

68A1096 # 267 LIA WASTE ACTIVITY

MEMO ROUTE SLIP Form AEC-93 (Rev. May 14, 1947)		See me about this. Note and return.	For concurrence. For signature.	For action. For information.
TO (Name and unit)  Art Schoen	INITIALS <i>AS</i>	REMARKS I believe that the ORNL "Liquid Waste-Activity Monitoring and Flow Measuring" system is justifiably telemetered to a central location and recorded. The telemetering is necessary for prompt action in the event of accidental release of high level materials to the process waste system. The need for recording (not pointed out in the proposal) is that the system as a whole will serve not only as an accident detector and controller but also as a device for evaluating the sources and magnitudes of wastes originating in the various operations, permitting servicable overall waste management and planning.		
	DATE 7/18/60			
TO (Name and unit) <i>G. M. Haythorn</i>	INITIALS JUL 19 1960	REMARKS The system itself consists of flow and activity measuring devices, and two telemeter transmitters at each station, feeding to multipoint recorders and the central control station. The <del>flow</del> flow rate and proportional sampling equipment are necessary also for waste management and not incident control.		
	DATE			
TO (Name and unit)  <i>Filer</i>	INITIALS	REMARKS The system itself consists of flow and activity measuring devices, and two telemeter transmitters at each station, feeding to multipoint recorders and the central control station. The <del>flow</del> flow rate and proportional sampling equipment are necessary also for waste management and not incident control.		
	DATE			
FROM (Name and unit)  <i>Lenhard</i> J. A. Lenhard	REMARKS			
PHONE NO. 4289	DATE 7/18			

OAK RIDGE NATIONAL LABORATORY  
LIQUID WASTE - ACTIVITY MONITORING AND FLOW MEASURING

PRELIMINARY PROPOSAL  
298

June 14, 1960

**FILE COPY**

ChemRisk Repository # 1242

A-5981

CONTENTS

References.....1  
Justification of Basic Need.....1  
Description.....2  
Preliminary Schematic Plan.....3  
Preliminary Estimate of Cost.....3  
Proposed Starting and Completion Dates.....4  
Division of Work.....4  
Risks and Exposure Hazards.....4  
Estimate  
Drawing A - Plot Plan

## LIQUID WASTE - ACTIVITY MONITORING AND FLOW MEASURING

This proposal describes changes and additions necessary to measure flow rate and monitor radioactivity of liquid waste in process drains.

### A. References:

1. Oak Ridge National Laboratory Budget Estimates, KAD-413, dated April 22, 1960 (Funding FY-1960 Equipment \$48,000 and FY-1961 \$153,000).
2. Request for Directive CR-298, "Liquid Waste - Activity Monitoring and Flow Measuring," dated June 14, 1960.

### B. Justification of Basic Need:

Within the present liquid waste disposal system it has been found impossible to identify sources of liquid process waste quickly enough to institute control measures. The process waste system (low radiation level) includes drains from all the major process buildings in the Laboratory which feed into waste collection basins before treatment and discharge. The only monitor at the present time is on the combined waste streams at the diversion box just before the entrance to the waste basins. The only means of determining the source of radioactivity spills is by analyzing samples from the manholes in various waste lines before the streams are combined in the system. This procedure has proved to be inadequate since much time is lost in obtaining the samples and analyses and since the radioactivity may be released in spurts instead of continuously.

Because the capacity of the Process Waste Water Treatment Plant, Building 3518, is limited, it is necessary to control the total amount of process waste to avoid situations where, during an emergency, such large volumes of waste are accumulated that the waste system becomes overburdened and the release of activity to the creek cannot be prevented. Also, during emergencies, it is necessary to restrict the process waste flow from each operating building. To permit better control of the process waste, it is proposed to provide flow and proportional sampling equipment along with radioactivity detection devices in each of eight main process waste streams. Information gathered at the different manhole monitoring stations will be telemetered to a central station, permitting quick evaluation of an emergency situation and prompt remedial measures. In addition to beta-gamma monitors in each of the monitored manholes, alpha and soft beta monitors will be provided for the existing diversion box near the waste basins. In most operations any release of radioactivity will be composed of fission products which could be detected by beta-gamma monitors. However, from a few of the process buildings it is possible to obtain release of ;

separated alpha and soft beta emitters which might not be detected by a standard beta-gamma monitor.

