

3264

Y-12 Quarterly
Reports

Hg File Extracts (quarterly 1953-1955 all; 1952,56,59,63 one quarter only):

Y-12 Plant Quarterly

Date % over 0.1 mg/m³ (N) ^{no 2/3/5.} avg. EFPC (mg/L)

yr/quarter	Y-12	B4	A2	9202	A5	A4
(52-1) 20						
(52-2) 14						
(52-3) 34						
M-24 52-4 48						
M-25 53-1 20 (3248)						
M-26 53-2 31 (3266)						
M-27 53-3		33 (58)	33 (1752)	63 (963)		
✓ M-28 53-4		19 (841)	30 (90)	99 (1144)		
M-29 54-1 --		16 (1068)	--	73 (1435)		
M-30 54-2 2 (60)		21 (1136)	--	24 (227)		
M-31 54-3 --		--	--	--		
✓ M-32 54-4 -- (0)		18 (1204)	78 (9)	--		
✓ M-33 55-1 2 (40)		26 (803)	65 (40)	0 (54)	77 (421)	
✓ M-34 55-2 11 (1022)		34 (692)	37 (2242)	0 (0)	50 (719)	42(2011)
✓ M-35 55-3 24 (2282)		35 (271)	22 (2553)	--	74 (211)	76(16212)
✓ M-36 55-4 26 (1000)		18 (735)	44 (2930)	--	48 (175)	74(17950)
(M-37) 56-1						

0.13
 0.21 (.09) pH 8.2
 1.07 ← hi (1.14)
 0.20 (0.56)
 0.20 (0.20)
 --
 0.18
 0.61 - (0.74 corrected from)
 1.81 - (1.75 "
 1.26 - (1.06 "
 0.75 - (0.70 "
 0.37

avg A5 (mg/m ³)			avg A4 (mg/m ³)		
A	M	J	A	M	J
0.07	0.08	0.08	0.08	0.07	0.06
% over 0.1 mg/m ³			% over 0.1 mg/m ³		
28	26	27	30	30	21

avg A5 (mg/m ³)			avg A4 (mg/m ³)		
J	A	S	J	A	S
0.04	0.04	0.04	0.05	0.04	0.03
% over 0.1 mg/m ³			% over 0.1 mg/m ³		
4	5	5	6	3	2

HAS AVGS. FOR 7-55 to 3-56 monthly

to 6-56
 0.66 pH 8.8
 1.53 pH 8.8

1st Q 1955- 27% of Hg urine samples over 0.3 mg/L this quarter (has been less than 10%)
 2nd Q 1955- 22% of Hg urine samples over 0.3.
 3rd Q 1955- 32% over.
 4th Q 1955- 26% over.

1st Q 1956- 30% over.
 2nd Q 1956- 26% over. The average daily creek flow for EFPC was 10.8 million gals/day.
 3rd Q 1956- 14% over. The average daily creek flow for EFPC was 11.3 million gals/day.

3rd Q 1959 - N/A
 2nd Q 1963- The detection limit for X-ray fluorescence is 0.5 µg/g Lithium. The detection limit for the dithizone method is 0.02 µg/g Li.

Y-12 Tech. Progress Reports

M-14
 M-15

Y-12 Reports 1952-1963

⊗ from 4Q52 report

mlb/23/94

OAK RIDGE Y-12 PLANT INFORMATION CONTROL FORM

Document No. Y-1000/EXTRACT IT DESCRIPTION (Completed By Requesting Division)

Author's Telephone No. 6-0263 Acct. No. 23366-0002 Date of Request 8/19/94

Unclassified Title: Selected Pages From Y-12 Plant Quarterly Report SECOND FISCAL QUARTER, OCTOBER 1 - DECEMBER 31, 1952 (PGS F-1/F-14)

Author(s) Requested by Steve Wiley G-16/17) M-24

TYPE: Formal Report Informal Report Progress/Status Report Co-Op Report Thesis/Term Paper Oral Presentation (identify meeting, sponsor, location, date):

Journal Article (Identify Journal):

Other (Specify): To Be Released for Phase II of HSA

Document will be published in proceedings No Yes

Document will be distributed at meeting No Yes

Document has patent or invention significance No Yes (Identify)

Document has been previously released No Yes (Reference)

1994 AUG 22 PM 2:11

DIVISION REVIEW AND APPROVAL (Completed By Requesting Division)

TECHNICAL CLASSIFICATION REVIEW (Divisional Classification Representative)
Title(s): UNC Abstract: NA
DOCUMENT: Level UNC Category NA
Steve Wiley 8/19/94
Signature Date

DOCUMENT REQUEST APPROVED (Division or Department)

Signature Date

Signature Date

THE REMAINDER OF THIS FORM TO BE COMPLETED BY THE TECHNICAL INFORMATION OFFICE DISTRIBUTION

Internal Distribution
 External Distribution
TID-4500 Category or Copies to OSTI
ANNOUNCED IN: ERA Atomindex (Available from NTIS)
M-3679 Category:
ANNOUNCE IN: AWDR (Available from OSTI) ANCR

Distribution: UCN-7721B DOE F-1332.15 Document
Y-12 Central Files Y-12 RC Y-12 RC Y-12 RC
TIO File
L.L. McCauley
S.W. Wiley
T.R. Butz

Distribution Remarks: clear for public release (chem file)

To Record Copy of This Document Is In The DRC

APPROVAL AND RELEASE

Date Received Date Initiated 8-22-94
 CLASSIFICATIONS:
Title(s): Unclassified Abstract -
DOCUMENT: Level Unclassified Category -
Weapons Data - Sigma -
Lloyd B Porter 8/22/94
Y-12 Classification Office Date

Editor Date
 Wendell Stewart
Patent Office Date
 Other Date
 Other Date

APPROVED FOR: Declassification Release subject to use of the following admonitory markings and conditions:
 Disclaimer Copyright Patent Caution Other
 8/23/94
Technical Information Office Date

Conditions/Remarks:

1952-1963

nation levels as well as the maintenance of the urine and personnel meter collection stations. The results of all investigations and analyses are routinely reported to responsible supervision.

Special Surveys Surveys were undertaken to determine the source of stray X-radiation and to measure the effectiveness of X-ray shielding. Monitoring for samarium and for technetium was also carried out during this report period. Personnel exclusion areas have been established for the safe operation of new accelerators and for a gamma ray radiographic installation.

TOXICOLOGICAL HAZARDS

Personnel Monitoring Employees handling mercury participate in a urinalysis program by submitting urine specimens quarterly. A concentration of 0.3 milligrams of mercury per liter of urine (mg/l) is being used tentatively as the MPL at this plant. The percentage of total findings which exceeds the MPL for the 2nd, 3rd, and 4th quarters of calendar year 1952 is 4.6, 2.1, and 5.3 respectively. No samples were obtained during the first quarter. Group excretion levels are more significant than individual findings when observed over an extended period.

Area Monitoring, Mercury In all areas where mercury is handled, routine air samples are taken for the purpose of measuring the level of air contamination. The MPL for mercury in air has been set at 0.1 milligrams per cubic meter (mg/M^3). The percentage of positive findings, i. e., $>0.1 \text{ mg}/\text{M}^3$, for the successive quarters of calendar year 1952 is approximately 19.7, 14, 34, and 48. The rapid expansion of existing programs, which includes extensive research and development activities, is largely responsible for the rise of mercury contamination levels throughout the year.

Area Monitoring, Uranium Production areas and operations which involve the handling of uranium compounds are monitored routinely by air sampling for the purpose of: (1) measuring the general level of uranium contamination in air, and (2) determining the location and degree of inhalation hazard. The former involves full shift general air samples that are taken in all areas where large scale uranium operations are performed. The latter involves operational and breathing zone samples that are taken at all operations potentially capable of generating air-borne uranium.

The percentage of total operational and breathing zone findings in excess of the MPL during the 1st, 2nd, 3rd, and 4th quarters of calendar year 1952 for normal uranium operations is 46, 30, 31, and 41 respectively; for enriched uranium operations the percentages are 60, 42, 30, and 37 respectively. These percentages are not too significant since there are shifts in emphasis and location of the air analysis program from one quarter to the next.

A supplemental program of air sampling involving full shift general air samples is in effect in all areas where large scale uranium operations are performed. The results from all general air samplers in any one area are averaged over each month of the year (when available) and the results are presented in Figure F-6. These findings indicate low levels or a downward trend in all areas. The high average for the month of September in the enriched foundry area is due to an extremely high result on a single day which resulted from a large uranium fire. Excluding this day the average for September would have been $13\text{d}/\text{m}/\text{M}^3$.

Area Monitoring, Beryllium Beryllium handling operations are monitored daily to determine the extent of air-borne contamination. The MPL for beryllium and its compounds is 2 micrograms per cubic meter of air (ug/M^3). Eighty, eighty-seven, sixty-four, and seventy-one operational and breathing zone air samples are reported for the 1st, 2nd, 3rd, and 4th quarters of 1952 with 6%, 1%, 0%, and 4% of the total analyses for each quarter in excess of the MPL. Beryllium operations are well controlled from the standpoint of air contamination.

CONTAMINATION CONTROL

The large quantities of active materials handled in this Plant give rise to a correspondingly large contamination problem. It is realized that it is impossible, in all cases, to prevent the occurrence of contamination, but it is felt that its magnitude and extent can be controlled. To this end, the present policy of contamination control has been inaugurated.

DOCU T DESCRIPTION (Completed By Requesting Div.)

Document No. Y-1001 / EXTRACT Author's Telephone No. 6-0263 Acct. No. 23366-0002 Date of Request 8/19/94

Unclassified Title: Selected Pages From Y-12 Plant Quarterly Report THIRD FISCAL QUARTER (JANUARY 1, - MARCH 31, 1953) (Pgs F-1/F-13) M-25

Author(s) Requested by Steve Wiley

TYPE: [] Formal Report [] Informal Report [] Progress/Status Report [] Co-Op Report [] Thesis/Term Paper [] Oral Presentation (identify meeting, sponsor, location, date):

[] Journal Article (Identify Journal): [X] Other (Specify): To Be Released for Phase II of HSA

Document will be published in proceedings [X] No [] Yes Document will be distributed at meeting [X] No [] Yes Document has patent or invention significance [X] No [] Yes (Identify) Document has been previously released [X] No [] Yes (Reference)

1994 AUG 22 PM 2:46

DIVISION REVIEW AND APPROVAL (Completed By Requesting Division)

TECHNICAL CLASSIFICATION REVIEW (Divisional Classification Representative) Title(s): VNC Abstract: NA DOCUMENT Level: VNC Category: NA Signature: [Signature] Date: 8/19/94

DOCUMENT REQUEST APPROVED (Division or Department) Signature: Date: Signature: Date:

THE REMAINDER OF THIS FORM TO BE COMPLETED BY THE TECHNICAL INFORMATION OFFICE DISTRIBUTION

[] Internal Distribution [] External Distribution TID-4500 Category or Copies to OSTI ANNOUNCED IN: ERA Atomindex (Available from NTIS) M-3679 Category ANNOUNCE IN: [] AWDR (Available from OSTI) [] ANCR

Distribution: UCN-77218 DOE F-1332.15 Document Y-12 Central Files Y-12 RC Y-12 RC Y-12 RC TIO File L.L. McCauley S.W. Wiley T.R. Butz

Distribution Remarks: cleared for public release (checkbox)

To Record Copy of This Document Is In The DRC

APPROVAL AND RELEASE

Date Received Date Initiated 8-22-94 CLASSIFICATIONS: U Title(s): Abstract - DOCUMENT: Level Unclassified Category - Weapons Date Sigma Signature: Floyd B. Portu 8/22/94 Y-12 Classification Office Date

[] Editor Date [X] Patent Office Date [] Other Date [] Other Date

APPROVED FOR: [] Declassification [] Release subject to use of the following admonitory markings and conditions:

[] Disclaimer [] Copyright [] Patent Caution [] Other

m. d. east 8/23/94 Technical Information Office Date

Conditions/Remarks:

TABLE F-5
AIR CONTAMINATION RESULTS

Contaminant	MPL	Type of Sample	Location	Number of Samples	Percent of Results Greater than MPL
Normal Uranium	50 $\mu\text{g}/\text{M}^3$	Operational	9206	136	21
Normal Uranium	50 $\mu\text{g}/\text{M}^3$	Operational	9212	251	19
Normal Uranium	50 $\mu\text{g}/\text{M}^3$	General Air	9212	1956	2
Enriched Uranium	70 $\text{d}/\text{m}/\text{M}^3$	Operational	9212	253	55
Enriched Uranium	70 $\text{d}/\text{m}/\text{M}^3$	General Air	9212	1800	3
Mercury	0.1 mg/M^3	Operational	Y-12	79	15
Mercury	0.1 mg/M^3	General Air	Y-12	3248	20
Beryllium	2.0 $\mu\text{g}/\text{M}^3$	Operational	Y-12	27	7
Beryllium	2.0 $\mu\text{g}/\text{M}^3$	General Air	Y-12	458	0
Cyanide	5.0 mg/M^3	Operational	Y-12	4	0
Lead	0.15 mg/M^3	Operational	Y-12	5	0
Nitric Acid	26.0 mg/M^3	Operational	Y-12	9	0

leaving the Plant area are inspected to determine whether they meet the approved Interstate Commerce Commission regulations.

PROMOTION AND TRAINING

The training program as outlined in the previous progress report continued this quarter with one addition. A local training program has been inaugurated to better prepare departmental personnel for the performance of their duties.

CRITICALITY CONTROL

GENERAL

In accordance with standard practice, daily contact with operational supervision and inspection of production processes were made by the Special Hazards Engineers to evaluate the nuclear safety of routine operations. In general, these activities have been performed according to prescribed criticality control regulations. No significant violation of established procedure or regulation was observed during the quarter.

Two reports, Y-A2-108, "Radiation Control Review of Building 9206 Salvage Processes," and Y-A2-109, "Radiation Control Analysis of Building 9212 Production Processes," were issued during this period. These studies were designed to condense the criticality control regulations for each step in the respective operational cycles into a readily accessible reference form. Since relatively complete flow diagrams and specific operational procedure references were included in these studies, it is anticipated that this information will be useful to both the operations and control groups.

MLB 8/24/94

OAK RIDGE Y-12 PLANT INFORMATION CONTROL FORM

DOCU IT DESCRIPTION (Completed By Requesting Division)

Document No. Y-1002/EXTRACT Author's Telephone No. 6-0263 Acct. No. 23366-0002 Date of Request 8/19/94

Unclassified Title: Selected Pages From Y-12 Plant Quarterly Report FOURTH FISCAL QUARTER (APRIL 1 - JUNE 30, 1953) (PGS F-1/F-14)

Author(s) Requested by Steve Wiley G-16/17 M-26

TYPE: [] Formal Report [] Informal Report [] Progress/Status Report [] Co-Op Report [] Thesis/Term Paper [] Oral Presentation (identify meeting, sponsor, location, date):

[] Journal Article (Identify Journal):

[X] Other (Specify): To Be Released for Phase II of HSA

Document will be published in proceedings [X] No [] Yes
Document will be distributed at meeting [X] No [] Yes
Document has patent or invention significance [X] No [] Yes (Identify)
Document has been previously released [X] No [] Yes (Reference)

1994 AUG 22 PM 2:32

DIVISION REVIEW AND APPROVAL (Completed By Requesting Division)

TECHNICAL CLASSIFICATION REVIEW (Divisional Classification Representative)
Title(s): VNC Abstract: NA
DOCUMENT: Level VNC Category NA
Signature M. J. Wiley Date 8/19/94
DOCUMENT REQUEST APPROVED (Division or Department)
Signature Date

THE REMAINDER OF THIS FORM TO BE COMPLETED BY THE TECHNICAL INFORMATION OFFICE

DISTRIBUTION

Internal Distribution
External Distribution
TID-4500 Category or Copies to OSTI
ANNOUNCED IN: ERA Atomindex (Available from NTIS)
M-3679 Category
ANNOUNCE IN: [] AWDR (Available from OSTI) [] ANCR
Distribution: UCN-7721B DOE F-1332.15 Document
Y-12 Central Files Y-12 RC Y-12 RC Y-12 RC
TIO File
L.L. McCauley
S.W. Wiley
T.R. Butz

Distribution Remarks: cleared for Public Release (ChemRisk)

To Record Copy of This Document Is In The DRC

APPROVAL AND RELEASE

Date Received Date Initiated 8-22-94
CLASSIFICATIONS:
Title(s): Unclassified Abstract
DOCUMENT: Level Unclassified Category
Weapons Data Sigma
Lloyd B Porter 8/22/94
Y-12 Classification Office Date

[] Editor Date
[3] Waived Patent Office Date
[] Other Date
[] Other Date

APPROVED FOR: [] Declassification [] Release subject to use of the following admonitory markings and conditions:
[] Disclaimer [] Copyright [] Patent Caution [] Other

m. d. Bond slw/ply
Technical Information Office Date

Conditions/Remarks:

Major Alterations to Important Structures

Building 9204-3 - Approximately 5,880 square feet in the basement of this building was remodeled from a locker room to a central file room. Metal file cabinets will be used and an approved fire door installed.

Building 9206 - The southeast section of approximately 3,000 square feet consisting of rooms 31, 32, 33, 35, and 36 were completely remodeled for the

L-2
Colest
pilot

Building 9201-2 - A conference room of approximately 440 square feet was built on the second floor, northeast section, of fire resistant material on wood studs. Stripping was done on the first and second floors, southeast section, preparatory to the expansion of the Colex operation.

Building 9212 - Southwest loading dock of approximately 810 square feet was enclosed with tile walls and an approved fire door for a jig and fixture storage facility. B-Wing was stripped and remodeled for a different type operation and facilities were provided for Rust Engineering Company in the northeast section of the building.

Building 9204-1 - An area of approximately 960 square feet on the second floor, southwest of the building, was enclosed for the Metallography work. Fire resistant material on wood studs was used.

R

Building 81-10 - Approximately 30 feet was removed from the east end of this combustible building preparatory to erecting facilities for a solvent recovery operation.

Important Occupancy Changes

Building 9929-1 - The Salvage Department moved from Building 9914 into this newly remodeled, sprinklered building.

Orsk
pilot

Building 9202 - Health Physics Department moved offices from Building 9711-1 and laboratories from Building 9706-2 into the south part, first floor of this building occupying approximately 8,000 square feet of floor space.

Building 9701-3 - Rust Engineering Company occupied four offices of approximately 1,200 square feet of floor space in the east section of this building.

Building 9711-1 - This large wooden former cafeteria building, which has been in stand-by except for the section occupied by health physics, was reactivated as a training school and offices for ADP personnel.

Installation of Automatic Fire Protection Equipment

Building 9212 - An automatic carbon dioxide extinguishing system was installed to protect the

B-4

Building 9204-4 - Four automatic waterfog spray systems were installed to protect the electrical transformers located on the outside of the building.

Building 9202 - Four additional auxiliary fire alarm boxes were installed in the of this building.

Buildings 9728, 9720-5, 9710-1, 9610, 9204-4, and 9738 - Automatic sprinkler systems were connected to the Gamewell Fire Alarm System in these buildings.

TABLE F-7

AIR CONTAMINATION RESULTS

Contaminant	MPL	Type of Sample	Location	Number of Samples	Percent of Results Greater than MPL
Normal Uranium	50 $\mu\text{g}/\text{M}^3$	General Air	9212	2,438	1
Normal Uranium	50 $\mu\text{g}/\text{M}^3$	Operational	9212	164	33
Normal Uranium	50 $\mu\text{g}/\text{M}^3$	Operational	9206	100	38
Normal Uranium	50 $\mu\text{g}/\text{M}^3$	Operational	Rest of Y-12	52	23
Enriched Uranium	70 d/m/M ³	General Air	9212	3,476	2
Enriched Uranium	70 d/m/M ³	Operational	9212	377	40
Mercury	0.1 mg/M ³	Operational	Y-12	57	16
Mercury	0.1 mg/M ³	General Air	Y-12	3,266	31
Beryllium	2 $\mu\text{g}/\text{M}^3$	Operational	Y-12	16	0
Silica	5 mppcf*	Operational	Y-12	10	100
Fluorides	2.5 mg/M ³	Operational	Y-12	8	0
Caustic Hydroxides	None Estab.	Operational	Y-12	6	

*Million particles per cubic foot

In order that a current record of the status of the areas in each category might be maintained, a thorough survey of all buildings in present use has been inaugurated. Buildings in which a reasonable proportion of the smear samples show the contamination to be in the activity range from 20 to 500 d/m/100 cm² are classed as Yellow Areas. Those in which the contamination is greater than 500 d/m/100 cm², as shown by a like proportion of the smears, are classed as Red Areas. Correspondingly, buildings on those areas free of contamination are listed as White. In conjunction with the survey program, a map of the Y-12 Area was prepared showing all the buildings in the proper color code. To date, buildings and areas totaling 58 have been completely surveyed and properly color-coded on the map. A summary of this survey is shown in Table F-8.

TABLE F-8

SURVEY OF CONTAMINATED LOCATIONS

Color Category	Total number of locations	Total number of smears	Average Activity per smear
Red	5	760	221.4 d/m/100 cm ²
Yellow	36	12,943	48.0 d/m/100 cm ²
White	16	7,336	3.2 d/m/100 cm ²

*This average is well below the 500 d/m/100 cm² limit because some of the locations had been thoroughly cleaned just prior to surveying. Of course smears taken from beryllium handling areas are not included since they are Red only because of their chemical toxicity.

Routine contamination monitoring of shipments and transfers was continued throughout the quarter. Routine analysis of the liquid effluent in the East Fork of Poplar Creek will be started in the near future. The results of the one spot sample obtained during this quarter are shown in Table F-9.

TABLE F-9

ANALYSIS OF POPLAR CREEK WATER

Material	Concentration
Normal Uranium	40 $\mu\text{g}/\text{liter}$
Enriched Uranium	72 d/m/liter
Plutonium	27 d/m/liter
Mercury	0.13 mg/liter

ms 8/24/94

OAK RIDGE Y-12 PLANT INFORMATION CONTROL FORM

DOCUMENT DESCRIPTION (Completed By Requesting Division)

Document No. Y-1003/EXTRACT Author's Telephone No. 6-0263 Acct. No. 23366-0002 Date of Request 8/19/94

Unclassified Title: Selected Pages From Y-12 Plant Quarterly Report FIRST FISCAL QUARTER 1954 (JULY 1 - SEPTEMBER 30, 1953)

Author(s) Requested by Steve Wiley (PGS F-1/19; G-23) M-27

TYPE: Formal Report Informal Report Progress/Status Report Co-Op Report Thesis/Term Paper
 Oral Presentation (identify meeting, sponsor, location, date): _____

Journal Article (Identify Journal): _____
 Other (Specify): To Be Released for Phase II of HSA

Document will be published in proceedings No Yes
Document will be distributed at meeting No Yes
Document has patent or invention significance No Yes (Identify) _____
Document has been previously released No Yes (Reference) _____

1991
AUG 22 PM 2:33

DIVISION REVIEW AND APPROVAL (Completed By Requesting Division)

TECHNICAL CLASSIFICATION REVIEW (Divisional Classification Representative)
Title(s): VNC Abstract: NA
DOCUMENT: Level VNC Category NA
Steve Wiley Signature 8/19/94 Date

DOCUMENT REQUEST APPROVED (Division or Department)

Signature _____ Date _____

Signature _____ Date _____

THE REMAINDER OF THIS FORM TO BE COMPLETED BY THE TECHNICAL INFORMATION OFFICE
DISTRIBUTION

Internal Distribution
 External Distribution
TID-4500 Category _____ or _____ Copies to OSTI
ANNOUNCED IN: ERA Atomindex (Available from NTIS)
M-3679 Category: _____
ANNOUNCE IN: AWDR (Available from OSTI) ANCR

Distribution: UCN-7721B DOE F-1332.15 Document
Y-12 Central Files Y-12 RC Y-12 RC Y-12 RC
TIO File _____
L.L. McCauley
S.W. Wiley
T.R. Butz

Distribution Remarks: cleared for public release (Chang-Risk)

To Record Copy of This Document Is In The DRC

APPROVAL AND RELEASE

Date Received _____ Date Initiated 8-22-94
 CLASSIFICATIONS:
Title(s): Unclassified Abstract -
DOCUMENT:
Level Unclassified Category -
Weapons Data _____ Sigma _____
Lloyd B Porter 8/22/94
Y-12 Classification Office Date

Editor _____ Date _____
 Waived/ms
Patent Office _____ Date _____
 Other _____ Date _____
 Other _____ Date _____

APPROVED FOR: Declassification Release subject to use of the following admonitory markings and conditions:

Disclaimer Copyright Patent Caution Other

m. j. Bond 8/24/94
Technical Information Office Date

Conditions/Remarks:

buildings. Combustible buildings that are essential to the Plant operations and are to be retained are protected by sprinkler systems. Others are sold and removed, or salvaged by our own work forces as expeditiously as work schedules will permit. Our objective is to finally protect all combustible buildings in the Plant with automatic sprinkler systems, or to remove them.

Attention is focused in this report to all major changes affecting the fire risk of this Plant and facts on fire experience during this reporting period.

MAJOR FIRE PREVENTION ACTIVITIES FOR THE QUARTER

Structures Removed

- Building 9976 - This combustible building located on "E" Road at the southeast corner of Building 9204-3 was torn down and salvaged.
- Building 9926 - This sub-standard building located on Argon Drive was sold and removed.
- Building 9974 - This large combustible building located on "H" Road, which was partly destroyed by fire, was removed and salvaged.

Major Alterations to Important Structures

- Building 9201-2 - An area of approximately nine hundred square feet on the first floor, north center section of this building was remodeled and occupied as a laboratory in connection with the ADP operation.
- Building 9723-25 - The cafeteria section of this building is being remodeled for occupancy by maintenance shops presently housed in temporary unprotected combustible buildings located on Glycol Drive, which creates an exposure to 9212 and the surrounding buildings. A sprinkler system will protect the new shops.
- Building 9711-5 - An office section of approximately seven hundred and fifty square feet was built on the second floor, southeast corner, of this building and occupied as superintendent's, cashier's, and accounting offices for the cafeteria. Fire-resistive material was utilized throughout.
- Building 9731 - Approximately five hundred and twelve square feet in the southeast corner of the basement previously used as a storage room was remodeled to serve as a chemical research laboratory. Fire-resistive material was used.

Important Occupancy Changes

- Building 9201-2 - Product Finishing Laboratory moved from the second floor to the first floor into a remodeled room approximately nine hundred square feet in area.
- Building 9201-2 -
- Building 81-40 - This isolated frame building was used to store undamaged material salvaged from Building 9974 which was partially destroyed by fire. Electrical conductors were disconnected to minimize the possibility of lightning striking the building.

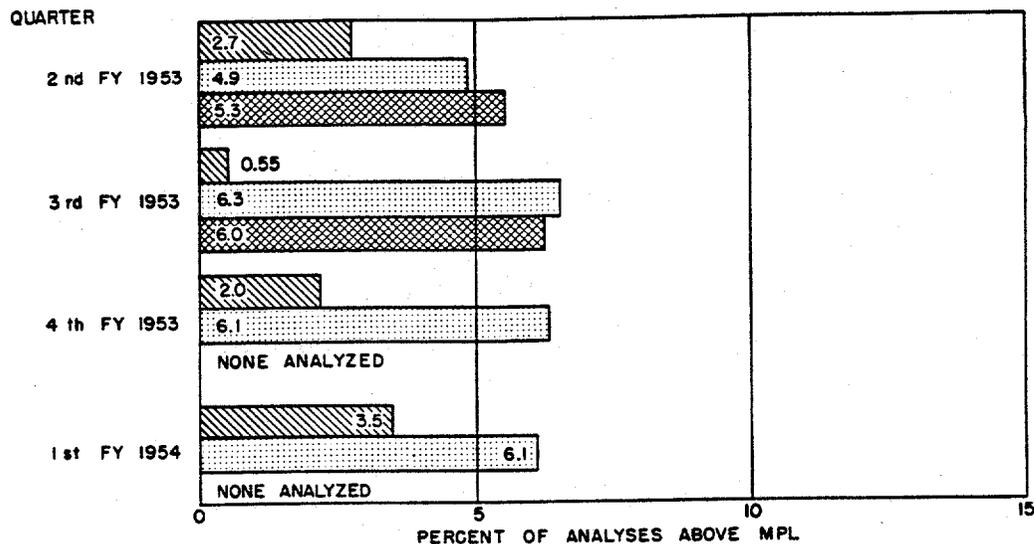
A temporary frame construction building was moved from third street west of building 81-10 to an isolated section in the southeast corner of the area on South Patrol Road, to be used for additional ammonium nitrate storage.

Installation of Automatic Fire Protection Equipment

- Building 9212 - Automatic carbon dioxide high pressure, Class "A," fire extinguishing system was installed to protect the flammable materials vault in the Sub-stores.

URINALYSIS RESULTS

F-9



LEGEND:

- NORMAL URANIUM - 50 MICROGRAMS / 24 HOUR VOIDING
- ENRICHED URANIUM - 70 DISINTEGRATIONS / MINUTE / 24 HOUR VOIDING
- MERCURY - 0.3 MILLIGRAMS / LITER

NOTE: MPL - MAXIMUM PERMISSIBLE LEVEL

FIGURE F-4

Plutonium Isotope Separation

A successful run has just been completed. Monitoring data will be presented in the next report.

TOXICOLOGICAL HAZARDS

Personnel Monitoring

During this quarter, a system for a study of the urinary mercury results from a statistically representative number of individuals from each of several exposure groups was designed. It is expected that the program will be initiated during the month of October.

Area Monitoring

Routine air analysis in the uranium, mercury and beryllium handling areas was continued. Samples for other air contaminants were taken whenever the need arose. Table F-6 shows a breakdown of the results of the air analyses, while the general air analyses results are shown in Figure F-5.

CONTAMINATION CONTROL

The surveying of buildings and/or areas for loose contamination using the smear sampling technique was continued during the quarter to establish or verify their classifications as Red, Yellow, or White areas as previously described. Table F-7 shows the number and classification of areas, number of smears taken and the average count per minute per smear.

Routine contamination monitoring of shipments and transfers was continued throughout the quarter. Weekly samples, composited from samples taken daily at random times from the East Fork of Poplar Creek, which carries all the storm and waste effluent from the Y-12 Area, were analyzed for normal uranium, enriched uranium, and mercury. Table F-8 shows the average analysis of these samples.

TABLE F-6
AIR CONTAMINATION RESULTS*

Contaminant	MPL	Type of Sample	Location	No. of Samples	Percent of Results Greater than MPL
Normal Uranium	50 $\mu\text{g}/\text{M}^3$	General Air	9212	2470	1
Normal Uranium	50 $\mu\text{g}/\text{M}^3$	Operational	9212	89	37
Normal Uranium	50 $\mu\text{g}/\text{M}^3$	Operational	9206	5	33
All Alpha Emitters	7 d/m/M ³	Outdoor	Y-12	171	0
Enhanced Uranium	70 d/m/M ³	General Air	9212	3520	4
Enhanced Uranium	70 d/m/M ³	Operational	9212	264	7
Mercury	.1 mg/M ³	Spot General Air	9202	797	71
Mercury	.1 mg/M ³	Spot General Air	9201-2	1752	33
Mercury	.1 mg/M ³	Spot General Air	9204-4	1518	19
Mercury	.1 mg/M ³	Continuous Reading			
		General Air	9204-4	100	0
Dust	50 MPPCF**	Operational	9709	5	0
Dust	50 MPPCF**	General Air	9709	3	0
Beryllium	2 $\mu\text{g}/\text{M}^3$	Operational	Y-12	35	<1
Beryllium	2 $\mu\text{g}/\text{M}^3$	General Air	Y-12	88	0

*Estimated as explained.

**Million particles per cubic foot.

TABLE F-7
SURVEY OF CONTAMINATED LOCATIONS*

Color Category	Total number of locations	Total number of smears	Average activity per smear
Red	2	456	376.3 d/m/100 cm ²
Yellow	31	6,128	91.2 d/m/100 cm ²
White	35	4,191	0.7 d/m/100 cm ²

*Estimated as explained.

TABLE F-8
ANALYSIS OF POPLAR CREEK WATER*

Material	Concentration
Normal Uranium	91 $\mu\text{gm}/\text{liter}$
Enriched Uranium	492.5 d/m/liter
Alpha Activity by Lanthanum Extraction	1046 d/m/liter
Mercury	0.09 mg/liter
Average pH of Stream	8.2

*Estimated as explained.

PROMOTION AND TRAINING

Twenty-one recipients of AEC Fellowships in Radiological Physics were guided in performing the routine cycle of work in the Photographic Dosimetry Section as a part of their field training in Y-12. These students were also oriented in the interpretation of urinary uranium excretions of employees exposed to uranium and its compounds.

Document No. Y-1004 / EXTRACT Author's Telephone No. 6-0263 Acct. No. 23366-0002 Date of Request 8/22/94

Unclassified Title: Selected Pages From Y-12 Plant Quarterly Report SECOND FISCAL REPORT (OCTOBER 1- DECEMBER 31, 1953) (Pgs F-1/14; G-19/21) M-28

Author(s) Requested by Steve Wiley M-28

TYPE: Formal Report Informal Report Progress/Status Report Co-Op Report Thesis/Term Paper

Oral Presentation (identify meeting, sponsor, location, date): _____

Journal Article (Identify Journal): _____

Other (Specify): To Be Released for Phase II of HSA

Document will be published in proceedings No Yes

Document will be distributed at meeting No Yes

Document has patent or invention significance No Yes (Identify) _____

Document has been previously released No Yes (Reference) _____

DIVISION REVIEW AND APPROVAL (Completed By Requesting Division)

TECHNICAL CLASSIFICATION REVIEW (Divisional Classification Representative)

Title(s): UNC Abstract: NA

DOCUMENT: Level UNC Category NA

[Signature] 8/22/94

DOCUMENT REQUEST APPROVED (Division or Department)

Signature _____ Date _____

Signature _____ Date _____

THE REMAINDER OF THIS FORM TO BE COMPLETED BY THE TECHNICAL INFORMATION OFFICE

DISTRIBUTION

Internal Distribution

External Distribution

TID-4500 Category _____ or _____ Copies to OSTI

ANNOUNCED IN: ERA Atomindex (Available from NTIS)

M-3679 Category _____

ANNOUNCE IN: AWDR (Available from OSTI) ANCR

Distribution:	UCN-7721B	DOE F-1332.15	Document
Y-12 Central Files	Y-12 RC	Y-12 RC	Y-12 RC
TIO File			
<u>L.L. McCauley</u>			
<u>S.W. Wiley</u>			
<u>T.R. Butz</u>			

Distribution Remarks: Cleared for Public Release (Chambers)

To Record Copy of This Document Is In The DRC

APPROVAL AND RELEASE

Date Received _____ Date Initiated 8-22-94

CLASSIFICATIONS:

Title(s): Unclassified Abstract -

DOCUMENT: Level Unclassified Category -

Weapons Data _____ Sigma 87

Lloyd S. Porter 87

Y-12 Classification Office Date

Editor _____ Date _____

Went over Patent Office / me Patent Office _____ Date _____

Other _____ Date _____

Other _____ Date _____

APPROVED FOR: Declassification Release subject to use of the following admonitory markings and conditions:

Disclaimer Copyright Patent Caution Other

[Signature] 8/23/94

Technical Information Office Date

Conditions/Remarks:

INTRODUCTION
TO
PART F
EMPLOYEE AND PLANT PROTECTION

This part of the report pertains to all phases of Plant activity relating to the protection of both the employee and the Plant. Included among the activities are: medical and health physics services, plant safety and accident prevention programs, fire prevention and control, plant security, emergency and disaster planning programs, and criticality controls.

In addition to the normal hazards of industrial chemical operations, the Y-12 Plant is concerned with unique problems arising from the handling of large quantities of such radioactive and toxic materials as uranium, beryllium, and mercury.

Plant operations must be carried on in a highly classified and controlled manner so that precautions are necessary in order to assure adequate protection of classified materials and information.

Statistical information in a majority of the tables to follow has been estimated for the current quarter from actual values obtained for the months of October, November, and a part of December. Corrected final totals for the previous quarter appear in the appropriate columns of this report.

FIRE PREVENTION AND CONTROL

INTRODUCTION

Fire prevention and control activities in Y-12 remained essentially the same this quarter. Added responsibilities were acquired as the result of the large construction program in the Alpha-5 Area. A number of building alterations and occupancy changes were necessary to accommodate Rust Engineering and Atomic Energy Commission personnel who are stripping Buildings 9201-4 and 9201-5.

Some obsolete combustible buildings were removed from Y-12. Others were protected by the installation of sprinklers in line with our ultimate aim to remove all wooden structures not essential to plant operations, and to protect with sprinkler systems those that are essential.

Educational activities were continued among personnel in the Y-12 Area through orientation classes, by attending departmental and divisional meetings, and by individual contacts with supervision and employees. The greatest emphasis of our educational program was evidenced during Fire Prevention Week when an attempt was made to review the fundamentals of fire prevention with all employees through lectures and demonstrations.

All changes to structures and operational techniques affecting the fire risk of the Plant were reviewed with Engineering in an effort to assure maximum fire safety.

MAJOR FIRE PREVENTION ACTIVITIES FOR THE QUARTER

Structures Removed

Building 9912 - This large combustible building located on "A" Road, 75 feet south of First Street was sold and removed from the area.

A temporary combustible building located on Glycol Drive, which was used as maintenance shops, was torn down and the material salvaged.

Major Alterations to Important Structures

Building 9711-1 - An area of approximately 7,500 square feet in this building was reactivated as an engineering office and drafting room for the Vitro Corporation.

Building 9701-3 - Rust Engineering Company remodeled and occupied approximately 7,000 square feet of floor space in the west section of this building as a personnel office.

Building 9723-16 - This large, wooden, change house which had been in stand-by was remodeled into offices by the Rust Engineering Company. Fire resistive material on combustible studding was used.

Building 9711-6 - Rust Engineering Company remodeled this cafeteria building into offices. Fire resistive materials were used.

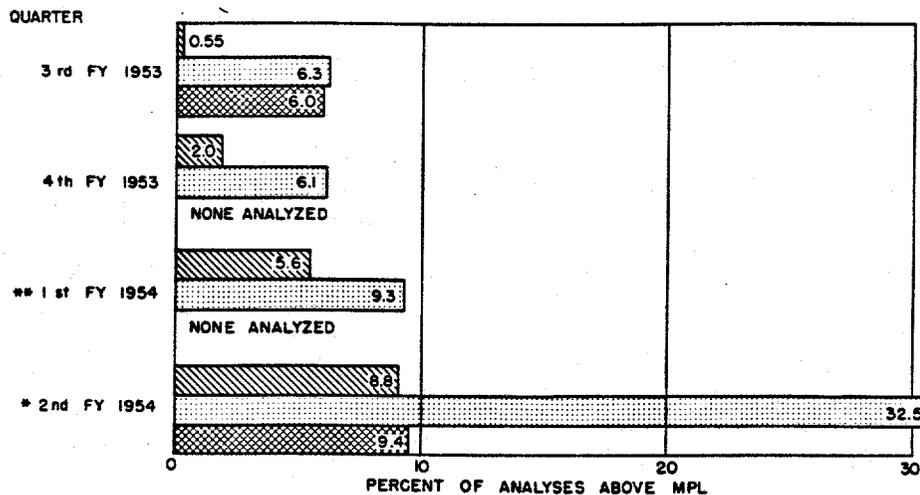
Building 9723-21 - This large change house which had been in stand-by was re-conditioned into offices by the Rust Engineering Company. Fire resistive material was used.

Building 9938 - This frame and homosote building was re-conditioned for a sign shop by the Rust Engineering Company.

Building 9968 - This large temporary building was reconditioned for a heavy equipment garage and carpenter shop for Rust Engineering Company.

Buildings 9201-4 and 9201-5 - These large Alpha production buildings, which have been in stand-by for a number of years, are being stripped by the Rust Engineering Company preparatory to the construction of the new lithium isotope separation facility.

URINALYSIS RESULTS



LEGEND:

▨ NORMAL URANIUM - 50 MICROGRAMS / 24 HOUR VOIDING

▤ ENRICHED URANIUM - 70 DISINTEGRATIONS / MINUTE / 24 HOUR VOIDING

▧ MERCURY - 0.3 MILLIGRAMS / LITER

NOTE: MPL - MAXIMUM PERMISSIBLE LEVEL

** CORRECTED AS EXPLAINED IN INTRODUCTION TO PART F

* ESTIMATED AS EXPLAINED IN INTRODUCTION TO PART F

FIGURE F-4

TABLE F-6
AIR CONTAMINATION RESULTS

Contaminant	MPL	Type of Sample	Location	This Quarter *		Last Quarter **	
				No. of Samples	Percent of Results Greater than MPL	No. of Samples	Percent of Results Greater than MPL
Normal Uranium	50 µg/M ³	General Air	9212	2,916	3	2,628	< 1
Normal Uranium	50 µg/M ³	Operational	9212	85	56	141	38
Normal Uranium	50 µg/M ³	Operational	9206	18	33	88	24
Normal Uranium	----	Duct	9211	10	--	--	--
All Alpha Emitters	7 d/m/M ³	Outdoors	Y-12	171	0	171	0
Enhanced Uranium	70 d/m/M ³	General Air	9212	4,117	13	3,656	7
Enhanced Uranium	70 d/m/M ³	Operational	9212	223	52	226	43
Mercury	.1 mg/M ³	Spot, General Air	9204-4	2,832	11	2,102	19
Mercury	.1 mg/M ³	Continuous Reading	9204-4	915	22	58	33
Mercury	.1 mg/M ³	Spot, General Air	9201-2	1,797	48	2,016	36
Mercury	.1 mg/M ³	Continuous Reading	9201-2	9	30	--	--
Mercury	.1 mg/M ³	Spot, General Air	9202	1,216	87	963	63
Mercury	----	Duct	9204-4	10	--	--	--
Beryllium	2 µg/M ³	General Air	9766	141	0	84	0
Beryllium	2 µg/M ³	Operational	9766	30	0	17	0
Ozone	.1 mg/M ³	Operational	9734	3	0	--	--
Carbon Monoxide	100 ppm	Breathing Zone	9212	5	0	--	--
Dust	50 MPCF	General Air	9766	8	0	--	--
Lithium	----	General Air	9204-4	10	--	--	--

*Estimated as explained in Introduction to Part F.

**Corrected as explained in Introduction to Part F.

CONTAMINATION CONTROL

The surveying of buildings and/or areas for loose contamination was continued during this quarter. Table F-7 shows the number and classification of areas, number of smears taken, and the average count per smear. The surveying of equipment and materials shipped from the Y-12 Area was continued throughout this report period. This includes all items leaving the area by way of the Shipping and Receiving, Uranium Control, and Salvage Departments and also all surplus equipment stripped from process buildings.

TABLE F-7
SURVEY OF CONTAMINATED LOCATIONS

Color Category	Total Number of Locations		Total Number of Smears		Average Activity Per Smear	
	This Qt.*	Last Qt.**	This Qt.*	Last Qt.**	This Qt.*	Last Qt.**
Red	2	2	500	456	432.8 d/m/100 cm ²	376.3 d/m/100 cm ²
Yellow	28	33	3,370	6,538	167.2 d/m/100 cm ²	98.6 d/m/100 cm ²
White	5	36	600	4,341	8.5 d/m/100 cm ²	1.5 d/m/100 cm ²

*Estimated as explained in Introduction to Part F.

