324 routine samples taken during the month of November 1947. ~~The trend of contamination has increased generally throughout the areas sampled on a routine basis.~~ The contamination throughout the area has remained essentially the same with a possible slight increase noted.

III

Location	Maximum $\mu\text{c/kg}$	Average $\mu\text{c/kg}$	Previous Month's Average $\mu\text{c/kg}$
1' " of the 200 Areas	0.12	0.05	< 0.04
Near the 200 Areas	2.76	0.29	0.20
South of the 200 Areas	0.18	0.06	0.05
Richland	0.07	< 0.04	< 0.04
Pasco	0.26	0.05	< 0.04
Kennewick	0.10	< 0.04	0.04
Benton City	0.06	< 0.04	< 0.04
Richland "Y"	0.04	< 0.04	< 0.04
Hanford	0.26	0.08	0.06

Inside Separation Areas

Location	Maximum $\mu\text{c/kg}$	Average $\mu\text{c/kg}$	Previous Average $\mu\text{c/kg}$
200 West	2.21	0.33	< 0.04
200 East	1.56	0.29	0.24

Off Area

3 samples of vegetation were collected outside the perimeter fence during this report period. These samples were taken at M.P. Posts and the results were $< 0.04 \mu\text{C/kg}$.

There is an off area survey in progress but not completed and it will be reported under separate cover.

Ground Contamination Measured with Portable G.M. Meter.

200 West - A maximum reading of 2300 c/m was obtained 1000' feet East of the 291-T stack.

200 East - A maximum reading of 5000 c/m was obtained 2000 feet ESE of the 291-B stack.

Drinking Water :

Large volume (~2½ gal) samples of well water were taken and positive indications were detected in the following samples :

	<u>Direct Counting</u> / ^{alpha} <u>Residue</u> ^{activity}	<u>Ether Extraction</u>	<u>TTA</u>	<u>Beta Act</u>
Rich well #12	0.09 ± [0.9] d/m/L.	0.5 ± [1.6] d/m/L	—	5 ± [1.3] d/m/L
Rich well #14	0.04 ± [1.2] d/m/L.	3.1 ± [5.5] d/m/L	0.7 ± [1.7] d/m/L	—
Rich well #18	0.2 ± [1.0] d/m/L	5.0 ± [0.4] d/m/L	—	0.8 ± [1.4] d/m/L

The direct counting results are listed to emphasize the apparent significant differences in α activity when comparing the results with an ether extraction. The above is preliminary to the expansion planned for continuing this simulation to above and to reach well proven conclusions.

WaterDrinking

234 samples of drinking water were surveyed this report period, with the following significant results:

<u>Location</u>	<u>Alpha d/m/L</u>	<u>Beta & Gamma u/L</u>	<u>Date</u>
Benton City	2.56 ± 1.52	$< 5 \times 10^{-5}$	Nov 19, 1947
" "	2.2 ± 1.72	$< 5 \times 10^{-5}$	Nov 21, 1947
Recount 2.4 ± 1.7			

Benton City along with White Bluffs water continues to indicate + amounts of detectable activity - qualitative indication with a fluorophotometer points to presence of Uranium, amount which may be in realm of possible quantity present in natural amounts. Large volume samples of above (25-5 gal.) will be tested by direct counting, ether extraction, T.T.A. & fluorophotometer to confirm above indication.

The 300 Area wells and White Bluff city well samples are included in the above total but are listed separately as follows:

<u>Location</u>	<u>Alpha d/m/L</u> Maximum	<u>Beta & Gamma u/L</u>	<u>Date</u>	<u>Alpha d/m/L</u> Average	<u>B. & G. u/L</u>
300 Area #1	5.04 ± 2.0	$< 5 \times 10^{-5}$	11/3/47	2.0 ± 1.4	$< 5 \times 10^{-5}$
300 Area #2	7.64 ± 2.4	$< 5 \times 10^{-5}$	11/10/47	3.0 ± 1.7	$< 5 \times 10^{-5}$
300 Area Sanitary	7.6 ± 2.8	$< 5 \times 10^{-5}$	11/21/47	2.95 ± 1.7	$< 5 \times 10^{-5}$
White Bluffs.	3.04 ± 1.2	$< 5 \times 10^{-5}$	11/24/47	< 2	$< 5 \times 10^{-5}$

Test Wells

9 samples of water were taken this period with no indication of contamination present. Spring 13 gave the maximum reading of 3×10^{-5} $\mu\text{e}/\text{L}$ B+G and 1.04 ± 1 d/m/L Alpha.