Description:

The alphabetical notations locate on the plot plan the specific areas involved in this project.

- A. New manholes and drainage lines to handle wastes from the Filter House, Building 3002, and the Alpha Materials Storage, Building 3013.
- B. New drainage lines from the Graphite Reactor, Building 3001.

A and B above modify the existing systems to divert the flow from the system which serves the Chemical Processing Pilot Plant, Building 3019.

- C. New equipment in existing manhole for beta and gamma activity monitoring and flow measuring of wastes from the Chemical Processing Pilot Plant, Building 3019.
- D. Bypass on trunk line from Building 3019 at the Radioisotope Production Laboratory (G), Building 3506, and new manhole for that building.
- E. New weir and equipment in existing manhole for beta and gamma activity monitoring and flow measuring of wastes from the Reactor Fuels Reprocessing Plant (I), Building 3505, and a bypass drainage line around the existing manhole.
- F. New line from trough drainage in Building 3505 to existing manhole to divert all wastes from that building into one monitoring station.
- G. New equipment in existing manhole with weir for beta and gamma activity monitoring and flow measuring of wastes from the Fission Products Pilot Plant, Building 3517.
- H. Addition to existing diversion box for the installation of weir for beta, gamma, soft beta, and alpha activity monitoring, and flow measuring and alterations to influent piping for all plant process wastes to the waste basins.
- J. New equipment in existing manhole with weir for beta and gamma activity monitoring and flow measuring of wastes from the Fabrication Department, Shop B, Building 3024; the Solid State Laboratory, Building 3025; the Radioisotope Development Laboratory, Building 3026-C; and the Reactor Fuels Dismantling Building 3026-D.

- K. New drainage line from the Transuranium Laboratory, Building 3508, to new manhole at "L".
- L. New manhole, weir and equipment for beta and gamma activity monitoring and flow measuring of wastes from the Transuranium Laboratory, Building 3508, and the High-Radiation-Level Chemical Engineering Laboratory, Building 3503.
- M. New manhole, weir and equipment for beta and gamma activity monitoring and flow measuring of wastes from the Radioisotope Area, and an effluent drainage line from the new manhole to bypass the existing manhole at "N".
- N. New weir and equipment in existing manhole for beta and gamma activity monitoring and flow measuring of wastes from the Graphite Reactor, Building 3001, and the Oak Ridge Research Reactor, Building 3042.
- P. New equipment in existing manhole with weir for beta and gamma activity monitoring and flow measuring of wastes from Areas 4500, 5500, and 6000.

Proportional sampling equipment will be installed at each location. A water meter and a shutoff valve will be installed on the process water supply lines at each building to provide a means of selective control. Electrical services will be installed.

C. Preliminary Schematic Plan:

Drawing A - Plot Plan

D. Preliminary Estimate of Cost:

The total estimated cost of the project is (see accompanying estimate)  
 .....\$201,000.

SUMMARY COST ESTIMATE

	<u>CPFF</u>	<u>UCNC</u>	<u>Total</u>
<u>Direct Construction Costs</u>			
Monitoring and Measuring Equipment	19,000	1,800	20,800
Manholes and Drainage	23,100	3,700	26,800
Alterations to Diversion Box (Item H)	2,400		2,400

	<u>GPFF</u>	<u>UCNC</u>	<u>Total</u>
Electrical Power	2,400	500	2,900
Instrumentation		103,400	103,400
<u>*Engineering</u>			
Design		2,100	2,100
Inspection		2,300	2,300
<u>Indirect Costs</u>	7,000	15,600	22,600
<u>Allowance for Contingencies</u>	<u>5,100</u>	<u>12,600</u>	<u>17,700</u>
<u>Gross Project Cost</u>	59,000	142,000	201,000

\*Net

#### UNIT COSTS

Not applicable.