**Corrected as explained in Introduction to Part F.

Water samples from the East Fork of Poplar Creek were taken daily at random times and composited into weekly samples for analysis by the Health Physics Analytical Section. The results of the analyses are shown in Table F-8.

TABLE F-8
ANALYSIS OF POPLAR CREEK WATER

Material	Concentration	
	This Quarter*	Last Quarter**
Normal Uranium	83.5 µg/liter	71.0 µg/liter
Enriched Uranium	127.0 d/m/liter	474.0 d/m/liter
Plutonium	141.0 d/m/liter	174.0 d/m/liter
Mercury	1.14 mg/liter	0.21 mg/liter

*Estimated as explained in Introduction to Part F.

**Corrected as explained in Introduction to Part F.

A special survey was made for alpha and beta contamination of approximately 7,500 items of salvageable equipment and materials, such as high voltage cubicles, manifolds, diffusion pumps, dollies, etc., located in the west salvage yard and in several of the chemical production standby buildings.

In order to determine more definitely the amount of contamination picked up on the protective clothing used in certain of the Plant operating areas, a thorough study was made of 1,033 complete uniforms. Two direct readings and two smear samples from the same spots were obtained from inside and outside of each garment. Table F-9 gives a summary of this survey.

MLB 8/22/94

Document No. 4-1005/EXTRACT Author's Telephone No. 6-0263 Acct. No. 23366-0002 Date of Request 8/22/94

Unclassified Title: Selected Pages From Y-12 Plant Quarterly Report THIRD FISCAL QUARTER, 1954 (JANUARY 1-MARCH 31, 1954) (Pgs F-1/15, G-18/19)

Requested by Steve Wiley M-29

TYPE: Formal Report Informal Report Progress/Status Report Co-Op Report Thesis/Dissertation Paper
 Oral Presentation (identify meeting, sponsor, location, date): _____

Journal Article (Identify Journal): _____

Other (Specify): To Be Released for Phase II of HSA

Document will be published in proceedings No Yes
 Document will be distributed at meeting No Yes
 Document has patent or invention significance No Yes (Identify) _____
 Document has been previously released No Yes (Reference) _____

DIVISION REVIEW AND APPROVAL (Completed By Requesting Division)

TECHNICAL CLASSIFICATION REVIEW (Divisional Classification Representative)
 Title(s): VNC Abstract: NA
 DOCUMENT: Level VNC Category NA
[Signature] 8/22/94
 Signature Date

DOCUMENT REQUEST APPROVED (Division or Department)

 Signature Date

 Signature Date

THE REMAINDER OF THIS FORM TO BE COMPLETED BY THE TECHNICAL INFORMATION OFFICE

DISTRIBUTION

Internal Distribution
 External Distribution
 TID-4500 Category _____ or _____ Copies to OSTI
 ANNOUNCED IN: ERA Atomindex (Available from NTIS)
 M-3679 Category: _____
 ANNOUNCE IN: AWDR (Available from OSTI) ANCR

Distribution:	UCN-7721B	DOE F-1332.15	Document
Y-12 Central Files	Y-12 RC	Y-12 RC	Y-12 RC
TIO File	_____	_____	_____
	<u>L.L. McCauley</u>	_____	_____
	<u>S.W. Wiley</u>	_____	_____
	<u>T.R. Butz</u>	_____	_____

Distribution Remarks: cleared for public release (Chambers)

To Record Copy of This Document Is In The DRC

APPROVAL AND RELEASE

Date Received _____ Date Initiated 8-22-94
 CLASSIFICATIONS:
 Title(s): Unclassified Abstract _____
 DOCUMENT: Level Unclassified Category _____
 Weapons Data _____ Sigma _____
Lloyd B Porter 8/22/94
 Y-12 Classification Office Date

Editor _____ Date _____
 Waived per Patent Control/mlb
 Patent Office _____ Date _____
 Other _____ Date _____
 Other _____ Date _____

APPROVED FOR: Declassification Release subject to use of the following cautionary markings and conditions:
 Disclaimer Copyright Patent Caution Other
m. J. Bond 8/23/94
 Technical Information Office Date

Conditions/Remarks:

Educational activities were continued among personnel in the Y-12 area through orientation classes, attending departmental and divisional safety meetings, and through contacts with individuals by members of the Fire Prevention and Control Department.

By working closely with engineering departments, a maximum degree of fire safety was incorporated into structural and equipment alterations and additions. In some instances obsolete buildings were removed in line with our ultimate aim of improving the fire resistive qualities of Y-12 structures, thereby improving the fire risk of the plant.

MAJOR FIRE PREVENTION ACTIVITIES FOR THE QUARTER

Structures Removed

- Building 9914 - This large combustible building located on Second Street was torn down and salvaged.
- Building 9620-1 - This oil purification house with large storage tanks was razed to make way for the new steam plant (9401-3).
- Buildings 9420-13 and 14 - These wood studded and corrugated transite pump houses and deaerator buildings were removed for remodeling of Buildings 9201-4 and 9201-5.

Major Alterations to Important Structures

- Buildings 9201-1 and 9204-2 - These large Alpha and Beta production buildings, which have been in stand-by for a number of years, are being stripped preparatory to the construction of the new Alpha-5 production facility.
- Building 9207 - The bulk treatment section of this building, which has been in stand-by, is being stripped preparatory to the construction of new analytical laboratories.
- Building 9769 - This old obsolete incinerator building was stripped and remodeled into a training school for new personnel.
- Building 9206 - Approximately 7,200 square feet of floor space on the southeast section was stripped preparatory to the construction of a machining, casting, and dry chemistry area.
- Building 9206
- Building 81-22 - This large combustible building is being remodeled for the storage of uranium salvage materials. Outside walls will be covered with corrugated transite to preserve the building and make it more fire resistive.
- Building 9204-4 - A large steel and corrugated transite evaporator building has been erected, as an expansion to Building 9204-4 operation, in the yard west of the building.
- Building 9711-5 - An area of approximately 900 square feet in this building was reactivated as an employee's Federal Credit Union.

Rust Engineering Company is in the process of erecting two 15,000 square foot and one 12,500 square foot Bulter-type fire resistive warehouses on Third Street south of Buildings 9201-4 and 9201-5.

Important Occupancy Changes

- Building 9769 - Storage of magnesium turnings and was moved to Building 9771 to make room for the training school which occupied this building.

TABLE F-6
AIR CONTAMINATION RESULTS

Contaminant	MPL	Type of Sample	Location	This Quarter*		Last Quarter**	
				No. of Samples	Percent of Results Greater than MPL	No. of Samples	Percent of Results Greater than MPL
Normal Uranium	50 µg/M ³	General Air	9212	2,238	7	2,920	3
Normal Uranium	50 µg/M ³	Operational	9212	204	15	86	56
Normal Uranium	50 µg/M ³	General Air	9206	75	7	---	---
Normal Uranium	50 µg/M ³	Operational	9206	40	50	13	33
Normal Uranium	---	Duct	9211	---	--	10	---
All Alpha Emitters	7 d/m/M ³	Outdoors	Y-12	129	0	155	0
Enhanced Uranium		General Air	9212	2,250	12	3,231	13
Enhanced Uranium		Operational	9212	276	35	293	52
Mercury	.1 mg/M ³	Spot, General Air	9204-4	648	4	2,000	12
Mercury	.1 mg/M ³	Continuous Reading	9204-4	1,044	12	841	19
Mercury	.1 mg/M ³	Spot, General Air	9201-2	1,196	57	1,638	51
Mercury	.1 mg/M ³	Continuous Reading	9201-2	---	--	9	30
Mercury	.1 mg/M ³	Spot, General Air	9202	1,502	66	1,144	999
Mercury	---	Duct	9204-4	---	--	10	---
Beryllium	2 µg/M ³	General Air	9766	61	0	205	0
Beryllium	2 µg/M ³	Operational	9766	5	0	25	0
Lithium	35 µg/M ³ ***	General Air	9204-4	7	14	20	25
Trichloroethylene	200 ppm	Operational	9212	3	33	---	---
Fluoride	2.5 mg/M ³	Operational	9201-3	12	59	---	---

*Estimated values for 3rd Quarter fiscal year 1954.

**Corrected Values for 2nd Quarter fiscal year 1954.

***This limit is based on irritation level.

CONTAMINATION CONTROL

The surveying of buildings and/or areas for loose contamination was continued during this quarter. Table F-7 shows the number and classification of areas surveyed, the number of smears taken, and the average count per smear. The surveying of equipment and materials shipped from the Y-12 area was continued throughout this report period. This includes all items leaving the area by way of the Shipping and Receiving, Uranium Control, and Salvage Departments and also surplus equipment stripped from process buildings. The latter increased in volume during this quarter due to an accelerated stripping program.

TABLE F-7
SURVEY OF CONTAMINATED LOCATIONS

Color Category	Total Number of Locations		Total Number of Smears		Average Activity Per Smear	
	This Qt.*	Last Qt.**	This Qt.*	Last Qt.**	This Qt.*	Last Qt.**
Red	0	3	0	750	--	398.2 d/m
Yellow	22	30	3,848	3,530	221.0 d/m	126.5 d/m
White	14	11	540	850	4.9 d/m	5.6 d/m

*Estimated as explained in Introduction to Part F.

**Corrected as explained in Introduction to Part F.

F-12

Water samples from the East Fork of Poplar Creek were taken daily at random times and composited into weekly samples for analysis by the Health Physics Analytical Section. The results of the analyses are shown in Table F-8. Preliminary plans have been completed for the installation of a water gaging station and proportional sampler in the creek near the east end of the Y-12 area.

TABLE F-8
ANALYSIS OF POPLAR CREEK WATER

Material	Concentration	
	This Quarter*	Last Quarter**
Normal Uranium	84.7 $\mu\text{g}/\text{l}$	82.2 $\mu\text{g}/\text{l}$
Enriched Uranium	489.8 $\text{d}/\text{m}/\text{l}$	127.4 $\text{d}/\text{m}/\text{l}$
Plutonium	749.6 $\text{d}/\text{m}/\text{l}$	217.3 $\text{d}/\text{m}/\text{l}$
Mercury	0.56 mg/l	1.07 mg/l

*Estimated as explained in Introduction to Part F.

**Corrected as explained in Introduction to Part F.

CRITICALITY CONTROL

GENERAL ACTIVITIES

Routine Plant Operations

Routine inspections of production processes involving fissionable materials and contacts with operational supervision have been maintained by this Department. In general, operations have been performed according to established criticality control regulations.

A very significant shifting of emphasis from routine product uranium manufacture to the fabrication of large quantities of uranium-aluminum alloy slugs occurred during the quarter. Consequently, a number of additional problems arose as this change-over was put into effect. At the present time these problems have been satisfactorily resolved and acceptable routines have been established.

Uranium-aluminum Alloy Slug Manufacture

The magnitude of the alloy slug fabrication program increased considerably during this reporting period. Previous control regulations were re-emphasized as the scope of the program increased, and revisions were made as the need arose. Revised flow charts were issued and agreements were made concerning the following items:

Document No. Y-1006 / EXTRACT Author's Telephone No. 6-0263 Acct. No. 23366-0002 Date of Request 8/22/94

Unclassified Title: Selected Pages From Y-12 Plant Quarterly Report FOURTH FISCAL QUARTER, 1954 (APRIL 1 - JUNE 30, 1954) (PGS F-1/14; G-16) M-3

Author(s) Requested by Steve Wiley

TYPE: Formal Report Informal Report Progress/Status Report Co-Op Report Thesis/Term Paper
 Oral Presentation (identify meeting, sponsor, location, date): _____

Journal Article (Identify Journal): _____
 Other (Specify): To Be Released for Phase II of HSA

Document will be published in proceedings No Yes
 Document will be distributed at meeting No Yes
 Document has patent or invention significance No Yes (Identify) _____
 Document has been previously released No Yes (Reference) _____

199 AUG 22 PM 2:37

DIVISION REVIEW AND APPROVAL (Completed By Requesting Division)

TECHNICAL CLASSIFICATION REVIEW (Divisional Classification Representative)
 Title(s): VNC Abstract: NA
 DOCUMENT: Level VNC Category NA
[Signature] 8/22/94
 Signature Date

DOCUMENT REQUEST APPROVED (Division or Department)

Signature _____ Date _____
 Signature _____ Date _____

THE REMAINDER OF THIS FORM TO BE COMPLETED BY THE TECHNICAL INFORMATION OFFICE
 DISTRIBUTION

Internal Distribution
 External Distribution
 TID-4500 Category _____ or _____ Copies to OSTI
 ANNOUNCED IN: ERA Atomindex (Available from NTIS)
 M-3679 Category: _____
 ANNOUNCE IN: AWDR (Available from OSTI) ANCR

Distribution:	UCN-7721B	DOE F-1332.15	Document
Y-12 Central Files	Y-12 RC	Y-12 RC	Y-12 RC
TIO File	_____	_____	_____
	<u>L.L. McCauley</u>	_____	_____
	<u>S.W. Wiley</u>	_____	_____
	<u>T.R. Butz</u>	_____	_____

Distribution Remarks: Classified for Public Release (when possible)

To Record Copy of This Document Is In The DRC

APPROVAL AND RELEASE

Date Received _____ Date Initiated 8-22-94

CLASSIFICATIONS:
 Title(s): Unclassified Abstract -
 DOCUMENT: Level Unclassified Category -
 Weapons Data _____ Sigma _____
Lloyd B Porter 8/22/94
 Y-12 Classification Office Date

Editor _____ Date _____
 Wiley/MS Patent Office _____ Date _____
 Other _____ Date _____
 Other _____ Date _____

APPROVED FOR: Declassification Release subject to use of the following admonitory markings and conditions:

Disclaimer Copyright Patent Caution Other

[Signature] 8/22/94
 Technical Information Office Date

Conditions/Remarks:

TABLE F-6
AIR CONTAMINATION RESULTS

Contaminant	MPL	Type of Sample	Location	4th Qt. FY 1954*		3rd Qt. FY 1954**	
				No. of Samples	Percent of Results Greater than MPL	No. of Samples	Percent of Results Greater than MPL
Normal Uranium	50 µg/M ³	General Air	9212	1,398	3	2,031	6
Normal Uranium	50 µg/M ³	Operational	9212	75	25	204	18
Normal Uranium	50 µg/M ³	General Air	9206	366	0	89	0
Normal Uranium	50 µg/M ³	Operational	9206	134	11	59	24
Normal Uranium	---	Duct	9212	50	--	--	--
All Alpha Emitters	7 d/m/M ³	Outdoors	Y-12	270	0	270	0
Enhanced Uranium	.5 µg/M ³	General Air	9212	2,652	20	2,701	10
Enhanced Uranium	.5 µg/M ³	Operational	9212	245	38	275	40
Mercury	0.1 mg/M ³	Spot, General Air	9204-4	1,851	30	607	5
Mercury	0.1 mg/M ³	Continuous Reading	9204-4	1,136	21	1,068	16
Mercury	0.1 mg/M ³	General Air					
Mercury	0.1 mg/M ³	Spot, General Air	9201-2	1,750	18	1,236	52
Mercury	0.1 mg/M ³	Continuous Reading	9201-2	---	--	9	30
Mercury	0.1 mg/M ³	General Air					
Mercury	0.1 mg/M ³	Spot, General Air	9202	227	24	1,435	73
Mercury	0.1 mg/M ³	Spot, General Air	Y-12	60	2	---	--
Beryllium	2 µg/M ³	General Air	9766	52	0	59	0
Beryllium	2 µg/M ³	Operational	9766	1	0	5	0
Lithium	35 µg/M ³ ***	General Air	9704-4	101	70	3	33
Trichloroethylene	200 ppm	Operational	9212	2	50	3	33
Trichloroethylene	200 ppm	Operational	9204-4	4	0	---	--
Quartz	---	Operational	9733-1	2	--	---	--
Fluoride	2.5 mg/M ³	Operational	9201-3	---	--	12	59

*Estimated values for 4th Quarter fiscal year 1954.

**Corrected values for 3rd Quarter fiscal year 1954.

***This limit is based on irritation level.

was continued throughout this report period. This includes all items leaving the area by way of the Shipping and Receiving, Uranium Control and Salvage Departments and also all surplus equipment stripped from process buildings.

TABLE F-7
SURVEY OF CONTAMINATED LOCATIONS

Area Classification	Total Number of Locations		Total Number of Smears		Average Activity per Smear	
	This Qt. *	Last Qt. **	This Qt. *	Last Qt. **	This Qt. *	Last Qt. **
Red	3	1	240	100	841.1	516.3
Yellow	22	24	3,076	3,968	128.7	232.1
White	17	15	3,199	1,740	4.1	5.2

*Estimated as explained in Introduction to Part F.

**Corrected as explained in Introduction to Part F.

Water samples from the east fork of Poplar Creek were taken daily at random times and composited into weekly samples for analysis by the Health Physics Analytical Section. The results of the analyses are shown in Table F-8. The construction of a water gaging station and proportional sampler in the creek is being temporarily held up pending procurement of certain items of equipment.

TABLE F-8
ANALYSIS OF POPLAR CREEK WATER

Material	Concentration	
	This Quarter*	Last Quarter**
Normal Uranium	32.3 µg/liter	154.1 µg/liter
Enriched Uranium	148.0 d/m/liter	302.4 d/m/liter
Plutonium	226.3 d/m/liter	196.2 d/m/liter
Mercury	0.20 mg/liter	0.20 mg/liter

*Estimated as explained in Introduction to Part F.

**Corrected as explained in Introduction to Part F.

RADIATION CONTROL

GENERAL ACTIVITIES

Routine Plant Operations

Operational activities in the production areas involving fissionable materials were, in general, carried out according to prescribed criticality control regulations. During the past three months no significant incidents involving nuclear safety were noted. Routine liaison has been maintained between operational supervision and representatives of the Radiation Control Group to detect and eliminate any such problems as might occur. Contacts have also been maintained with various members of the Technical Division to assure the incorporation of nuclear safety features in the design and development of process improvement projects.

The following is a partial listing of plant problems encountered during this quarter:

Partially Enriched Oralloid Program

Frequent contacts have been maintained between special hazards representatives and project engineers who are responsible for the current expansion in the partially enriched oralloid processing facility in Building 9206. Criticality control features have been incorporated in the design and layout of equipment proposed for the new addition.

Uranium-aluminum Slug Manufacture

In spite of the fact that the demand for alloy slugs has decreased significantly during the past quarter, close observation of the fabrication facilities has been maintained. Nuclear safety practices have been established and observed for the casting of large slugs and billets and for the extrusion of such slugs to long rods.

Catastrophe Monitoring System

In view of recent process changes, the radiation detection monitoring system has been reviewed for Buildings 9206, 9212, and 9995. Alterations have been proposed for the 9206 system in order to provide coverage for the expanded processing facilities. In addition, recommendations were made concerning the evacuation of Rust personnel during a monitor alarm. Notification and explanation of the evacuation alarm system has been transmitted to the contractor.

MLB 8/23/94

OAK RIDGE Y-12 PLANT INFORMATION CONTROL FORM

00 INT DESCRIPTION (Completed By Requesting Division)

Document No. Y-1007/EXTRACT Author's Telephone No. 6-0263 Acct. No. 23366-0002 Date of Request 8/22/94

Unclassified Title: Selected Pages From Y-12 PLANT QUARTERLY REPORT FIRST FISCAL QUARTER, 1955 (JULY 1-SEPTEMBER 30, 1954) (PGS F-1/10) M-31

Author(s) Requested by Steve Wiley

TYPE: Formal Report Informal Report Progress/Status Report Co-Op Report Thesis/Term Paper
 Oral Presentation (identify meeting, sponsor, location, date): _____

Journal Article (Identify Journal): _____
 Other (Specify): To Be Released for Phase II of HSA

Document will be published in proceedings No Yes
Document will be distributed at meeting No Yes
Document has patent or invention significance No Yes (Identify) _____
Document has been previously released No Yes (Reference) _____

1994 AUG 22 PM 2:39

DIVISION REVIEW AND APPROVAL (Completed By Requesting Division)

TECHNICAL CLASSIFICATION REVIEW (Divisional Classification Representative)
Title(s): UNC Abstract: NA
DOCUMENT: Level UNC Category NA
Steve Wiley Signature 8/22/94 Date

DOCUMENT REQUEST APPROVED (Division or Department)

Signature _____ Date _____
Signature _____ Date _____

THE REMAINDER OF THIS FORM TO BE COMPLETED BY THE TECHNICAL INFORMATION OFFICE

DISTRIBUTION

Internal Distribution
 External Distribution
TID-4500 Category _____ or _____ Copies to OSTI
ANNOUNCED IN: ERA Atomindex (Available from NTIS)
M-3679 Category _____
ANNOUNCE IN: AWDR (Available from OSTI) ANCR

Distribution: UCN-7721B DOE F-1332.15 Document
Y-12 Central Files Y-12 RC Y-12 RC Y-12 RC
TIO File _____
L.L. McCauley _____
S.W. Wiley _____
T.R. Butz _____

Distribution Remarks: cleared for public release (when Rish)

To Record Copy of This Document Is In The DRC

APPROVAL AND RELEASE

Date Received _____ Date Initiated 8-22-94
 CLASSIFICATIONS:
Title(s): Unclassified Abstract _____
DOCUMENT: Level Unclassified Category _____
Weapons Data _____ Sigma _____
Lloyd B. Porter 8/22/94
Y-12 Classification Office Date

Editor _____ Date _____
 Wiley/mls
Patent Office _____ Date _____
 Other _____ Date _____
 Other _____ Date _____

APPROVED FOR: Declassification Release subject to use of the following admonitory markings and conditions:

Disclaimer Copyright Patent Caution Other

W.D. Bond 8/23/94
Technical Information Office Date

Conditions/Remarks:

HEALTH PHYSICS

During this quarter the opinions of several members of the National Committee on Radiation Protection were secured in an effort to resolve several local health physics problems. This effort has resulted in a redefinition of the maximum permissible limit of exposure to ionizing radiations in terms of an average and a cumulative exposure over a period of time not exceeding thirteen weeks.

Excessive internal radiation exposure to certain groups of chemical operators in the uranium processing facilities necessitated a recommendation for the removal of 30 employees from their regular work areas.

The institution of a revised urine sampling program at the end of this quarter is expected to result in the reduction of sample bias from both contamination sources and recently inhaled soluble uranium compounds.

The general level of plant contamination remained about the same as last quarter with the exception of a significant drop in the enriched uranium areas near the end of the quarter.

The construction of a water gaging and proportional sampling station in the east fork of Poplar Creek is nearing completion. This facility will permit more rapid and efficient monitoring of the Y-12 effluent waste.

RADIATION CONTROL

GENERAL ACTIVITIES

Audit of Operations by the Criticality Consulting Committee

In order to preclude the possibility of overlooking some vital point in the Y-12 nuclear safety program, a group of four men who are recognized in the field of Atomic Energy and are familiar with criticality concepts, are invited each year to inspect Y-12 Plant operations and review the local program of nuclear safety.

During the period, September 9-10, 1954, three of this group met in Y-12 for this purpose. This committee again approved the general criticality control program and made several specific comments which are now under consideration. Their comments and recommendations are presented in memorandum Y-A2-161, "Review of Criticality Hazards in Y-12 Operations." Follow-up considerations of the recommendations and brief comments concerning problems discussed at the meeting are given in memorandum Y-A2-163.

Routine Plant Operations

With one exception, operations were carried out according to prescribed criticality control regulations. A single incident occurred which involved quantities of uranium in excess of the prescribed limit. When detected, this situation was immediately corrected and an investigation was initiated to determine the cause of the over-accumulation. The results of the investigation, together with corrective actions and long-term recommendations are presented in memorandum Y-A2-162. It was determined that the safety factors established for the operation involved were adequate to render this situation safe.

PLANT INVESTIGATIONS

The following lists some of the more important plant studies conducted during this reporting period:

MB 8/25/94

OAK RIDGE Y-12 PLANT INFORMATION CONTROL FORM

DOCUM. DESCRIPTION (Completed By Requesting Division...)

Document No. Y-1011 / EXTRACT Author's Telephone No. 6-0263 Acct. No. 23366-0002 Date of Request 8/23/94

Unclassified Title: Selected Pages From Y-12 Plant Quarterly Report FIRST FISCAL QUARTER, 1956 (JULY-SEPTEMBER 30, 1955) (PGS F-1/16; G-21/22)

Author(s) Requested by Steve Wiley M-35

TYPE: Formal Report Informal Report Progress/Status Report Co-Op Report Thesis/Term Paper

Oral Presentation (Identify meeting, sponsor, location, date): _____

Journal Article (Identify Journal): _____

Other (Specify): To Be Released for Phase II of HSA

Document will be published in proceedings No Yes

Document will be distributed at meeting No Yes

Document has patent or invention significance No Yes (Identify) _____

Document has been previously released No Yes (Reference) _____

1994 AUG 23 11:50

DIVISION REVIEW AND APPROVAL (Completed By Requesting Division)

TECHNICAL CLASSIFICATION REVIEW (Divisional Classification Representative)
Title(s): UNC Abstract: NA
DOCUMENT: Level UNC Category NA
Steve Wiley 8/23/94
Signature Date

DOCUMENT REQUEST APPROVED (Division or Department)

Signature Date

Signature Date

THE REMAINDER OF THIS FORM TO BE COMPLETED BY THE TECHNICAL INFORMATION OFFICE

DISTRIBUTION

Internal Distribution
 External Distribution
TID-4500 Category _____ or _____ Copies to OSTI
ANNOUNCED IN: ERA Atomindex (Available from NTIS)
M-3679 Category: _____
ANNOUNCE IN: AWOR (Available from OSTI) ANCR

Distribution: UCN-77218 DOE F-1332.15 Document
Y-12 Central Files Y-12 RC Y-12 RC Y-12 RC
TIO File _____
L.L. McCauley _____
S.W. Wiley _____
T.R. Butz _____

Distribution Remarks: Cleared for Publication (when Rish)

To Record Copy of This Document Is In The DRC

APPROVAL AND RELEASE

Date Received _____ Date Initiated 8-24-94
 CLASSIFICATIONS:
Titles: Unclassified Abstract _____
DOCUMENT: Level Unclassified Category _____
Weapons Data _____ Sigma _____
Lloyd B Porter 8/24/94
Y-12 Classification Office Date

Editor _____ Date _____
 Wanted for Patent Office / MB
Patent Office _____ Date _____
 Other _____ Date _____
 Other _____ Date _____

APPROVED FOR: Declassification Release subject to use of the following admonitory markings and conditions:

Disclaimer Copyright Patent Caution Other
m. d. Bond 8/25/94
Technical Information Office Date

Conditions/Remarks:

- Building 9910 - This large frame and homosote building, located on First Street at Agate Drive, was sold and removed.
- Building 9975 - This small wooden building located on "E" Road, southwest of Building 9204-1, was sold and removed.

Upon the near completion of the Rust Engineering Company's participation in the Alpha-5 Project several temporary combustible shacks were moved from the area and sold.

Major Alterations to Important Structures

- Building 9723-9 - An air conditioning room of approximately 160 sq ft of floor space was added to this building. Wood framing covered with asbestos shingles was used. A wet sprinkler line with four heads was installed to protect this addition.
- Building 9206
- Building 9212 - The B-1 wing of this building was stripped of furnaces preparatory to housing an Alterations Shop and Sub-stores.

Important Occupancy Changes

- Building 9207 - An area of approximately 15,000 sq ft of space, floors 3, 4, and 5 were occupied as a pilot plant, Raw Materials Testing Facilities, which operation was originally located in Building 9202.
- Building 9201-4 - Portions of this building, which are still under construction were completed and occupied by the Alloy Division.
- Building 9720-8 - Storage of alcohol was moved from Building 9771, an unprotected area, to a flammable liquid storage vault in this new warehouse which has an automatic CO₂ fire protection system.
- Building 9711-5 - Employee's check cashing facilities moved from Building 9723-12 to the Time Office, basement of this building.
- Building 9720-2 - The bulk clothing storage facility which was stored in Building 9753, an unsprinklered building, was moved to this building which has complete automatic sprinkler coverage.
- Building 9709 - New lumber which was stored in Building 9910, a sub-standard building, was moved into this building which has automatic sprinkler coverage.

Installation of Fixed Fire Protection Equipment

- Building 9201-4 - Eight automatic water fog spray systems were installed to protect electrical oil filled transformers in and around this building. These systems are connected to the Gamewell Fire Alarm System.
- Building 9201-4 - Twenty-two auxiliary fire alarm boxes and eight water flow switches for fire protection systems were installed in this building and connected to the Gamewell Fire Alarm System.
- Buildings 9711-6, 9723-16 and -18 - The automatic sprinkler systems in these buildings were connected to the Gamewell Fire Alarm System.

Other Action Taken Which Would Tend to Improve the Plant's Fire Defense

- Buildings 9701-1, 9723-1, 9723-4, 9753, 9754, and 9983 - These large combustible buildings were covered with asbestos shingles to preserve the buildings and make them more fire resistive.

AREA MONITORING

Direct Radiation

Films from the cassettes in Buildings 9212, 9206, 9995, and 9998 were changed and processed routinely on a monthly basis. The developed film gave no indication of any significant radiation.

Air Analyses

Routine air analyses were continued in all areas handling uranium, plutonium, mercury, or beryllium. Samples of other contaminants were taken whenever the need appeared. Table F-4 gives a detailed breakdown of all air analyses results. Figure F-5 shows, since July, 1955, the levels of uranium air concentrations as determined from general air samples taken in six areas in Building 9212, while Figure F-6 shows, since July, 1955, the indicated levels of uranium air concentrations in one area in Building 9206, and the levels of mercury air concentrations in two areas in Building 9201-5.

TABLE F-4
AIR CONTAMINATION RESULTS

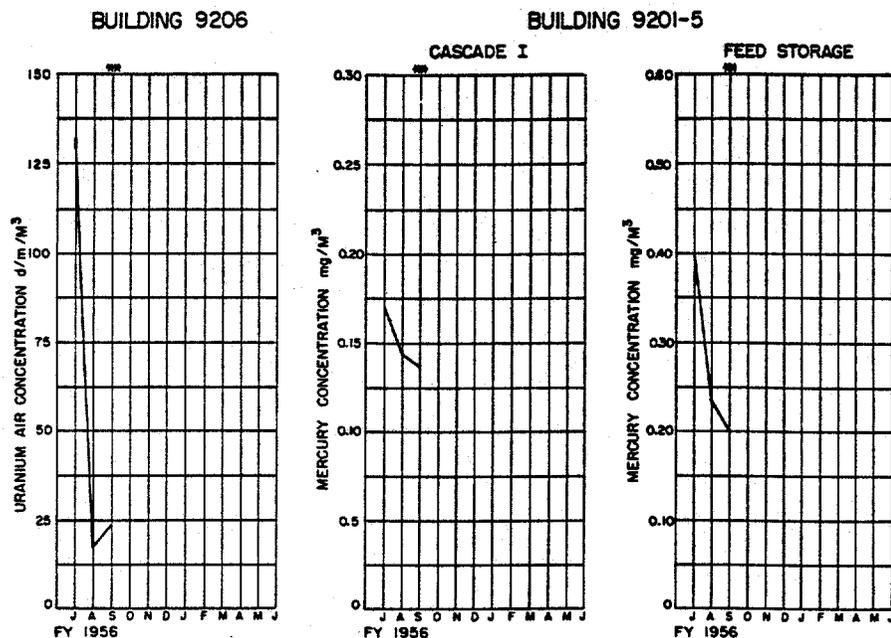
Contaminant	MPL	Type of Sample	Location	This Quarter *		Last Quarter**	
				No. of Samples	% of Results > MPL	No. of Samples	% of Results > MPL
Normal Uranium	50 $\mu\text{g}/\text{M}^3$	General Air	9212	1,900	17	2,387	7
Normal Uranium	50 $\mu\text{g}/\text{M}^3$	Operational	9212	160	86	501	93
Normal Uranium	50 $\mu\text{g}/\text{M}^3$	Operational	9206	0	--	6	0
Normal Uranium	50 $\mu\text{g}/\text{M}^3$	Operational	9211	30	90	50	64
All Alpha Emitters	7 d/m/M ³	Outdoors	Y-12	65	0	57	0
Enriched Uranium	0.5 $\mu\text{g}/\text{M}^3$	General Air	9212	7,300	5	3,594	2
Enriched Uranium	0.5 $\mu\text{g}/\text{M}^3$	Operational	9212	75	60	431	33
Enriched Uranium	0.5 $\mu\text{g}/\text{M}^3$	General Air	9206	2,800	4	1,406	21
Enriched Uranium	0.5 $\mu\text{g}/\text{M}^3$	Operational	9206	150	30	148	28
Enriched Uranium	0.5 $\mu\text{g}/\text{M}^3$	General Air	9995	75	0	0	--
Mercury	0.1 mg/M ³	Spot, General Air	9201-2	2,225	19	2,242	37
Mercury	0.1 mg/M ³	Spot, General Air	9201-4	12,250	83	2,011	42
Mercury	0.1 mg/M ³	Spot, General Air	9201-5	11,700	84	13,659	51
Mercury	0.1 mg/M ³	Continuous Reading General Air	9201-5	575	68	719	50
Mercury	0.1 mg/M ³	Spot, General Air	9204-4	4,600	13	2,670	7
Mercury	0.1 mg/M ³	Continuous Reading General Air	9204-4	825	33	692	34
Mercury	0.1 mg/M ³	Spot, General Air	Y-12, Other Areas	3,100	25	1,022	11
Beryllium	2 $\mu\text{g}/\text{M}^3$	General Air	9706	156	0	256	0
Beryllium	2 $\mu\text{g}/\text{M}^3$	Operational, BZ	9766	4	0	0	--
Beryllium	2 $\mu\text{g}/\text{M}^3$	Operational	9734-2	3	0	0	--
Plutonium	9 d/m/M ³	Operational	9205	0	--	20	5
Plutonium	9 d/m/M ³	General Air	9995	100	1	0	--
Plutonium	9 d/m/M ³	Operational	9995	25	8	0	--
Lithium	35 $\mu\text{g}/\text{M}^3$ ***	Operational	ADP Areas	50	0	95	27
Ozone	0.1 ppm	Operational	Y-12 Areas	30	40	44	39
Fluoride	2.5 mg/M ³	Breathing Zone	9211	0	--	6	0
Ammonia	100 ppm	Operational	9211	0	--	9	22
Oxides of Nitrogen	-----	Breathing Zone	Y-12	30	0	13	0
Acids and Bases	-----	Operational	9212	30	0	0	--
Cyanide	5 mg/M ³	Operational	9212	20	0	0	0

*Estimated values for 1st quarter fiscal year 1956.

**Corrected values for 4th quarter fiscal year 1955.

***This limit is based on the irritation level.

GENERAL AIR CONCENTRATIONS



* CORRECTED AS EXPLAINED IN INTRODUCTION TO PART F
 ** ESTIMATED AS EXPLAINED IN INTRODUCTION TO PART F

FIGURE F-6

CONTAMINATION CONTROL

Surveying of Plant areas for removable surface contamination was continued during this quarter. Table F-5 shows the number and classifications of areas monitored, the number of smears taken, and the average count per smear. Results of these surveys indicate that during the quarter contamination control methods within the White and Red areas were very effective. The levels of contamination in the Yellow areas, though not as favorable as that for the previous quarter, remained well within the prescribed control limits.

TABLE F-5

SURVEY OF CONTAMINATED LOCATIONS

Area Classifications	Total Number of Locations		Total Number of Smears		Average Activity per Smear	
	This Qt. *	Last Qt. **	This Qt. *	Last Qt. **	This Qt. *	Last Qt. **
Red	1	1	150	203	30	208
Yellow	37	37	6,000	5,988	450	433
White	5	5	160	264	7	5

* Estimated as explained in Introduction to Part F.

** Corrected as explained in Introduction to Part F.

Surveying of equipment and materials shipped from the Y-12 area was continued throughout this report period which included all items leaving the area by way of the Shipping and Receiving, Uranium Control, and Salvage Departments.

Analyses for tritium contamination in incoming deuterium gas are being made on a routine basis. The reported values are based on calculated ion chamber response rather than calibrated data. The ion chambers will be calibrated upon receipt of a standard solution which is on requisition.

Water samples from the East Fork of Poplar Creek were taken daily at random times and composited into weekly samples for analysis for gross alpha and beta-gamma activity, and for mercury concentration. The average results of the analyses are shown in Table F-6.

TABLE F-6
ANALYSIS OF POPLAR CREEK WATER

Type of Analysis	Average Analysis	
	This Qt.*	Last Qt.**
Alpha Activity	435 d/m/l	345 d/m/l
Beta Activity	2,500 d/m/l	4,292 d/m/l
✓ Mercury	1.06 mg/l	1.81 mg/l

* Estimated as explained in Introduction to Part F.

** Corrected as explained in Introduction to Part F.

A routine sampling program was inaugurated this quarter whereby weekly water samples are collected from Bear Creek and analyzed for alpha and beta activity to determine the amount of drainage of radioactive material from the burial pit west of the Y-12 area. Insufficient results are available at this time for inclusion in this report.

RADIATION CONTROL

GENERAL ACTIVITIES

Annual Audit of Operations by Criticality Consulting Committee

Each year a group of four men, who are recognized in the field of atomic energy and are familiar with criticality concepts, are invited to inspect Y-12 plant operations and review the local program of nuclear safety.

This group met during the period August 29 to September 2, for this purpose. The committee again approved the general criticality control program of the Plant and made several specific comments and recommendations which are now under consideration.

Routine Plant Operations

Routine operations in the fissionable materials processing facilities have been performed without the occurrence of a nuclear hazard. Daily contacts and routine investigations have been maintained by special hazards engineers to insure proper nuclear safety controls.

PLANT INVESTIGATIONS

Nuclear safety has continued to be maintained through strict adherence to specified limits and controls. Particular attention has been directed toward all new or non-standard problems. The following items are among those considered during the past three months.

MLB 8/23/94

OAK RIDGE Y-12 PLANT INFORMATION CONTROL FORM

Document No. Y-1008 / EXTRACT NT DESCRIPTION (Completed By Requesting Division)

Author's Telephone No. 6-0263 Acct. No. 23366-0002 Date of Request 8/22/94

Unclassified Title: Selected Pages From Y-12 PLANT QUARTERLY REPORT SECOND FISCAL QUARTER, 1955 (OCTOBER 1 - DECEMBER 31, 1954 (Pages 1-14))

Author(s) Requested by Steve Wiley M-32

TYPE: Formal Report Informal Report Progress/Status Report Co-Op Report Thesis/Term Paper Oral Presentation (identify meeting, sponsor, location, date):

1994 AUG 22 PM 2:40

Journal Article (Identify Journal):
 Other (Specify): To Be Released for Phase II of HSA

Document will be published in proceedings No Yes
Document will be distributed at meeting No Yes
Document has patent or invention significance No Yes (Identify)
Document has been previously released No Yes (Reference)

DIVISION REVIEW AND APPROVAL (Completed By Requesting Division)

TECHNICAL CLASSIFICATION REVIEW (Divisional Classification Representative)
Title(s): VNC Abstract: NA
DOCUMENT Level VNC Category NA
Steve Wiley 8/22/94
Signature Date

DOCUMENT REQUEST APPROVED (Division or Department)

Signature Date

Signature Date

THE REMAINDER OF THIS FORM TO BE COMPLETED BY THE TECHNICAL INFORMATION OFFICE

DISTRIBUTION

Internal Distribution
 External Distribution
TID-4500 Category or Copies to OSTI
ANNOUNCED IN: ERA Atomindex (Available from NTIS)
M-3679 Category
ANNOUNCE IN: AWDR (Available from OSTI) ANCR

Distribution:	UCN-7721B	DOE F-1332.15	Document
Y-12 Central Files	Y-12 RC	Y-12 RC	Y-12 RC
TIO File	<u> </u>	<u> </u>	<u> </u>
<u>L.L. McCauley</u>	<u> </u>	<u> </u>	<u> </u>
<u>S.W. Wiley</u>	<u> </u>	<u> </u>	<u> </u>
<u>T.R. Butz</u>	<u> </u>	<u> </u>	<u> </u>

Distribution Remarks: cleared for public release (Chambers)

To Record Copy of This Document Is In The DRC

APPROVAL AND RELEASE

Date Received Date Initiated 8-22-94
 CLASSIFICATIONS:
Title(s): Unclassified Abstract -
DOCUMENT:
Level Unclassified Category -
Weapons Data Sigma
Lloyd B Porter 8/22/94
Y-12 Classification Office Date

Editor Date
 Patent Office Wiley/MLB Date
 Other Date
 Other Date

APPROVED FOR: Declassification Release subject to use of the following admonitory markings and conditions:

Disclaimer Copyright Patent Caution Other

Technical Information Office Date

Conditions/Remarks:

- Building 9949-1 - This large combustible badge exchange booth, located on "E" Road, north of 9204-1, was torn down and salvaged.
- Building 9949-7 - This combustible badge exchange booth, located on First Street at Bitumin Drive, was removed.

Major Alterations to Important Structures

- Building 9711-5 - Approximately 3,000 square feet of floor space, basement floor, southeast corner, was remodeled and occupied by the Payroll and Timekeeping Departments.
- Building 9723-9 - This combustible change house, which has been in standby for a number of years, was completely remodeled into a Health Physics Laboratory (Boston General Hospital Project). A wet sprinkler system was installed and the outside walls covered with asbestos shingles.
- Building 9704-2 - Approximately 2,500 square feet of floor space, first floor, southeast section of this building, was remodeled and occupied by the Property Department.
- Building 9704-2 - The northeast section, second floor of this building, was remodeled and additional offices added.

Important Occupancy Changes

- Building 9711-5 - The Payroll and Timekeeping Offices moved from Building 9704-2 and occupied approximately 3,000 square feet of floor space in the southeast corner, basement floor, of this building.
- Building 9704-2 - Property Department moved from the second floor, southeast wing, to the first floor, southeast wing of this building.
- Building 9704-2 - The Plant Superintendent's group moved from Building 9764 into remodeled offices on the second floor, northeast wing of this building.
- Building 9764 - The Plant Shift Superintendents' office moved from Building 9706-2 into offices in the north section of this building.
- Building 9704-2 - Methods Engineering Department offices moved from the south section of Building 9764 to the second floor, southeast wing of this building.
- Building 9204-2 - A large part of the first and second floors of Building 9204-2 was taken over from Rust Engineering Company and occupied by the Alloy Division.
- Building 9201-5 - The Alloy Division took over portions of Building 9201-5 during this period.
- Building 9998 - Portions of this building, which is still under construction by Rust Engineering Company, were completed and occupied by operations personnel.

Installation of Fixed Fire Protection Equipment

- Building 9720-7 - A dry type automatic sprinkler system with 265 heads was installed in this building.
- Building 9723-9 - A wet type automatic sprinkler system with 100 heads was installed in this building.

AREA MONITORING

Direct Radiation

Films from the cassettes in Buildings 9212 and 9995 were changed near the end of the quarter. The developed film gave no indication of any significant radiation. Cassettes were installed in Building 9206 during the latter part of the quarter.