RiversColumbia River

67 samples of Columbia River water were collected this period and surveyed with the following results:

Location	No of samples	Alpha d/m/L		Beta & Gamma $\mu\text{e}/\text{L}$	
		Maximum	Average	Maximum	Average
181 B	0	<2	<2	<5	<5
181 D	5	<2	<2	$< 5 \times 10^{-5}$	$< 5 \times 10^{-5}$
181 F	5	<2	<2	15×10^{-5}	10×10^{-5}
Hanford	15	<2	<2	65×10^{-5}	25×10^{-5}
300 Area	5	<2	<2	15×10^{-5}	10×10^{-5}
Richland	8	<2	<2	25×10^{-5}	10×10^{-5}
Raw Water (Export Line)	20	<2	<2	$< 5 \times 10^{-5}$	$< 5 \times 10^{-5}$
Above 100 B	2	<2	<2	$< 5 \times 10^{-5}$	$< 5 \times 10^{-5}$
Pasco	7	<2	<2	20×10^{-5}	5×10^{-5}

Columbia River Flow (Thousands of gallons per second)

Oct. 30 1947 908,000

Nov 7, 1947 713,000

Nov. 3 1947 833,000

Nov. 19, 1947 683,000

Rivers (cont)

Yakima River

12 samples of Yakima water were collected and surveyed during this period with no indication of contamination present.

107 Effluent

18 samples of the effluent water from the 107 Basins

were taken with results as follows:

Location	No of samples	Alpha d/m/L		Beta & Gamma uc/L	
		Maximum	Average	Maximum	Average
1904 B	3	< 2	< 2	1.1×10^{-4}	7.4×10^{-5}
		2.2 ± 4.8	< 2	$19. \times 10^{-2}$	6.5×10^{-2}
107 D	7	$15.4 \pm 12^*$	< 2	2.4×10^{-2}	5.5×10^{-3}
		7.4 ± 6.4	< 2	23×10^{-2}	9.8×10^{-2}
107 F	8	$36 \pm 14^*$	4.4 ± 4.3	2×10^{-2}	4.9×10^{-3}

* Indicates count on Filter. of filtered 107 sample water.

Waste Contamination

200 West

Waste Solutions

<u>Location</u>	<u>Alpha d/m/L (Maximum)</u>	<u>Beta & Gamma uo/L (Maximum)</u>
T Swamp Inlet	< 40	11×10^{-5}
W. Side	< 40	23×10^{-5}
S. Side	40 ± 16	17×10^{-5}
U Swamp W. Side	96 ± 32 * (Composite of Filters and Filtrate)	137×10^{-5}
Laundry Ditch Inlet	42 ± 16	17×10^{-5}
600'	< 40	14×10^{-5}
231 Ditch Inlet	< 40	7×10^{-5}
1st Underpass	< 40	6×10^{-5}
Swamp Inlet	< 40	7×10^{-5}

Waste Solids

<u>Location</u>	<u>Date</u>	<u>Alpha d/m/g</u> <u>Direct Count</u> 1.0g sample	<u>Ether Extraction</u> 10.0g Samples	<u>Beta & Gamma uo/kg</u>
T Swamp S. Side	10-30	44 ± 4	—	.14
" " "	11-6	18 ± 2	308 ± 7.4	.009
" " "	11-13	52 ± 4	289 ± 6.8	.21
" " "	11-20	26 ± 4	1379.8 ± 27 *	.21
T Swamp W. Side	10-30	34 ± 4	—	.21
	11-6	40 ± 4	388 ± 8	.01
	11-13	63 ± 4	311 ± 7.4	.17
	11-20	34 ± 4	317 ± 12 *	.07
dry lint	10-30	46 ± 4	—	.02
	11-6	8 ± 4	—	< .001
	11-13	2.6 ± 1.6	—	.02

Waste Solids (cont)

In counting for Alpha, the "direct count" is not corrected. The "ether extraction" is correct for yield and self absorption (65%).

* These samples were run at 1.0g in order to keep total activity low. The 10.0g samples counted approximately 4000 c/m.

Portable GM Meter Survey

The maximum reading obtained in this area was 450 c/m on mud at the 500' from the Inlet of the T Ditch.

200 East

Portable GM Meter Survey

The maximum reading obtained in this area was 750 c/m on mud at the 1st Underpass of the B Ditch.