#### F. \*\*Proposed Starting and Completion Dates:

	<u>Start</u>	<u>Complete</u>
<u>Engineering</u>		
Design	6-60	6-60
Inspection	7-60	10-60
<u>Construction</u>		
Contract	7-60	10-60
Oak Ridge National Laboratory	7-60	10-60

\*\*Based on receipt of directive by June 15, 1960.

#### G. Division of Work:

Oak Ridge National Laboratory will furnish engineering services, instrumentation and controls and miscellaneous assistance to contractor. The construction will be performed by a cost-plus-fixed-fee contractor.

#### F. Risks and Exposure Hazards:

Although there will be possible radiation hazards present during the installation of the work, it is not anticipated that any abnormal risks will be involved.

ESTIMATE

LIQUID WASTE - ACTIVITY MONITORING AND FLOW MEASURING

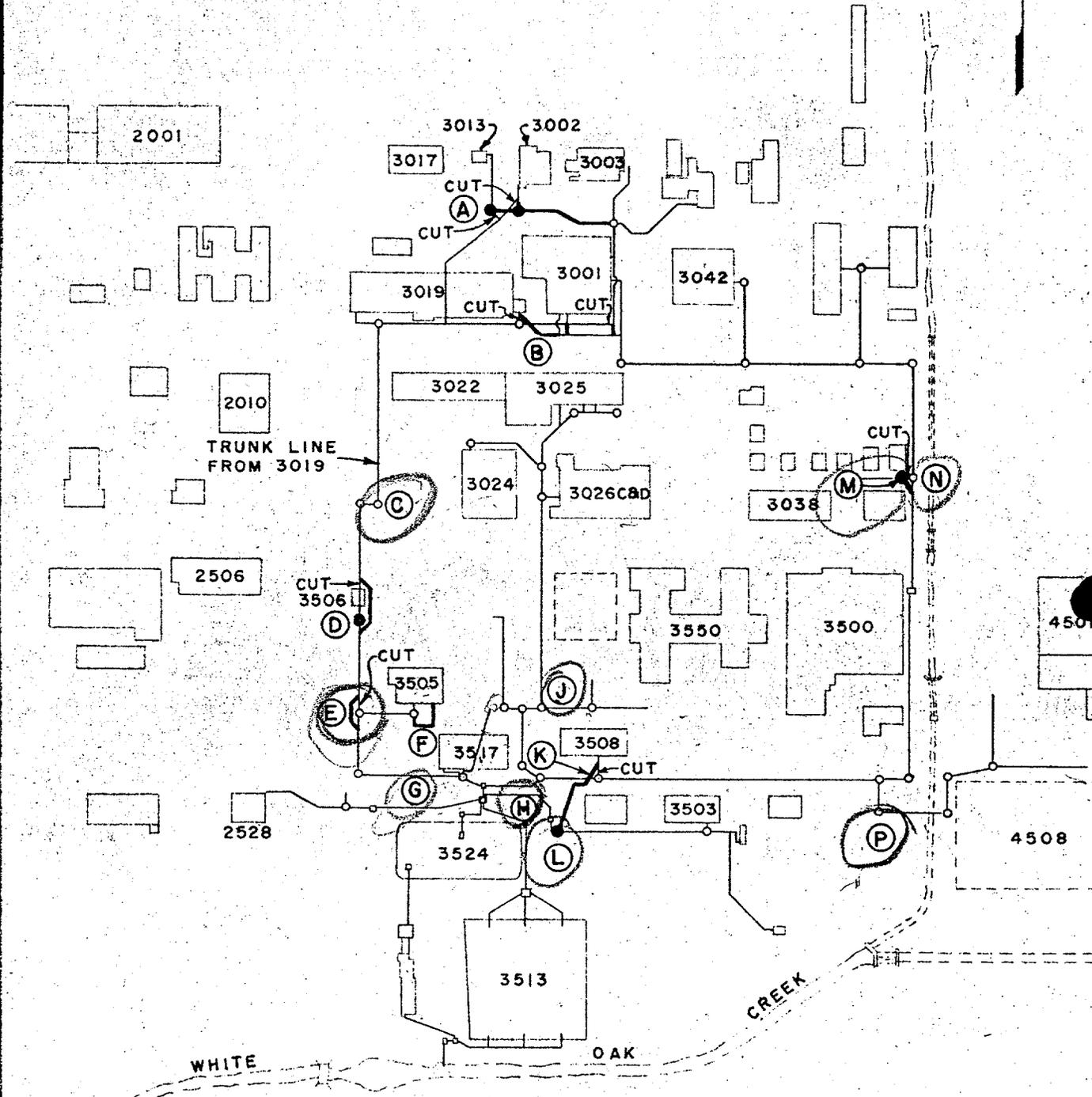
PRELIMINARY PROPOSAL

298

	<u>CPF</u>	<u>UCNC</u>	<u>Total</u>
<u>Metering Pits</u>			
Area 4500	1,500		1,500
Building 3038	1,500		1,500
Building 3508	1,200		1,200
Building 3503	1,200		1,200
Building 3517	1,500		1,500
Building 3505	1,500		1,500
Building 3025	1,500		1,500
Building 3019	1,500		1,500
Building 3002	1,200		1,200
Building 3001	2,700		2,700
Building 3042	2,500		2,500
Building 3506	1,200		1,200
Connections	_____	<u>1,800</u>	<u>1,800</u>
Sub-Total	19,000	1,800	20,800
<u>Area "A"</u>			
Manhole, 5 Feet	500		500
Manhole, 9 Feet 6 Inches	1,100		1,100
Piping	7,600		7,600
Connections	_____	<u>1,300</u>	<u>1,300</u>
Sub-Total	9,200	1,300	10,500