Air Analyses

Routine air analyses were continued in all areas handling uranium, mercury, or beryllium. Table F-5 gives a breakdown on all air analyses results. Samples of other contaminants were taken whenever the need appeared. Figure F-5 shows the levels of uranium air concentrations from general air samples taken in six areas in Building 9212. Figure F-6 shows uranium air concentration from one area in Building 9206, and mercury levels in two areas in Building 9204-4.

TABLE F-5
AIR CONTAMINATION RESULTS

Contaminant	MPL	Type of Samples	Location	2nd Quarter FY 1955	
				No. of Samples	Percent of Results Greater than MPL
Normal Uranium	50 μ g/M ³	General Air	9212	1,930	10
Normal Uranium	50 μ g/M ³	Operational	9212	139	50
Normal Uranium	50 μ g/M ³	General Air	9206	6	10
Normal Uranium	50 μ g/M ³	Operational	9206	69	50
Normal Uranium	---	Duct	9212	3	--
Normal Uranium	50 μ g/M ³	General Air	9995	176	0
Normal Uranium	50 μ g/M ³	Operational	9201-2	15	75
All Alpha Emitters	7 d/m/M ³	Outdoors	Y-12	84	0
Enriched Uranium	.5 μ g/M ³	General Air	9212	3,270	5
Enriched Uranium	.5 μ g/M ³	Operational	9212	302	34
Enriched Uranium	.5 μ g/M ³	Operational	9206	69	50
Enriched Uranium	.5 μ g/M ³	General Air	9206	348	34
Mercury	0.1 mg/M ³	Spot, General Air	9204-4	2,890	6
Mercury	0.1 mg/M ³	Continuous Reading	9204-4	1,307	17
Mercury	0.1 mg/M ³	Spot, General Air	9201-2	2,149	52
Mercury	0.1 mg/M ³	Continuous Reading	9201-2	22	73
Mercury	0.1 mg/M ³	Spot, General Air	Y-12	25	10
Mercury	---	Duct	9204-4	16	--
Plutonium	9 d/m/M ³	General Air	9205	150	1
Beryllium	2 μ g/M ³	General Air	9766	150	0
Trichloroethylene	200 ppm	Operational	9212	20	0
Fluoride	2.5 mg/M ³	Operational	9766	4	0
Lithium	35 μ g/M ³ **	General Air	Y-12	5	0
Ammonia	100 ppm	Operational	9206	16	33
Ozone	0.1 ppm	Operational	Y-12	20	15
Cadmium	0.1 mg/M ³	Operational	9212	12	0

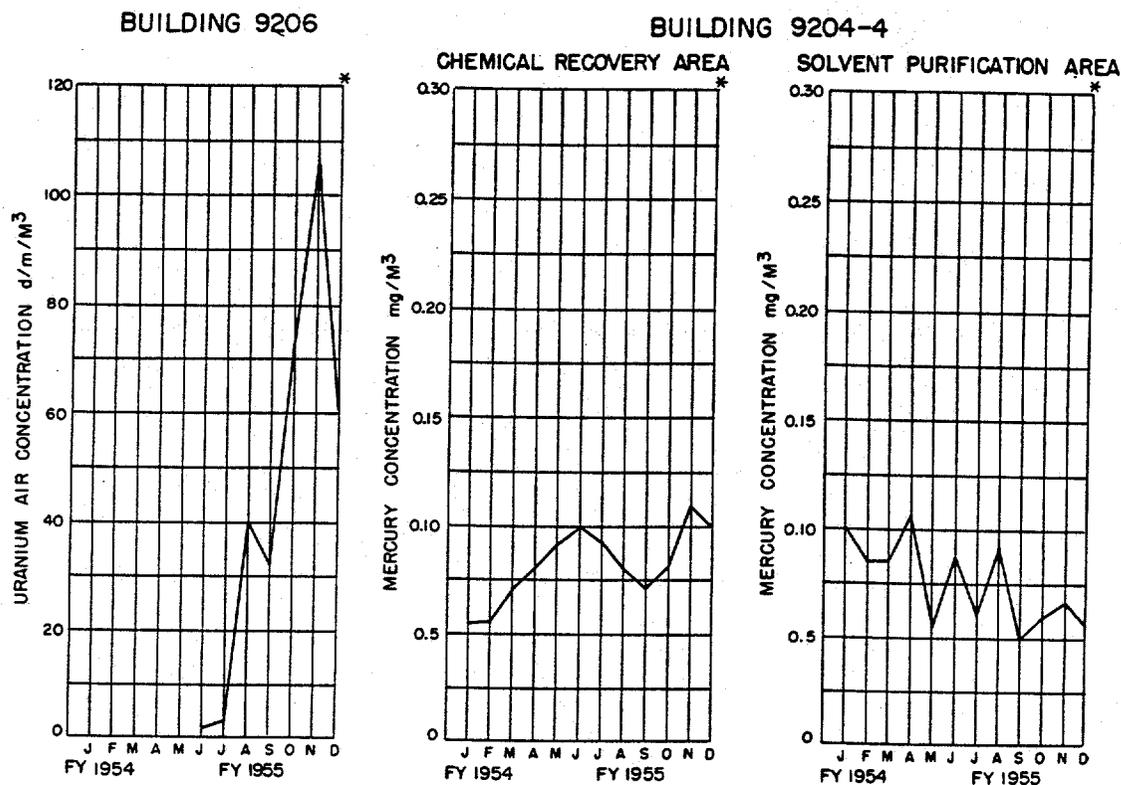
* Estimated values for 2nd Quarter Fiscal Year 1955.

** Based on irritation level.

Contamination Control

Surveying of plant areas for loose contamination was continued during this quarter. Table F-6 shows the number and classifications of areas monitored, the number of smears taken, and the average count per smear. Results of these surveys indicate that, during the quarter contamination

GENERAL AIR CONCENTRATIONS



* ESTIMATED AS EXPLAINED IN INTRODUCTION TO PART E

FIGURE F-6

TABLE F-6

SURVEY OF CONTAMINATED LOCATIONS

Area Classifications	Total Number of Locations *	Total Number of Smears *	Average Activity per Smear *
Red	2	230	18.5
Yellow	7	5,275	287.1
White	4	778	1.5

*Estimated as explained in Introduction to Part F.

control methods within the Red and White Areas were very effective, while the level of contamination in the Yellow Areas, though not as favorable as that evidenced in the other two, remained well within prescribed control limits.

Surveying of equipment and materials shipped from the Y-12 Area was continued throughout this report period. This includes all items leaving the area by way of Shipping and Receiving, Uranium Control, and Salvage Departments.

Water samples from the east fork of Poplar Creek were taken daily at random times and composited into weekly samples for analysis for gross alpha and beta - gamma activity, and for mercury concentration. The average results of the analyses are shown in Table F-7.

TABLE F-7

ANALYSIS OF POPLAR CREEK WATER

Contaminant	Average Analysis
Alpha Activity	3,360 d/m/liter
Beta Activity	13,750 d/m/liter
Mercury	0.18 mg/liter

RADIATION CONTROL

GENERAL ACTIVITIES

Routine Plant Operations

During the past three months activities in the fissionable materials production areas have been performed without the occurrence of a significant nuclear hazard.

Building 9212

Several important supervisory changes have recently been made in this building. Accordingly, meetings were held to discuss the area criticality control program. Nuclear safety responsibilities were reestablished and the over-all program was discussed.

Building 9206

An increasing amount of attention has been directed toward the expanded facilities within 9206. Increased commitments, crowded conditions, inadequate storage facilities, inexperienced personnel, and production during construction are definite hindrances to safe operations. Because of these conditions, extra careful consideration has been given to each request concerning operational changes.

PLANT INVESTIGATIONS

Product Plating

Limit control areas in the oralloy plating shop have been reworked as a result of recent production requirements. The capacity of this area has been nearly doubled through use of additional barriers, storage facilities, and minor changes in equipment.

Combustible Salvage Survey

Consideration was given to the presence of increasing amounts of uranium in type 52-0000 combustible salvage. The average uranium content of this material, which was running considerably higher than anticipated, was reduced substantially through reemphasis on operational methods such as:

1. Closer observance to prevent chip pickup with Kleenex at the machines.
2. Special batching of vacuum cleanings and floor sweepings.

MLB
8/25/94

OAK RIDGE Y-12 PLANT INFORMATION CONTROL FORM

DOCU. DESCRIPTION (Completed By Requesting Div.)

Document No. Y-1009/EXTRACT Author's Telephone No. 6-0263 Acct. No. 23366-0002 Date of Request 8/22/94

Unclassified Title: Selected Pages From Y-12 Plant Quarterly Report THIRD FISCAL QUARTER 1955 (JANUARY 1-MARCH 31, 1955) (PGS F-1/15; G-22/24) M-33

Author(s) Requested by Steve Wiley

TYPE: Formal Report Informal Report Progress/Status Report Co-Op Report Thesis/Term Paper
 Oral Presentation (Identify meeting, sponsor, location, date): _____

Journal Article (Identify Journal): _____
 Other (Specify): To Be Released for Phase II of HSA

Document will be published in proceedings No Yes
 Document will be distributed at meeting No Yes
 Document has patent or invention significance No Yes (Identify) _____
 Document has been previously released No Yes (Reference) _____

DIVISION REVIEW AND APPROVAL (Completed By Requesting Division)

TECHNICAL CLASSIFICATION REVIEW (Divisional Classification Representative)
 Title(s): UNC Abstract: NA
 DOCUMENT Level UNC Category NA
[Signature] 8/22/94
 Signature Date

DOCUMENT REQUEST APPROVED (Division or Department)

 Signature Date

 Signature Date

1994 AUG 21 11:50

THE REMAINDER OF THIS FORM TO BE COMPLETED BY THE TECHNICAL INFORMATION OFFICE

DISTRIBUTION

Internal Distribution
 External Distribution
 TID-4500 Category _____ or _____ Copies to OSTI
 ANNOUNCED IN: ERA Atomindex (Available from NTIS)
 M-3679 Category: _____
 ANNOUNCE IN: AWDR (Available from OSTI) ANCR

Distribution:	UCN-77218	DOE F-1332.15	Document
Y-12 Central Files	Y-12 RC	Y-12 RC	Y-12 RC
TIO File	_____	_____	_____
	<u>L.L. McCauley</u>	_____	_____
	<u>S.W. Wiley</u>	_____	_____
	<u>T.R. Butz</u>	_____	_____

Distribution Remarks: cleared for Public Release (ChemRisk)

To Record Copy of This Document Is In The DRC

APPROVAL AND RELEASE

Date Received _____ Date Initiated 8-24-94
 CLASSIFICATIONS:
 Title(s): Unclassified Abstract -
 DOCUMENT:
 Level Unclassified Category -
 Weapons Data _____ Sigma _____
Lloyd B. Porter 8/22/94
 Y-12 Classification Office Date

Editor _____ Date _____
 Patent Office [Signature] _____ Date _____
 Other _____ Date _____
 Other _____ Date _____

APPROVED FOR: Declassification Release subject to use of the following advisory markings and conditions:

Disclaimer Copyright Patent Caution Other

[Signature] 8/25/94
 Technical Information Office Date

Conditions/Remarks:

The initial training program for emergency squads was completed this quarter and some follow-up training was given by Fire Prevention and Control Department personnel.

With a decrease in construction work and a subsequent decrease in the number of construction personnel in the Rust Engineering Project, fewer fires occurred in construction areas this quarter.

MAJOR FIRE PREVENTION ACTIVITIES FOR THE QUARTER

Structures Removed

Several temporary combustible buildings located on First Street and North First Street, which were being used by Rust Engineering Company for shops and offices, were removed from the area.

Major Alterations to Important Structures

- Building 9723-18 - This combustible change house, which has been in standby for a number of years, was completely remodeled and new metal lockers installed. A wet sprinkler system was installed and the outside wall covered with asbestos shingles.
- Building 9202 - This large building, which has been in semistandby status for a number of years, is being stripped by Rust Engineering Company preparatory to the installation of a new operation.
- Building 9720-8 - This Butler type non-combustible building on Second Street at "B" Road, which has approximately 80,000 square feet of floor space, was erected for a general warehouse. This building has automatic sprinklers and a one-hour concrete block fire wall.
- Building 9204-1 - An office section of approximately 13,000 square feet was built on the second floor, southeast corner, by V. L. Nicholson Construction Company. Fire resistive materials on combustible studding were used.
- Building 9995 - The north section of this building is being stripped preparatory to remodeling into a new Assay Laboratory and related shops.
- Building 9704-2 - Rooms 160 and 166, first floor, southeast section of this building, were remodeled for new cashier and travel offices.
- Building 9723-1 - This large change house, which has been in standby, was renovated for machine shop personnel who will occupy Building 9201-1 at a later date.
- Building 9727-2 - Rust Engineering Company built an air filter storage room of approximately 400 square feet of floor space onto this building. Concrete blocks were used in the construction.
- Building 9404-8 - This semifireproof pump house, which has been in standby, was stripped preparatory to rebuilding it into a welding shop and welding test shop.
- Building 9743-2 - This ammonia storage building was stripped by the Rust Engineering Company preparatory to another type occupancy.
- Building 81-40 - This frame and homosote building was reconditioned for a sheet metal and welding shop by Rust Engineering Company.
- Building 9207 - Approximately 2,800 square feet of floor space, first floor, B. T. section, was remodeled and occupied by the Stores Department. Fire resistive materials were used. A wet sprinkler system was installed to protect the stock.

F-6

- Building 9207 - Approximately 1,900 square feet of floor space, first floor, south section of this building, was remodeled and occupied as an addition to the Biology Technical Library.
- Building 9201-1 - The second floor of this building was stripped and prepared for occupancy by the General Machine Shop.

Important Occupancy Changes

- Building 9201-1 - The inspecting and testing group moved from Building 9201-3 and occupied approximately 3,500 square feet of floor space in the northwest corner, first floor, of this building.
- Building 9998 - Construction on this building was completed by the Rust Engineering Company and occupied by operations.
- Building 9201-5 - A major portion of this building was completed and occupied by the Alloy Division during this quarter.
- Building 9204-2 - This building was taken over in its entirety by the Alloy Division. Machining operations previously located in Building 9204-4 were moved to the north side of this building, ground floor.
- Building 9206 - The renovation of a large portion of Building 9206 was completed by Rust Engineering Company and dry chemistry, machining, and casting operations started in the building.
- Building 9401-3 - Steam plants, Buildings 9401-1 and 9401-2, were placed in standby and were replaced by 9401-3, a coal burning plant.

Installation of Fixed Fire Protection Equipment

- Building 9723-9 - The automatic sprinkler system in this building was connected to the Gamewell Fire Alarm System.
- Building 9204-2 - Sixteen auxiliary fire alarm boxes and two water fog flow switches for electrical transformers were installed in this building and connected to the Gamewell Fire Alarm System.
- Building 9720-7 - The dry pipe valve automatic sprinkler system in this building was connected to the Gamewell Fire Alarm System. Fire alarm box #857 was installed for the supervisory of the air supply to the automatic sprinkler system.
- Building 9207 - A wet-type automatic sprinkler system was installed in the newly built store room, first floor, B. T. section.
- Building 9723-18 - An automatic wet-type sprinkler system, with 133 heads, was installed in this change house.
- Building 9720-8 - Four automatic sprinkler systems, with a total of 813 heads, were installed in this large general warehouse.
- Building 9204-2 - Automatic water fog spray systems were installed to protect the 1,000 kva transformer in Building 9404-10 and the 20,000 kva transformer, south center, outside of Building 9204-2. These systems are connected to the Gamewell Fire Alarm System.

Other Action Taken to Improve the Plant's Fire Defense

Rust Engineering Company installed approximately 1,200 feet of 12-inch water main from the southwest corner of Building 9720-7 to the 12-inch main located south of Building 9201-3. A fire hydrant was installed on the new main, south of Warehouse 9720-8. This main and hydrant will give protection to the south portion of Building 9720-8.

AREA MONITORING

Direct Radiation

Films from the cassettes in Buildings 9212, 9206, and 9995 were changed and processed routinely on a monthly basis. The developed film gave no indication of any significant radiation.

Air Analyses

Routine air analyses were continued in all areas handling uranium, mercury, or beryllium. Table F-5 gives a breakdown of all air analyses results. Samples of other contaminants were taken whenever the need appeared. Figure F-5 shows the levels of uranium air concentrations from general air samples taken in six areas in Building 9212. Figure F-6 shows uranium air concentration from one area in Building 9206 and mercury levels in two areas in Building 9204-4.

TABLE F-5
AIR CONTAMINATION RESULTS

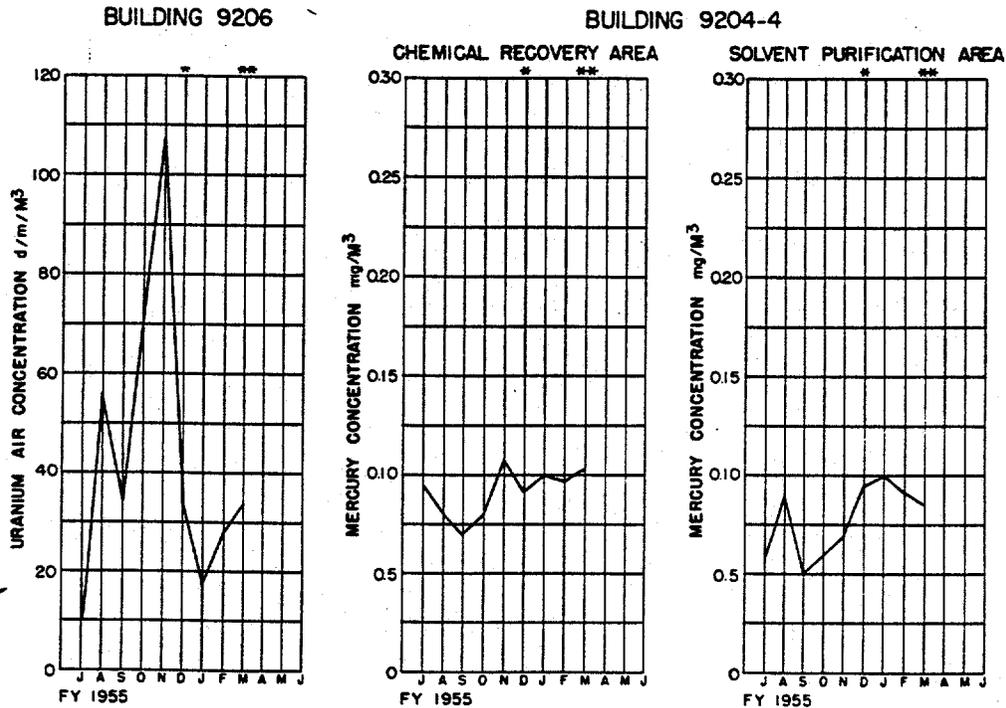
Contaminant	MPL	Type of Samples	Location	2nd Qt. FY 1955*		3rd Qt. FY 1955**	
				No. of Samples	% of Results > MPL	No. of Samples	% of Results > MPL
Normal Uranium	50 μ g/M ³	General Air	9212	1,808	16	1,418	19
Normal Uranium	50 μ g/M ³	Operational	9212	159	49	20	0
Normal Uranium	50 μ g/M ³	Operational	9206	127	48	54	44
Normal Uranium	50 μ g/M ³	Duct	9206	0	--	12	--
Normal Uranium	50 μ g/M ³	Duct	9212	2	--	0	--
All Alpha Emitters	7 d/m/M ³	Outdoors	Y-12	80	0	89	0
Enriched Uranium	.5 μ g/M ³	General Air	9212	3,572	5	3,454	3
Enriched Uranium	.5 μ g/M ³	Operational	9212	266	36	291	36
Enriched Uranium	.5 μ g/M ³	General Air	9206	388	26	448	9
Enriched Uranium	.5 μ g/M ³	Operational	9206	58	43	71	22
Enriched Uranium	.5 μ g/M ³	General Air	9995	151	0	131	0
Mercury	0.1 mg/M ³	Spot, General Air	9204-4	2,680	6	944	4
Mercury	0.1 mg/M ³	Continuous Reading General Air	9204-4	1,204	18	733	27
Mercury	0.1 mg/M ³	Spot, General Air	9201-2	2,028	54	1,507	78
Mercury	0.1 mg/M ³	Continuous Reading General Air	9201-2	9	78	154	62
Mercury	0.1 mg/M ³	Spot, General Air	9202	0	--	54	0
Mercury	0.1 mg/M ³	Spot, General Air	9201-5	0	--	3,932	66
Mercury	0.1 mg/M ³	Continuous Reading General Air	9201-5	0	--	348	57
Mercury	0.1 mg/M ³	Spot, General Air	Y-12, Other Areas	0	--	40	2
Beryllium	2 μ g/M ³	General Air	9766	120	0	135	0
Beryllium	2 μ g/M ³	Operational	9766	3	0	0	--
Plutonium	9 d/m/M ³	General Air	9205	165	0	169	0
Lithium	35 μ g/M ³ ***	Operational	9204-2	5	0	100	25
Trichloroethylene	200 ppm	Operational	9212	75	0	--	--
Trichloroethylene	200 ppm	Operational	9204-4	24	0	25	0
Ozone	0.1 ppm	Operational	9212	21	25	5	100
Fluoride	-----	Operational	Stack	0	--	27	--
Fluoride	2.5 mg/M ³	Operational	Outside	11	0	0	--
Uranium K-25	-----	Operational	Stack	0	--	6	--
Ammonia	100 ppm	Operational	9206	16	40	0	--
Mercury	0.1 mg/M ³	Operational, duct	9204-4	16	0	--	--
Cadmium	0.1 mg/M ³	Operational	9212	12	0	14	80
Cyanide	5 mg/M ³	Operational	9212	0	--	3	0

*Corrected values for 2nd Quarter fiscal year 1955.

**Estimated values for 3rd Quarter fiscal year 1955.

***This limit is based on irritation level.

GENERAL AIR CONCENTRATIONS



*CORRECTED AS EXPLAINED IN INTRODUCTION TO PART E
 **ESTIMATED AS EXPLAINED IN INTRODUCTION TO PART E

FIGURE F-6

CONTAMINATION CONTROL

Surveying of plant areas for removable contamination was continued during this quarter. Table F-6 shows the number and classification of areas monitored, the number of smears taken, and the average count per smear. Results of these surveys indicate that, during the quarter, contamination control methods within the Red and White areas were very effective while the level of contamination in the Yellow areas, though not as favorable as that evidenced in the other two, remained well within prescribed control limits.

TABLE F-6

SURVEY OF CONTAMINATED LOCATIONS

Area Classification	Total Number of Locations		Total Number of Smears		Average Activity Per Smear	
	2nd Qt.*	3rd Qt.**	2nd Qt.*	3rd Qt.**	2nd Qt.*	3rd Qt.**
Red	2	2	200	200	21.3	35.3
Yellow	33	39	4,826	6,298	369.7	329.9
White	8	2	1,069	400	5.6	1.5

*Corrected as explained in introduction to Part F.
 **Estimated as explained in introduction to Part F.

Surveying of equipment and materials shipped from the Y-12 area was continued throughout this report period. This includes all items leaving the area by way of Shipping and Receiving, Uranium Control, and Salvage Departments.

Water samples from the east fork of Poplar Creek were taken daily at random times and composited into weekly samples for analysis for gross alpha and beta-gamma activity, and for mercury concentration. The average results of the analyses are shown in Table F-7.

TABLE F-7
ANALYSIS OF POPLAR CREEK WATER

Contaminant	Average Analysis	
	This Quarter	Last Quarter
Alpha Activity	249 d/m/liter	3,360 d/m/liter
Beta Activity	15,154 d/m/liter	13,750 d/m/liter
Mercury	0.74 mg/liter	0.18 mg/liter

An initial calibration of the gauge has been made following the installation of a weir and gauging station in the creek east of Building 9201-3.

RADIATION CONTROL

GENERAL ACTIVITIES

Routine Plant Operations

Routine operations in the uranium production facilities have been performed for the most part without the occurrence of a nuclear hazard. One significant incident happened, however, which was cause for considerable concern.

tem was such that nuclear safety was maintained. Appropriate action was taken to prevent a recurrence of such a condition. Subsequently, the operation was eliminated entirely by start-up of the dry chemistry installation in Building 9206.

Area Monitoring and Evacuation Plans

The presence of outside contractors in the vicinity of operational areas has considerably complicated the area evacuation plans over the past months. When these areas are returned to the Company, revised plans will be initiated. Furthermore, certain revisions appear desirable as a result of recommendations made by the Y-12 Nuclear Emergency Committee. Reconsideration of these plans has been initiated.

PLANT INVESTIGATIONS

Control of Fissionable Materials During Off-shifts — Consideration has been given to the problem of material control during off-shifts which occur in the revised operating schedule. The following agreements are understood:

1. Fissionable materials must be placed only in approved limit control areas by authorized operating personnel prior to the off-period.
2. Under no circumstances should fissionable material be moved during this period by maintenance or clean-up personnel except by specific approval of designated chemical supervisory personnel.
3. Emergency alarms will continue to be coordinated by the Plant Shift Superintendent.

MLB
8/25/94

OAK RIDGE Y-12 PLANT INFORMATION CONTROL FORM

DOCU. DESCRIPTION (Completed By Requesting Div.)

Document No. Y-1010/EXTRACT Author's Telephone No. 6-0263 Acct. No. 23366-0002 Date of Request 8/22/94

Unclassified Title: Selected Pages From Y-12 Plant Quarterly Report FOURTH FISCAL QUARTER, 1955 (APRIL 1 - JUNE 30, 1955) (Pgs F-1/14; 9-18/20) M-3

Author(s) Requested by Steve Wiley

TYPE: Formal Report Informal Report Progress/Status Report Co-Op Report Thesis/Term Paper
 Oral Presentation (identify meeting, sponsor, location, date): _____

Journal Article (Identify Journal): _____
 Other (Specify): To Be Released for Phase II of HSA

Document will be published in proceedings No Yes
Document will be distributed at meeting No Yes
Document has patent or invention significance No Yes (Identify) _____
Document has been previously released No Yes (Reference) _____

1994 AUG 24 11:51

DIVISION REVIEW AND APPROVAL (Completed By Requesting Division)

TECHNICAL CLASSIFICATION REVIEW (Divisional Classification Representative)
Title(s): VNC Abstract: NA
DOCUMENT Level VNC Category NA
[Signature] 8/22/94
Signature Date

DOCUMENT REQUEST APPROVED (Division of Department)

Signature Date

Signature Date

THE REMAINDER OF THIS FORM TO BE COMPLETED BY THE TECHNICAL INFORMATION OFFICE

DISTRIBUTION

Internal Distribution
 External Distribution
TID-4500 Category _____ or _____ Copies to OSTI
ANNOUNCED IN: ERA Atomindex (Available from NTIS)
M-3679 Category: _____
ANNOUNCE IN: AWDR (Available from OSTI) ANCR

Distribution: UCN-7721B DOE F-1332.15 Document
Y-12 Central Files Y-12 RC Y-12 RC Y-12 RC
TIO File _____
L.L. McCauley _____
S.W. Wiley _____
T.R. Butz _____

Distribution Remarks: cleared for public release
(Chem 2/26)

To Record Copy of This Document Is In The DRC

APPROVAL AND RELEASE

Date Received _____ Date Initiated 8-24-94
 CLASSIFICATIONS:
Title(s): Unclassified Abstract _____
DOCUMENT:
Level Unclassified Category _____
Weapons Data _____ Sigma _____
Lloyd D. Porter 8/24/94
Y-12 Classification Office Date

Editor _____ Date _____
 Wiley/MLB
Patent Office _____ Date _____
 Other _____ Date _____
 Other _____ Date _____

APPROVED FOR: Declassification Release subject to use of the following admonitory markings and conditions:

Disclaimer Copyright Patent Caution Other

[Signature] 8/25/94
Technical Information Office Date

Conditions/Remarks:

AREA MONITORING

Direct Radiation

Films from the cassettes in Buildings 9212, 9206, 9995, and 9998 were changed and processed routinely on a monthly basis. The developed film gave no indication of any significant radiation.

Air Analyses

Routine air analyses were continued in all areas handling uranium, mercury, or beryllium. Samples of other contaminants were taken whenever the need appeared. Table F-5 gives a breakdown of all air analyses results. Figure F-5 shows the levels of uranium air concentrations from general air samples taken in six areas in Building 9212. Figure F-6 shows the levels of uranium air concentrations from general air samples taken in one area of Building 9206 and also the levels of mercury air concentrations, as determined by recording general air samples, in two areas of Building 9204-4.

TABLE F-5
AIR CONTAMINATION RESULTS

Contaminant	MPL	Type of Sample	Location	This Quarter*		Last Quarter**	
				No. of Samples	% of Results > MPL	No. of Samples	% of Results > MPL
Normal Uranium	50 $\mu\text{g}/\text{M}^3$	General Air	9212	2,160	7	1,696	18
Normal Uranium	50 $\mu\text{g}/\text{M}^3$	Operational	9212	370	90	36	28
Normal Uranium	50 $\mu\text{g}/\text{M}^3$	Operational	9206	40	40	42	40
All Alpha Emitters	7 d/m/M ³	Outdoors	Y-12	80	0	61	0
Enriched Uranium	0.5 $\mu\text{g}/\text{M}^3$	General Air	9212	3,300	2	3,710	3
Enriched Uranium	0.5 $\mu\text{g}/\text{M}^3$	Operational	9212	285	35	273	33
Enriched Uranium	0.5 $\mu\text{g}/\text{M}^3$	General Air	9206	1,675	18	847	13
Enriched Uranium	0.5 $\mu\text{g}/\text{M}^3$	Operational	9206	75	30	114	25
Enriched Uranium	0.5 $\mu\text{g}/\text{M}^3$	General Air	9995	0	0	137	0
Mercury	0.1 mg/M ³	Spot, General Air	9201-2	2,775	40	1,323	72
Mercury	0.1 mg/M ³	Continuous Reading General Air	9201-2	0	0	40	65
Mercury	0.1 mg/M ³	Spot, General Air	9201-5	14,985	45	5,027	51
Mercury	0.1 mg/M ³	Continuous Reading General Air	9201-5	785	50	421	77
Mercury	0.1 mg/M ³	Spot, General Air	9202	0	0	54	0
Mercury	0.1 mg/M ³	Spot, General Air	9204-4	2,200	8	976	5
Mercury	0.1 mg/M ³	Continuous Reading General Air	9204-4	700	37	803	26
Mercury	0.1 mg/M ³	Spot, General Air	Y-12, Other Areas	0	0	40	2
Beryllium	2 $\mu\text{g}/\text{M}^3$	General Air	9766	189	0	133	0
Plutonium	9 d/m/M ³	General Air	9205	60	< 1	167	0
Lithium	35 $\mu\text{g}/\text{M}^3$ ***	Operational	9204-2	135	29	97	28
Trichloroethylene	200 ppm	Operational	9204-4	0	0	29	3
Ozone	0.1 ppm	Operational	9212, 9998, 9709	18	30	5	40
Fluoride	-----	Operational	Stack	0	0	22	--
Fluoride	2.5 mg/M ³	Operational	Outdoors	0	0	12	0
Ammonia	100 ppm	Operational	9206	0	0	0	0
Cadmium	0.1 mg/M ³	Operational	9212	0	0	16	50
Cyanide	5 mg/M ³	Operational	9212	0	0	2	0

*Estimated values for 4th Quarter fiscal year 1955.

** Corrected values for 3rd Quarter fiscal year 1955.

*** This limit is based on irritation level.

GENERAL AIR CONCENTRATIONS

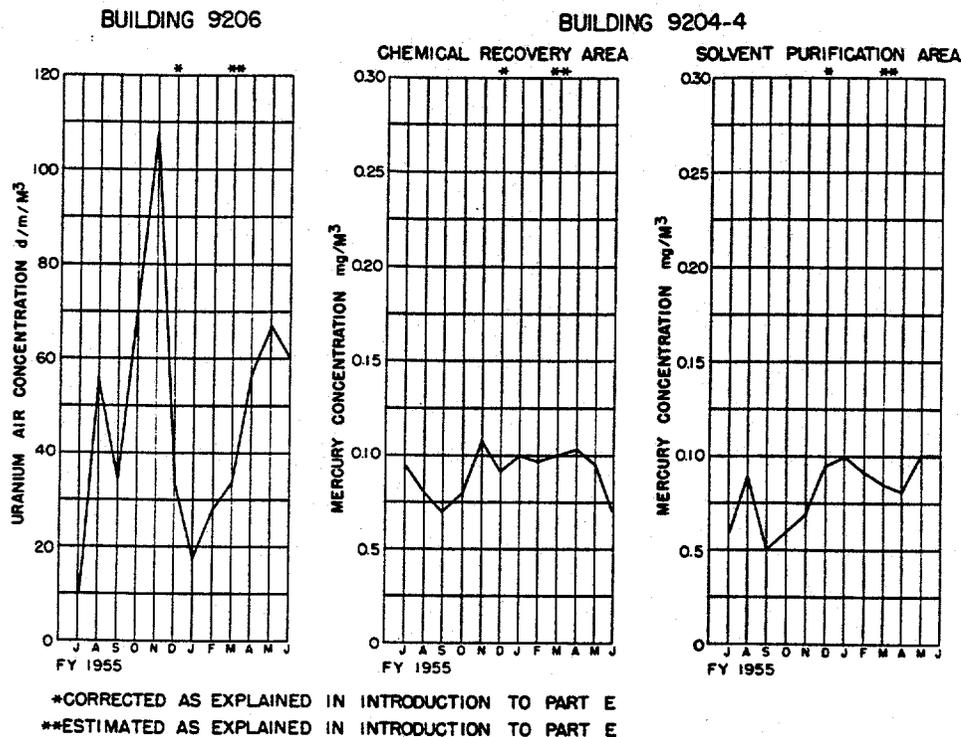


FIGURE F-6

A mercury vapor generator apparatus for the calibration of portable GE vapor detectors has been put into routine operation in Building 9201-4.

Problems arising from the operation of the Alpha-5 plant necessitated an increase in the level of monitoring services provided by the Health Physics Department which, in turn, resulted in a temporary curtailment of other phases of the health physics program.

CONTAMINATION CONTROL

Surveying of plant areas for removable surface contamination was continued during this quarter. Table F-6 shows the number and classification of areas monitored, the number of smears taken, and the average count per smear. Results of these surveys indicate that, during the quarter, contamination control methods within the White areas were very effective. The levels of contamination in the Red and Yellow areas, though not as favorable as that for the previous quarter, remained well within the prescribed control limits.

TABLE F-6
SURVEY OF CONTAMINATED LOCATIONS

Area Classification	Total Number of Location		Total Number of Smears		Average Activity per Smear	
	This Qt.*	Last Qt.**	This Qt.*	Last Qt.**	This Qt.*	Last Qt.**
Red	1	2	217	200	198	35
Yellow	35	36	5,466	5,745	456	386
White	5	4	264	530	5	3

* Estimated as explained in Introduction to Part F.
 ** Corrected as explained in Introduction to Part F.

Surveying of equipment and materials shipped from the Y-12 area was continued throughout this report period. This includes all items leaving the area by way of Shipping and Receiving, Uranium Control, and Salvage Departments.

The equipment necessary for the monitoring of incoming deuterium gas for tritium contamination is now being assembled. One sample of this gas has been analyzed using equipment at the Oak Ridge National Laboratory and the tritium concentration was found to be well within the acceptable limits.

Water samples from the East Fork of Poplar Creek were taken daily at random times and composited into weekly samples for analysis for gross alpha and beta-gamma activity, and for mercury concentration. The average results of the analyses are shown in Table F-7.

TABLE F-7
ANALYSIS OF POPLAR CREEK WATER

Contaminant	Average Analysis	
	This Quarter *	Last Quarter **
Alpha Activity	300 d/m/liter	255 d/m/liter
Beta Activity	5,000 d/m/liter	15,050 d/m/liter
Mercury	1.75 mg/liter	0.61 mg/liter

* Estimated as explained in Introduction to Part F.
** Corrected as explained in Introduction to Part F.

Installation of the water gaging station on the East Fork of Poplar Creek has been completed and is now in routine operation. It is anticipated that the automatic continuous water sampler will be installed during the coming quarter.

RADIATION CONTROL

GENERAL ACTIVITIES

Routine Plant Operations

Operations in the uranium production facilities have been performed without the occurrence of a nuclear hazard. Routine investigations have been maintained by special hazards engineers to assist in the prevention of such an incident.

Nuclear Emergency Planning

The committee formed to plan the combating of a nuclear accident has met several times during the past period. Various phases of this problem have been considered and specific assignments have been made in order to modernize plant emergency techniques and facilities.

PLANT INVESTIGATIONS

The nuclear safety of this area has been improved considerably during recent weeks through a concentrated effort to dispose of accumulated salvage. Since the backlog of this material has been significantly decreased the associated nuclear hazards have accordingly diminished.

The first dilution tube which is to serve as a model for the other tubes in the series has been fabricated and tested. The design of the venturi throat seems to give satisfactory mixing of the aerosol with the dilution air regardless of how the aerosol is introduced upstream to the throat. Considerable difficulty was encountered in the filter system used on this tube. The pressure drop across the filters was so great that the desired flow rate could not be obtained with the pumping system available. A new filter system having many times the surface area of the old filter system has been designed and placed in the shops for fabrication. This should reduce the pressure drop across the filter and allow the desired flow rates of 121 cfm to be obtained. A pumping system is to be installed that is capable of handling any pressure drop that might be developed by the new filter system.

Indium Foil Badges

Unmoderated Bursts — Calculations were completed for the Godiva experiment made outside the reactor building. The best curve that could be drawn through the points of dose vs badge activity was a straight line for each badge position of the 2, 3, and 4-meter phantoms. The badge activities of the 1-meter phantom were exceedingly low and did not relate well to those of the other phantoms so that this result is not well established.

The thermal component of a fast neutron burst contributes little to the dose yet causes most of the direct badge activity. To off-set the importance of this unwanted activity the back badge reading was assumed to be a measure of the direct activation at the front badge position and was subtracted from the front badge reading. When the resultant "net badge activity" was plotted against dose it was found that the curve was essentially a straight line passing through the origin. Since points taken both inside and outside the reactor building fell within their limits of error of the same straight line the line was apparently insensitive to the number of room-scattered thermal neutrons, and since it passes inappreciably far from the origin it is apparently independent of burst intensity. Under the conditions of this experiment this net badge activity proved to be the best measure of dose because of its independence from the room scattering effect, and was sufficiently well determined to establish the LD-50 dose for a burst of 10^{17} fissions.

Moderated Bursts — The above conclusions apply only to metal bursts in air. While they can reasonably be applied to situations approaching this they do not necessarily hold for moderated bursts. To extend the calibration additional tests are being run at the ORNL TSF using a GE shielded reactor. Calculations of the initial experiments are in progress.

Y-12 Creek Monitor-sampler

Dye experiments at the creek to determine the mixing characteristics of the stream indicated that effluent from the nearest upstream main was satisfactorily mixed with the stream at the still pool just above the weir.

Data from the water level recorder at the weir was analyzed. A maximum head of 2.47 feet, equivalent to 71.15 cfs by an Engineering Department tentative calibration, was recorded in the March and April period. This flow was too large for any commercially available sampler, but the Lakeside Engineering Corporation has stated that they could build a sampler of proper capacity.

A memorandum including recommendations for purchase and installation of a dipper-type sampler has been forwarded by the Health Physics Department for completion of the project.

Efficiency of Plating Uranium from Urine Samples

Introduction — A statistical analysis has been made to determine whether any relationship exists between the efficiency of plating uranium from a given urine sample and the urine excretion rate as indicated by the individual submitting the sample. Such a correlation might be expected since the weight of solid matter (primarily calcium), which adversely affects the plating efficiency, is excreted at a constant time rate whereas the volume excreted depends on the fluid intake of the individual. The plating efficiency would therefore be expected to increase with the excretion rate.

mlb 8/25/94

OAK RIDGE Y-12 PLANT INFORMATION CONTROL FORM

DOC JT DESCRIPTION (Completed By Requesting Division)

Document No. Y-1012/EXTRACT Author's Telephone No. 6-0263 Acct. No. 23366-0002 Date of Request 8/23/94

Unclassified Title: Selected Pages From Y-12 PLANT QUARTERLY REPORT SECOND FISCAL QUARTER, 1956 (OCTOBER 1-DECEMBER 31, 1955)

Author(s) Requested by Steve Wiley (PASF-1/14; G-22/23) M-36

TYPE: Formal Report Informal Report Progress/Status Report Co-Op Report Thesis/Term Paper
 Oral Presentation (identify meeting, sponsor, location, date):

Journal Article (Identify Journal):
 Other (Specify): To Be Released for Phase II of HSA

Document will be published in proceedings No Yes
Document will be distributed at meeting No Yes
Document has patent or invention significance No Yes (Identify)
Document has been previously released No Yes (Reference)

DIVISION REVIEW AND APPROVAL (Completed By Requesting Division)

TECHNICAL CLASSIFICATION REVIEW (Divisional Classification Representative)
Title(s): KNC Abstract: NA
DOCUMENT: Level KNC Category NA
Steve Wiley 8/23/94
Signature Date

DOCUMENT REQUEST APPROVED (Division or Department)

Signature Date

Signature Date

THE REMAINDER OF THIS FORM TO BE COMPLETED BY THE TECHNICAL INFORMATION OFFICE DISTRIBUTION

Internal Distribution
 External Distribution
TID-4500 Category _____ or _____ Copies to OSTI
ANNOUNCED IN: ERA Atomindex (Available from NTIS)
M-3679 Category _____
ANNOUNCE IN: AWDR (Available from OSTI) ANCR

Distribution:	UCN-7721B	DOE F-1332.15	Document
Y-12 Central Files	Y-12 RC	Y-12 RC	Y-12 RC
TIO File			
<u>L.L. McCauley</u>			
<u>S.W. Wiley</u>			
<u>T.R. Butz</u>			

Distribution Remarks: cleared for Public Release (Chambers)

To Record Copy of This Document Is In The DRC

APPROVAL AND RELEASE

Date Received _____ Date Initiated 8-24-94
 CLASSIFICATIONS:
Title(s): Unclassified Abstract -
DOCUMENT: Level Unclassified Category -
Weapons Data _____ Sigma _____
Lloyd S. Porter 8/23/94
Y-12 Classification Office Date

Editor _____ Date _____
 Waived per Patent office/mus
Patent Office _____ Date _____
 Other _____ Date _____
 Other _____ Date _____

APPROVED FOR: Declassification Release subject to use of the following admonitory markings and conditions:

Disclaimer Copyright Patent Caution Other

m-j. [Signature] 8/23/94
Technical Information Office Date

Conditions/Remarks:

TABLE F-4
AIR CONTAMINATION RESULTS

Contaminant	MPL	Type of Sample	Location	This Quarter*		Last Quarter**	
				No. of Samples	% of Results > MPL	No. of Samples	% of Results > MPL
Normal Uranium	50 $\mu\text{g}/\text{M}^3$	General Air	9212	1,940	5	1,772	14
Normal Uranium	50 $\mu\text{g}/\text{M}^3$	Operational	9212	175	82	136	87
Normal Uranium	50 $\mu\text{g}/\text{M}^3$	Operational	9206	55	35	25	12
Normal Uranium	50 $\mu\text{g}/\text{M}^3$	Operational	9211	30	80	24	92
All Alpha Emitters	7 d/m/M ³	Outdoors	Y-12	215	11	54	0
Enriched Uranium	0.5 $\mu\text{g}/\text{M}^3$	General Air	9212	4,300	6	6,913	4
Enriched Uranium	0.5 $\mu\text{g}/\text{M}^3$	Operational	9212	255	47	92	64
Enriched Uranium	0.5 $\mu\text{g}/\text{M}^3$	General Air	9206	1,450	7	2,666	3
Enriched Uranium	0.5 $\mu\text{g}/\text{M}^3$	Operational	9206	220	34	174	30
Enriched Uranium	0.5 $\mu\text{g}/\text{M}^3$	General Air	9995	130	0	78	0
Enriched Uranium	0.5 $\mu\text{g}/\text{M}^3$	Operational	9995	15	0	3	0
Plutonium	6.3×10^{-5} $\mu\text{g}/\text{M}^3$	General Air	9995	130	0	78	0
Plutonium	6.3×10^{-5} $\mu\text{g}/\text{M}^3$	Operational	9995	0	--	14	7
Mercury	0.1 mg/M ³	Spot, General Air	9201-2	2,930	44	2,553	22
Mercury	0.1 mg/M ³	Spot, General Air	9201-4	17,950	74	16,212	76
Mercury	0.1 mg/M ³	Spot, General Air	9201-5	25,900	74	13,458	85
Mercury	0.1 mg/M ³	Continuous Reading General Air	9201-5	175	48	211	74
Mercury	0.1 mg/M ³	Spot, General Air	9204-4	3,200	11	1,031	3
Mercury	0.1 mg/M ³	Continuous Reading General Air	9204-4	735	18	271	35
Mercury	0.1 mg/M ³	Spot, General Air	Y-12, Other Areas	1,000	26	2,282	24
Beryllium	2 $\mu\text{g}/\text{M}^3$	General Air	9766	125	0	144	0
Beryllium	2 $\mu\text{g}/\text{M}^3$	Breathing Zone	9766	10	0	4	0
Beryllium	2 $\mu\text{g}/\text{M}^3$	Operational	9212	0	--	3	0
Lithium	35 $\mu\text{g}/\text{M}^3$ †	Stack	Alloy Areas	50	0	24	0
Lithium	35 $\mu\text{g}/\text{M}^3$ †	Outdoors	Y-12	3	0	12	0
Ozone	0.1 ppm	Operational	Y-12	30	18	74	23
Ozone	0.1 ppm	Breathing Zone	Y-12	25	15	0	--
Oxides of Nitrogen	25 ppm	Breathing Zone	Y-12	30	0	65	0
Cyanide	5 mg/M ³	General Air	9212	15	0	11	0
Cyanide	5 mg/M ³	Breathing Zone	9212	15	0	0	--
Cadmium	0.1 mg/M ³	Breathing Zone	9212	15	4	8	12
Yttrium	100 $\mu\text{g}/\text{M}^3$ ††	Breathing Zone	9204-2	15	0	0	--
Rhodium	100 $\mu\text{g}/\text{M}^3$ ††	Breathing Zone	9204-2	10	0	0	--
Thallium	100 $\mu\text{g}/\text{M}^3$ ††	Breathing Zone	9204-2	15	0	0	--
Scandium	0.10 mg/M ³	Breathing Zone	9204-2	10	0	0	--
Arsenic	0.10 mg/M ³	Breathing Zone	9204-2	10	0	0	--

*Estimated values.