300 Area

Waste Solutions

<u>No of Samples</u>	<u>Alpha d/m/L</u>		<u>Beta & Gamma uc/L</u>	
	<u>Maximum</u>	<u>Average</u>	<u>Maximum</u>	<u>Average</u>
8	295 ± 15	130 ± 10	50 × 10 ⁻⁵	15 × 10 ⁻⁵

Waste Solids

<u>Location</u>	<u>Date</u>	<u>Alpha d/m/g</u>		<u>Beta & Gamma uc/mg</u>
		<u>Direct Count</u>	<u>Ether Extraction</u>	
300 Area Inlet	10-28	136 ± 2	-	1119 × 10 ⁻³
" " "	11-4	122 ± 8	1134 ± 13.6	537 × 10 ⁻³
" " "	11-11	300 ± 10	3267 ± 37	2295 × 10 ⁻³
" " "	11-18	153 ± 8	5348 ± 65	1165 × 10 ⁻³
300 Area NW Corner	10-28	30 ± 2	-	218 × 10 ⁻³
" " "	11-4	12 ± 2	149 ± 4.6	73 × 10 ⁻³
" " "	11-11	178 ± 8	1985 ± 18.5	1481 × 10 ⁻³
" " "	11-18	24 ± 4	623 ± 15	86 × 10 ⁻³

Portable GM Meter Survey

The maximum reading obtained in this area was 8000 c/m on mud.

200 North Area Waste Surveys

<u>Location</u>	<u>Maximum Reading</u>			
N' Ditch	4	Mrep/hr	3	MR/hr 6800 c/m
P' Ditch	10	" "	8	" " 8500 " "
R' Ditch	10	" "	8	" " 8500 " "

Air Monitoring

Integrations: Results obtained at the atmospheric monitoring stations as compared to the previous month are as follows -

Average Dose in Mrep/24 hrs

<u>Location</u>	<u>November</u>	<u>October</u>
100 B	0.7	0.5
100 D	0.4	0.5
100 F	1.3	2.1
200 W	0.2	0.4
200 E	0.4	0.8
Riverland	1.4	3.3
Hanford	1.5	1.8
300 Area	1.3	2.5
700 Area	0.8	0.5
Kennewick	< 0.1	0.5
Pasco	< 0.1	< 0.1
Benton City	< 0.1	0.2

For the second consecutive month the level at the 700 Area has increased. However, ^{rather} the "S" chambers nor the Film packets in the 700 Area.

614 Bldg ~~to~~ verify these results and it appears that the instrumentation is in error. All other stations are within the generally expected magnitude of contamination.

'C' Chambers: A summary of the 'C' Chamber results for the month of November as compared to the previous month are as follows -

<u>Location</u>	<u>Dosage in Mrep/24 hours</u>	
	<u>November</u>	<u>October</u>
100 B	0.3	0.3
100 D	0.3	0.4
100 F	0.3	0.4
200 W	0.4	0.4
200 E	0.5	0.4
300 Area	0.4	0.3

The air levels monitored by 'C' chambers indicates that the results have remained comparable to the results obtained last month.

Film Packets: Results obtained from film packet data monitoring show the radiation levels to be < 5.0 Mrep/24 hours at all locations. Twenty-three packets were in service.

Detachable Chambers - Average dosage readings obtained with detachable

chambers as compared to the previous months observations are as follows - (all readings are average Mrep/hour)

Location October Table B November

100 Area & Environs	.02	.01
Route 1 mile 8	.01	.01
Route 2 mile 10	.03	.03
Route 2N mile 5	.02	.05
Route 11A mile 1	.02	.01
Route 1 & Route 4N	.02	.01
Within 5 miles 200 E	.03	.05
Route 4S mile 6	.03	.03
Route 11A mile 6	.10	.09
Route 3 mile 1	.03	.02
Meteorology 200'	.03	.03
Within 10 miles 200 E	.01	.03
Route 4S mile 10	.03	.03
Route 10 mile 1	.05	.01
Route 10 mile 3	.05	.03
Route 2S mile 4	.05	.04
Near 300 Area	.02	.02
Route 4S mile 16	.01	.03
Route 4S mile 22		

The chambers located ^{at} 700 Area, Benton City and Hanford show a level of <.02. The high level of Route 3 mile 1 as reported last month was confirmed by the average over this month.

Constant Iodine Monitoring - I¹³¹ concentrations as measured by C.I. units in the month of November were as follows

Location	8 hour concentrations and ^{Walla} Walla ^{Mean Average Concentration for Nov}
200 ESE	1.0×10^{-7} 1.5×10^{-7}
200 E Tur #11	2.4×10^{-7} 1.6×10^{-7}
Gable Mountain	2.0×10^{-7} 3.8×10^{-7}
Richland	$< 1.0 \times 10^{-7}$ 1.9×10^{-7}

The low levels of airborne I¹³¹ are ~~on~~ ^{considerably higher} results observed the previous month. However the data is insufficient due to instrumentation difficulties and is not representative of the entire period.