	<u>CPFF</u>	<u>UCNC</u>	<u>Total</u>
<u>Areas "E" and "F"</u>			
New Weir in Manhole	400		400
Piping	2,800		2,800
Floor Slab, Platform, and Paving	200		200
Connections	_____	<u>1,200</u>	<u>1,200</u>
Sub-Total	3,400	1,200	4,600
<u>Area "D"</u>			
Manhole, 9 Feet 6 Inches	1,800		1,800
Piping	2,100		2,100
Connections	_____	<u>300</u>	<u>300</u>
Sub-Total	3,900	300	4,200
<u>Areas "M" and "N"</u>			
Manhole, 7 Feet	1,500		1,500
Piping	1,200		1,200
Connections	_____	<u>400</u>	<u>400</u>
Sub-Total	2,700	400	3,100
<u>Area "B" (Piping)</u>	500		500
<u>Areas "K" and "L"</u>			
Manhole, 12 Feet	1,500		1,500
Piping	1,900		1,900
Connections	_____	<u>300</u>	<u>300</u>
Sub-Total	3,400	300	3,700
<u>Alterations to Diversion Box,</u> <u>Area "H"</u>	2,400	200	2,600
<u>Electrical Power</u>	2,400	500	2,900

	<u>CPFF</u>	<u>UCNC</u>	<u>Total</u>
<u>Instrumentation</u>			
Building 3505		10,000	10,000
Building 3501		10,000	10,000
Building 3506		10,000	10,000
Building 3517		10,000	10,000
Isotope Area		20,000	20,000
Buildings 3025 and 3026		10,000	10,000
Buildings 3503 and 3508		10,000	10,000
Building 3023		10,000	10,000
Diversion Box		<u>13,400</u>	<u>13,400</u>
Sub-Total		103,400	103,400
<u>Engineering</u>			
Design		2,100	2,100
Inspection		<u>2,300</u>	<u>2,300</u>
Sub-Total		4,400	4,400
TOTAL NET PROJECT COST	<u>46,900</u>	<u>113,800</u>	<u>160,700</u>



PLOT PLAN



PLOT PLAN  
LIQUID WASTE  
ACTIVITY MONITORING  
AND FLOW MEASURING  
DRAWING A

NOT CLASSIFIED  
A-39461