**Corrected values.

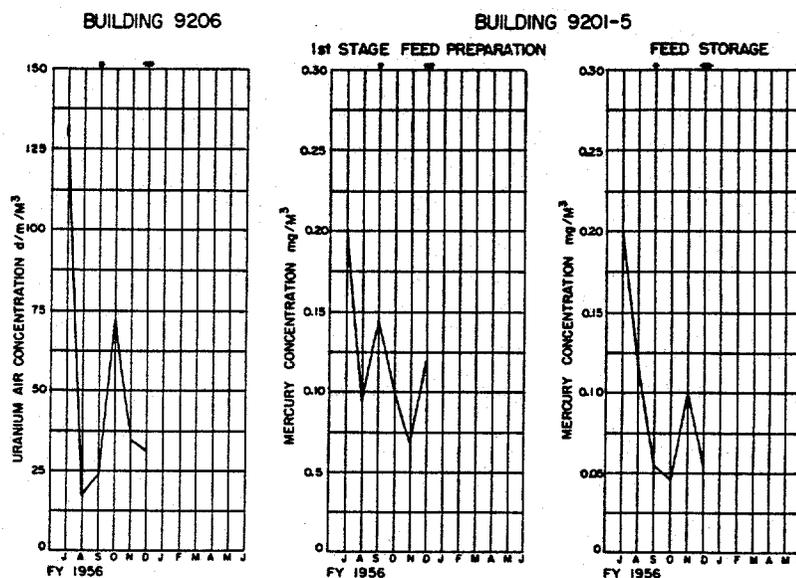
† This limit is based on the irritation level.

†† Arbitrary reporting limit.

Potable Water Analyses

The method of checking potable water in Y-12 was changed slightly during this quarter. Formerly, the ortho-tolidine test was made using a color comparator in the field. The test now made is the ortho-tolidine-arsenite test, using the same equipment as before. This modification in the test prevents certain interfering substances such as nitrites, ferric compounds and manganese compounds from causing the characteristic color to develop and thus being misinterpreted as chlorine.

GENERAL AIR CONCENTRATIONS



* CORRECTED AS EXPLAINED IN INTRODUCTION TO PART F
 ** ESTIMATED AS EXPLAINED IN INTRODUCTION TO PART F

FIGURE F-6

CONTAMINATION CONTROL

Area Monitoring

Except for Alloy areas, a Plant-wide survey was made for removable surface contamination. Table F-5 shows the number and classification of areas monitored, the number of smears taken, and the average count per smear. Data for the preceding quarter is included for comparison. Results of this survey indicate that contamination control methods in the Red and White areas were quite effective. The levels of contamination in the Yellow areas, though not as favorable as that for the previous quarter, remain within the prescribed control limits.

TABLE F-5

SURVEY OF CONTAMINATED LOCATIONS

Area Classifications	Total Number of Locations		Total Number of Smears		Average Activity per Smear	
	This Qt. *	Last Qt. **	This Qt. *	Last Qt. **	This Qt. *	Last Qt. **
Red	1	1	175	180	40	41
Yellow	42	36	10,663†	6,260	468	376
White	68	2	10,468†	190	3	6

* Estimated as explained in the introduction to Part F.

** Corrected as explained in the introduction to Part F.

† This figure is larger than usual due to the special survey program conducted during October.

Surveying of equipment and materials shipped from the Y-12 area was continued throughout this report period. This includes all items leaving the area by way of the Shipping and Receiving, Uranium Control, and Salvage Departments.

Tritium Analysis

A procedure for the analysis of tritium in both gas and liquid samples has been patterned after a method developed at Los Alamos. The equipment has been standardized with both the Savannah River Project and Los Alamos Laboratories through the use of a calibrated tritium standard solution. Routine analyses are now being performed on all shipments of incoming gas and outgoing heavy water.

Surface Water Sampling

Water samples from the East Fork of Poplar Creek were taken daily at random times and composited into weekly samples for analysis of gross alpha and beta-gamma activity and for mercury concentration. The average results of the analyses are shown in Table F-6. A similar sampling program was initiated this quarter for both the new burial pit west of the Plant and Bear Creek which drains this area. Samples from Bear Creek are being taken weekly while those from the burial area are taken whenever sufficient water has collected within the pit. The average results of the analyses obtained to date are also shown in Table F-6.

TABLE F-6
ANALYSIS OF SURFACE WATER CONTAMINATION

Location	Average Analysis					
	This Quarter*			Last Quarter**		
	Alpha Activity d/m/l	Beta Activity d/m/l	Mercury Concentration mg/l	Alpha Activity d/m/l	Beta Activity d/m/l	Mercury Concentration mg/l
Poplar Creek	300	2,000	0.75	416	1,714	1.26
Bear Creek	25	140	----	34	167	----
Burial Pit	100,000	500,000	----	----	-----	----

*Estimated as explained in the introduction to Part F.

**Corrected as explained in the introduction to Part F.

RADIATION CONTROLGENERAL ACTIVITIES

Routine operations in the uranium production facilities have been performed without the occurrence of a reportable nuclear hazard. Efficiency of operations, procedural changes, extended use of safe processing equipment, and less dependence on analytical results for batch control have contributed to safer handling of uranium in the production areas. However, the increase of receipts of various assay salvage materials from other uranium processing installations has presented numerous minor problems.

radiation hazards engineers have given special consideration to the various salvage operations.

Revisions to the evacuation procedures, relocation of survey instruments, and plans for the installation of fission threshold detectors are activities which have been accomplished toward meeting the recommendation of the Nuclear Emergency Committee in their re-evaluation of the Plant emergency procedures.

PLANT INVESTIGATIONS

The following activities were engaged in during the quarter:

1. Bird-cage shipping regulations were reviewed for the shipment of oralloy plates and pellets. These limits were made uniform in line with uranium button shipments.

DOCUMENT DESCRIPTION (Completed By Requesting Division)

Document No. Y-1015/EXTRACT Author's Telephone No. 6-0263 Acct. No. 23366-0002 Date of Request 8/19/94

Unclassified Title: Selected Pages From Y-12 Plant Quarterly Report, FIRST FISCAL QUARTER, 1957 (JULY 1-SEPTEMBER 30, 1956) (PGS F-1/F.

Requested by Steve Wiley 6-6; 6-37) M-19

TYPE: Formal Report Informal Report Progress/Status Report Co-Op Report Thesis/Term Paper

Oral Presentation (identify meeting, sponsor, location, date): _____

Journal Article (Identify Journal): _____

Other (Specify): To Be Released for Phase II of HSA

Document will be published in proceedings No Yes

Document will be distributed at meeting No Yes

Document has patent or invention significance No Yes (Identify) _____

Document has been previously released No Yes (Reference) _____

DIVISION REVIEW AND APPROVAL (Completed By Requesting Division)

TECHNICAL CLASSIFICATION REVIEW (Divisional Classification Representative)

Title(s): UNC Abstract: NA

DOCUMENT: Level UNC Category NA

Signature [Signature] Date 8/19/94

DOCUMENT REQUEST APPROVED (Division or Department)

Signature _____ Date _____

Signature _____ Date _____

THE REMAINDER OF THIS FORM TO BE COMPLETED BY THE TECHNICAL INFORMATION OFFICE

DISTRIBUTION

Internal Distribution

External Distribution

TID-4500 Category _____ or _____ Copies to OSTI

ANNOUNCED IN: ERA Atomindex (Available from NTIS)

M-3679 Category _____

ANNOUNCE IN: AWDR (Available from OSTI) ANCR

Distribution: UCN-7721B DOE F-1332.15 Document

Y-12 Central Files Y-12 RC Y-12 RC Y-12 RC

TIO File _____

L.L. McCauley _____

S.W. Wiley _____

T.R. Butz _____

Distribution Remarks: Classified for Public Release (ChamRisk)

To Record Copy of This Document Is In The DRC

APPROVAL AND RELEASE

Date Received _____ Date Initiated 8-22-94

CLASSIFICATIONS:

Title(s): Unclassified Abstract -

DOCUMENT: Level Unclassified Category -

Weapons Data _____ Signs _____

Signature Lloyd B Porter Date 8/22/94
Y-12 Classification Office

Editor _____ Date _____

Waived by Request Council / me
Patent Office _____ Date _____

Other _____ Date _____

Other _____ Date _____

APPROVED FOR: Declassification Release subject to use of the following admonitory markings and conditions:

Disclaimer Copyright Patent Caution Other

Signature [Signature] Date 8/23/94
Technical Information Office

Conditions/Remarks: _____

199A AUG 22 PM 2:42

Air Analyses

Routine environmental air analyses for the various contaminants found in Plant operating areas were continued. A breakdown of these analyses is given in table F-4. In addition to these, samples were taken covering stack effluents, source samples, smear data, etc. The number of samples taken under the various categories is given in table F-5.

Table F-4

ROUTINE ENVIRONMENTAL AIR ANALYSES

Contaminant	MAC	This Quarter		Last Quarter	
		No. of Samples	Percent Above MAC	No. of Samples	Percent Above MAC
Benzene	35 ppm	18	0	4	0
Beryllium	2 $\mu\text{g}/\text{m}^3$	182	2	233	0
Cadmium	100 $\mu\text{g}/\text{m}^3$	20	10	0	
Carbon Monoxide	100 ppm	0		6	0
Chlorine	1 ppm	0		51	14
Chromium	0.10 mg/m^3	4	0	0	
Dust (no free silica)	50 mppcf	0		24	0
Hydrogen Cyanide	10 ppm	34	0	51	0
Lead	0.15 mg/m^3	6	0	0	
Magnesium	15 mg/m^3	150	0	0	
Mercury	0.10 mg/m^3	86,126	18	87,942	19
Nitrogen Dioxide	5 ppm	33	0	4	0
Perchloroethylene	200 ppm	28	3	37	4
Thallium*	100 $\mu\text{g}/\text{m}^3$	246	0	0	
Trichloroethylene	200 ppm	14	0	194	40

*Arbitrary reporting limit.

Table F-5

MISCELLANEOUS AIR AND SMEAR SAMPLES

Contaminant	Type Sample	Number of Samples	
		This Quarter	Last Quarter
Beryllium	Smear	59	63
Lithium	Demister	41	60
Lithium	Dust	58	0
Lithium	Atmospheric	23	0
Mercury	Clean Laundry	306	509
Mercury	Wind Tunnels	334	800
Mercury	Miscellaneous	39	0
Sodium	Atmospheric	23	0
Potassium	Atmospheric	23	0

To: Jennifer Cockroft
MHES

Fax: 510-521-1547
From: Susan Fleck

Pb II

4-7-97

pages: 1

The Pb graph I saw looked just like these, but I don't have it in any of the pages I copied.

July-Sept 1956:

1st time Pb in Routine Air Analysis Table

Removed by Jim Jenkins (see)

Boxes:

- 12-10-18 Pb-58
- 18-4-10 mine
- 20-9-15 Pb air 52-55
- 12-1-57 air folder
- 15-2-8 Pb mid 60s
- 14-3-8 Pb Cl powder 1958-59
- 18-4-11 Pb air
- 28-7-21 1958-59
- 28-6-5 HAN
- mid 70s

STP report (monthly)

Jan-Mar 1958:

Pb Urinalysis program started...

Apr-June 1958:

1st Pb urinalysis results

(O.R. Processing Co. smelted Hg-contaminated scrap metal)

Oct-Dec 1959:

1st time Pb appears in Routine Air table

Jan-Mar 1963: Last one I have cause Hg Pb in urine and Pb in misc. air (stopped)

Most useful info
is monthly EFPC
Hg concs. - also
contains descriptive
info. on ventⁿ lⁿ changes

Tech Div Montⁿies
1955-1958

MERCURY PROCESSES AND ENVIRONMENTAL SAMPLING TIMELINE

Hg File Extracts (monthly 1955): Technical Div. Monthly Progress

M No.	Date	% over 0.1 mg/m ³				avg EFPC (mg/L)	
		A2	B4	A5	A4		
	(12-5 4)	73	18	--		0.14	avg. of 3 mo.
M-1	1-55	65	19	88		0.15	
2	2-55	86	28	64	17	0.59	v. 0.61 (0.74)
3	3-55	66	34	87	(80)	1.09	
4	4-55	52	36	52		1.48	
5	5-55	25	37	50	--	1.98	v. 1.81 (1.75)
6	6-55	20	29	51	42	1.93	
7	7-55	29	35	74	87	1.06	
8	8-55	15	32	60	82	0.82	v. 1.26 hi
9	9-55	37	22	56	86	1.3 (read off graph)	(1.06) o.k.
10	10-55	43	16	48	76	0.64	
11	11-55	45	18	48	73	0.77	v. 0.75 hi
12	12-55	21	34	23	80	0.67	(0.70) o.k.
13	1-56	26	28	17	62	0.3 (graph)	v. 0.37

Jan 1955- Hg air monitoring on a routine basis was begun in alpha 5. Building 9202 was being renovated.

Apr 1955- The Y-12 Creek Level Monitor shows min and max discharges of 16 and 71 cfs.

May 1955- Hg concentrations are above 0.1 mg/m³ in the absorber, cascade, feed preparation and feed storage areas. There is also Hg contamination in the pump and equipment cleaning areas.

June 1955- Hg air sampling was extended to the alpha 4 plant.

July 1955- Additional roof ventilators are being installed on alpha 5 absorber roofs. The flow of the roof ventilators in the cascade areas will be reversed to discharge outside air down into the cascade areas.

Aug 1955- Downdraft ventilations will be added to the area where Moyno pumps are assembled and disassembled on tables in alpha 5.

Sept 1955- Trace amounts of Hg are being introduced into Poplar Creek even though the building waste water passes into a settling basin.

Dec 1955- In addition to the Hg which is lost in the floor drain water, rather large amounts of Hg are tied up in filter cakes and other sludges... The largest amount of Hg is probably represented by the cake from the plate and frame filters which filter the backwash from the anthracite filters in the evaporator circuit.

↑

^{5?}
? In 1956, 280,000 air samples were taken.

Jan 1956- Alpha 5 is being deconded to reduce Hg contamination. Control of the floor [Hg contamination as fine droplets] will go a long way toward control of the whole problem.

*Engng
was started for* Preliminary stripping of 9202 will begin and process flow sheets for the New Colex Pilot Plant. An increased number of air changes will result from the ventilation system redesign now underway, with air changes up to 10 per hour in the absorber areas of alpha 4.

II. Operations

(a) Laboratory

Three hundred and eight routine urine samples were analyzed for mercury content during the second quarter of FY 1955, the average of which was 0.14 mg/l. Ten per cent of these exceeded the Maximum Permissible Limit of 0.3 mg/l. Nine special mercury urine samples were received from the Medical Department and have been analyzed.

The contamination level was too high in the laboratory to analyze the urine samples for participants in the enriched uranium urine program. Early results of the vacuum evaporation method were encouraging, but intervals of time were experienced in which the contamination was above the desired level. Blank urine samples evaporated by the conventional manner averaged 10.6 c/hr, whereas those done by the vacuum evaporation averaged 4.8 c/hr. The Analytical Development Department personnel are investigating the problem along similar lines. In the meantime, a work order was issued to Project Engineering for the installation of hoods in the laboratory in the Dispensary, so that the analysis of enriched uranium urine samples can be resumed. It was originally estimated that this work would be completed by February 3, but delays have been encountered and the completion date probably will be about February 15.

(b) Survey and Monitoring

The initial phase of the fluoride sampling program has been completed and the results have been reported to the Industrial Hygienist.

Mercury air monitoring was begun on a routine basis in 9201-5. Eighty-eight per cent of the findings exceeded the Maximum Permissible Limit of 0.1 mg/M³.

The construction of a mercury vapor detector calibration apparatus was started during the month and is nearly completed.

Surveys were made in the part of building 9202 which is being renovated. Recommendations were made to the liaison engineers as to precautions to be taken by construction personnel on the job.

The average activity and mercury concentration in the east fork of Poplar Creek during January, as determined from daily water

samples composited and analyzed weekly was as follows:

Alpha activity	259 d/m/l
Beta activity	23,500 d/m/l
Mercury concentration	0.15 mg/l

Twenty-two man hours overtime were worked to monitor radiographic tests.

A survey was made to determine the uranium removable surface contamination on respirators which had been cleaned. Results of this survey showed that the cleaning process was satisfactory.

No uranium operational and breathing zone samples were taken in the Machining and Foundry areas in building 9212, because of the emphasis put on the fluoride sampling and special air surveys made in the C and C-1 Wing areas.

The following is a tabulation of the percentage of the air and smear results in various areas which exceeded the Maximum Permissible Limits* in December and January.

<u>Area</u>	<u>Type Sample</u>	<u>December</u>	<u>January</u>
9201-2	Mercury, spot general air	61%	67%
9201-2	Mercury, recording general air	73%	65%
9204-4	Mercury, spot general air	4%	< 1%
9204-4	Mercury, recording general air	18%	19%
9201-5	Mercury, spot general air	--	88%
	Uranium, general air	43%	37%
	Uranium, general air	2%	1%
	Uranium, general air	9%	7%
	Uranium, air, operational and BZ**	18%	--
	Uranium smears	31%	57%

-cont'd-

DOC' NT DESCRIPTION (Completed By Requesting Division)

Document No. Y-1102 / EXTRACT Author's Telephone No. 6-0263 Acct. No. 23366-0002 Date of Request 8/15/94

Unclassified Title: Selected Pages From Technical Division Monthly Progress Report For FEBRUARY 1955 (Pgs 88-90) M-2

Author(s) Requested by Steve Wiley 8/15

TYPE: Formal Report Informal Report Progress/Status Report Co-Op Report Thesis/Term Paper

Oral Presentation (identify meeting, sponsor, location, date): _____

Journal Article (Identify Journal): _____

Other (Specify): To Be Released for Phase II of HSA

Document will be published in proceedings No Yes

Document will be distributed at meeting No Yes

Document has patent or invention significance No Yes (Identify) _____

Document has been previously released No Yes (Reference) _____

DIVISION REVIEW AND APPROVAL (Completed By Requesting Division)

<p>TECHNICAL CLASSIFICATION REVIEW (Divisional Classification Representative)</p> <p>Title(s): <u>UNC</u> Abstract: <u>NA</u></p> <p>DOCUMENT: Level <u>UNC</u> Category <u>NA</u></p> <p><u>[Signature]</u> <u>8/15/94</u></p> <p>Signature Date</p>	<p>DOCUMENT REQUEST APPROVED (Division or Department)</p> <p>_____ Signature Date</p> <p>_____ Signature Date</p>
---	---

THE REMAINDER OF THIS FORM TO BE COMPLETED BY THE TECHNICAL INFORMATION OFFICE

DISTRIBUTION

<p><input type="checkbox"/> Internal Distribution</p> <p><input type="checkbox"/> External Distribution</p> <p>TID-4500 Category _____ or _____ Copies to OSTI</p> <p>ANNOUNCED IN: ERA Atomindex (Available from NTIS)</p> <p>M-3679 Category _____</p> <p>ANNOUNCE IN: <input type="checkbox"/> AWDR (Available from OSTI) <input type="checkbox"/> ANCR</p>	<p>Distribution: UCN-7721B DOE F-1332.15 Document</p> <p>Y-12 Central Files Y-12 RC Y-12 RC Y-12 RC</p> <p>TIO File _____</p> <p><u>L.L. McCauley</u> _____</p> <p><u>S.W. Wiley</u> _____</p> <p><u>T.R. Butz</u> _____</p>
--	--

Distribution Remarks: Cleared for Public Release (ChemEch)

The Record Copy of This Document Is In the DRC

APPROVAL AND RELEASE

<p>Date Received _____ Date Initiated <u>8-16-94</u></p> <p><input checked="" type="checkbox"/> CLASSIFICATIONS:</p> <p>Title(s): <u>Unclassified</u> Abstract _____</p> <p>DOCUMENT: Level <u>Unclassified</u> Category _____</p> <p>Weapons Data _____ Sigma _____</p> <p><u>Lloyd B Porter</u> <u>8/16/94</u></p> <p>Y-12 Classification Office Date</p>	<p><input type="checkbox"/> Editor _____ Date _____</p> <p><input checked="" type="checkbox"/> <u>Waived/mcb</u> Patent Office _____ Date _____</p> <p><input type="checkbox"/> Other _____ Date _____</p> <p><input type="checkbox"/> Other _____ Date _____</p>
---	---

APPROVED FOR: Declassification Release subject to use of the following admonitory markings and conditions:

Disclaimer Copyright Patent Caution Other

[Signature] 8/16/94

Technical Information Office Date

Conditions/Remarks: _____

(b) Survey and Monitoring (cont'd)

The mercury vapor detector calibration apparatus was completed and satisfactory test runs were made. The equipment is being used routinely to calibrate the instruments in service in the Alloy production operations.

The average mercury air-borne contamination findings in Alpha-2 and Alpha-5 continue to run considerably above the Maximum Permissible Limit.

A representative number of laundered suits of Dynel protective clothing was checked for radioactive contamination. Eleven percent of the pieces were found to contain detectable amounts of radioactive material.

The average radioactivity and mercury concentrations in the east fork of Poplar Creek for the past two months were as follows:

	<u>January</u>	<u>February</u>
Alpha activity	259 d/m/l	332 d/m/l
Beta activity	23,500 d/m/l	4,250 d/m/l
Mercury concentration	0.15 mg/l	0.59 mg/l

The following is a tabulation of the percentage of the air, smear, and film badge results which exceeded the Maximum Permissible Limits* in January and February:

<u>Area</u>	<u>Type Sample</u>	<u>January</u>	<u>February</u>
Machine Shop, 9212	Film badge	----**	< 1%
Foundry, 9212	Film badge	----**	13%
9206	Film badge	----**	6%
Other Y-12	Film badge	----**	< 1%
9201-2	Mercury, spot general air	67%	86%
9201-2	Mercury, recording general air	65%	---

-cont'd-

~~SECRET~~

(b) Survey and Monitoring (cont'd)

<u>Area</u>	<u>Type Sample</u>	<u>January</u>	<u>February</u>
9204-4	Mercury, spot general air	< 1%	24%
9204-4	Mercury, recording general air	19%	28%
9201-5	Mercury, spot general air	88%	56%
9201-5	Mercury, recording general air	---	64%
	Uranium, general air	37%	36%
	Uranium, general air	1%	0%
	Uranium, air, operational and B.Z.***	---	0%
	Uranium, general air	7%	2%
	Uranium, air, operational and B.Z.***	---	0%
	Uranium, smears	57%	65%
Salvage, 9212	Uranium, general air	1%	< 1%
Salvage, 9212	Uranium, operational and B.Z.***	2%	18%
Salvage, 9212	Uranium, smears	28%	36%
C-Wing, 9212	Uranium, general air	0%	0%
C-Wing, 9212	Uranium, air, operational and B.Z.***	89%	---
C-Wing, 9212	Uranium, smears	44%	69%
E-Wing Reduction and Foundry, 9212	Uranium, general air	8%	3%

~~SECRET~~

-cont'd-

(b) Survey and Monitoring (cont'd)

<u>Area</u>	<u>Type Sample</u>	<u>January</u>	<u>February</u>
E-Wing Reduction and Foundry, 9212	Uranium, air, operational and B.Z.***	40%	57%
E-Wing Reduction and Foundry, 9212	Uranium, smears	56%	77%
Dry Chemistry, 9212	Uranium, general air	11%	4%
Dry Chemistry, 9212	Uranium, air, operational and B.Z.***	0%	---
Dry Chemistry, 9212	Uranium, smears	13%	20%
	Uranium, general air	5%	14%
	Uranium, air, operational and B.Z.***	73%	20%
	Uranium, smears	62%	63%
	Uranium, air, operational and B.Z.***	5%	11%

* Limits Used:

Mercury Air-Maximum Permissible Limit of 0.1 mg/M³.
 Uranium Air-Maximum Permissible Limit of 70 d/m/M³.
 Smear-Arbitrary Reporting Limit of 100 d/m/100cm².
 Film badge exposures for and 9212 - MPL 600 mr/wk.
 Film badge exposures for other Y-12 areas - MPL 300 mr/wk.

** Not broken down last month.

*** Breathing Zone

Listed below is a tabulation of the percentage of the uranium exposures, as determined by urine analyses, in excess of the Maximum Permissible Limit of 43 mrem/day:

MLW 8/18/94

OAK RIDGE Y-12 PLANT INFORMATION CONTROL FORM

DOC' NT DESCRIPTION (Completed By Requesting Division)

Document No. Y-1103 / EXTRACT Author's Telephone No. 6-0263 Acct. No. 23366-0002 Date of Request 8/15/94

Unclassified Title: Selected Pages From Technical Division Monthly Progress Report For MARCH 1955 (PGS 89-95) M-3

Author(s) Requested by Steve Wiley

TYPE: [] Formal Report [] Informal Report [] Progress/Status Report [] Co-Op Report [] Thesis/Term Paper [] Oral Presentation (identify meeting, sponsor, location, date):

[] Journal Article (Identify Journal):

[X] Other (Specify): To Be Released for Phase II of HSA

Document will be published in proceedings [X] No [] Yes

Document will be distributed at meeting [X] No [] Yes

Document has patent or invention significance [X] No [] Yes (Identify)

Document has been previously released [X] No [] Yes (Reference)

DIVISION REVIEW AND APPROVAL (Completed By Requesting Division)

TECHNICAL CLASSIFICATION REVIEW (Divisional Classification Representative) Title(s): VNC Abstract: NA DOCUMENT Level: VNC Category: NA Signature: [Signature] Date: 8/15/94 DOCUMENT REQUEST APPROVED (Division or Department) Signature: Date:

THE REMAINDER OF THIS FORM TO BE COMPLETED BY THE TECHNICAL INFORMATION OFFICE

DISTRIBUTION

Internal Distribution External Distribution TID-4500 Category or Copies to OSTI ANNOUNCED IN: ERA Atomindex (Available from NTIS) M-3679 Category ANNOUNCE IN: [] AWDR (Available from OSTI) [] ANCR Distribution: UCN-7721B DOE F-1332.15 Document Y-12 Central Files Y-12 RC Y-12 RC Y-12 RC TIO File L.L. McCauley S.W. Wiley T.R. Butz

Distribution Remarks: Cleared for Public Release (Whomobile)

The Record Copy of This Document Is In the DRC

APPROVAL AND RELEASE

Date Received Date Initiated 8-16-94 CLASSIFICATIONS: [X] Unclassified Title(s): Unclassified Abstract: - DOCUMENT: Level: Unclassified Category: - Weapons Data Sigma: - Signature: [Signature] Date: 8/16/94 Y-12 Classification Office

[] Editor Date [X] Patent Office Date [] Other Date [] Other Date

APPROVED FOR: [] Declassification [] Release subject to use of the following admonitory markings and conditions: [] Disclaimer [] Copyright [] Patent Caution [] Other

m. d. 802 8/18/94 Technical Information Office Date

Conditions/Remarks:

The Health Physics field forces were reassigned along the lines of area responsibilities rather than functional responsibilities.

The average radioactivity and mercury concentrations in the east fork of Poplar Creek for February and March were as follows:

	<u>February</u>	<u>March</u>
Alpha Activity	332 d/m/l	173 d/m/l
Beta Activity	4,250 d/m/l	17,400 d/m/l
<u>Mercury Concentration</u>	0.59 mg/l	1.09 mg/l

The following is a tabulation of the percentage of the air, smear, and film badge results which exceeded the Maximum Permissible Limits* in February and March:

<u>Area</u>	<u>Type Sample</u>	<u>February</u>	<u>March</u>
Machine Shop, 9212	Film badge	< 1%	< 1%
Foundry, 9212	Film badge	13%	5%
	Film badge	6%	0%
Other, Y-12	Film badge	< 1%	< 1%
9201-2	<u>Mercury</u> , spot general air	86%	66%
9204-4	<u>Mercury</u> , spot general air	24%	5%
9204-4	<u>Mercury</u> , recording general air	28%	34%
9201-5	<u>Mercury</u> , spot general air	56%	56%
9201-5	<u>Mercury</u> , recording general air	64%	87%
	Uranium, general air	36%	19%
	Uranium, air, operational and BZ**	---	48%
	Uranium, smears	---	44%
	Uranium, general air	0%	0%

-cont'd-

(b) Survey and Monitoring (cont'd)

<u>Area</u>	<u>Type Sample</u>	<u>February</u>	<u>March</u>
	Uranium, air, operational and BZ**	0%	---
Uranium, operatio	Uranium, general air	2%	1%
	Uranium, air, operational and BZ**	0%	0%
Uranium, smears	Uranium, smears	65%	42%
Salvage, 9212	Uranium, general air	< 1%	0%
Salvage, 9212	Uranium, air, operational and BZ**	18%	0%
Salvage, 9212	Uranium, smears	36%	30%
C-Wing, 9212	Uranium, general air	0%	2%
C-Wing, 9212	Uranium, air, operational and BZ**	---	0%
C-Wing, 9212	Uranium, smears	69%	48%
E-Wing Reduction and Foundry	Uranium, general air	3%	5%
E-Wing Reduction and Foundry	Uranium, operational and BZ**	57%	30%
E-Wing Reduction and Foundry	Uranium, smears	77%	42%
Dry Chemistry, 9212	Uranium, general air	4%	0%
Dry Chemistry, 9212	Uranium, operational and BZ**	---	29%
Dry Chemistry, 9212	Uranium, smears	20%	8%
as determined by <u>method</u> Permissible Limit of 43	Uranium, general air	---***	22%
<u>January</u>	Uranium, operational and BZ**	---***	17%
2%	Smears	---***	74%
	Uranium, general air	---***	3%

-cont'd-

MO 8/18/94

OAK RIDGE Y-12 PLANT INFORMATION CONTROL FORM

DOC NT DESCRIPTION (Completed By Requesting E n)

Document No. Y-1104 / EXTRACT Author's Telephone No. 6-0263 Acct. No. 23366-0002 Date of Request 8/15/94

Unclassified Title: Selected Pages From Technical Division Monthly Progress Report For APRIL 1955 (Pgs 29; 79-85) M-4

Author(s) Requested by Steve Wiley

TYPE: Formal Report Informal Report Progress/Status Report Co-Op Report Thesis/Term Paper

Oral Presentation (identify meeting, sponsor, location, date): _____

Journal Article (Identify Journal): _____

Other (Specify): To Be Released for Phase II of HSA

Document will be published in proceedings No Yes

Document will be distributed at meeting No Yes

Document has patent or invention significance No Yes (Identify) _____

Document has been previously released No Yes (Reference) _____

DIVISION REVIEW AND APPROVAL (Completed By Requesting Division)

<p>TECHNICAL CLASSIFICATION REVIEW (Divisional Classification Representative)</p> <p>Title(s): <u>VNC</u> Abstract: <u>NA</u></p> <p>DOCUMENT Level: <u>VNC</u> Category: <u>NA</u></p> <p><u>Steve Wiley</u> Signature <u>8/15/94</u> Date</p>	<p>DOCUMENT REQUEST APPROVED (Division or Department)</p> <p>_____ Signature _____ Date _____</p> <p>_____ Signature _____ Date _____</p>
---	---

THE REMAINDER OF THIS FORM TO BE COMPLETED BY THE TECHNICAL INFORMATION OFFICE

DISTRIBUTION

<p><input type="checkbox"/> Internal Distribution</p> <p><input type="checkbox"/> External Distribution</p> <p>TID-4500 Category _____ or _____ Copies to OSTI</p> <p>ANNOUNCED IN: ERA Atomindex (Available from NTIS)</p> <p>M-3679 Category _____</p> <p>ANNOUNCE IN: <input type="checkbox"/> AWDR (Available from OSTI) <input type="checkbox"/> ANCR</p>	<p>Distribution: UCN-7721B DOE F-1332.15 Document</p> <p>Y-12 Central Files Y-12 RC Y-12 RC Y-12 RC</p> <p>TIO File _____</p> <p><u>L.L. McCauley</u> _____</p> <p><u>S.W. Wiley</u> _____</p> <p><u>T.R. Butz</u> _____</p>
--	--

Distribution Remarks: Cleared for Public Release (Chambliss)

The Record Copy of This Document Is In the DRC

APPROVAL AND RELEASE

<p>Date Received _____ Date Initiated <u>8-16-94</u></p> <p><input checked="" type="checkbox"/> CLASSIFICATIONS:</p> <p>Title(s): <u>Unclassified</u> Abstract <u>-</u></p> <p>DOCUMENT: Level <u>Unclassified</u> Category <u>-</u></p> <p>Weapons Data _____ Signs _____</p> <p><u>Lloyd G. Porter</u> <u>8/16/94</u> Y-12 Classification Office Date</p>	<p><input type="checkbox"/> Editor _____ Date _____</p> <p><input checked="" type="checkbox"/> <u>Waived/MSB per telcon w/ Patent Comm</u> Patent Office _____ Date _____</p> <p><input type="checkbox"/> Other _____ Date _____</p> <p><input type="checkbox"/> Other _____ Date _____</p>
---	---

APPROVED FOR: Declassification Release subject to use of the following admonitory markings and conditions:

Disclaimer Copyright Patent Caution Other

Technical Information Office 8/18/94 Date

Conditions/Remarks:

of plated standards and from certain uranium parts on which rigorous gamma attenuation measurements had been made. The instrument, a calibration chart, and operating instructions were turned over to the Nondestructive Testing Laboratory on April 5, 1955. Project reports will be written on the cadmium plating measurement problems.

Effect of Copper Flash

A request was made to check the effect of excess copper flash on the measuring system. The addition of 1 and 2 mils of copper produced larger apparent cadmium thicknesses. Probably copper thicknesses greater than .5 mil would cause readily detectable errors in the eddy current method.

HEALTH PHYSICS

Uranium in Urine Analysis

Results from the extraction of spiked urine solutions with a TBP-Varsol mixture indicated that the stainless steel dishes used for evaporation gave much higher recoveries than the one mil platinum planchets. This was attributed to leakage caused by tearing of the platinum during the shaping of the very thin platinum foil.

Because of the creeping tendency of the TBP-Varsol mixture, a mixture of 75% TBP - 25% CCl_4 was tried as an extracting agent for uranium both in the presence and absence of aluminum nitrate (used as a salting-out agent for the aqueous phase). No results were obtained for spiked urine samples containing the aluminum salt because of emulsification. Results obtained from spiked urine without aluminum nitrate were (as % recovery): 54.3, 59.7, 61.8, 58.0, 56.1, 53.1. These results were obtained using a single extraction of 20 ml of urine. Los Alamos reports about 85% recovery for a triple extraction, which is comparable to these results.

Y-12 Creek Monitor - Sampler

The creek level recorder and the weir structure were completed in March 1955, and the record of the water level has been continuously recorded since that time. The maximum and minimum heads recorded to date have been 2.47 ft and 0.87 ft. In terms of cubic feet per second, based upon the tentative calibration prepared by the Engineering Department, the maximum discharge was 71.15 cfs and the minimum 15.75 cfs. This data indicates that the discharge is too great for either of the samplers previously described. It is planned to submit the maximum and minimum flow rates to manufacturers to determine if equipment is available for such a range.

Alpha Air Monitors

Stationary Filter Type - The required counting equipment for the stationary filter type alpha air monitor has been assembled. A light-tight alpha scintillation head is being designed.

HEALTH PHYSICS DEPARTMENT

A. SUMMARY

The Laboratory Group completed 7,836 samples in April, as compared with 10,743 in March.

The number of operations performed by the Survey and Monitoring Groups was 22,356 in April, as compared with 27,550 in March.

The urgent need for greater coverage of the Alpha-5 plant necessitated the curtailment of other phases of the Health Physics program during this report period. It is expected that this condition will exist throughout the month of May.

B. PRODUCTION

I. Sample and Survey Summary

(a) <u>Laboratory</u>	<u>March</u>	<u>April</u>
Urine, enriched uranium	507	1,146
Urine, normal uranium	769	618
Urine, mercury	381	272
Urine, plutonium	0	3
Water, Poplar Creek	5	20
Film, badge	2,337	1,965
Film, ring	129	52
Film, neutron	18	9
Film, cassette	61	63
Uranium, air samples	3,280	2,466
Uranium, smears	3,256	1,220
Special (Beta activity)	0	2
	-----	-----
Totals	10,743	7,836

(b) <u>Survey and Monitoring</u>	<u>March</u>	<u>April</u>
<u>Mercury</u> , recording air	626	575
<u>Mercury</u> , spot general air	4,101	8,385
Beryllium, permanent air	50	38
Special air samples	108	95
Contamination surveys	22,151	13,132

-cont'd-

(b) <u>Survey and Monitoring (cont'd)</u>	<u>March</u>	<u>April</u>
Area survey	131	45
Jobs monitored	4	1
Water samples collected	85	52
Miscellaneous	294	33
	<hr/>	<hr/>
Totals	27,550	22,356

II. Operations

(a) Laboratory

New solutions were made for the mercury urine procedure and standards and blanks were analyzed before starting the fourth quarter samples. Twenty-nine percent of the routine mercury analyses in April exceeded the MPL of 0.3 mg/l.

All laboratory procedures were employed on a routine basis. The average of 78 blank urine samples analyzed this month was 2.6 counts per half hour. This low value indicates that the contamination introduced by the analysis of the enhanced urine specimens is not significant.

(b) Survey and Monitoring

Four cassettes were installed in the G-1 and G-2 areas of Building 9998. The permanent air sampling system in Building 9998 was completed.

At the request of the Development Division, a group of air samples was taken in the motor generator areas in Alpha-5 to determine if air-borne cations were the cause of the arcing in the generators. The results of the analyses were reported to the Development Division for evaluation.

Sixty-eight air samples were collected in the Beta-2 area and analyzed for lithium content. Thirty-four percent of these results exceeded the irritation limit of 35 $\mu\text{g}/\text{M}^3$.