Walla 11/30

Air Filters - The average I¹³¹ concentrations at various locations during the month of November was as follows -

Air Filters (con't)

<u>Location</u>	<u>Table D</u>	
	<u>November</u>	<u>October</u>
Pasco	4.1×10^{-10}	5.0×10^{-10}
300 Area	7.0×10^{-10}	6.0×10^{-11}
200 E Twn #18	4.4×10^{-9}	4.9×10^{-9}
100 D	2.0×10^{-9}	3.0×10^{-9}
200 W Gate	4.2×10^{-9}	3.5×10^{-9}
Benton City	6.7×10^{-10}	1.1×10^{-9}
Hanford 614	2.2×10^{-10}	1.0×10^{-10}

The data indicates that the air contamination concentrations are low and are in agreement with the levels reported last month.

Rain Sampling - Eighty-three rain samples were collected in the period.

Results obtained are summarized as follows -

<u>Location</u>	<u>Table E</u>	
	<u>Maximum $\mu\text{cc/L}$</u>	<u>Average $\mu\text{cc/L}$</u>
Within 200 E Area	2.5×10^{-2}	4.2×10^{-3}
Within 200 W Area	6.8×10^{-2}	1.5×10^{-2}
100 Area & Environs	6.8×10^{-4}	2.1×10^{-4}
Intermediate on Area	2.2×10^{-2}	2.8×10^{-3}
Outlying - Off Area	2.9×10^{-4} (Benton City)	1.3×10^{-4}

The maximum off area sample was collected at Benton City.

241 BX Construction Area

Detachable Chambers - The average dosage rate as measured by detachable chambers was .03 Mrep/hr. This average was compiled from readings for the period October 20, 1947 to November 7, 1947. The chambers were removed from the 241 BX area on Nov. 7, 1947 after construction project was completed.

A Summary of Air and Soil Monitoring Program - 241 BX Area has been prepared and submitted for approval, which covers the monitoring program and results during the construction period.

Rain

15 samples of rain ~~were~~ collected in this area. The maximum contamination found was 7.2×10^{-3} $\mu\text{c/L}$ and the average was 3.2×10^{-3} $\mu\text{c/L}$.

The monitoring program in this area was discontinued on November 7, 1947.

A special test of the rain collected on 11-24-47 was made in an effort to isolate any specks which might be present in the collected rain samples. The rain samples were filtered and both the filter and the evaporated filtrate were counted for beta activity. Results were as follows:

Rain Data

<u>Sample #</u>	<u>vol. spile</u>	<u>Total</u> <u>clm wof Rain</u>	<u>Total</u> <u>clm Filter</u>
#10	27 ml.	$2 \pm [1]^*$	$0.7 \pm [1]^*$
#14	12 ml.	$5 \pm [1]$	$0.7 \pm [1]$
#17	13 ml.	$3 \pm [1]$	$-0.6 \pm [1]$
#21	6 ml.	$11 \pm [2]$	$2 \pm [1]$
#12	260 ml.	$1 \pm [1]$	—
#13	255 ml.	$4 \pm [1]$	—

* above samples counted for 30 minutes.

The ^{relatively} low activity of above results indicates that there were no specks ~~either~~ ^{as plus} found in the rain water or filterable material. This test will be repeated in future rain samples.

Isolation of Contaminated Particles.

A summary of the progress of the survey to define the range and frequency of contaminated particles is included, ~~for information.~~

Sixteen plots 4'x5' were staked out on the ground at locations indicated on the attached sketches. These plots were surveyed with a portable GM Meter.

Twenty plaques were made of 2'x3' pieces of Messnite and placed on stakes varying from 2' to 5' in height, and sloped at 15° from the horizontal. The surface of the plaques was covered with a coat of Vaseline. The plaques were located as indicated on the attached sketches.

To date, five radials have been established in 200 East Area. The radials run from the 291 B stack to some known point on the 200 East perimeter fence. These and other radials will be surveyed in an effort to determine the range and direction the particles travel.

The plots and plaques are surveyed as often as manpower permits and daily if possible. The results obtained will determine the need and location of additional installations.

Surveys have been made using a Victoreen GM Meter.

Note: The counts per minute listed under the heading "Speck" is the counting rate of the isolated particles counted on the second shelf of a "pig".

* This particle was counted on the second shelf of the 'pig' and recorded 188,800 c/m. It was recounted on a grill at 222-U laboratory and the count was 3500 c/m. The instrument department checked the counter in Site Survey and new plateaus were run. The particle still counted 188,800 on the second shelf of the 'pig' but only 6000 c/m on a "hot dog grill". The variation of counting rates has not yet been identified.

The above results were obtained from a total of 22 surveys.

200 EAST AREA

○ Indicates Ploques

□ Indicates Plots

⑨ ROUTE 45 MILE 6

⑩ ROUTE 25 MILE 4

200 WEST AREA

○ Indicates Plaques

□ Indicates Plots

11

Rt 3

12

Rt 3

DATE

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END