The average radioactivity and mercury concentrations in the east fork of Poplar Creek for March and April were as follows:

	<u>March</u>	<u>April</u>
Alpha activity	173 d/m/1	398 d/m/1
Beta activity	17,400 d/m/1	0 d/m/1
Mercury concentration	1.09 mg/1	1.48 mg/1

The following is a tabulation of the percentage of the air, smear, and film badge results which exceeded the Maximum Permissible Limits* in March and April:

<u>Area</u>	<u>Type Sample</u>	<u>March</u>	<u>April</u>
Machine Shop, 9212	Film badge	< 1%	0%
Foundry, 9212	Film badge	5%	1.3%
	Film badge	0%	0%
Other, Y-12	Film badge	< 1%	< 1%
9201-2	<u>Mercury</u> , spot general air	66%	52%
9204-4	<u>Mercury</u> , spot general air	5%	12%
9204-4	<u>Mercury</u> , recording general air	34%	36%
9201-5	<u>Mercury</u> , spot general air	56%	44%
9201-5	<u>Mercury</u> , recording general air	87%	52%
	Uranium, general air	19%	10%
	Uranium, general air	---	5%
	Uranium, air, operational and BZ**	48%	---
	Uranium, air, operational and BZ**	---	88%
	Uranium, smears	44%	---
	Uranium, general air	0%	0%
	Uranium, general air	1%	1%

-cont'd-

MLB 8/18/94

OAK RIDGE Y-12 PLANT INFORMATION CONTROL FORM

DOCU T DESCRIPTION (Completed By Requesting Division)

Document No. Y-1105 / EXTRACT Author's Telephone No. 6-0263 Acct. No. 23366-0002 Date of Request 8/15/94

Unclassified Title: Selected Pages From Technical Division Monthly Progress Report For MAY 1955 (PGS 28-29, 37-38, 73-79) M-5

Author(s) Requested by Steve Wiley

TYPE: [] Formal Report [] Informal Report [] Progress/Status Report [] Co-Op Report [] Thesis/Term Paper [] Oral Presentation (identify meeting, sponsor, location, date):

[] Journal Article (Identify Journal): [X] Other (Specify): To Be Released for Phase II of HSA

Document will be published in proceedings [X] No [] Yes Document will be distributed at meeting [X] No [] Yes Document has patent or invention significance [X] No [] Yes (Identify) Document has been previously released [X] No [] Yes (Reference)

DIVISION REVIEW AND APPROVAL (Completed By Requesting Division)

TECHNICAL CLASSIFICATION REVIEW (Divisional Classification Representative)

Title(s): UNC Abstract: NA DOCUMENT: Level UNC Category NA Signature [Signature] Date 8/15/94

DOCUMENT REQUEST APPROVED (Division or Department)

Signature Date Signature Date

THE REMAINDER OF THIS FORM TO BE COMPLETED BY THE TECHNICAL INFORMATION OFFICE

DISTRIBUTION

Internal Distribution External Distribution TID-4500 Category or Copies to OSTI ANNOUNCED IN: ERA Atomindex (Available from NTIS) M-3679 Category ANNOUNCE IN: [] AWDR (Available from OSTI) [] ANCR

Distribution: UCN-7721B DOE F-1332.15 Document Y-12 Central Files Y-12 RC Y-12 RC Y-12 RC TIO File L.L. McCauley S.W. Wiley T.R. Butz

Distribution Remarks: Cleared for Public Release (Unclassified)

The Record Copy of This Document Is In the DRC

APPROVAL AND RELEASE

Date Received Date Initiated 8-16-94 CLASSIFICATIONS: [X] Unclassified Title(s): Unclassified Abstract: - DOCUMENT: Level Unclassified Category: - Weapons Data Sigma Lloyd G Porter 8/16/94 Y-12 Classification Office Date

[] Editor Date [X] Waived per table with patent council / mlb Patent Office Date [] Other Date [] Other Date

APPROVED FOR: [] Declassification [] Release subject to use of the following admonitory markings and conditions:

[] Disclaimer [] Copyright [] Patent Caution [] Other

[Signature] 8/18/94 Technical Information Office Date

Conditions/Remarks:

1. Dissolution of diuranate cake in HNO_3 , removal of residue by filtration, and precipitation of the filtrate with H_2O_2 maintaining a pH of 2.0.
2. Dissolution of diuranate cake with NaHCO_3 plus KMnO_4 , followed by filtering and precipitation with NaOH . In early runs, the fluoride was reduced to 0.015%.
3. Dissolution of diuranate cake with NaHCO_3 followed by filtering and NaOH precipitation. In early runs, the fluoride was reduced to 0.016%, and this method will be tried on a production scale with certain of the 9211 salvage equipment.

Normal Salvage Treatment Installation - This installation is approximately 95% complete. Development expects to assist in checking out the operation of the various components during the first week in June. The work on this installation has been delayed until the installation for ammonium diuranate cake purification can be completed.

ANALYTICAL DEVELOPMENT

HEALTH PHYSICS

Alpha Air Monitors

Stationary Filter Type - The design and fabrication of an alpha scintillation head have been completed. This head consists of a cylindrical brass housing bolted to the tube socket for a 5819 photomultiplier. A phosphor-coated lucite disc is mounted in a threaded brass ring which may be screwed down to contact the window of the photomultiplier. The phosphor disc presents a surface two inches in diameter to the radiation and is coated with 34.3 mg/cm^2 of Type D phosphor (ZnS , Ag activated).

The phosphor disc is shielded from light by three thicknesses of 0.18 mg/cm^2 aluminum foil, or a total of 0.54 mg/cm^2 of absorber, which is considerably below the range of 4.1 mg/cm^2 for the 4.18 mev alpha of U^{238} . There is some possibility that the pressure differential across the thin foil will cause it to rupture when it is brought near an operating filter. If this occurs, it will be necessary to use a thicker foil.

Continuous, Instantaneous Type - Assembly of the air monitor housing and paper transport mechanism has been completed. Filter paper tape has been received in the proper width for testing the apparatus. Actual testing can begin with the availability of an air source.

Calibration of a Contaminated Air Source - Various parts of the standard contaminated test atmosphere apparatus were tested. The Venturi throat satisfactorily mixed smoke with diluting air regardless of how the smoke was introduced above the throat.

Considerable difficulty was experienced in trying to find filters capable of removing dangerous quantities of uranium from air streams, and yet pass the required volume of air without creating too great a pressure drop. A fiber glass "dust stop" filter will be used as a roughing filter to remove the bulk of the dust load, and an 8" by 8" dry-box filter will be used as a finishing filter. The dry-box filter contains pleated Chemical Corporation 6 paper and is designed to pass 50 CFM of air with a very small pressure drop.

Y-12 Creek Monitor

The experiment in studying the mixing characteristics of the stream has been completed. About sixteen ounces of an aqueous solution of twenty grams of methylene blue were poured into the effluent from the nearest main upstream from the weir, about 300 yards. The main body of the stream and the large pool above the weir were uniformly colored when the first dye went over the weir; however, there were small pools of uncolored water trapped behind projections along the stream. It was concluded that a sampler set in the large pool above the weir would be satisfactorily representative of the total stream.

Indium Foil Badges

A second series of experiments is in progress, intended to determine the badge activities that would result from critical accidents involving a water-moderated burst. This data would then supplement that obtained at Los Alamos from an untamped reactor.

The reactor at the Tower Shielding Facility at ORNL has been used for a set of six runs. Phantoms carrying indium foils have been exposed under a variety of conditions where the reactor was at ground level. Calculations are still in progress. The bulk of the testing has been completed, but further tests should include longer runs in which appreciable doses are accumulated, tests on an indium-loaded belt and use of an indium-cathode type of proportional counter.

Note: Uranium air samples collected by this group are reported under (a) above.

II. Operations

(a) Laboratory

The 19 percent increase in the sample load is attributed largely to an accelerated air and smear sampling program in the uranium production areas.

A film badge control program was initiated, with several levels of exposure to beta, gamma, and neutron radiation.

The blank urine samples analyzed by the electrodeposition of enriched uranium continue to show a background of a low order of magnitude.

(b) Survey and Monitoring

A radiation survey was made on the roofs of buildings 9212, 9980, and 9981 for the Non-Destructive Testing Laboratory while all radioactive sources were in their least shielded positions. The purpose of this survey was to determine a position for relocating a barrier around this area. The points at which an eight-hour working Maximum Permissible Limit (7.5 mr/hr) existed were determined.

A series of outdoor air samples was taken near building 9710-2 in connection with a uranium fire extinguishing study. Of the three materials tested, the Aerojet salt was the most effective in controlling the air-borne contamination associated with burning uranium.

The large uranium shielded radium-beryllium source installed in 9201-5 was monitored.

The average radioactivity and mercury concentrations in the east fork of Poplar Creek for April and May were as follows:

	<u>April</u>	<u>May</u>
Alpha activity	398 d/m/l	221 d/m/l
Beta activity	0 d/m/l	2900 d/m/l
Mercury concentration	1.48 mg/l	1.98 mg/l

Note: This is the fifth consecutive month that the mercury concentration in Poplar Creek has increased from that of the previous month.

The following is a tabulation of the percentage of the air, smear, and film badge results which exceeded the Maximum Permissible Limits* in April and May:

<u>Area</u>	<u>Type Sample</u>	<u>April</u>	<u>May</u>
Machine Shop, 9212	Film badge	0%	0%
Foundry, 9212	Film badge	1%	2%
	Film badge	0%	0%
Other, Y-12	Film badge	< 1%	< 1%
9201-2	<u>Mercury</u> , spot, general air	52%	25%
9201-5	<u>Mercury</u> , spot, general air	44%	47%
9201-5	<u>Mercury</u> , recording, general air	52%	47%
9204-4	<u>Mercury</u> , spot, general air	12%	4%
9204-4	<u>Mercury</u> , recording, general air	36%	38%
	Uranium, general air	10%	22%
	Uranium, general air	5%	15%
	Uranium, air, operational and BZ**	88%	97%
	Uranium, general air	0%	0%
	Uranium, general air	1%	0%
	Uranium, air, operational and BZ**	0%	0%
	Uranium, smears	36%	44%
Salvage, 9212	Uranium, general air	3%	0%
Salvage, 9212	Uranium, air, operational and BZ**	14%	17%
Salvage, 9212	Uranium, smears	39%	22%
C-Wing, 9212	Uranium, general air	0%	0%
C-Wing, 9212	Uranium, air, operational and BZ**	0%	45%

-cont'd-

DOC: **VT DESCRIPTION (Completed By Requesting Division)**

Document No. Y-1106/EXTRACT Author's Telephone No. 6-0263 Acct. No. 23366-0002 Date of Request 8/15/94

Unclassified Title: Selected Pages From Technical Division Monthly Progress Report For JUNE 1955 (Pgs 36-40; 51-52; 85-91) M-6

Requested by Steve Wiley

TYPE: Formal Report Informal Report Progress/Status Report Co-Op Report Thesis/Term Paper

Oral Presentation (identify meeting, sponsor, location, date): _____

Journal Article (Identify Journal): _____

Other (Specify): To Be Released for Phase II of HSA

Document will be published in proceedings No Yes

Document will be distributed at meeting No Yes

Document has patent or invention significance No Yes (Identify) _____

Document has been previously released No Yes (Reference) _____

DIVISION REVIEW AND APPROVAL (Completed By Requesting Division)

<p>TECHNICAL CLASSIFICATION REVIEW (Divisional Classification Representative)</p> <p>Title(s): <u>UNC</u> Abstract: <u>NA</u></p> <p>DOCUMENT: Level <u>UNC</u> Category <u>NA</u></p> <p><u>[Signature]</u> <u>8/15/94</u></p> <p>Signature Date</p>	<p>DOCUMENT REQUEST APPROVED (Division or Department)</p> <p>_____ Signature Date</p> <p>_____ Signature Date</p>
---	---

THE REMAINDER OF THIS FORM TO BE COMPLETED BY THE TECHNICAL INFORMATION OFFICE

DISTRIBUTION

Internal Distribution External Distribution

TID-4500 Category _____ or _____ Copies to OSTI

ANNOUNCED IN: ERA Atomindex (Available from NTIS)

M-3679 Category _____

ANNOUNCE IN: AWDR (Available from OSTI) ANCR

Distribution:	UCN-7721B	DOE F-1332.15	Document
Y-12 Central Files	Y-12 RC	Y-12 RC	Y-12 RC
TIO File	_____	_____	_____
<u>L.L. McCauley</u>	_____	_____	_____
<u>S.W. Wiley</u>	_____	_____	_____
<u>T.R. Butz</u>	_____	_____	_____

Distribution Remarks: Cleared for Public Release (ChamFisk)

The Record Copy of This Document Is In the DRC APPROVAL AND RELEASE

Date Received	Date Initiated	<input type="checkbox"/> Editor _____ Date _____ <input checked="" type="checkbox"/> <u>Wiley</u> Patent Office _____ Date _____ <input type="checkbox"/> Other _____ Date _____ <input type="checkbox"/> Other _____ Date _____
<input checked="" type="checkbox"/> CLASSIFICATIONS:		
Title(s): <u>Unclassified</u>	Abstract: _____	
DOCUMENT: Level <u>Unclassified</u>	Category: _____	
Weapons Date _____	Sigma _____	
<u>Lloyd S. Porter</u>	<u>8/16/94</u>	
Y-12 Classification Office	Date	

APPROVED FOR: Declassification Release subject to use of the following admonitory markings and conditions:

Disclaimer Copyright Patent Caution Other

Technical Information Office Date

Conditions/Remarks:

ANALYTICAL DEVELOPMENTHEALTH PHYSICSY-12 Creek Monitor-Sampler

The Lakeside Engineering Corporation can build an intermittent, clock-controlled, dipper-type "Trebler" sampler for the wide flow range required if the discharge calibration is provided in 2-inch steps. It was recommended to the Health Physics Department that a purchase requisition be placed, based on the Y-12 Engineering Department's calibration, for a "Trebler" sampler to be installed in the large still pool just above the weir. It was also recommended that the minimum sample-to-discharge ratio be one liter of sample per million gallons of discharge.

Four-Pi Beta Counter

The four-pi beta counter is being checked to determine the requirements necessary to get absolute beta counting. A broad plateau over a wide range of gain and voltage settings was found when a conducting disk covers the opening between the two chambers. When a sample mounted in an insulating disk is placed over the opening, no plateau is obtained and the counter operation is very erratic. When the insulating disk is sandwiched between two layers of thin aluminum containing a small opening the size of the sample, a medium range plateau is observed and erratic operation occurs at the higher voltages. The erratic operation is probably due to field effects within the chamber and a change in the method of sample preparation should correct this condition.

STATISTICAL ANALYSIS OF THE EFFICIENCY OF PLATING URANIUM FROM URINE SAMPLESIntroduction

A statistical analysis has been made to determine whether any relationship exists between the efficiency of plating uranium from a given urine sample and the urine excretion rate as indicated by the individual submitting the sample. Such a correlation might be expected since the weight of solid matter (primarily calcium), which adversely affects the plating efficiency, is excreted at a constant time rate whereas the volume excreted depends on the fluid intake of the individual. The plating efficiency would therefore be expected to increase with the excretion rate.

The study was undertaken for two reasons: If plating efficiency is related to excretion rate, then (1) added weight is given to proposals that the sampling method be changed to a method based on excretion rate, and (2) the present routine calculation using an average plating factor for all samples could be easily modified so as to use either the relationship found for the average of samples or that found for the individual.

Treatment of Data

The sample consisted of 230 analysis made on 23 individuals having a high

1955. Overall engineering is approximately 10% complete and all the major bills of material for ventilation equipment have been issued to Rust Engineering Company.

Mechanical Problems in ADP

During June the following major equipment was serviced by the Maintenance Division in 9201-4 and 9201-5:

An engineering study was started to determine the feasibility of a central pump servicing facility for servicing all Collex pumps, as well as other pumps in the Y-12 area that are now being shop serviced in various field shops. This study is divided into two parts, the first part concerning only pump servicing, and the second part including additional items of mechanical equipment which require shop servicing as well as pumps.

Design work has started on a new evaporator feed storage tank as a result of the explosion which occurred during the month in one of the tanks in the Alpha-4 tank farm. Additional design work is being done on vessels that might accumulate hydrogen.

Twenty-six items of servicing tools and equipment were designed for the Maintenance Department in Alpha-4 and Alpha-5. Work continued on equipment requirements and servicing procedures for reducing the contamination level in the Mechanical Servicing Area in Alpha-5.

Designs from Bethlehem Steel Company on the 30" pressure vessel were reviewed and approved as they were received from Bethlehem Steel Company. Several modifications to the design as proposed were requested of Bethlehem and were accepted. The question as to the feasibility of incorporating a removable seat for the breech seals has not been completely resolved and we are working with Bethlehem in an effort to determine the advisability of incorporating this change. Joseph Gillman Associates and the Naval Gun Factory have been contacted and we have requested them to review the proposed design to see if they feel it is sound from an engineering standpoint. We expect to receive their comments next month and a decision will be made based on a careful study of all the recommendations. In the meantime, the sealing surfaces on the 30" vessel will be kept under close scrutiny in order to keep track of the effect of the pressure cycling insofar as crack propagation is concerned. A tentative schedule of testing has been worked up in conjunction with the Mechanical Inspection Department and will be reviewed next month to see if it is acceptable for scheduled inspection.

II. Operations

(a) Laboratory

All laboratory procedures were employed on a routine basis.

Listed below is a tabulation of the percentage of uranium, plutonium, and mercury exposures, as determined by urine analyses, in excess of the Maximum Permissible Limits of 43 mrem/day in the case of uranium and plutonium, and 0.3 mg/l in the case of mercury:

<u>Program</u>	<u>April</u>	<u>May</u>
Normal uranium	5%	2%
Enhanced uranium	9%	7%
Plutonium	100%	40%
Mercury	29%	17%

(b) Survey and Monitoring

Mercury air sampling was extended to the Alpha-4 plant. The mercury vapor generating apparatus for the calibration of mercury vapor detectors was moved from building 9995 to 9201-4. Six vapor detectors were calibrated during the month.

As a result of the accelerated scrap metals salvage program, approximately 262 tons of scrap metal were monitored. Of this total, 132 tons were ferrous metal, 18 tons were stainless steel, 19 tons were brass, and 93 tons were copper. The number of contamination surveys shown in B, I(b) above does not include those made while monitoring the scrap metal.

The average radioactivity and mercury concentrations in the East Fork of Poplar Creek and May and June were as follows:

	<u>May</u>	<u>June</u>
Alpha activity	221 d/m/l	401 d/m/l
Beta activity	2,900 d/m/l	8,840 d/m/l
Mercury concentration	1.98 mg/l	1.93 mg/l

The following is a tabulation of the percentage of the air, smear, and film badge results which exceeded the Maximum

(b) Survey and Monitoring (cont'd)

Permissible Limits* in May and June:

<u>Area</u>	<u>Type Sample</u>	<u>May</u>	<u>June</u>
	Film badge	0%	0%
	Film badge	2%	0%
	Film badge	---	0%
	Film badge	0%	0%
ther, Y-12	Film badge	< 1%	0%
201-2	Mercury, spot, general air	25%	20%
201-4	Mercury, spot, general air	---	42%
201-5	Mercury, spot, general air	47%	65%
201-5	Mercury, recording, general air	47%	51%
204-4	Mercury, spot, general air	4%	5%
204-4	Mercury, recording, general air	38%	29%
	Uranium, general air	22%	67%
	Uranium, general air	15%	10%
	Uranium, air, operational and BZ**	97%	92%
	Uranium, smears	---	31%
	Uranium, general air	0%	3%
	Uranium, air, operational and BZ**	---	0%
	Uranium, general air	0%	< 1%
	Uranium, air, operational and BZ**	0%	0%

Document No. Y-1107/EXTRACT Author's Telephone No. 6-0263 Acct. No. 23366-0002 Date of Request 8/16/94

Unclassified Title: Selected Pages From Technical Division Monthly Progress Report For JULY 1955 (Pgs 37; 49; 85-91) M-7

Author(s) Requested by Steve Wiley

TYPE: Formal Report Informal Report Progress/Status Report Co-Op Report Thesis/Term Paper

Oral Presentation (identify meeting, sponsor, location, date): _____

Journal Article (Identify Journal): _____

Other (Specify): To Be Released for Phase II of HSA

Document will be published in proceedings No Yes

Document will be distributed at meeting No Yes

Document has patent or invention significance No Yes (Identify) _____

Document has been previously released No Yes (Reference) _____

DIVISION REVIEW AND APPROVAL (Completed By Requesting Division)

TECHNICAL CLASSIFICATION REVIEW (Divisional Classification Representative) Title(s): <u>UNC</u> Abstract: <u>NA</u> DOCUMENT: Level <u>UNC</u> Category <u>NA</u> <u>[Signature]</u> <u>8/16/94</u> Signature Date	DOCUMENT REQUEST APPROVED (Division or Department) _____ Signature Date _____ Signature Date
--	--

THE REMAINDER OF THIS FORM TO BE COMPLETED BY THE TECHNICAL INFORMATION OFFICE DISTRIBUTION

<input type="checkbox"/> Internal Distribution <input checked="" type="checkbox"/> External Distribution TID-4500 Category _____ or _____ Copies to OSTI ANNOUNCED IN: ERA Atomindex (Available from NTIS) M-3679 Category _____ ANNOUNCE IN: <input type="checkbox"/> AWDR (Available from OSTI) <input type="checkbox"/> ANCR	Distribution: UCN-7721B DOE F-1332.15 Document Y-12 Central Files Y-12 RC Y-12 RC Y-12 RC TIO File _____ <u>L.L. McCauley</u> <u>S.W. Wiley</u> <u>T.R. Butz</u>
--	---

Distribution Remarks: cleared for Public Release (Chem Phys)

The Record Copy of This Document Is In the DRC APPROVAL AND RELEASE

Date Received _____ Date Initiated <u>8-18-94</u> <input checked="" type="checkbox"/> CLASSIFICATIONS: Title(s): <u>Unclassified</u> Abstract <u>-</u> DOCUMENT: Level <u>Unclassified</u> Category <u>-</u> Weapons Data _____ Sigma _____ <u>Lloyd B Porter</u> <u>8/17/94</u> Y-12 Classification Office Date	<input type="checkbox"/> Editor _____ Date _____ <input checked="" type="checkbox"/> Patent Office <u>[Signature]</u> <u>8/8/94</u> <input type="checkbox"/> Other _____ Date _____ <input type="checkbox"/> Other _____ Date _____
--	--

APPROVED FOR: Declassification Release subject to use of the following admonitory markings and conditions:

Disclaimer Copyright Patent Caution Other

_____ 8/16/94
 Technical Information Office Date

Conditions/Remarks:

(b) Survey and Monitoring

The sharp increase in the number of water samples collected from the East Fork of Poplar Creek is due to an effort to locate the source of the high concentrations of alkali metals and mercury. The results of these analyses were reported to the Industrial Hygienist for evaluation.

The scrap metal monitored in the salvage yard included 426 tons of ferrous metal, 35 tons of copper, 5 tons of conduit, and 1 ton of stainless steel.

The following is a tabulation of the percentage of air and smear results which exceeded the Maximum Permissible Limits* in June and July:

<u>Area</u>	<u>Type Sample</u>	<u>June</u>	<u>July</u>
9201-2	Mercury, spot, general air	20%	29%
9201-4	Mercury, spot, general air	42%	87%
9201-5	Mercury, spot, general air	65%	83%
9201-5	Mercury, recording, general air	51%	74%
9204-4	Mercury, spot, general air	5%	3%
9204-4	Mercury, recording, general air	29%	35%
Miscellaneous Y-12	Mercury, spot, general air	---	16%
	Uranium, general air	67%	71%
	Uranium, general air	10%	12%
	Uranium, air, operational and BZ**	92%	96%
	Uranium, smears	31%	35%
	Uranium, general air	3%	< 1%
	Uranium, air, operational and BZ**	0%	---
	Uranium, general air	< 1%	1%

-cont'd-

II. Operations

(a) Laboratory

A considerable amount of difficulty was experienced with the fluorimetric procedure for normal uranium in urine. Sporadic high blanks made it necessary to re-run a large number of samples. The cause of this contamination is possibly due to the venting to the atmosphere of air exhaust from certain production areas in building 9212.

Interference of an undetermined nature caused the results obtained from the mercury urine procedure to be unreliable toward the end of the month. It was necessary to discontinue routine analyses while an investigation was made. New reagents and an improved glassware cleaning technique have apparently eliminated the difficulty.

The average radioactivity and mercury concentrations in the East Fork of Poplar Creek for June and July were as follows:

	<u>June</u>	<u>July</u>
Alpha Activity	401 d/m/l	423 d/m/l
Beta Activity	8,840 d/m/l	2,857 d/m/l
<u>Mercury Concentration</u>	1.93 mg/l	1.06 mg/l

Listed below is a tabulation of the percentage of the internal exposures due to uranium, plutonium, and mercury, as determined by urine analyses, in excess of the Maximum Permissible Limits of 43 mrem/day in the case of uranium and plutonium, and 0.3 mg/l in the case of mercury:

	<u>May</u>	<u>June</u>
Normal uranium	2%	3%
Enhanced uranium	7%	9%
Plutonium	40%	0%
<u>Mercury</u>	17%	33%

Exposures to external radiation, as determined by film badges, remain at a low order of magnitude throughout the plant. Less than 0.1% of the results exceeded the Maximum Permissible Limits.

MLD 8/17/94

OAK RIDGE Y-12 PLANT INFORMATION CONTROL FORM

DOCUMENT DESCRIPTION (Completed By Requesting Division)

Document No. Y-1108 / EXTRACT Author's Telephone No. 6-0263 Acct. No. 23366-0002 Date of Request 8/16/94

Unclassified Title: Selected Pages From Technical Division Monthly Progress Report For AUGUST 1955 (PGS 42-43; 54-55; 56; 93-100) M-8

Author(s) Requested by Steve Wiley

TYPE: [] Formal Report [] Informal Report [] Progress/Status Report [] Co-Op Report [] Thesis/Term Paper [] Oral Presentation [] Journal Article [X] Other (Specify): To Be Released for Phase II of HSA

Document will be published in proceedings [X] No [] Yes
Document will be distributed at meeting [X] No [] Yes
Document has patent or invention significance [X] No [] Yes (Identify)
Document has been previously released [X] No [] Yes (Reference)

DIVISION REVIEW AND APPROVAL (Completed By Requesting Division)

TECHNICAL CLASSIFICATION REVIEW (Divisional Classification Representative)
Title(s): UNC Abstract: NA
DOCUMENT: Level UNC Category NA
Signature Date 8/16/94

DOCUMENT REQUEST APPROVED (Division or Department)
Signature Date

THE REMAINDER OF THIS FORM TO BE COMPLETED BY THE TECHNICAL INFORMATION OFFICE DISTRIBUTION

[] Internal Distribution [] External Distribution
TID-4500 Category or Copies to OSTI
ANNOUNCED IN: ERA Atomindex (Available from NTIS)
M-3679 Category
ANNOUNCE IN: [] AWDR (Available from OSTI) [] ANCR

Distribution: UCN-7721B CUE P-1332.15
Y-12 Central Files Y-12 RC Y-12 F
TIO File
L.L. McCauley
S.W. Wiley
T.R. Butz

Distribution Remarks: Cleared for Public Release (Chemical)

The Record Copy of This Document Is In the DRC

APPROVAL AND RELEASE

Date Received Date Initiated 8-18-94
[2] CLASSIFICATIONS:
Title(s): Unclassified Abstract -
DOCUMENT: Level Unclassified Category -
Weapons Data Signa -
Lloyd to Porter 8/17/94
Y-12 Classification Office Date

[] Editor Date
[3] Waived per telephone w/ Patent Office / mls Patent Office Date
[] Other Date
[] Other Date

APPROVED FOR: [] Declassification [] Release subject to use of the following admonitory markings and conditions:

[] Disclaimer [] Copyright [] Patent Caution [] Other

m. J. Bond 8/17/94
Technical Information Office Date

Conditions/Remarks:

II. Operations

(a) Laboratory

The difficulty experienced with the mercury urine analyses as noted in the report for July was resolved by using new reagents, an improved glassware cleaning technique, and by the employment of a different type separatory funnel. Also, these samples are being analyzed in duplicate.

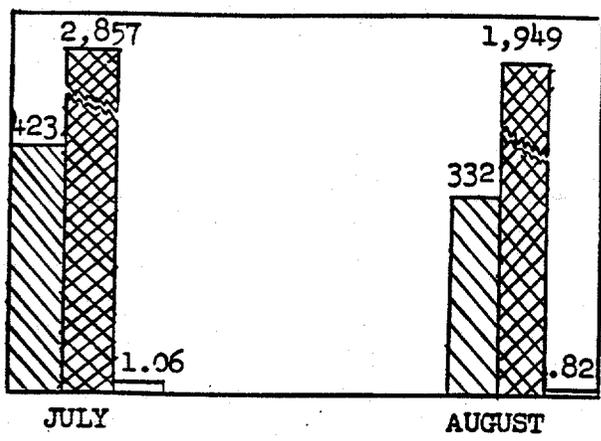
The operation of the permanent air samplers on a 24-hour basis in the uranium production areas has necessitated the counting of each sample twice for a five minute period instead of three times for five minutes.

The Special Samples Laboratory submitted 24 Poplar Creek water samples to be analyzed for mercury.

Six urine samples were analyzed for the National Lead Co of Ohio. These were analyzed by the fluorimetric procedure for normal uranium. The spread of the results was from 0.05 mg/l to 1.28 mg/l.

The average radioactivity and mercury concentrations at East Fork of Poplar Creek for July and August are shown in Figure 1.

Figure 1



Legend:
 [Hatched Box] Alpha activity as d/m/l
 [Cross-hatched Box] Beta activity as d/m/l
 [White Box] Mercury concentration as mg/l

of the uranium shield for one of the Ra-Be sources in Alpha-5. A sample of the gas was collected and analyzed by the Special Testing Laboratory. The gas was found to be largely hydrogen. It was at first feared that the gas might have been radon or helium which would have indicated a rupture of the metal capsule which contains the Ra-Be compounds. Since the source could not be removed from the uranium shield, the shield and source were removed to the radioactive source vault in the rear of building 9711-1, where observations are to be made.

The following is a tabulation of the percentage of air and smear results which exceeded the Maximum Permissible Limits* in July and August.

<u>Area</u>	<u>Type Sample</u>	<u>July</u>	<u>August</u>
9201-2	Mercury, spot, general air	29%	15%
9201-4	Mercury, spot, general air	87%	
9201-5	Mercury, spot, general air	83%	
9201-5	Mercury, recording, general air	74%	60%
9204-4	Mercury, spot, general air	3%	17%
9204-4	Mercury, recording, general air	35%	32%
Misc. Y-12	Mercury, spot, general air	16%	26%
	Uranium, general air	71%	---
	Uranium, general air	12%	16%
	Uranium, air, operational and BZ**	96%	---
	Uranium, smears	35%	33%
	Uranium, general air	< 1%	< 1%
	Uranium, air, operational and BZ**	---	78%

-cont'd-

DOC NT DESCRIPTION (Completed By Requesting Division)

Document No. Y-1109 / EXTRACT Author's Telephone No. 6-0263 Acct. No. 23366-0002 Date of Request 8/16/94

Unclassified Title: Selected Pages From Technical Division Monthly Progress Report For SEPTEMBER 1955 (Pgs 42; 45-46; 95-102) M-9 103,104

Author(s) Requested by Steve Wiley

TYPE: [] Formal Report [] Informal Report [] Progress/Status Report [] Co-Op Report [] Thesis/Term Paper [] Oral Presentation (identify meeting, sponsor, location, date):

[] Journal Article (Identify Journal): [X] Other (Specify): To Be Released for Phase II of HSA

Document will be published in proceedings [X] No [] Yes
Document will be distributed at meeting [X] No [] Yes
Document has patent or invention significance [X] No [] Yes (Identify)
Document has been previously released [X] No [] Yes (Reference)

from AUG 18 AM 8 35

DIVISION REVIEW AND APPROVAL (Completed By Requesting Division)

TECHNICAL CLASSIFICATION REVIEW (Divisional Classification Representative)
Title(s): UNC Abstract: NA
DOCUMENT Level UNC Category NA
Signature Date 8/16/94

DOCUMENT REQUEST APPROVED (Division or Department)
Signature Date
Signature Date

THE REMAINDER OF THIS FORM TO BE COMPLETED BY THE TECHNICAL INFORMATION OFFICE

DISTRIBUTION

Internal Distribution
External Distribution
TID-4600 Category or Copies to OSTI
ANNOUNCED IN: ERA Atomindex (Available from NTIS)
M-3679 Category
ANNOUNCE IN: [] AWDR (Available from OSTI) [] ANCR

Distribution: UCN-77218 DOE F-1332.15 Document
Y-12 Central Files Y-12 RC Y-12 RC Y-12 RC
TIO File
L.L. McCauley
S.W. Wiley
T.R. Butz

Distribution Remarks: Cleared for Public Release (ChemRisk)

The Record Copy of This Document Is In the DRC

APPROVAL AND RELEASE

Date Received Date Initiated 8-18-94
[2] CLASSIFICATIONS:
Title(s): Unclassified Abstract -
DOCUMENT:
Level Unclassified Category -
Weapons Data Sigma -
Lloyd G. Porter 8/17/94
Y-12 Classification Office Date

[] Editor Date
[2] Patent Office 8/18/94 Date
[] Other Date
[] Other Date

APPROVED FOR: [] Declassification [] Release subject to use of the following admonitory markings and conditions:

[] Disclaimer [] Copyright [] Patent Caution [] Other

Technical Information Office Date 8/18/94

Conditions/Remarks:

ANALYTICAL DEVELOPMENT

CHEMISTRY AND OPTICAL SPECTROSCOPY

Recovery of Mercury from Building Waste Water

Preliminary examination of Poplar Creek waste waters indicate that trace amounts of mercury are introduced into Poplar Creek even though the building waste water passes into a settling basin before it is discharged into the creek. This indicates that the mercury is present as finely divided particulate matter. An experiment is being conducted to determine if the finely dispersed mercury particulates can be removed from a water stream by passing the stream through a copper shot bed or an amalgamated copper shot bed. If this method will work it may be possible to design equipment that will remove the mercury from the waste water and prevent further stream pollution and, in addition, the mercury can be recovered from the copper by a distillation process.

Isotopic Hydrogen Analysis of Heavy Water

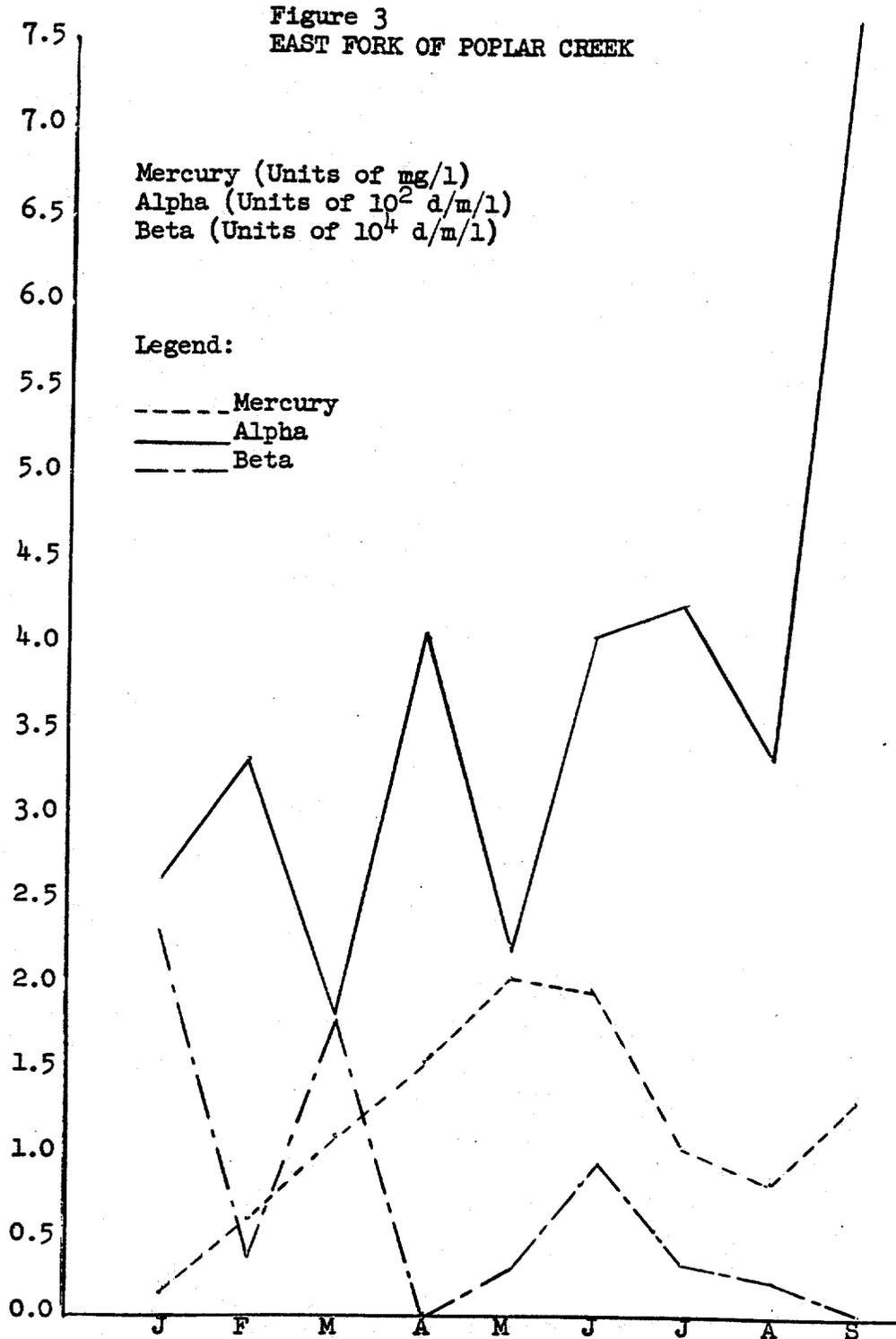
The results from various isotopic hydrogen analyses on D₂O samples by mass spectrometry, falling drop density analysis, and infrared absorption spectrophotometry are being compared. The precision of the falling drop density analysis performed by the Production Analysis Department is being evaluated. D₂O standards and samples are being provided for infrared absorption spectrophotometry analysis.

Primary Lithium Standard

The investigation on the purification of Li₂CO₃ by taking advantage of the inverse solubility in water of both Li₂CO₃ and LiHCO₃ with temperature was not successful. A marked decrease in sodium and potassium was obtained, but the calcium remained the same.

An investigation on the purification of Li₂CO₃ is being made by use of fractional crystallization techniques. It is assumed that the distribution of CaCO₃ in the Li₂CO₃ precipitate will follow either of the two distribution laws for isomorphous incorporation.

The average radioactivity and mercury concentrations in the East Fork of Poplar Creek for the past nine months are shown in Figure 3.



(b) Survey and Monitoring

The operation of the permanent uranium air samplers at night was discontinued in the

since all work in these areas is now being done on the 8 to 4:30 shift. In other uranium production areas, the permanent air samplers are being run from one to three nights per week depending on the nature of the processes in the areas.

Maintenance forces began the decontamination of the B-1 area of 9212. This has consisted of vacuum cleaning and washing the floors, walls, etc. Removable surface contamination was reduced from 740 d/m/100cm² before washing to 145 d/m/100cm² after washing.

The scrap metal monitored in the salvage yards included 936 tons of ferrous metal, 125 tons of conduit, 31 tons of stainless steel, and 4 tons of copper.

The following is a tabulation of the percentage of uranium operational air and smear results, and the mercury general air samples which exceeded the Maximum Permissible Limits* in August and September.

<u>Area</u>	<u>Type Sample</u>	<u>August</u>	<u>September</u>
9201-2	Mercury, spot, general air	15%	37%
9201-4	Mercury, spot, general air	82%	86%
9201-5	Mercury, spot, general air	84%	87%
9201-5	Mercury, recording, general air	60%	56%
9204-4	Mercury, spot, general air	17%	11%
9204-4	Mercury, recording, general air	32%	22%
Misc. Y12	Mercury, spot, general air	26%	13%
	Uranium, operational and BZ**	81%	53%
	Uranium, smears	33%	26%
	Uranium, operational and BZ**	19%	32%

DOC: IT DESCRIPTION (Completed By Requesting Division)
Document No. Y-1110 / EXTRACT Author's Telephone No. 6-0263 Acct. No. 23366-0002 Date of Request 8/16/94
Unclassified Title: Selected Pages From Technical Division Monthly Progress Report For OCTOBER 1955 (Pg 57-58; 95-102) M-10

Author(s) Requested by Steve Wiley

TYPE: [] Formal Report [] Informal Report [] Progress/Status Report [] Co-Op Report [] Thesis/Term Paper
[] Oral Presentation (identify meeting, sponsor, location, date):

[] Journal Article (Identify Journal):
[X] Other (Specify): To Be Released for Phase II of HSA

Document will be published in proceedings [X] No [] Yes
Document will be distributed at meeting [X] No [] Yes
Document has patent or invention significance [X] No [] Yes (Identify)
Document has been previously released [X] No [] Yes (Reference)

DIVISION REVIEW AND APPROVAL (Completed By Requesting Division)

TECHNICAL CLASSIFICATION REVIEW (Divisional Classification Representative)
Title(s): VNC Abstract: NA
DOCUMENT Level VNC Category NA
Signature: [Signature] Date: 8/16/94

DOCUMENT REQUEST APPROVED (Division or Department)
Signature: Date:
Signature: Date:

THE REMAINDER OF THIS FORM TO BE COMPLETED BY THE TECHNICAL INFORMATION OFFICE
DISTRIBUTION

Internal Distribution
External Distribution
TID-4500 Category or Copies to OSTI
ANNOUNCED IN: ERA Atomindex (Available from NTIS)
M-3679 Category
ANNOUNCE IN: [] AWDR (Available from OSTI) [] ANCR

Distribution: UCN-7721B DOE F-1332.15 Document
Y-12 Central Files Y-12 RC Y-12 RC Y-12 RC
TIO File
L.L. McCauley
S.W. Wiley
T.R. Butz

Distribution Remarks: Cleared for Public Release (ChamPub)

The Record Copy of This Document Is In the DRC

APPROVAL AND RELEASE

Date Received Date Initiated 8-18-94
[2] CLASSIFICATIONS:
Title(s): Unclassified Abstract -
DOCUMENT:
Level Unclassified Category -
Weapons Data Sigma -
Lloyd B Porter 8/17/94
Y-12 Classification Office Date

[] Editor Date
[3] Weira/mls Patent Office Date
[] Other Date
[] Other Date

APPROVED FOR: [] Declassification [] Release subject to use of the following admonitory markings and conditions:
[] Disclaimer [] Copyright [] Patent Caution [] Other
m. J. Bond 8/18/94
Technical Information Office Date

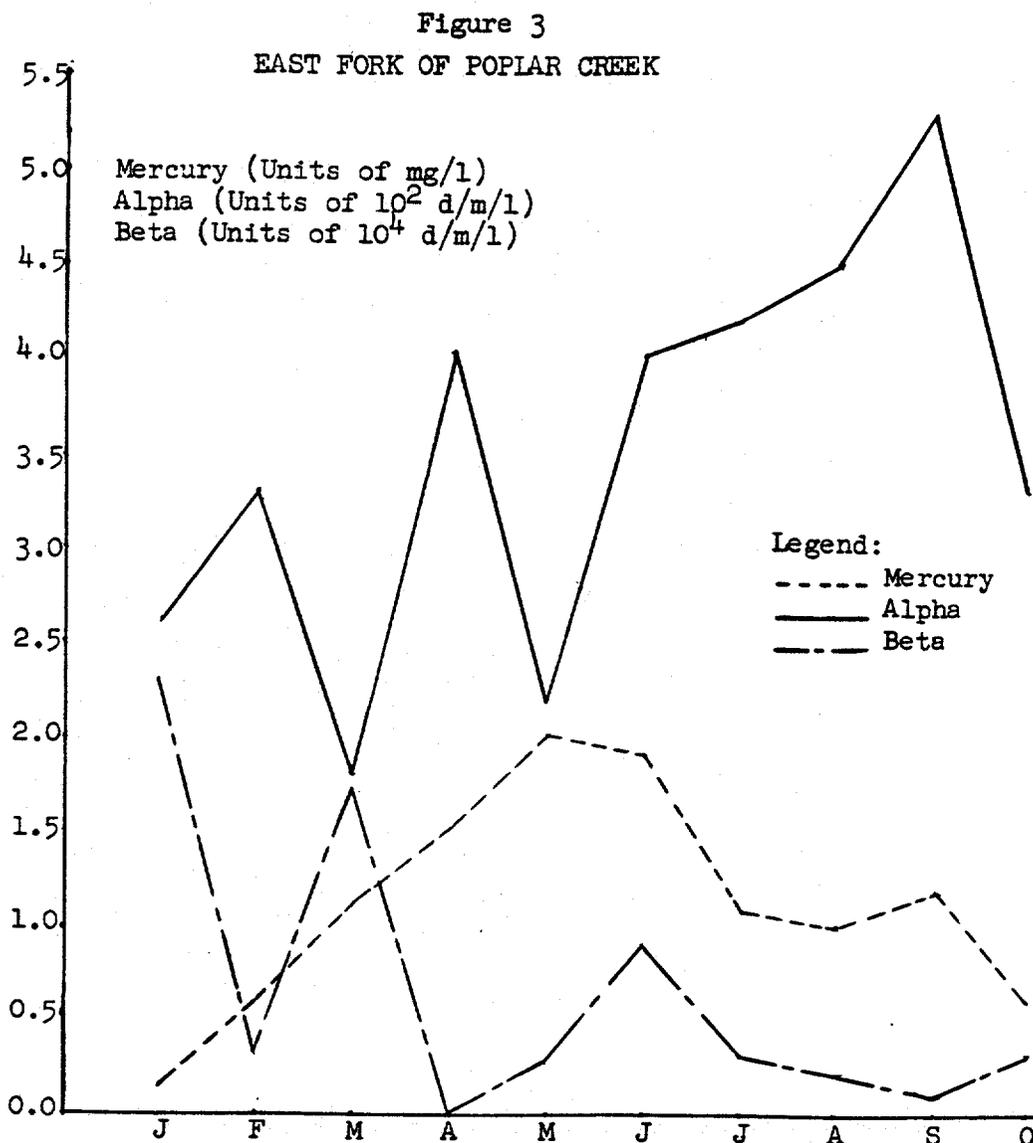
Conditions/Remarks:

II. Operations (cont'd)

(a) Laboratory

contamination is probably air borne. A statistical study of the results of the routine samples analyzed by this method show that there is no significant shift in the average of the counts. Therefore, the procedure is being employed in a routine manner.

The average radioactivity and mercury concentrations in the East Fork of Poplar Creek for the past ten months are shown in Figure 3.



II. Operations (cont'd)

(b) Survey and Monitoring

The tritium standard was received from Los Alamos towards the end of the month. The results of the first runs using this standard are, as yet, unavailable.

No significant improvement in the alpha spectrometer drift rate resulted from the installation of a positive cathode ground. With the assistance of personnel from the Analytical Development Department, a thorough leak hunting effort was initiated. Several large leaks were found and corrected which resulted in a significant improvement in the drift. This effort is being continued in order to completely eliminate all leaks in the system.

A final contamination survey was made in the B-1 area of building 9212 following washing of the contaminated surfaces. The maintenance group concerned has been advised that further efforts at decontamination were not necessary, but that painting of the floors and walls should be done.

Operation of the permanent air samplers in the E-Wing, 9212, at night has been discontinued since production activities are being done only on the day shift.

A re-survey of buildings in Y-12 was begun in order to determine the surface contamination classification of the areas. The collection of the smear samples is about one-third complete.

The Health Physics inspectors assigned to the ADP and Salvage areas are now changing clothes and clocking in at the change houses nearest their work area. This should make for better utilization of the work time.

A sampling program for gross alpha and beta activity in water from the new burial pit west of the plant has been inaugurated.

The scrap metal monitored in the salvage yards included 320 tons of ferrous metal, 12 tons of copper, and 6 tons of stainless steel.

The following is a tabulation of the percentage of uranium operational air and smear results, and the mercury general air samples which exceeded the Maximum Permissible Limits* in September and October.

II. Operations (cont'd)

(b) Survey and Monitoring

<u>Area</u>	<u>Type Sample</u>	<u>September</u>	<u>October</u>
9201-2	Mercury, spot, general air	37%	43%
9201-4	Mercury, spot, general air	86%	76%
9201-5	Mercury, spot, general air	87%	78%
9201-5	Mercury, recording, general air	56%	48%
9204-4	Mercury, spot, general air	11%	16%
9204-4	Mercury, recording general air	22%	16%
Misc. Y-12	Mercury, spot, general air	13%	18%
	Uranium, operational and BZ**	53%	64%
	Uranium, smears	26%	48%
	Uranium, operational and BZ**	32%	19%
	Uranium, smears	16%	30%
	Uranium, operational and BZ**	64%	52%
	Uranium, smears	23%	25%

* Limits Used:

Mercury Air-Maximum Permissible Limit of 0.1 mg/M³.
 Uranium Air-Maximum Permissible Limit of 70 d/m/M³.
 Smear-Arbitrary Reporting Limit of 250 d/m/100cm².

** Breathing Zone

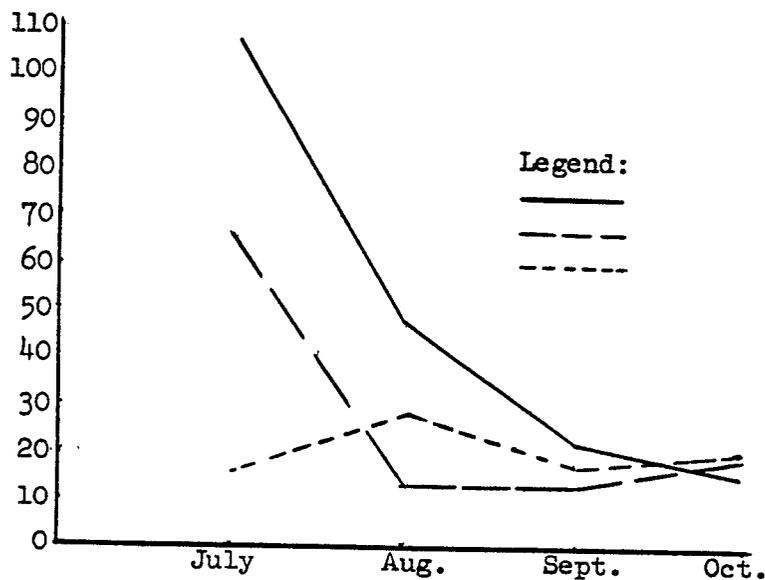
Figure 4 shows the average d/m/M³ for the day general air samples taken in uranium production areas for the past four months.

II. Operations (cont'd)

(b) Survey and Monitoring

Figure 4

URANIUM GENERAL AIR (Day Samples)



The radium-beryllium source, which was reported last month as jammed in the uranium shield, was successfully removed by an electrostripping process.

III. Quality Control

The means, precision, and bias for the methods controlled in September were not significantly different from the values reported for August.

C. SAFETY AND SECURITY

A safety meeting was held by both groups. Two minor injuries were reported. No security violations were reported.

mlb 8/18/94

DOCUMENT DESCRIPTION (Completed By Requesting Division)

Document No. Y-1111 / EXTRACT Author's Telephone No. 6-0263 Acct. No. 23366-0002 Date of Request 8/16/94

Unclassified Title: Selected Pages From Technical Division Monthly Progress Report For
NOVEMBER 1955 (PGS 22; 48-49; 55; 94-102) M-11

Author(s) Requested by Steve Wiley

TYPE: Formal Report Informal Report Progress/Status Report Co-Op Report Thesis/Term Paper
 Oral Presentation (identify meeting, sponsor, location, date): _____

Journal Article (Identify Journal): _____
 Other (Specify): To Be Released for Phase II of HSA

Document will be published in proceedings No Yes
 Document will be distributed at meeting No Yes
 Document has patent or invention significance No Yes (Identify) _____
 Document has been previously released No Yes (Reference) _____

DIVISION REVIEW AND APPROVAL (Completed By Requesting Division)

TECHNICAL CLASSIFICATION REVIEW (Divisional Classification Representative)
 Title(s): UNC Abstract: NA
 DOCUMENT Level UNC Category NA
[Signature] 8/16/94
 Signature Date

DOCUMENT REQUEST APPROVED (Division or Department)

Signature _____ Date _____
 Signature _____ Date _____

THE REMAINDER OF THIS FORM TO BE COMPLETED BY THE TECHNICAL INFORMATION OFFICE

DISTRIBUTION

Internal Distribution
 External Distribution
 TID-4500 Category _____ or _____ Copies to OSTI
 ANNOUNCED IN: ERA Atomindex (Available from NTIS)
 M-3679 Category _____
 ANNOUNCE IN: AWDR (Available from OSTI) ANCR

Distribution:	UCN-7721B	DOE F-1332.15	Document
Y-12 Central Files	Y-12 RC	Y-12 RC	Y-12 RC
TIO File	_____	_____	_____
<u>L.L. McCauley</u>	_____	_____	_____
<u>S.W. Wiley</u>	_____	_____	_____
<u>T.R. Butz</u>	_____	_____	_____

Distribution Remarks: Classified for Public Release
(chem Risk)

The Record Copy of This Document Is In the DRC

APPROVAL AND RELEASE

Date Received _____ Date Initiated 8-18-94
 CLASSIFICATIONS:
 Title(s): Unclassified Abstract -
 DOCUMENT:
 Level Unclassified Category -
 Weapons Data _____ Sigma _____
Lloyd B Porter 8/17/94
 Y-12 Classification Office Date

Editor _____ Date _____
V. A. [Signature] 8/18/94
 Patent Office Date _____
 Other _____ Date _____
 Other _____ Date _____

APPROVED FOR: Declassification Release subject to use of the following admonitory markings and conditions:

Disclaimer Copyright Patent Caution Other

[Signature] 8/16/94
 Technical Information Office Date

Conditions/Remarks:

APPROVED FOR PHASE II

Mercury Vapor Contamination

Accumulated evidence indicated that the mercury vapor control solution which was being employed in the plant was of little, if any, benefit. New solutions were made up using the best known technique and formula and carefully applied to test areas. Although these solutions appeared highly efficient in the laboratory, they failed completely when applied to test areas in the plant. The precise reason for the failure is not evident but may be due to a combination of the rough floor and intense vibration which prevent formation of a stable film. Examination of the floor with a 20 power glass showed it to be covered with tiny droplets of mercury (about 0.1 mm diameter). It appears that an extensive investigation of this problem will be necessary to produce a satisfactory solution.

A General Electric mercury vapor detector is being altered to allow its use in controlled experiments. This alteration may also make possible the accurate analysis of samples containing as little of 0.1 microgram of mercury.

Decomposers

A high resistance bridge was substituted for the Brown potentiometer used with the concentration cell in Alpha-4 to measure the alkali content of mercury leaving the decomposers. It was hoped that this would extend the range in which the method could be used to extremely low concentrations. Actually, it was not possible to obtain good results below a concentration of about 5×10^{-5} mols per gallon. The Brown instrument had been usable to about 1×10^{-4} mols per gallon. The method breaks down at lower concentrations due to oxidation of the zinc amalgam. When standards were made up at a concentration of 1×10^{-5} mols per gallon and placed in the cell quickly, the instrument needle drifted until it read full scale in only a few minutes. Alteration of the cell and sampling equipment to exclude oxygen should yield accurate results at lower concentrations but this effort is not indicated at present.

Ion Exchange Systems

The three ion exchange systems previously described are still being operated. After eight complete cycles, there is still no significant difference noted between the three systems.

An effort is being made to concentrate and isolate the organic matter which occurs in raw water and is believed to be responsible for the fouling of strong base anion exchange resins. The weak base resin in the number 3 ion exchange system is being repeatedly regenerated with the same batch of caustic. When this caustic is essentially exhausted it is planned to remove the sodium on a cation exchange resin and then examine the organic matter which remains. Infra-red absorption analysis should indicate what organic groups are present and the molecular weight can be estimated by physical methods. Knowing with some accuracy the nature of the materials involved may make the solution to the problem more apparent.

The average recovery of the four samples was 96.4%. Spectrographic analysis indicated the Y_2O_3 additive to be 99% pure.

Determination of Uranium

Completed methods for fluorophotometric analysis for uranium and for the volumetric determination in a phosphate solution of uranium in the presence of molybdenum have been turned over to the Laboratory and are in process of being tested for current use.

HEALTH PHYSICS

Air Monitor

Stationary Filter Type - The dual channel M-2 model was put into operation, but difficulties with the pumping system have made field testing impossible. The counting circuits are now balanced within the error expected of such low counting rates. A two-pen Brown recorder has been extremely useful in recording the output of both channels on the same chart.

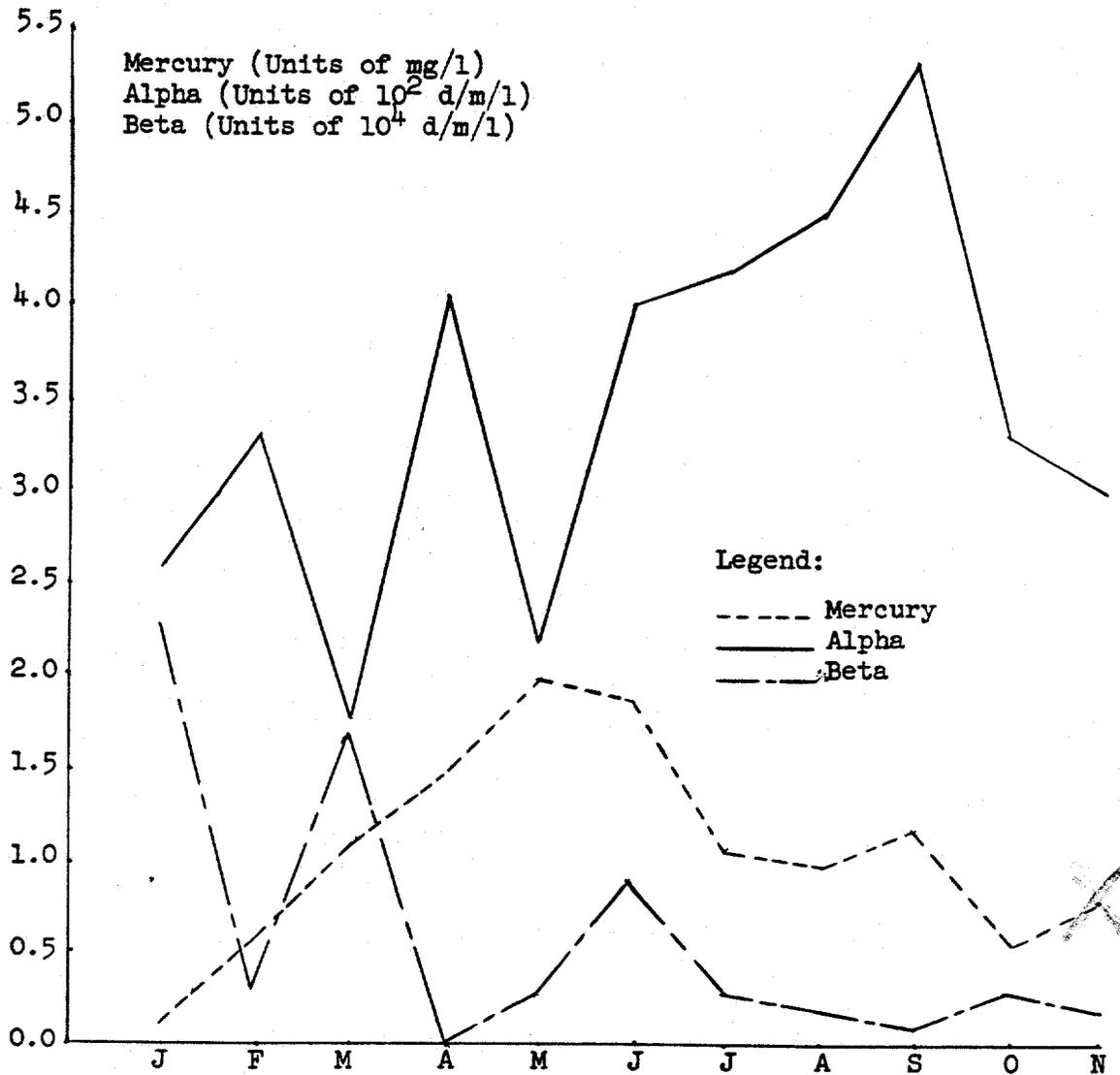
The pumping system difficulties have been caused by defective gravity feed oilers on the pumps. Under the pumping load applied, the oilers leaked oil into the pumps causing large amounts of oil to be thrown from the exhaust and causing one pump to smoke badly. Replacing the oiler with a different type has apparently repaired the smoking pump. The second pump is now being repaired.

The requirement for the differentiating and subtracting circuits ultimately required for the stationary filter monitor has been discussed with the Electronics Section and a request has been made that the Section proceed with the building of the networks required.

In analyzing the operating principles of the stationary filter method for a patent disclosure now being considered, it is concluded that if the increase in self-absorption is slow when dust loading of the filter begins, the method of taking the differential of the total count rate vs. time curve will minimize the effect of self-absorption. Dust loading will still be a problem, however, in that the increased resistance of the filter may cause changes in the sampling rate.

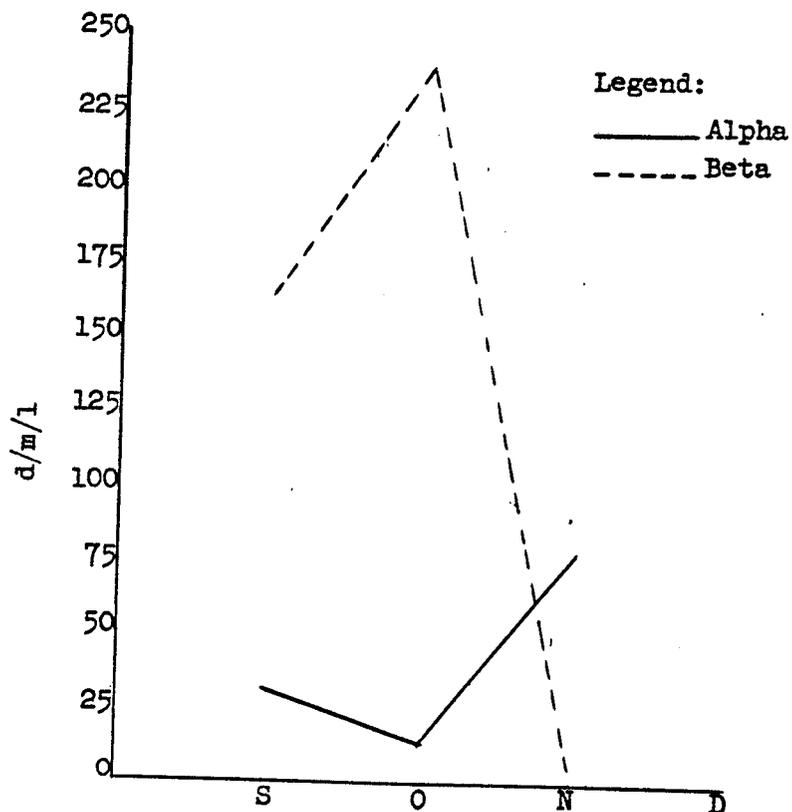
Annular Impactor Experiments - The original plan was to test the annular impactor particle size separator in series with a Millipore filter so that the ratio of heavy particles collected by the impactor, to the smaller particles passed by the impactor, but collected by the filter, could be determined. A pump has not been found that can pull the required 24 cfm through a 47 mm diameter Millipore filter. Therefore, the evaluation will probably have to be made by comparing the heavy particle activity collected by the impactor to the total activity collected by a filter sampling in parallel with the impactor. By determining the decay rates, it should be possible to discover how efficiently the impactor is collecting uranium activity and passing radon-thoron series activities.

Figure 3
EAST FORK OF POPLAR CREEK



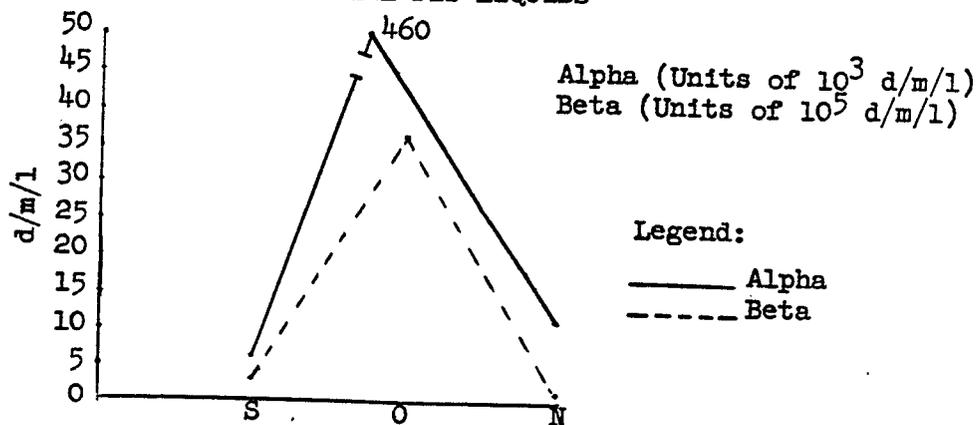
The average beta and alpha concentrations in Bear Creek Water for the past three months are shown in Figure 4.

Figure 4
BEAR CREEK WATER



The average beta and alpha concentrations in Burial Pit Liquids for the past three months are shown in Figure 5.

Figure 5
BURIAL PIT LIQUIDS



(b) Survey and Monitoring

Functional checks are made daily on the Jordan Radector Beta-Gamma Survey meters which were purchased as a part of the Nuclear Emergency Planning Committee's recommendations. These instruments are located as follows: one in Plant Shift Superintendent's office, one in Plant Shift Superintendents' automobile; one in Fire Department Patrol Truck; Z Area: two on north wall in the 9212 lunch room; two at a station 100 feet west of Dock No. 6, two at a station at north entrance to Building 9995, two in hall leading to Dock No. 4; two at Fire Hall, two in hall near Room No. 1, Laboratory Area, Building 9995: two on west wall of Records Room, one in Room 104.

The survey of buildings in Y-12, other than ADP area, to determine the surface contamination classification has been completed. This accounts for the great increase in the number of uranium smears counted in the laboratory.

The method of checking potable water in Y-12 was changed slightly during this month. Formerly, the ortho-tolidine test was made using a color comparator in the field. The test now made is the ortho-tolidine-arsenite test, using the same equipment as before. This test prevents certain interfering substances, such as nitrites, ferric compounds, and manganic compounds, from causing the characteristic color to develop and being read as chlorine.

Late in the month, outside air samplers were set up near the West Portal, at the air intake of Building 9995, and near Building 9983 in order to compare the alpha contamination in the outside air to that in the laboratory. An electrostatic precipitator is also being run in one of the laboratory hoods. Insufficient data are available to draw any conclusion at this time.

The scrap metal monitored in the salvage yards included 1,006 tons of ferrous metal, 50 tons of copper, and 14 tons of stainless steel.

Special Industrial Hygiene samples were collected for ozone, silica dust, oxides of nitrogen, cadmium, lithium in stacks, yttrium, thallium, cyanide, rhodium, arsenic, and scandium. Samples are routinely collected for air-borne beryllium concentrations in the machine shop in Building 9766. The results of these are reported to the Industrial Hygienist for interpretation and evaluation.

The following is a tabulation of the percentage of uranium operational air and smear results, and the mercury general air samples

which exceeded the Maximum Permissible Limits* in October and November.

<u>Area</u>	<u>Type Sample</u>	<u>October</u>	<u>November</u>
9201-2	Mercury, spot, general air	43%	45%
9201-4	Mercury, spot, general air	76%	73%
9201-5	Mercury, spot, general air	78%	79%
9201-5	Mercury, recording, general air	48%	48%
9204-4	Mercury, spot, general air	16%	8%
9204-4	Mercury, recording, general air	16%	18%
Misc. Y12	Mercury, spot, general air	18%	34%
	Uranium, operational and BZ**	64%	84%
	Uranium, smears	48%	40%
	Uranium, operational and BZ**	19%	76%
	Uranium, smears	30%	50%
	Uranium, operational and BZ**	52%	43%
	Uranium, smears	25%	32%

* Limits Used:

Mercury Air-Maximum Permissible Limit of 0.1 mg/M^3 .
 Uranium Air-Maximum Permissible Limit of 70 d/m/M^3 .
 Smear-Arbitrary Reporting Limit of 250 d/m/100cm^2 .

** Breathing Zone

MLD 8/11/94

DOCUM

DESCRIPTION (Completed By Requesting Divi

Document No.

Author's Telephone No.

Acct. No.

Date of Request

Y-1112 / EXTRACT

6-0263

23366-0002

8/18/94

Unclassified Title: Selected Pages From Technical Division Monthly Progress Report For

DECEMBER 1955 (PGS 18; 20; 52-53; 62; 64; 102-111)

Author(s) Requested by Steve Wiley (118-119) M-12

65

TYPE: Formal Report Informal Report Progress/Status Report Co-Op Report Thesis/Term Paper

Oral Presentation (identify meeting, sponsor, location, date):

Journal Article (Identify Journal):

Other (Specify): To Be Released for Phase II of HSA

Document will be published in proceedings No Yes

Document will be distributed at meeting No Yes

Document has patent or invention significance No Yes (Identify)

Document has been previously released No Yes (Reference)

9311 AUG 19 AM 7:17

DIVISION REVIEW AND APPROVAL (Completed By Requesting Division)

TECHNICAL CLASSIFICATION REVIEW (Divisional Classification Representative)

DOCUMENT REQUEST APPROVED (Division or Department)

Title(s): VNC Abstract: NA

DOCUMENT Level VNC Category NA

Signature [Signature] Date 8/18/94

Signature _____ Date _____

Signature _____ Date _____

THE REMAINDER OF THIS FORM TO BE COMPLETED BY THE TECHNICAL INFORMATION OFFICE

DISTRIBUTION

Internal Distribution
 External Distribution
TID-4500 Category _____ or _____ Copies to OSTI
ANNOUNCED IN: ERA Atomindex (Available from NTIS)
M-3679 Category _____
ANNOUNCE IN: AWDR (Available from OSTI) ANCR

Distribution: UCN-7721B DOE F-1332.15 Document
Y-12 Central Files Y-12 RC Y-12 RC Y-12 RC
TIO File _____
L.L. McCauley
S.W. Wiley
T.R. Butz

Distribution Remarks: Cleared for Public Release (stem risk)

The Record Copy of This Document Is In the DRC

APPROVAL AND RELEASE

Date Received _____ Date Initiated 8-19-94

CLASSIFICATIONS:

Title(s): Unclassified Abstract -

DOCUMENT: Level Unclassified Category -

Weapons Data _____ Sigma _____

Signature Lloyd B Porter Date 8/18/94
Y-12 Classification Office

Editor _____ Date _____

Wiley Patent Office _____ Date _____

Other _____ Date _____

Other _____ Date _____

APPROVED FOR: Declassification Release subject to use of the following admonitory markings and conditions:

Disclaimer Copyright Patent Caution Other

Signature [Signature] Date 8/18/94
Technical Information Office

Conditions/Remarks:

December 1955

M-12

18

coefficient is extremely large and favors the accumulation of the

Extract

Using the same apparatus as that described in the November report, the vapor pressure of water over $\text{LiOH} \cdot \text{H}_2\text{O}$ has been determined at several temperatures. The results obtained are given in the lowest curve in Figure 3. The upper two curves are those presented in the November monthly report.

A sieve analysis was run on a sample of extract crystals. The results are given in Table I. It is felt that the fraction of fines may be large and so additional analyses will be made.

TABLE I

<u>Sieve Size (mesh)</u>		<u>Fraction (%)</u>
<u>Through</u>	<u>On</u>	
--	20	3.9
20	40	52.5
40	60	19.9
60	80	13.3
80	120	7.3
120	160	2.1
160	200	0.6
200	--	1.1

Mercury Vapor Contamination

A new General Electric instantaneous mercury vapor detector has been obtained and will be used in the study of mercury contamination. It is planned first to investigate the floors as a source of vapor contamination. In this connection, such matters as means of cleaning the floors, means of deactivating the mercury on the floors, types of floor surface treatments which facilitate cleanup, and the importance of the floors as a source of contamination in comparison with the walls, ceilings, and piping will be considered.

Mercury Recovery

In addition to the mercury which is lost in floor drain water, rather large amounts of mercury are tied up in filter cakes and other sludges which result from operation of the plant. The largest amount of mercury is probably represented by the cake from the plate and frame filters which filter the backwash from the anthracite filters in the evaporator circuit. This material is accumulating at a rapid rate and is greater than 50% mercury, the remainder being mostly fine anthracite coal from attrition of the filter medium. It has been found by the production group that most of the mercury can be recovered in a relatively pure form by drying this filter cake with gentle

agitation which allows the mercury to coalesce and separate from the anthracite. A bird bath evaporator serves this purpose quite well. However, the residue of anthracite still contains a considerable amount of mercury (perhaps 15%). Since the material cannot be discarded and the volume has not been greatly reduced by removing the mercury, the problem of storage is still present and so is the need for an additional treatment to remove the residual mercury. In addition, it is necessary to handle the dry and rather dusty material resulting from the drying operation and this may be somewhat hazardous. It would appear that a single treatment which would remove and recover all the mercury in a single operation and in a condition for immediate re-use is indicated. These conditions are probably best met by distillation. It should not be difficult to purchase a well-engineered mercury still scaled to the requirements of the plant. Such a device would be quite versatile in that it should be applicable to recovery of mercury from all plant sources such as filter cakes, sludges of solid amalgam which accumulate in various tanks, and salvage materials which may result from treatment of waste water.

Ion Exchange Systems

The three ion exchange systems are still operating satisfactorily and without much difference in capacity or in the purity of product water.

The colored solution, which results when the weak base anion resin in one of the systems is regenerated with aqueous NaOH, has been treated to recover the color bodies. The sodium was removed with a cation exchange resin in the hydrogen form and the water was removed under vacuum. The resulting residue is a yellow, wax-like material which can be separated into a colorless fraction and a yellow fraction on the basis of solubility in diethyl ether and carbon disulfide, respectively. Paper chromatograms would appear to indicate that there are only a few substances of substantially different properties present since very few bands were obtained. The material is also being examined by infra-red absorption techniques.

It has been noticed that the resin beds and the activated carbon filters in the Alpha-4 demineralizer system have accumulated large amounts of iron oxide. Whether this results from inefficient filtration of the raw water in the water treatment plant or from pickup of iron in the subsequent pipes and tanks is not known.

Need p. 19?

No - graph,
Figure 3

unit have been issued for comment. Engineering was completed and materials are being purchased to fabricate a set of jumpers which will allow an absorber tray switch to be isolated from the DC bus, so that maintenance may be performed safely. This jumper may also be used to by-pass a failed tray switch, allowing operation to be resumed with a minimum of down time. The purchase of an air circuit breaker to be installed experimentally in parallel with a tray shorting switch has been held up; auxiliary contacts for attachment to the present switches have been designed and are to be built and tried out soon. These are intended to reduce the normal maintenance on the main switch by closing "before" and opening "after" the main switch contacts operate, and are expected to make the purchase of commercial air circuit breakers unnecessary.

Absorber Tray Ground Detector System

Drawings are being made for a new circuit arrangement for the CCR-located ground detector and alarm units. The new circuit will be more sensitive and will give a more positive indication of tray grounds than does the present one, by virtue of an increased differential between normal leakage currents and fault currents.

Insulation is being procured to

Since approximately 90% of the grounds occur in these boxes it is expected that this insulation will materially decrease the frequency of their removal.

Tests in the tray room with a battery-powered arc revealed that, with the

Mercury Contamination Problem, Buildings 9201-4 and -5

The Engineering Division is working very closely with the Development, Alloy, and other interested divisions in the investigation of all angles of the mercury contamination problem in the Alpha-4 and -5 production area. The matter of stopping or controlling mercury leaks is so vital to the solution of the problem that the Engineering Division has assigned four men to investigate and recommend design changes on equipment to minimize or control such leaks. Projects include:

pumps, process tanks, hot piping, etc.; and the design of barrier enclosures for the Building 9201-4 absorber areas.

Arrangements have been made to conduct a test in of Building 9201-5 to determine the effect of lower air temperatures on the mercury contamination problem.

CHEMICAL OPERATIONS

Chemical Operations, Building 9206 and 9211

Engineering for the installation of a fume scrubber to improve the ventilation in Building 9211 was completed.

Preliminary engineering was started for major improvements to the Ash Leaching System, Building 9206.

Continuous Uranium Chemistry

Layout drawings for the primary and secondary column extraction systems are nearly complete and a layout drawing for the spray dryer system is under way.

Investigation to determine the extent of utilization of existing piping for the primary and secondary columns is underway and piping drawings will be started soon. Procurement specifications for the nitric acid still have been completed and specifications covering both "always-safe" evaporators is nearly ready to be issued for comment.

Engineering on the continuous dissolver and ash leacher is to be held up six to eight weeks pending further development work on the method of handling slag buttons. The continuous dissolver was shipped by the manufacturer and will be set up in our plant and thoroughly tested prior to engineering to insure its performance on plant materials.

Dry Chemistry, Building 9212

The architect-engineer, Patchen and Zimmerman, Engineers, has completed the engineering design for alterations on the dry chemistry process. The engineering contract will be terminated as soon as the architect-engineer submits the tracings to UCNC.

B. PRODUCTION (cont'd)

II. Operations

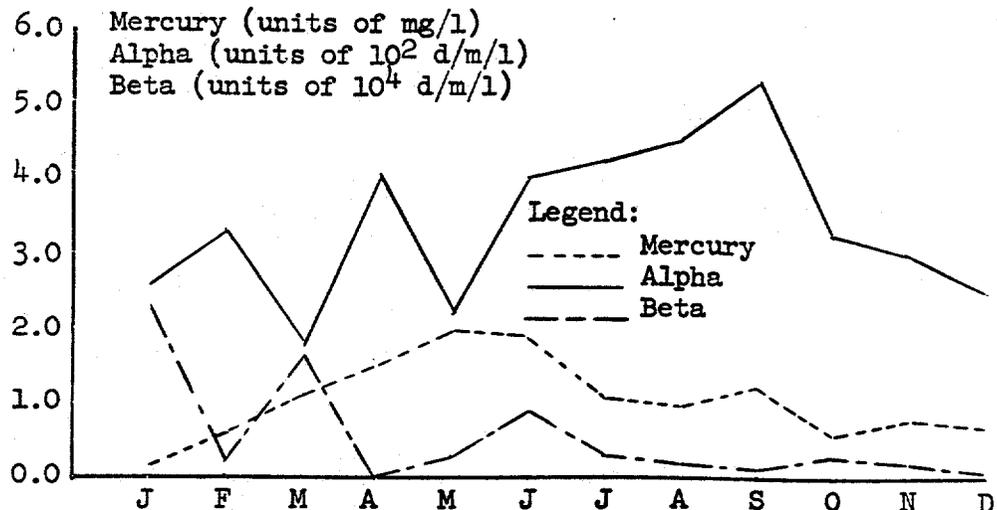
(a) Laboratory

The alpha contamination inherent in the urinalysis electroplating procedure was at normal background proportions, except during the first week of the month. The prevailing winds during the period when the highest blank results were obtained for the most part were from a westerly direction. However, little correlation is evident between this and data obtained from outside air samples collected near building 9983, which is some 200 yards downwind from the location of the electroplating apparatus.

The changing of filters in the air supply for building 9995 evidently caused sporadic high blanks in the fluorimetric procedure. This necessitated re-running in triplicate the routine samples for three random days during the month.

The average radioactivity and mercury concentrations in the East Fork of Poplar Creek for the past twelve months are shown in Figure 1.

Figure 1
EAST FORK OF POPLAR CREEK



B. PRODUCTION (cont'd)

II. Operations(b) Survey and Monitoring

The following is a tabulation of the percentage of uranium operational air and smear results, and the mercury general air samples which exceeded the Maximum Permissible Limits* in November and December.

<u>Area</u>	<u>Type Sample</u>	<u>November</u>	<u>December</u>
9201-2	Mercury, spot, general air	45%	21%
9201-4	Mercury, spot, general air	73%	80%
9201-5	Mercury, spot, general air	79%	74%
9201-5	Mercury, recording, general air	48%	23%
9204-4	Mercury, spot, general air	8%	9%
9204-4	Mercury, recording, general air	18%	34%
	Uranium, operational and BZ**	84%	33%
	Uranium, smears	40%	19%
	Uranium, operational and BZ**	76%	24%
	Uranium, smears	50%	32%
	Uranium, operational and BZ**	43%	56%
	Uranium, smears	32%	42%

* Limits

Mercury Air-Maximum Permissible Limit of 0.1 mg/M^3 .
 Uranium Air-Maximum Permissible Limit of 70 d/m/M^3 .
 Smear-Arbitrary Reporting Limit of 250 d/m/100cm^2 .

** Breathing Zone

Weapons Fabrication

Work continued on the AEC request for a preliminary proposal for the fabrication of the [redacted] This information is scheduled for the end of January.

Preliminary indications are that a new building would be required adjacent to Building 9998 to house proposed rolling and forming equipment. On a trip to Rocky Flats, design data and other information was obtained concerning Dow's rolling and forming facilities. Differences in the type and number of weapons to be processed necessitate a Y-12 design incorporating several times the handling facilities of the Rocky Flats installation.

Reactor Fuel Preparation and Scrap Recovery

In anticipation of fuel requirements for Power Demonstration Reactors, the AEC has requested UCNC to survey the K-25, Paducah and Y-12 facilities that could be used to produce fuel materials such as UF₆, UF₄ or metal ingots, and recover scrap generated in these facilities and from other installations. Part of the information requested has been transmitted and further studies are under way. The evaluation is to include capacities, in-process inventories, capital investments, amortization periods and unit production costs. Possible fuels range in assay from 1.5% U-235 to product level material, and include Zr and Th as alloying agents.

Solvent Hazards Problems

Major activities of the Solvent Hazards Committee were as follows:

The Committee met with Messrs. Strasser and Murray to discuss the effectiveness of showers for reducing mercury exposure to personnel. At the meeting the Committee was requested to conduct a test to help evaluate the need and effectiveness of showers. Mr. LaFrance, who would conduct the test, presented a procedure and, after discussion, agreement was reached on the following main points:

- (1) About 40 process supervisors would be requested to take a shower at the end of the shift for about one month.
- (2) They would be checked before and after the shower with the mercury vapor detector for a seven day period.
- (3) Urine samples would be collected at the beginning and end of the month's period and compared as a group with data from one of the groups of process operators. Dr. Emerson would schedule the operator group so that regular quarterly samples will be utilized.

ML 8/18/94

Document No. Y-1120 / EXTRACT DOC# VT DESCRIPTION (Completed By Requesting Division)
 Author's Telephone No. 6-0263 Acct. No. 23366-0002 Date of Request 8/18/94
 Unclassified Title: Selected Pages From Technical Division Monthly Progress Report For JANUARY 1956 (PGS 13, 24-26; 56-58; 69-71; 109-117)
 Author(s) Requested by Steve Wiley M-13

TYPE: Formal Report Informal Report Progress/Status Report Co-Op Report Thesis/Term Paper
 Oral Presentation (identify meeting, sponsor, location, date): _____
 Journal Article (Identify Journal): _____
 Other (Specify): To Be Released for Phase II of HSA

Document will be published in proceedings No Yes
 Document will be distributed at meeting No Yes
 Document has patent or invention significance No Yes (Identify) _____
 Document has been previously released No Yes (Reference) _____

DIVISION REVIEW AND APPROVAL (Completed By Requesting Division)

TECHNICAL CLASSIFICATION REVIEW (Divisional Classification Representative)
 Title(s): UNC Abstract: NA
 DOCUMENT Level UNC Category NA
Steve Wiley Signature 8/18/94 Date

DOCUMENT REQUEST APPROVED (Division or Department)
 _____ Signature _____ Date
 _____ Signature _____ Date

THE REMAINDER OF THIS FORM TO BE COMPLETED BY THE TECHNICAL INFORMATION OFFICE DISTRIBUTION

Internal Distribution
 External Distribution
 TID-4500 Category _____ or _____ Copies to OSTI
 ANNOUNCED IN: ERA Atomindex (Available from NTIS)
 M-3679 Category _____
 ANNOUNCE IN: AWDR (Available from OSTI) ANCR

Distribution:	UCN-7721B	DOE F-1332.15	Document
Y-12 Central Files	Y-12 RC	Y-12 RC	Y-12 RC
TIO File	_____	_____	_____
<u>L.L. McCauley</u>	_____	_____	_____
<u>S.W. Wiley</u>	_____	_____	_____
<u>T.R. Butz</u>	_____	_____	_____

Distribution Remarks: Cleared for Public Release (checklist)

The Record Copy of This Document Is In the DRC APPROVAL AND RELEASE

Date Received _____ Date Initiated 8-19-94
 CLASSIFICATIONS:
 Title(s): Unclassified Abstract -
 DOCUMENT:
 Level Unclassified Category -
 Weapons Date _____ Sigma _____
Lloyd B. Porter Signature 8/18/94 Date
 Y-12 Classification Office

Editor _____ Date _____
 Waived/MS Patent Office _____ Date _____
 Other _____ Date _____
 Other _____ Date _____

APPROVED FOR: Declassification Release subject to use of the following admonitory markings and conditions:
 Disclaimer Copyright Patent Caution Other
M. J. Bond Signature 8/19/94 Date
 Technical Information Office

Conditions/Remarks:

change, to provide for more adequate control of any amalgam or aqueous leakage from the packing gland, is expected to delay shipments about one month.

Mercury Decontamination

During January, shift operations were established in Alpha-5 with approximately ten window and wall washers, their foreman, and an engineer from the Cascade Development Department per shift. These crews are cleaning the West Crane Bay starting with the fourth floor and working downward. As the work progresses, procedures and recommendations are being prepared for not only the cleaning techniques found useful in reducing the mercury contamination, but also for the operation, maintenance, and minor equipment and building design changes.

In approximately eight days, the two fourth floors of the crane bay had been covered. Air surveys after such cleaning indicated these areas to be below the maximum allowable concentration, even on one day when higher ambient temperatures were encountered.

This program will continue to receive major attention from all concerned groups and departments until a final solution is obtained.

PLEX DEVELOPMENT (ALPHA-4 PLANT)

Absorbers

Demisters, 4-7/8 inches in diameter, were installed in Checks will be made periodically to determine the effectiveness of the larger diameter. Tests have shown that the hydroxide loss, in the banks having no metal mesh demisters, is in the order of ten times the loss from banks equipped with mesh.

The tray equipped with saw-toothed, raffinate baffles continued to operate satisfactorily. Number 1 anode was connected in the lifted position in this tray with no noticeable difficulty.

Cascades

Decided to run an experiment, in an area sufficiently gross contamination from other areas, to determine the effect of the floor to the contamination at the breathing level. The second floor in Alpha-4 was selected. The drains

Water piping to the Moyno pump packing glands on the second floor was replaced with 1/2 inch pipe. The area was then sprinkled with water. The mercury vapor concentration dropped to an average of 0.003 mg/m³. This area did not have a particularly high concentration of mercury vapor, but the results do indicate

A recommendation that the checking of spare raffinate pumps be confined to switching to the spare without transferring back to original pumps has resulted in a materially reduced number of pump failures. Other pump failures are under investigation. It appears that ferric

Mercury Vapor Contamination

A survey of plant areas was made to determine the principal sources of mercury vapor in the air. It was found that the floors and other horizontal surfaces had the highest degree of contamination as might be expected, but that the walls and other vertical surfaces were also heavily contaminated even though no mercury was visible. Since the area of the floors in the vicinity of the breathing zone is much higher than the wall area it was decided to run an experiment, in an area sufficiently large to prevent cross contamination from other areas, to determine the contribution of the floor to the contamination at the breathing level. A large area on the second floor in Alpha-4 was selected, the drains sealed off, and the area flooded with water. After about ten hours, the mercury vapor concentration at the breathing level averaged 0.08 mg/m^3 which is about what it was before treatment. The area was then sprinkled with "Hg-X" and the mercury vapor concentration dropped to an average value of 0.03 mg/m^3 . This area did not have a particularly high concentration of pipes and other process equipment, but the results do indicate that control of the floor will go a long way toward control of the whole problem.

In addition to "Hg-X", which is primarily sodium thiosulfate, other decontaminating agents are under investigation. It appears that ferric chloride solutions of about 20% concentration or dilute hypochlorite

The filters in the evaporator system in both Alpha-4 and Alpha-5 continue to give short filter cycles. Microscopic examination of the suspended matter in the evaporator feed stream showed it to be of about equal amounts by volume of graphite and mercury with a much smaller amount of lithium carbonate. There is almost no extraneous material such as iron, nickel, etc.

The minimum particles of suspended matter in the evaporator feed were estimated at 5 to 10 microns. It should be possible to remove most of this material with a two-inch liquid cyclone. The function of the cyclone would be to thicken the solid slurry and thus decrease the load on the filters. There is a possibility that the mercury droplets will be dispersed due to the high shear forces developed in this device unless, because of their high density, they remain close to the wall. A test is to be made on the liquid cyclone in this application.

Ion Exchange

The activated carbon filters in the Alpha-4 demineralizer system were observed to have picked up a great deal of apparent iron oxide. A sample of used carbon had an ash content of about 6% compared to an ash content of about 1% in the unused carbon. Analysis of the ash

(a) Laboratory (cont'd)

than the usual background contamination. Blank urine samples analyzed in the Health Physics laboratory in Building 9995 continue to show levels of uranium contamination about twice as great as the desired maximum, thus indicating the need for more complete isolation of the laboratory from its environment.

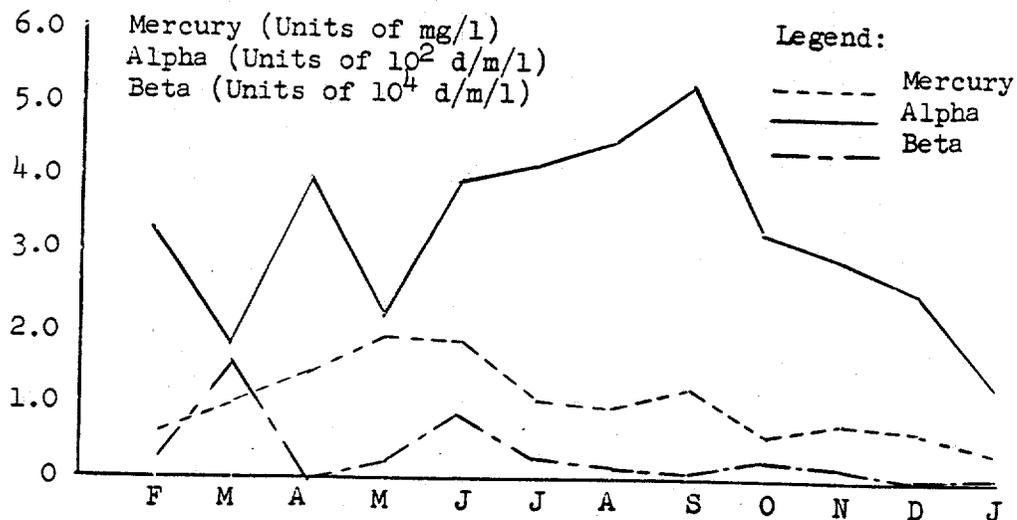
A special personnel exposure to mercury study was begun late in the month by the Y-12 Industrial Hygienist. This has resulted in approximately doubling the mercury urine sample load. Additional laboratory equipment has been procured and overtime work is being employed to increase the laboratory output.

The apparatus for making tritium determinations was moved from Building 9983 to Building 9995, since these analyses are now being done by laboratory personnel.

The average radioactivity and mercury concentrations in the East Fork of Poplar Creek for the past twelve months are shown in Figure 1.

FIGURE 1

POPLAR CREEK WATER



(b) Survey and Monitoring

During the month, radiation monitoring was done at two radiographic tests where iridium gamma sources were used. Both areas were surveyed and posted to prevent personnel from entering the hazardous areas. One of the jobs was testing a reactor which is being built in Building 9201-1 and the other was testing a reactor in Building 9212. Both jobs were completed without incident.

The average total residual and free available chlorine concentrations at all potable water sampling points in the Y-12 area was 0.3 ppm. A sample from Building 9711-1 on January 9 showed no chlorine content and a standard agar plate count of 56. A re-sample at this point on January 23 was also negative for chlorine with a standard agar plate count of 140. A sample from Building 9204-2 on January 23 was negative for both chlorine and standard agar plate count. These locations will be re-sampled. All gas in lactose broth tests were negative. Re-samples of the two locations noted in last month's report which gave high standard agar plate counts were within the threshold limits of 50 counts.

The mercury vapor detector apparatus was moved from the laboratory in Building 9201-4 to Building 9201-5 because the hood space was needed by operating personnel. A hood was installed for this purpose on the 2nd level in the northeast corner of Building 9201-5. It was determined that the fluctuation of the line voltage in the ADP areas adversely affected the operation of the mercury vapor detectors. This has been corrected by putting constant voltage transformers across the line voltage. Another difficulty with these instruments has recently been encountered and found to be due to the increased magnetic fields of force in the Alpha-4

Readings are being taken with the instruments at 90° to the lines of force. A better solution is being sought.

At the request of the Engineering Department, an extensive stack sampling program is under way at Alpha-5 to determine the effluent mercury concentrations. It has been estimated that seven work days will be needed to complete the job.

There is some evidence of mercury cross contamination of clothes at the laundry. Approximately 135 suits of laundered dynel clothes not worn in ADP areas were spot checked. About 80 per cent of these showed readings greater than the MPL of 0.1 mg/M³ for air-borne concentrations. These results have been reported to the Medical Department.

(b) Survey and Monitoring (cont'd)

The following is a tabulation of the percentage of uranium operational air and smear results, and the mercury general air samples which exceeded the MPL* in December, 1955 and January, 1956:

<u>Area</u>	<u>Type Sample</u>	<u>December</u>	<u>January</u>
9201-2	Mercury, spot, general air	21%	26%
9201-4	Mercury, spot, general air	80%	62%
9201-5	Mercury, spot, general air	74%	63%
9201-5	Mercury, recording, general air	23%	17%
9204-4	Mercury, spot, general air	9%	19%
9204-4	Mercury, recording, general air	34%	28%
	Uranium, operational and BZ**	33%	52%
	Uranium, smears	19%	40%
	Uranium, operational and BZ**	24%	46%
	Uranium, smears	32%	26%
	Uranium, operational and BZ**	56%	53%
	Uranium, smears	42%	39%

* Limits:

Mercury Air-Maximum Permissible Limit of 0.1 mg/M^3 .
 Uranium Air-Maximum Permissible Limit of 70 d/m/M^3 .
 Smear-Arbitrary Reporting Limit of 250 d/m/100cm^2 .

** Breathing Zone

MARTIN MARIETTA ENERGY SYSTEMS, INC.POST OFFICE BOX 2009
OAK RIDGE, TENNESSEE 37831

June 2, 1995

Ms. S. M. Flack
ChemRisk
2870 Kalmia Avenue
Suite 308
Boulder, Colorado 80301

Dear Ms. Flack:

Documents Requested by ChemRisk - Health Studies Agreement

Enclosed are copies of 20 documents which you have requested. These documents have not been previously submitted for review and approval for public release. The Y-12 Plant Classification and Technical Information Offices have reviewed them and determined that they do not contain classified or controlled information.

Y/HG-0268/ DEL REV	Anderson, J. S., "Mercury Flasking Synopsis Memo (M-322)," Union Carbide Corporation, Nuclear Division, Y-12 Plant (September 25, 1978).
MS/ChR2-0143	Compiled by the 1983 Mercury Task Force, "Internal Correspondence Folder (M-221)," Union Carbide Corporation, Nuclear Division, Y-12 Plant (June 1983).
MS/ChR2-0144	Author not shown, "Solvent Air Analysis - Draft Memo (M-836)," Carbide and Carbon Chemicals Company, Y-12 Plant (November 1956).
MS/ChR2-0145	Bailey, E. W. and Uffelman, F. C., "Internal Correspondence - Metals Processed at the Y-12 Plant," Carbide and Carbon Chemicals Corporation, Y-12 Plant (April 30, 1948).
Y/EXT-00075	Author not shown, "Selected pages from Y-12 Plant Technical Division Monthly Progress Report (Y-1121), February 1956 (M-94)," Union Carbide Nuclear Company, Y-12 Plant.
Y/EXT-00076	Author not shown, "Selected page from Y-12 Plant Technical Division Monthly Progress Report (Y-1122), March 1956 (M-95)," Union Carbide Nuclear Company, Y-12 Plant.
Y/EXT-00077	Author not shown, "Selected page from Y-12 Plant Technical Division Monthly Progress Report (Y-1123), April 1956 (M-96)," Union Carbide Nuclear Company, Y-12 Plant.

- Y/EXT-00078 Author not shown, "Selected page from Y-12 Plant Technical Division Monthly Progress Report (Y-1124), May 1956 (M-97)," Union Carbide Nuclear Company, Y-12 Plant.
- Y/EXT-00079 Author not shown, "Selected page from Y-12 Plant Technical Division Monthly Progress Report (Y-1125), June 1956 (M-98)," Union Carbide Nuclear Company, Y-12 Plant.
- Y/EXT-00080 Author not shown, "Selected page from Y-12 Plant Technical Division Monthly Progress Report (Y-1126), July 1956 (M-99)," Union Carbide Nuclear Company, Y-12 Plant.
- Y/EXT-00081
DEL REV Author not shown, "Selected pages from Y-12 Plant Technical Division Monthly Progress Report (Y-1127), August 1956 (M-100)," Union Carbide Nuclear Company, Y-12 Plant.
- Y/EXT-00082 Author not shown, "Selected pages from Y-12 Plant Technical Division Monthly Progress Report (Y-1128), September 1956 (M-101)," Union Carbide Nuclear Company, Y-12 Plant.
- Y/EXT-00083 Author not shown, "Selected page from Y-12 Plant Technical Division Monthly Progress Report (Y-1129), October 1956 (M-102)," Union Carbide Nuclear Company, Y-12 Plant.
- Y/EXT-00084/
DEL REV Author not shown, "Selected page from Y-12 Plant Technical Division Monthly Progress Report (Y-1165), June 1957 (M-111)," Union Carbide Nuclear Company, Y-12 Plant.
- Y/EXT-00085 Author not shown, "Selected pages from Y-12 Plant Technical Division Monthly Progress Report (Y-1227), July 1958 (M-148)," Union Carbide Nuclear Company, Y-12 Plant.
- Y/EXT-00086 Author not shown, "Selected page from Y-12 Plant Technical Division Monthly Progress Report (Y-1228), August 1958 (M-149)," Union Carbide Nuclear Company, Y-12 Plant.
- Y/EXT-00087/
DEL REV Author not shown, "Selected page from Y-12 Plant Technical Division Monthly Progress Report (Y-1230), September 1958 (M-150)," Union Carbide Nuclear Company, Y-12 Plant.
- Y/EXT-00088/
DEL REV Author not shown, "Selected page from Y-12 Plant Technical Division Monthly Progress Report (Y-1231), October 1958 (M-151)," Union Carbide Nuclear Company, Y-12 Plant.

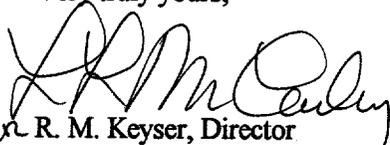
Ms. S. M. Flack, ChemRisk
Page 3
June 2, 1995

Y/EXT-00089/
DEL REV Author not shown, "Selected page from Y-12 Plant Technical Division
Monthly Progress Report (Y-1231), November 1958 (M-152)," Union Carbide
Nuclear Company, Y-12 Plant.

Y/EXT-00090/
DEL REV Author not shown, "Selected page from Y-12 Plant Technical Division
Monthly Progress Report (Y-1232), December 1958 (M-153)," Union Carbide
Nuclear Company, Y-12 Plant.

If you have any questions, please contact L. L. McCauley at (615) 574-7593 or S. W. Wiley at
(615) 576-0263.

Very truly yours,


for R. M. Keyser, Director
Health, Safety, Environment,
and Accountability Organization

RMK:djl

Enclosures: As Stated

cc/enc: T. W. Joseph, DOE-ORO
S. W. Wiley (RC)

cc: D. J. Bostock
T. R. Butz
R. J. Cornwell
C. D. Goins, Jr.
R. M. Keyser
A. K. Lee
L. L. McCauley
S. G. Morris, DOE-ORO
R. J. Spence, DOE-ORO

Selected Pages From Y-12 Plant Technical Division
Monthly Progress Report, February 1956 M-94
EXTRACT

Authorized Derivative Classifier
J. Rowan 5-23-95
Authorized Signature Date

Authorized Derivative Declassifier
H. A. Dickman 5-24-95
Authorized Signature Date

This material has been reviewed by the Y-12
Classification office and has been determined
to be UNCLASSIFIED.

APPROVED FOR PUBLIC RELEASE
P. L. McKemey 5/26/95
Technical Information Office Date

This document is an EXTRACT from Y-1121 (M-94)

THIS PAGE MUST NOT BE SEPARATED FROM THE ATTACHED DOCUMENT

II. Operations

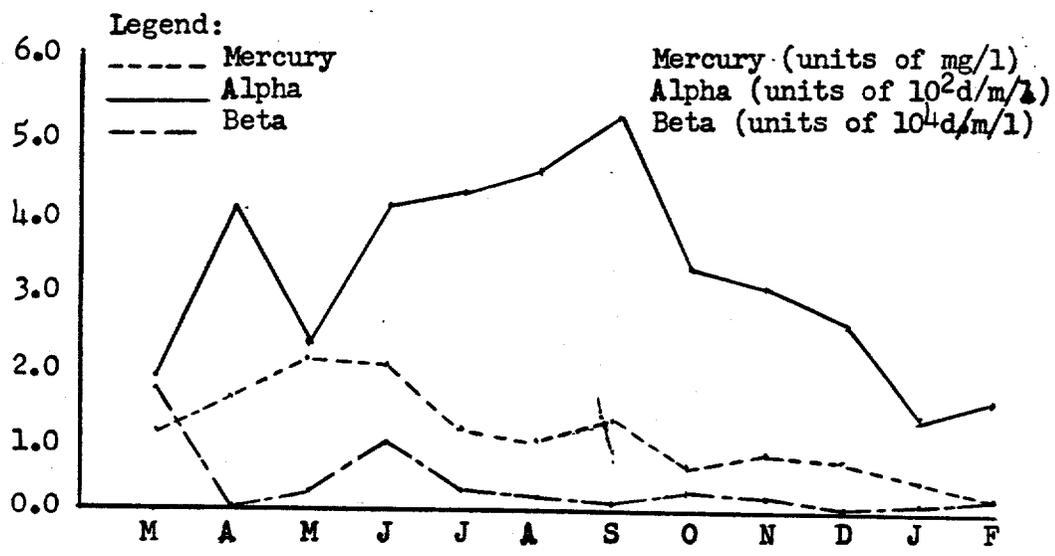
(a) Laboratory

By working a portion of the personnel on three Saturdays in the month, the commitment to analyze the increased mercury in urine work load is being met. Some maintenance difficulties were experienced with the pH meter and the spectrophotometer used with this procedure, but these troubles have been corrected.

Personnel monitoring was extended to include tritium in the urine of persons employed at the Gas Facility. All results were negative.

The average radioactivity and mercury concentrations in the East Fork of Poplar Creek for the past twelve months is shown in Figure 1.

Figure 1
EAST FORK OF POPLAR CREEK



The average alpha and beta concentrations in Bear Creek Water and Burial Pit Water for the past six months are shown in Figures 2 and 3 respectively.

Selected Pages From Y-12 Plant Technical Division
Monthly Progress Report, March 1956
EXTRACT

M-95

Authorized Derivative Classifier
J. R. Brown 5-23-95
Authorized Signature Date

Authorized Derivative Declassifier
J. A. Wickham 5-24-95
Authorized Signature Date

This material has been reviewed by the Y-12
Classification office and has been determined
to be UNCLASSIFIED.

APPROVED FOR PUBLIC RELEASE
P. L. McKenney 5/26/95
Technical Information Office Date

This document is an EXTRACT from Y-1122 (M-95)

THIS PAGE MUST NOT BE SEPARATED FROM THE ATTACHED DOCUMENT

I. Samples and Survey Summary (cont'd)

(b) <u>Survey and Monitoring</u>	<u>February</u>	<u>March</u>
Beryllium smears	0	87
Special air samples	151	252
Contamination surveys	12,994	12,905
Water samples collected	69	87
Scrap metal monitored (tons)	606	217
	<hr/>	<hr/>
Totals	36,625	46,967

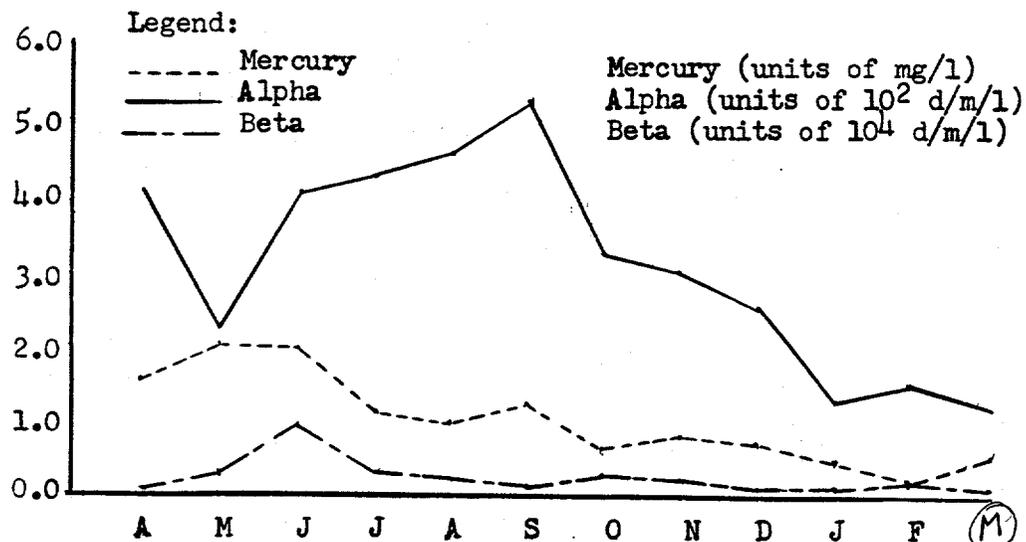
II. Operations(a) Laboratory

All laboratory procedures were employed on a routine basis.

The average radioactivity and mercury concentrations in the East Fork of Poplar Creek for the past twelve months are shown in Figure 1.

FIGURE 1

POPLAR CREEK WATER



NOTE: At the request of the X-10 Health Physics Group in Y-12, a water sample was collected and analyzed for plutonium content. The result of this analysis was 315 d/m/l.

Selected Pages From Y-12 Plant Technical Division
Monthly Progress Report, April 1956 M-96
EXTRACT

Authorized Derivative Classifier

H. E. Hickman 5-23-95
Authorized Signature Date

Authorized Derivative Declassifier

Rouan 5-23-95
Authorized Signature Date

This material has been reviewed by the Y-12
Classification office and has been determined
to be UNCLASSIFIED.

APPROVED FOR PUBLIC RELEASE

P. L. McKenney 5/26/95
Technical Information Office Date

This document is an EXTRACT from Y-1123 (M-96)

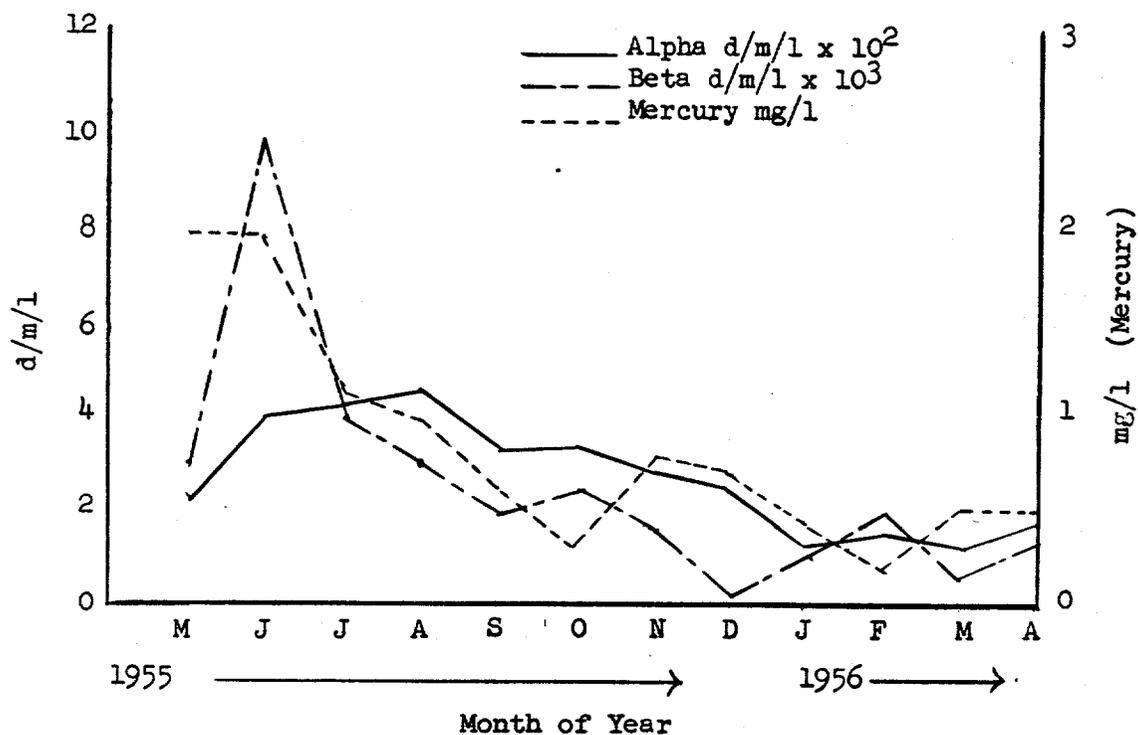
THIS PAGE MUST NOT BE SEPARATED FROM THE ATTACHED DOCUMENT

II. Operation

The average radioactivity and mercury concentrations in the East Fork of Poplar Creek for the past twelve months are shown in Figure 1.

Figure 1

POPLAR CREEK WATER



The average radioactivity in Bear Creek Water and Burial Pit Water for the past eight months is shown in Figures 2 and 3.

Selected Pages From Y-12 Plant Technical Division
Monthly Progress Report, May 1956
EXTRACT

M-97

Authorized Derivative Classifier
J. B. Nichols 5-23-95
Authorized Signature Date

Authorized Derivative Declassifier
Roman 5-23-95
Authorized Signature Date

This material has been reviewed by the Y-12
Classification office and has been determined
to be UNCLASSIFIED.

APPROVED FOR PUBLIC RELEASE
P. L. McKenney 5/26/95
Technical Information Office Date

This document is an EXTRACT from Y-1124 (M-97)

THIS PAGE MUST NOT BE SEPARATED FROM THE ATTACHED DOCUMENT

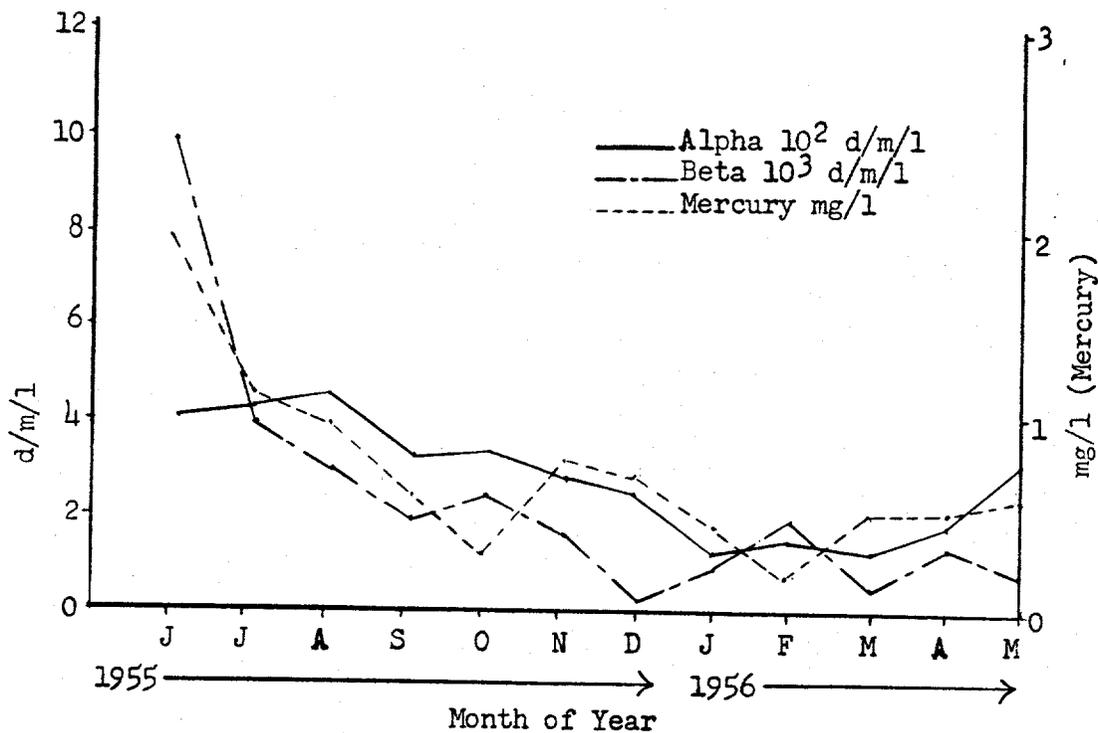


FIGURE 1 POPLAR CREEK WATER

The average activity in Bear Creek Water and Burial Pit Water for the past nine months is shown in Figures 2 and 3 respectively.

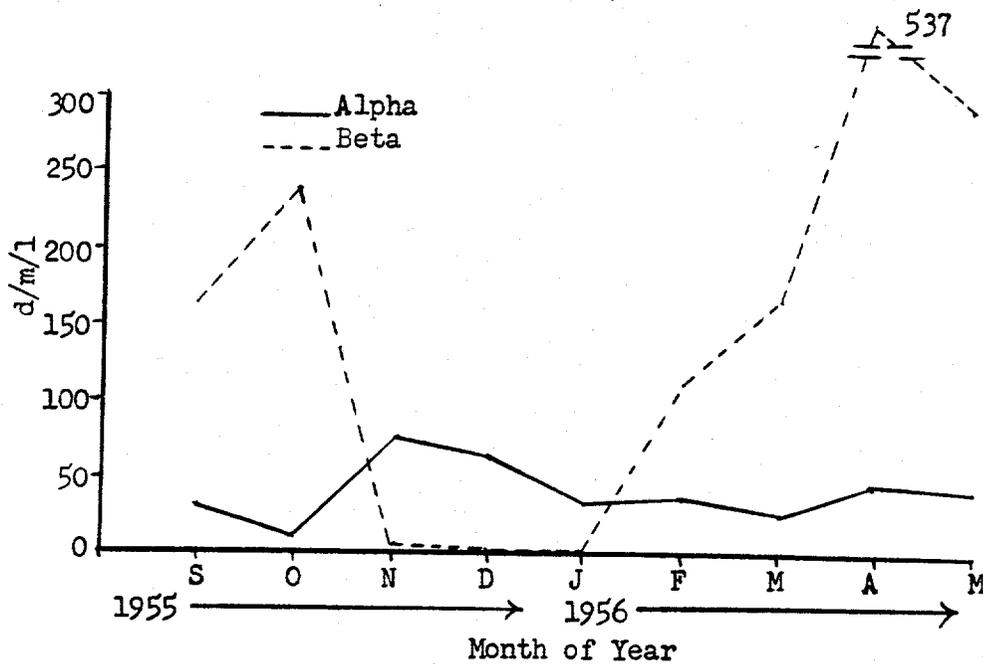


FIGURE 2 BEAR CREEK WATER

Selected Pages From Y-12 Plant Technical Division
Monthly Progress Report, June 1956
EXTRACT

M-98

Authorized Derivative Classifier
H. A. Nicholson 5-23-95
Authorized Signature Date

Authorized Derivative Declassifier
J. R. ... 5-23-95
Authorized Signature Date

This material has been reviewed by the Y-12
Classification office and has been determined
to be UNCLASSIFIED.

APPROVED FOR PUBLIC RELEASE
P. L. McKenney 5/26/95
Technical Information Office Date

This document is an EXTRACT from Y-1125 (M-98)

THIS PAGE MUST NOT BE SEPARATED FROM THE ATTACHED DOCUMENT

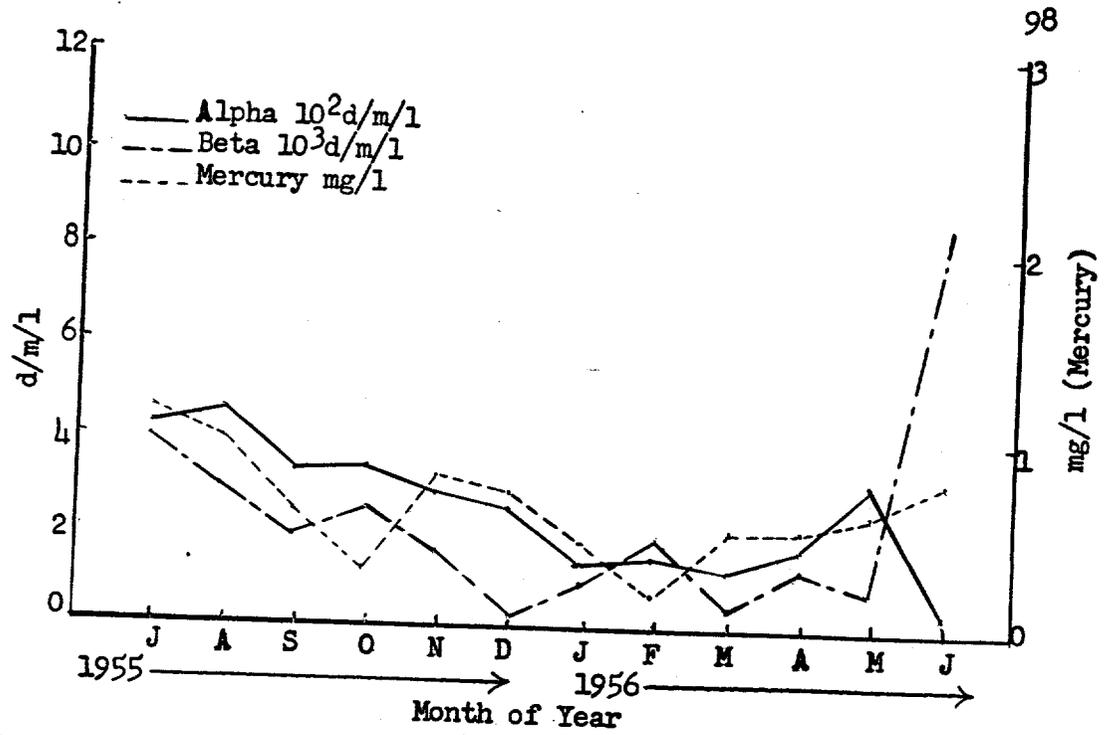


FIGURE 1. POPLAR CREEK WATER

The average concentration of radioactivity in Bear Creek and drainage from the plant disposal pit for the past ten months is shown in Figures 2 and 3 respectively.

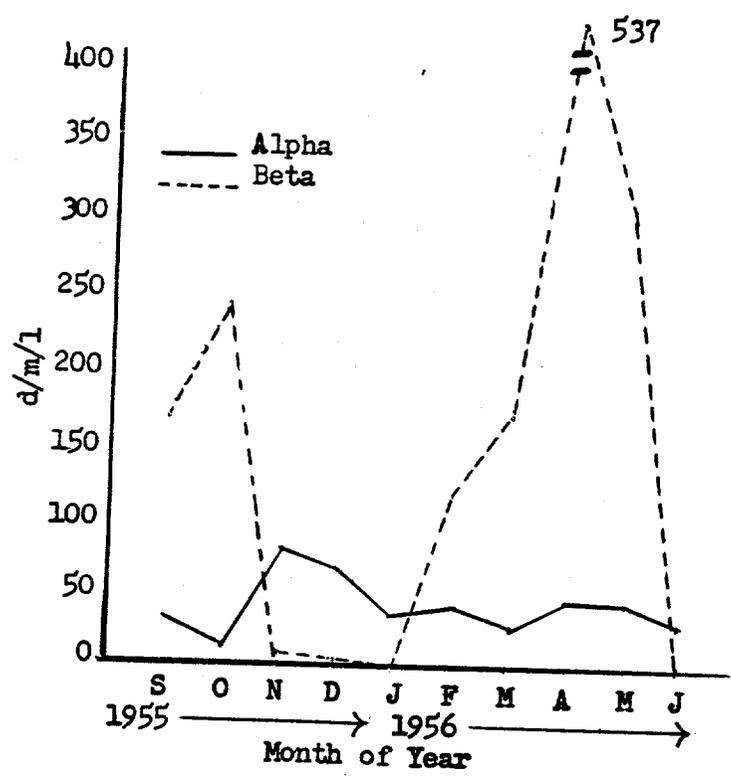


FIGURE 2. BEAR CREEK WATER

Selected Pages From Y-12 Plant Technical Division
Monthly Progress Report, July 1956 M-99
EXTRACT

Authorized Derivative Classifier
H. D. Nichols 5-23-95
Authorized Signature Date

Authorized Derivative Declassifier
Roman 5-23-95
Authorized Signature Date

This material has been reviewed by the Y-12
Classification office and has been determined
to be UNCLASSIFIED.

APPROVED FOR PUBLIC RELEASE
P. L. McCarney 5/26/95
Technical Information Office Date

This document is an EXTRACT from Y-1126 (M-99)

THIS PAGE MUST NOT BE SEPARATED FROM THE ATTACHED DOCUMENT

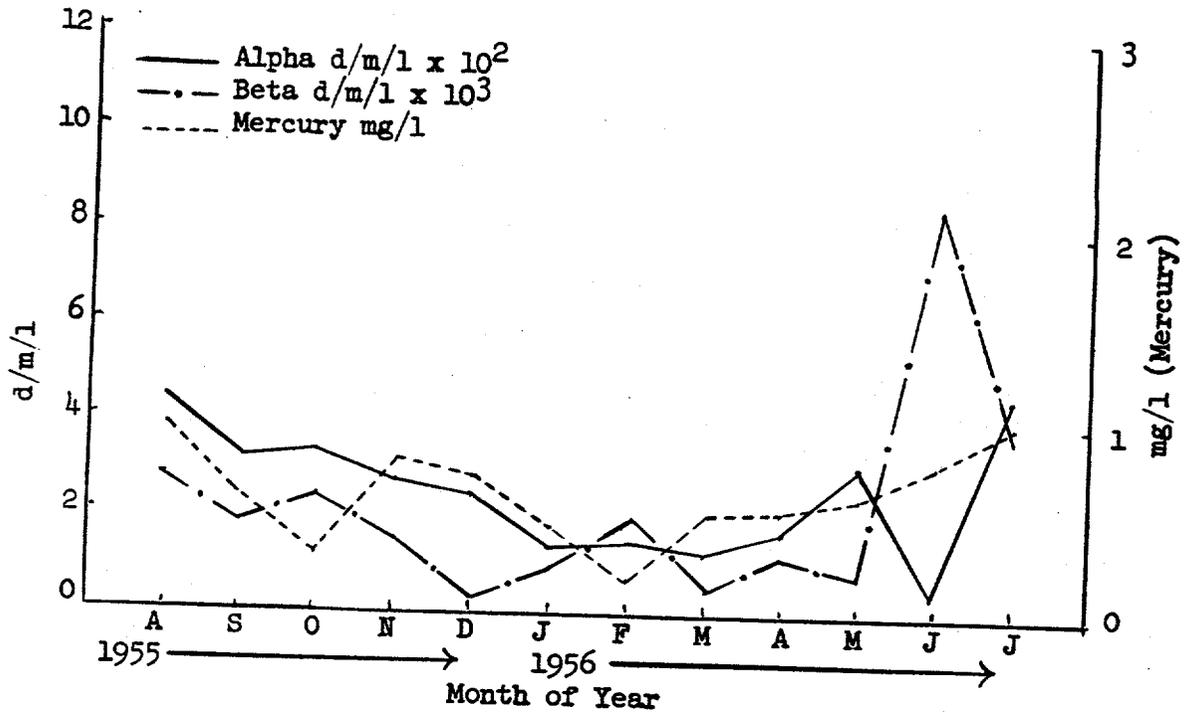


FIGURE 1. POPLAR CREEK WATER

The average concentrations of radioactivity in Bear Creek and Burial Pit for the past eleven months are shown in Figures 2 and 3 respectively.

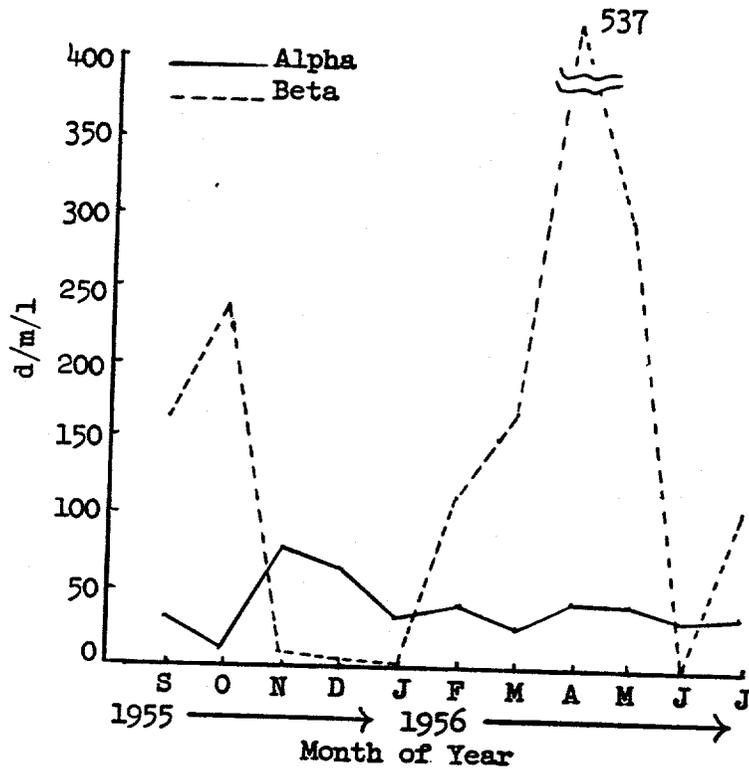


FIGURE 2. BEAR CREEK WATER

Selected Pages From Y-12 Plant Technical Division
Monthly Progress Report, August 1956 M-100
EXTRACT

Authorized Derivative Classifier
A. D. Richards 5-24-95
Authorized Signature Date

Authorized Derivative Declassifier
R. J. [Signature] 5/26/95
Authorized Signature Date

This material has been reviewed by the Y-12
Classification office and has been determined
to be UNCLASSIFIED.

APPROVED FOR PUBLIC RELEASE
P. L. McKenney 5/30/95
Technical Information Office Date

This document is an EXTRACT from Y-1127 (M-100)

THIS PAGE MUST NOT BE SEPARATED FROM THE ATTACHED DOCUMENT

II. Operation

The radioactivity and mercury concentrations in the East Fork of Poplar Creek for the past twelve months are shown in Figure 1.

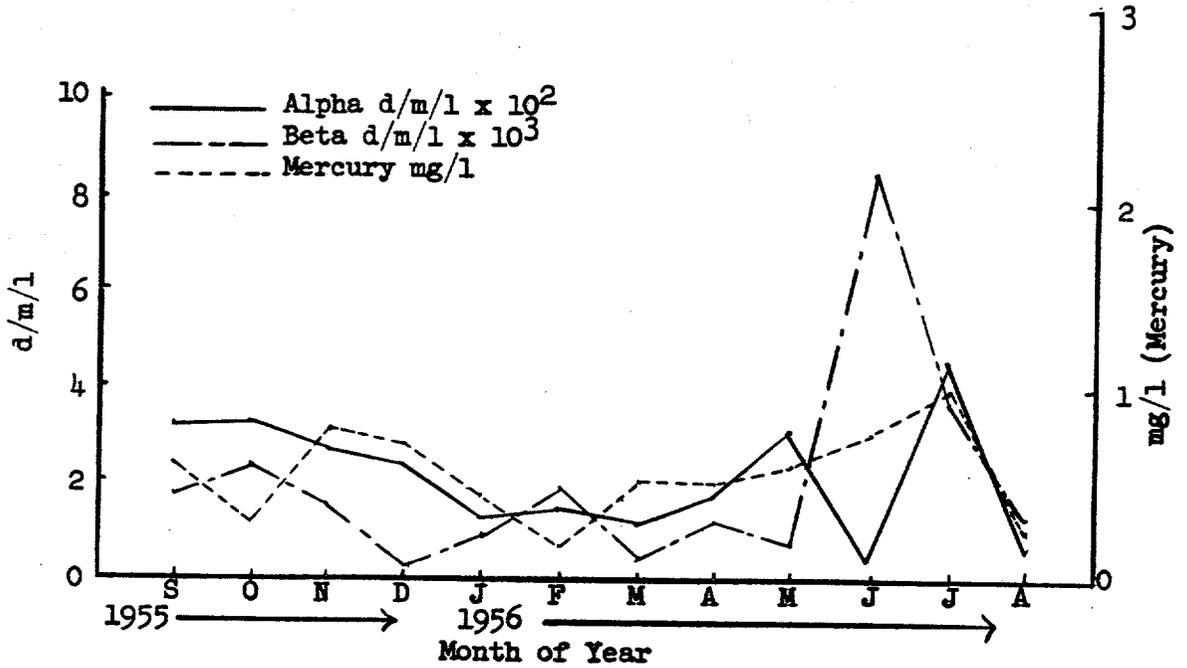


FIGURE 1. POPLAR CREEK WATER

The average concentrations of radioactivity in Bear Creek and Burial Pit for the past twelve months are shown in Figures 2 and 3 respectively.

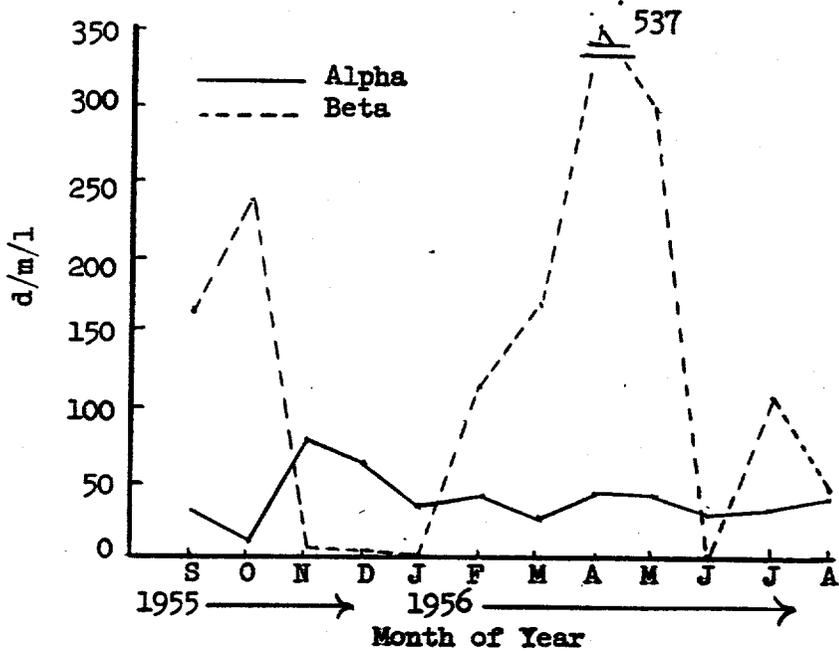


FIGURE 2. BEAR CREEK WATER

Selected Pages From Y-12 Plant Technical Division
Monthly Progress Report, September 1956 M-101
EXTRACT

Authorized Derivative Classifier
H. D. Nickerson 5-23-95
Authorized Signature Date

Authorized Derivative Declassifier
J. Rowan 5-23-95
Authorized Signature Date

This material has been reviewed by the Y-12
Classification office and has been determined
to be UNCLASSIFIED.

APPROVED FOR PUBLIC RELEASE
P. R. McKernan 5/26/95
Technical Information Office Date

This document is an EXTRACT from Y-1128 (M-101)

THIS PAGE MUST NOT BE SEPARATED FROM THE ATTACHED DOCUMENT

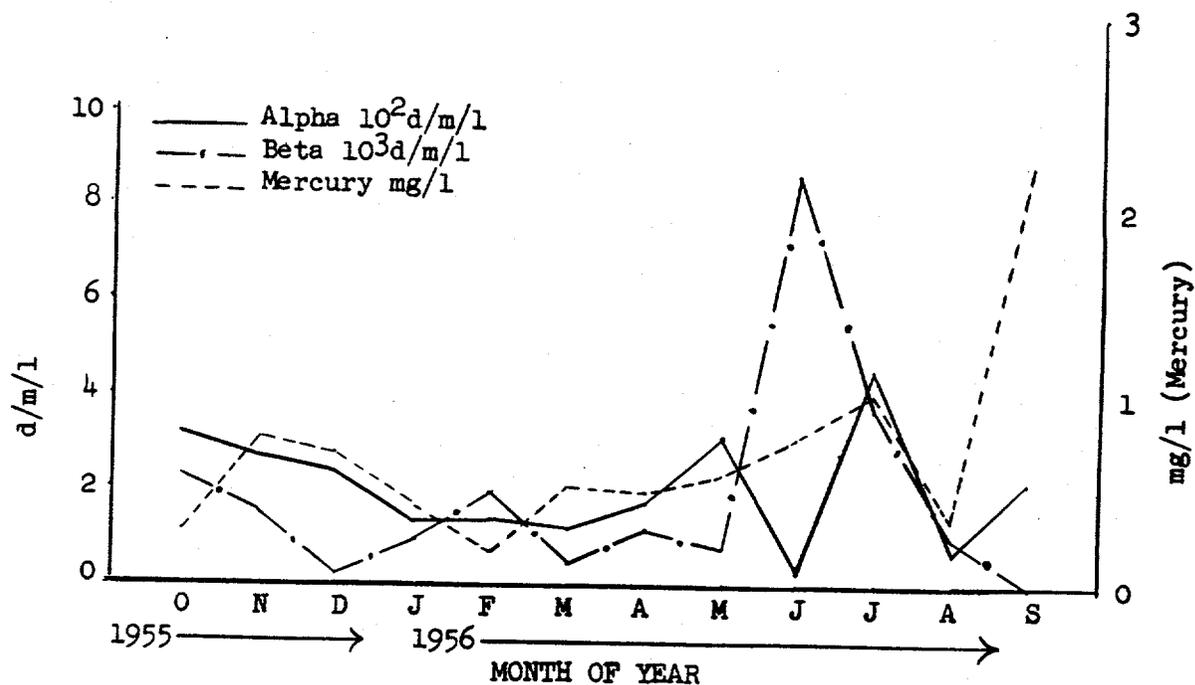


FIGURE 1. POPLAR CREEK WATER

The average concentrations of the radioactivity in Bear Creek and Burial Pit for the past twelve months are shown in Figures 2 and 3 respectively.

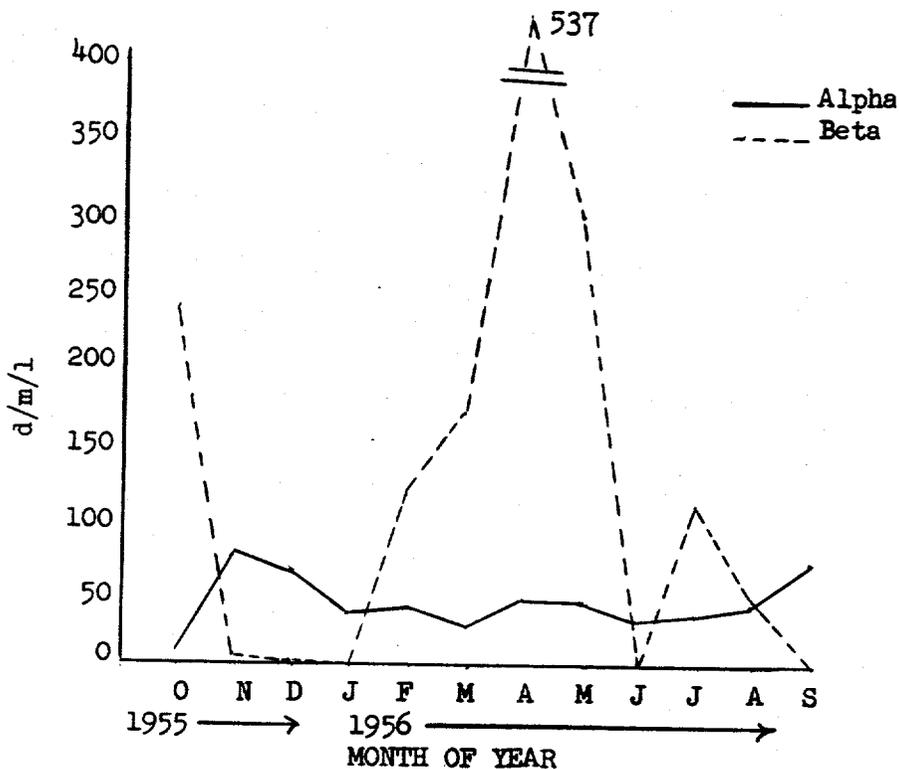


FIGURE 2. BEAR CREEK WATER

Selected Pages From Y-12 Plant Technical Division
Monthly Progress Report, October 1956 M-102
EXTRACT

Authorized Derivative Classifier
H. P. Wickham 5-23-95
Authorized Signature Date

Authorized Derivative Declassifier
Roman 5-23-95
Authorized Signature Date

This material has been reviewed by the Y-12
Classification office and has been determined
to be UNCLASSIFIED.

APPROVED FOR PUBLIC RELEASE
P. R. McKinney 5/26/95
Technical Information Office Date

This document is an EXTRACT from Y-1129 (M-102)

THIS PAGE MUST NOT BE SEPARATED FROM THE ATTACHED DOCUMENT

Fork of Poplar Creek for the past twelve months are shown in Figure D-1.

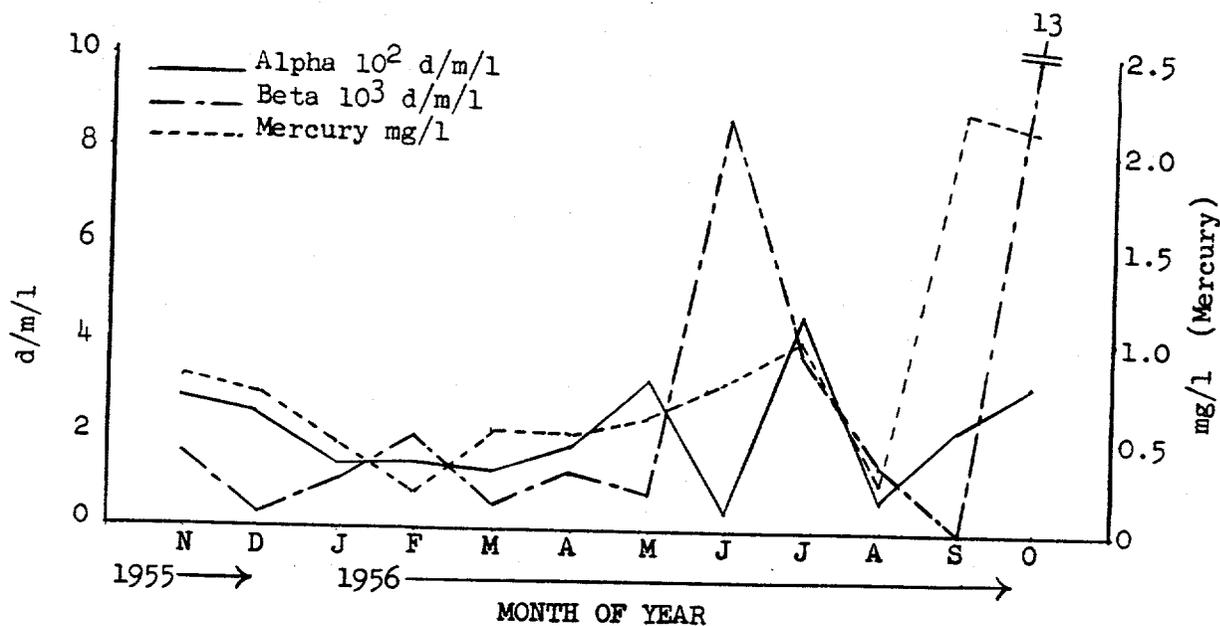


FIGURE D-1. POPLAR CREEK WATER

The average concentrations of the radioactivity in Bear Creek and Burial Pit for the past twelve months are shown in Figures D-2 and D-3 respectively.

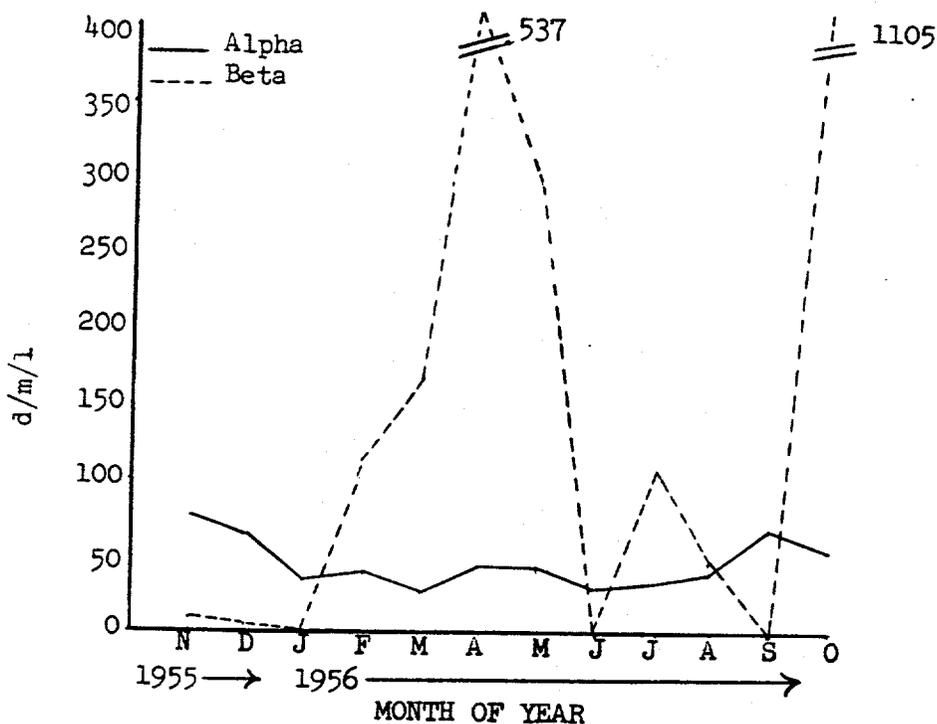


FIGURE D-2. BEAR CREEK WATER

Selected Pages From Y-12 Plant Technical Division
Monthly Progress Report, June 1957
EXTRACT

M-111

Authorized Derivative Classifier
H. A. Hickman 5-23-95
Authorized Signature Date

Authorized Derivative Declassifier
R. J. Groser 5/26/95
Authorized Signature Date

This material has been reviewed by the Y-12
Classification office and has been determined
to be UNCLASSIFIED.

APPROVED FOR PUBLIC RELEASE
P. L. McKamey 5/30/95
Technical Information Office Date

This document is an EXTRACT from Y-1165 (M-111)

THIS PAGE MUST NOT BE SEPARATED FROM THE ATTACHED DOCUMENT

The levels of radioactivity in all effluent streams from the Y-12 area continue to remain well below the prescribed control criterion as shown in Figures D-1 and D-2.

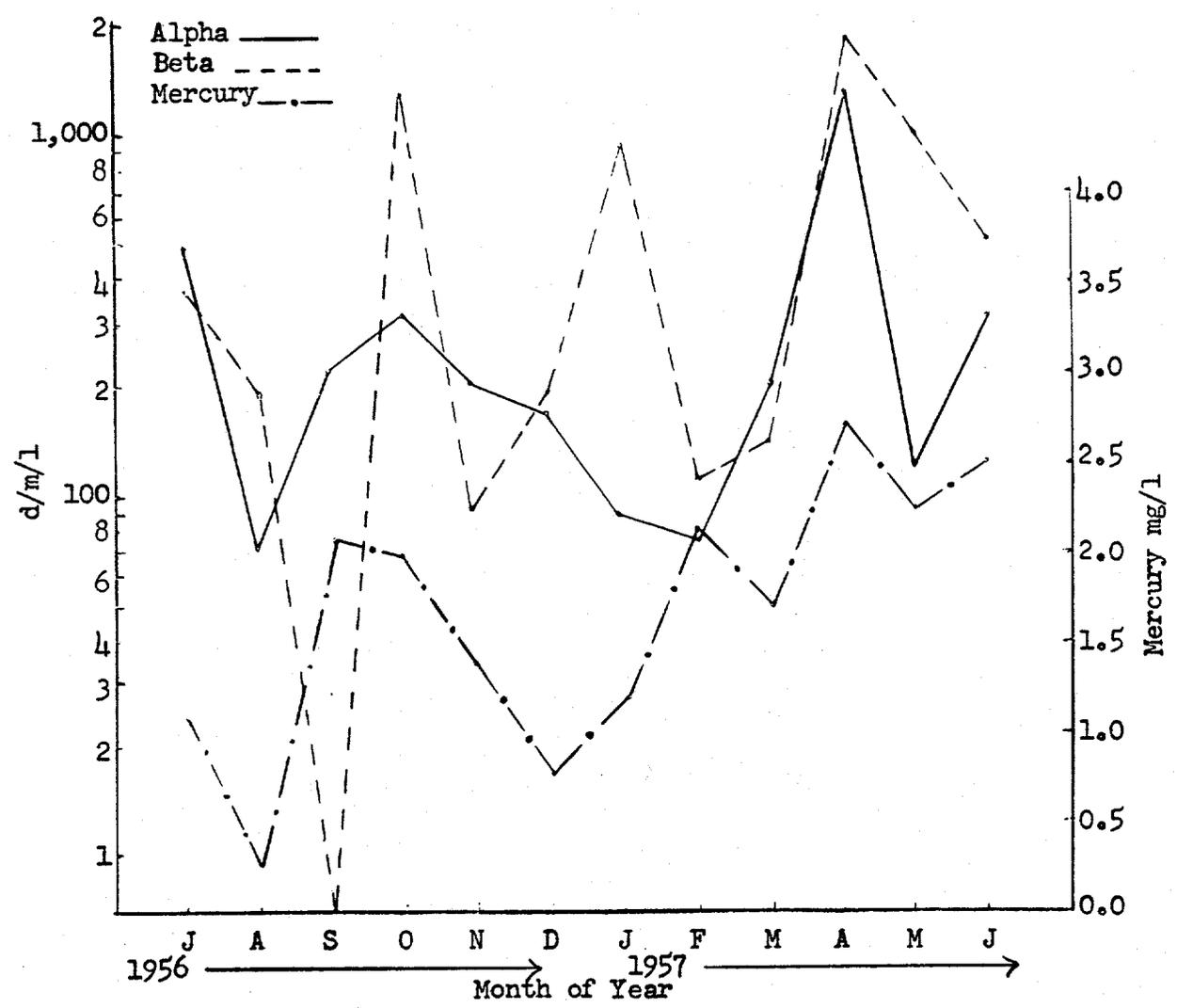


FIGURE D-1. POPLAR CREEK WATER

The maximum permissible limit (MPL) used for alpha activity is that for soluble uranium in drinking water outside of controlled areas, 1.5×10^4 d/m/liter.

The MPL used for beta activity is that for soluble thorium in water outside of controlled areas, 6.7×10^6 d/m/liter.

Selected Pages From Y-12 Plant Technical Division
Monthly Progress Report, July 1958 M148
EXTRACT

Authorized Derivative Classifier
H. A. Kishner 5-23-95
Authorized Signature Date

Authorized Derivative Declassifier
Rowan 5-23-95
Authorized Signature Date

This material has been reviewed by the Y-12
Classification office and has been determined
to be UNCLASSIFIED.

APPROVED FOR PUBLIC RELEASE
P. R. McKenney 5/26/95
Technical Information Office Date

This document is an EXTRACT from Y-1227 (M-148)

THIS PAGE MUST NOT BE SEPARATED FROM THE ATTACHED DOCUMENT

HEALTH PHYSICS

Production

Samples and Survey Summary - Listed in the table below is a summary of the routine work performed during the month of July. The June results are included for comparison.

TABLE D-1. SAMPLES AND SURVEY SUMMARY

	<u>June</u>	<u>July</u>
Water, Poplar Creek	48	48
Water, Bear Creek	4	4
Water, Burial Pit	4	3
Water, Settling Ponds	10	8
Water, Potable	42	39
Film, Badges	2,722	3,402
Film, Cassettes	68	74
Uranium Air Samples	4,566	7,971
Uranium Smears	3,077	4,535
Beryllium Air Samples	573	1,086
Beryllium Smears	74	162
Mercury Air Samples	4,613	13,010
Common Carriers Surveyed	22	49
Special Air Samples	108	94
Contamination Checks	12,900*	16,000*
Scrap Metal Monitored (tons)	67	64
Mercury Survey Instruments Calibrated	4	4
Radiation Survey Instruments Calibrated	614	937
Film Calibrated	187	229
Uranium Air Stack Samples	563	300
Tritium Air Samples	9	6
<hr/>		
Totals	30,275	48,025

*Approximate

Operation

Surface Water - The radioactive and mercury contamination in the East Fork of Poplar Creek for the past twelve months are shown in Figure D-1. In addition to the results shown in Figure D-1, daily twenty-four-hour composite samples are taken and analyzed for sodium, potassium, alloy and pH determination. These results are reported routinely to the Plant Industrial Hygienist. The average concentrations of the radioactivity in Bear Creek and Burial Pit for the past twelve months are shown in Figures D-2 and D-3 respectively.

The levels of radioactivity in all effluent streams from the Y-12 Area continue to remain well below the prescribed control criterion as shown in Figures D-1 and D-2.

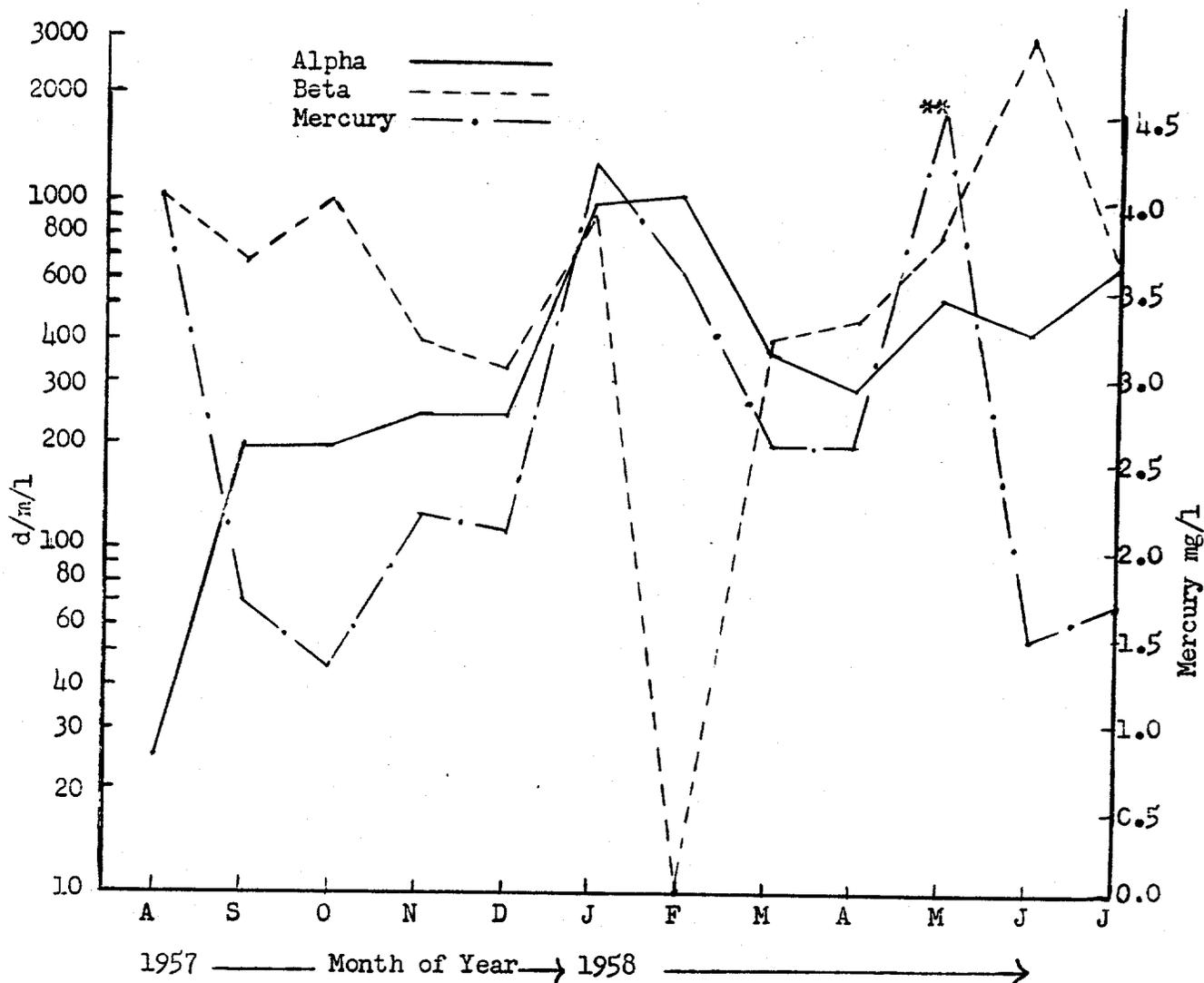


FIGURE D-1. POPLAR CREEK WATER

**This high monthly average mercury concentration is due to one high weekly concentration of 14.5 mg/l during the week of 5-9-58.

The maximum permissible limit (MPL) used for alpha activity is that for soluble uranium in drinking water outside of controlled areas, 1.5×10^4 d/m/liter.

The MPL used for beta activity is that for beta emitting daughters of natural uranium in drinking water outside of controlled areas, 1.1×10^7 d/m/liter.

Selected Pages From Y-12 Plant Technical Division
Monthly Progress Report, August 1958 M-149
EXTRACT

Authorized Derivative Classifier
H. D. Dickman 5-23-95
Authorized Signature Date

Authorized Derivative Declassifier
J. R. Ryan 5-23-95
Authorized Signature Date

This material has been reviewed by the Y-12
Classification office and has been determined
to be UNCLASSIFIED.

APPROVED FOR PUBLIC RELEASE
P. L. McKenney 5/26/95
Technical Information Office Date

This document is an EXTRACT from Y-1228 (M-149)

THIS PAGE MUST NOT BE SEPARATED FROM THE ATTACHED DOCUMENT

The levels of radioactivity in all effluent streams from the Y-12 Area continue to remain well below the prescribed control criterion as shown in Figures D-1 and D-2.

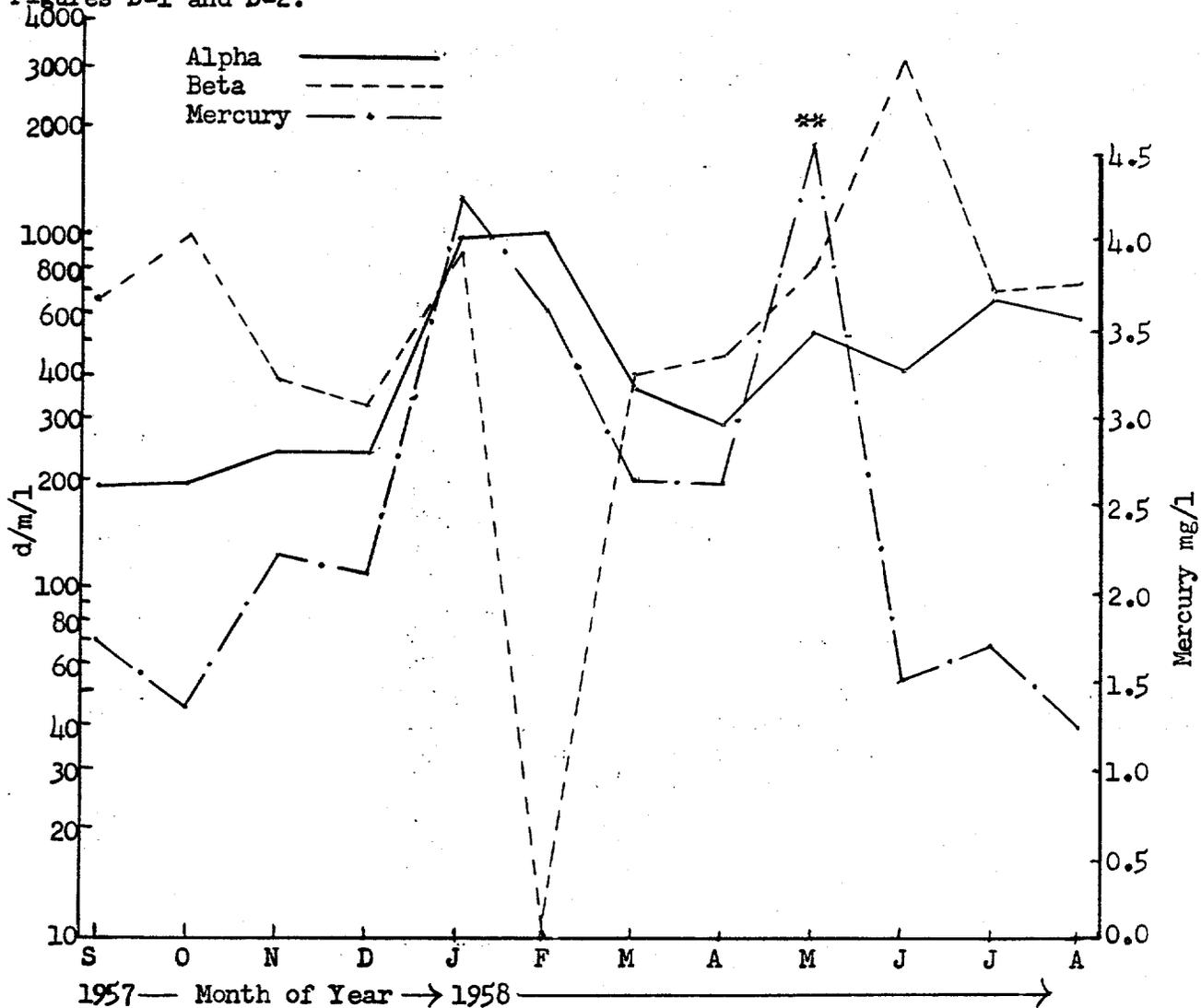


FIGURE D-1. POPLAR CREEK WATER

**This high monthly average mercury concentration is due to one high weekly concentration of 14.5 mg/l during the week of 5-9-58.

The maximum permissible limit (MPL) used for alpha activity is that for soluble uranium in drinking water outside of controlled areas, 1.5×10^4 d/m/liter.

The MPL used for beta activity is that for beta emitting daughters of natural uranium in drinking water outside of controlled areas, 1.1×10^7 d/m/liter.

Selected Pages From Y-12 Plant Technical Division
Monthly Progress Report, September 1958 M-150
EXTRACT

Authorized Derivative Classifier
J. Roman 5-23-95
Authorized Signature Date

Authorized Derivative Declassifier
R. J. Tracer 5/24/95
Authorized Signature Date

This material has been reviewed by the Y-12
Classification office and has been determined
to be UNCLASSIFIED.

APPROVED FOR PUBLIC RELEASE
P. L. McKamey 5/31/95
Technical Information Office Date

This document is an EXTRACT from Y-1229 (M-150)

THIS PAGE MUST NOT BE SEPARATED FROM THE ATTACHED DOCUMENT

are collected for radioactive determination. Submitted in Table D-2 is a resume' of the results obtained during the month of September. Daily twenty-four hour composite samples are also taken from Poplar Creek and analyzed for sodium, potassium, alloy and pH determination. These results are reported to the Plant Industrial Hygienist. The maximum permissible limit (MPL) for drinking water outside of controlled areas is 1.5×10^4 d/m/l for alpha activity and 1.1×10^7 d/m/l for beta activity.

TABLE D-2
ANALYSIS OF SURFACE WATER CONTAMINATION

Locations	Average Analysis		
	Alpha (d/m/l)	Beta (d/m/l)	Mercury (mg/l)
Poplar Creek (effluent stream)	720	3,345	0.95
Bear Creek (effluent stream)	493	571	---
Burial Pit	67,762	25,455	---
Waste Disposal Pits	54,736	270,329	---

The levels of radioactivity in all effluent streams from the Y-12 area continue to remain well below the prescribed control criterion.

Surface Contamination - Smears are taken periodically in the process areas to determine the levels of removable surface contamination. Figure D-1 shows the average results for the past twelve months for the Sunflower, Daffodil, and Areas. The Daffodil and Areas averages remain above the control criterion of 500 d/m/100cm².

Selected Pages From Y-12 Plant Technical Division
Monthly Progress Report, October 1958 M-151
EXTRACT

Authorized Derivative Classifier
R. P. Ryan 5-23-95
Authorized Signature Date

Authorized Derivative Declassifier
R. J. Mason 5/26/95
Authorized Signature Date

This material has been reviewed by the Y-12
Classification office and has been determined
to be UNCLASSIFIED.

APPROVED FOR PUBLIC RELEASE
P. L. McKenney 5/31/95
Technical Information Office Date

This document is an EXTRACT from Y-1230 (M-151)

THIS PAGE MUST NOT BE SEPARATED FROM THE ATTACHED DOCUMENT

are collected for radioactive determination. Submitted in Table D-2 is a resume' of the results obtained during the month of October. Daily twenty-four hour composite samples are also taken from Poplar Creek and analyzed for sodium, potassium, alloy and pH determination. These results are reported to the Plant Industrial Hygienist. The maximum permissible limit (MPL) for drinking water outside of controlled areas is 1.5×10^4 d/m/l for alpha activity and 1.1×10^7 d/m/l for beta activity.

TABLE D-2
ANALYSIS OF SURFACE WATER CONTAMINATION

Locations	Average Analysis		
	Alpha (d/m/l)	Beta (d/m/l)	Mercury (mg/l)
Poplar Creek (effluent stream)	1,075	1,729	1.3
Bear Creek (effluent stream)	70	110	---
Burial Pit*	435,818	19,189	---
Waste Disposal Pits	36,710	133,225	---

*Only one sample collected from this location.

The levels of radioactivity in all effluent streams from the Y-12 area continue to remain well below the prescribed control criterion.

Surface Contamination - Smears are taken periodically in the process areas to determine the levels of removable surface contamination. Figure D-1 shows the average results for the past twelve months for the Sunflower, Daffodil, and [redacted] Areas. The Daffodil Areas continue to show an average greater than the control criterion of $500 \text{ d/m}/100\text{cm}^2$.

Selected Pages From Y-12 Plant Technical Division
Monthly Progress Report, November 1958 M-152
EXTRACT

Authorized Derivative Classifier
J. Rowan 5-23-95
Authorized Signature Date

Authorized Derivative Declassifier
R. J. Fraser 5/26/95
Authorized Signature Date

This material has been reviewed by the Y-12
Classification office and has been determined
to be UNCLASSIFIED.

APPROVED FOR PUBLIC RELEASE
P. L. McKenney 5/30/95
Technical Information Office Date

This document is an EXTRACT from Y-1231 (M-152)

THIS PAGE MUST NOT BE SEPARATED FROM THE ATTACHED DOCUMENT

collected for radioactive determination. Ordinarily, weekly samples are collected from the Burial Pit and analyzed for radioactivity; however, due to an insufficient amount of water being available in the pit, no samples were collected during this report period. Submitted in Table D-2 is a resume' of the results obtained during the month of November. Daily twenty-four-hour composite samples are also taken from Poplar Creek and analyzed for sodium, potassium, alloy and pH determination. These results are reported to the Plant Industrial Hygienist. The maximum permissible limit (MPL) for drinking water outside of controlled areas is 1.5×10^4 d/m/l for alpha activity and 1.1×10^7 d/m/l for beta activity.

TABLE D-2
ANALYSIS OF SURFACE WATER CONTAMINATION

Locations	*Average Analysis		
	Alpha (d/m/l)	Beta (d/m/l)	Mercury (mg/l)
Poplar Creek (effluent stream)	500	1,200	0.75
Bear Creek (effluent stream)	110	600	----
Waste Disposal Pits	69,200	54,625	----

*Estimated

The levels of radioactivity in all effluent streams from the Y-12 area continue to remain well below the prescribed control criterion.

Surface Contamination - Smears are taken periodically in the process areas to determine the levels of removable surface contamination. Figure D-1 shows the average results for the past twelve months for the Sunflower, Daffodil, and _____ Areas. The Daffodil Areas continue to show an average greater than the control criterion of 500 d/m/100cm².

Selected Pages From Y-12 Plant Technical Division
Monthly Progress Report, December 1958
EXTRACT

M-153

Authorized Derivative Classifier
Roman 5-23-95
Authorized Signature Date

Authorized Derivative Declassifier
R. J. Traver 5/26/95
Authorized Signature Date

This material has been reviewed by the Y-12
Classification office and has been determined
to be UNCLASSIFIED.

APPROVED FOR PUBLIC RELEASE
P. L. McKemey 5/30/95
Technical Information Office Date

This document is an EXTRACT from Y-1232 (M-153)

THIS PAGE MUST NOT BE SEPARATED FROM THE ATTACHED DOCUMENT

of the results obtained during the month of December. Daily twenty-four hour composite samples are also taken from Poplar Creek and analyzed for sodium, potassium, alloy and pH determination. These results are reported to the Plant Industrial Hygienist. The maximum permissible limit (MPL) for drinking water outside of controlled areas is 1.5×10^4 d/m/l for alpha activity and 1.1×10^7 d/m/l for beta activity.

TABLE D-2

ANALYSIS OF SURFACE WATER CONTAMINATION

Locations	Average Analysis		
	Alpha (d/m/l)	Beta (d/m/l)	Mercury (mg/l)
Poplar Creek (effluent stream)	500	783	1.3
Bear Creek (effluent stream)	322	0	---
Waste Disposal Pits	26,681	113,200	---

The levels of radioactivity in all effluent streams from the Y-12 area continue to remain well below the prescribed control criterion.

Surface Contamination - Smears are taken periodically in the process areas to determine the levels of removable surface contamination. Figure D-1 shows the average results for the past twelve months for the Sunflower, Daffodil, and [redacted] Areas. The Daffodil Areas continue to show an average greater than the control criterion of 500 d/m/100 cm². Largely responsible for the high average in the Daffodil Areas were the Head House, C Wing, and C-1 Wing which indicated average levels of removable surface contamination of 2,119, 2,285, and 1,870 d/m/100 cm², respectively. The reason for the high levels in these particular areas is contamination resulting from remodeling of some of the operating equipment.

MARTIN MARIETTA ENERGY SYSTEMS, INC.

POST OFFICE BOX 2009
OAK RIDGE, TENNESSEE 37831

February 8, 1995

Ms. S. M. Flack
ChemRisk
2870 Kalmia Avenue
Suite 308
Boulder, Colorado 80301

*Y-12 Reports
Resume*

Dear Ms Flack:

Documents Requested by ChemRisk - Health Studies Agreement

Enclosed are copies of 32 documents which you have requested. Of these documents, 2 had previously been submitted for review and approval for public release, and 30 had not. In addition, there is one document that is a compilation of notes which you have taken at the Y-12 Plant. The Y-12 Plant Classification and Technical Information Offices have reviewed them and determined that they do not contain classified or controlled information.

- Y/DK-254 White, L. E., and Carter, M. H. Jr., "Determination of Mercury in Rocks, Sediments, and Soils by Flameless Atomic Absorption," Union Carbide Corporation, Nuclear Division, Y-12 Plant (May 1980).
- Y/EXT-00033 Compiled by the 1983 Mercury Task Force, "Mercury at Y-12," Union Carbide Corporation, Nuclear Division, Y-12 Plant (August 18, 1983).
DEL REV
- Y/EXT-00034 Author not shown, "Selected pages from Y-12 Plant Quarterly Report for Third Quarter, 1956, January 1-March 31, 1956," Union Carbide Nuclear Company, Y-12 Plant.
DEL REV
- Y/EXT-00035 Author not shown, "Selected pages from Y-12 Plant Quarterly Report for Fourth Quarter, 1956, April 1-June 30, 1956," Union Carbide Nuclear Company, Y-12 Plant.
DEL REV
- Y/EXT-00036 Author not shown, "Selected pages from Y-12 Plant Quarterly Report for Second Quarter, 1957, October 1-December 31, 1957," Union Carbide Nuclear Company, Y-12 Plant. *6*
DEL REV
- Y/EXT-00037 Author not shown, "Selected pages from Y-12 Plant Quarterly Report for Third Quarter, 1957, January 1-March 31, 1957," Union Carbide Nuclear Company, Y-12 Plant. *7*
DEL REV
- Y/EXT-00038 Author not shown, "Selected pages from Y-12 Plant Quarterly Report for Fourth Quarter, 1957, April 1-June 30, 1957," Union Carbide Nuclear Company, Y-12 Plant.
DEL REV

Ms. S. M. Flack
Page 2
February 8, 1995

Y/EXT-00039 DEL REV	Author not shown, "Selected pages from Y-12 Plant Quarterly Report for First Quarter, 1958, July 1-September 30, 1957," Union Carbide Nuclear Company, Y-12 Plant.
Y/EXT-00040 DEL REV	Author not shown, "Selected pages from Y-12 Plant Quarterly Report for Second Quarter, 1958, October-December 31, 1957," Union Carbide Nuclear Company, Y-12 Plant.
Y/EXT-00041 DEL REV	Author not shown, "Selected pages from Y-12 Plant Quarterly Report for Third Quarter, 1958, January-March, 1958," Union Carbide Nuclear Company, Y-12 Plant.
Y/EXT-00042 DEL REV	Author not shown, "Selected pages from Y-12 Plant Quarterly Report for Fourth Quarter, 1958, April-June, 1958," Union Carbide Nuclear Company, Y-12 Plant.
Y/EXT-00043 DEL REV	Author not shown, "Selected pages from Y-12 Plant Quarterly Report for First Quarter, 1959, July-September, 1958," Union Carbide Nuclear Company, Y-12 Plant.
Y/EXT-00044 DEL REV	Author not shown, "Selected pages from Y-12 Plant Quarterly Report for Second Quarter, 1959, October-December, 1958," Union Carbide Nuclear Company, Y-12 Plant.
Y/EXT-00045 DEL REV	Author not shown, "Selected pages from Y-12 Plant Quarterly Report for Third Quarter, 1959, January-March, 1959," Union Carbide Nuclear Company, Y-12 Plant.
Y/EXT-00046 DEL REV	Author not shown, "Selected pages from Y-12 Plant Quarterly Report for Fourth Quarter, 1959, April-June, 1959," Union Carbide Nuclear Company, Y-12 Plant.
Y/EXT-00047 DEL REV	Author not shown, "Selected pages from Y-12 Plant Quarterly Report for First Quarter, 1959, July-September, 1959," Union Carbide Nuclear Company, Y-12 Plant.
Y/EXT-00048 DEL REV	Author not shown, "Selected pages from Y-12 Plant Quarterly Report for Second Quarter, 1960, October-December, 1959," Union Carbide Nuclear Company, Y-12 Plant.
Y/EXT-00049 DEL REV	Author not shown, "Selected pages from Y-12 Plant Quarterly Report for Third Quarter, 1960, January-March, 1960," Union Carbide Nuclear Company, Y-12 Plant.

Y/EXT-00050
DEL REV Author not shown, "Selected pages from Y-12 Plant Quarterly Report for Fourth Quarter, 1960, April-June, 1960," Union Carbide Nuclear Company, Y-12 Plant.

Y/EXT-00051
DEL REV Author not shown, "Selected pages from Y-12 Plant Quarterly Report for First Quarter, 1961, July-September, 1961," Union Carbide Nuclear Company, Y-12 Plant. O

Y/EXT-00052
DEL REV Author not shown, "Selected pages from Y-12 Plant Quarterly Report for Second Quarter, 1961, October-December, 1960," Union Carbide Nuclear Company, Y-12 Plant.

Y/EXT-00053
DEL REV Author not shown, "Selected pages from Y-12 Plant Quarterly Report for Third Quarter, 1961, January-March, 1961," Union Carbide Nuclear Company, Y-12 Plant.

Y/EXT-00054
DEL REV Author not shown, "Selected pages from Y-12 Plant Quarterly Report for Fourth Quarter, 1961, April-June, 1961," Union Carbide Nuclear Company, Y-12 Plant.

Y/EXT-00055
DEL REV Author not shown, "Selected pages from Y-12 Plant Quarterly Report for First Quarter, 1962, July-September, 1961," Union Carbide Nuclear Company, Y-12 Plant.

Y/EXT-00056
DEL REV Author not shown, "Selected pages from Y-12 Plant Quarterly Report for Second Quarter, 1962, October-December, 1961," Union Carbide Nuclear Company, Y-12 Plant.

Y/EXT-00057
DEL REV Author not shown, "Selected pages from Y-12 Plant Quarterly Report for Third Quarter, 1962, January-March, 1962," Union Carbide Nuclear Company, Y-12 Plant.

Y/EXT-00058
DEL REV Author not shown, "Selected pages from Y-12 Plant Quarterly Report for Fourth Quarter, 1962, April-June, 1962," Union Carbide Nuclear Company, Y-12 Plant.

Y/EXT-00059
DEL REV Author not shown, "Selected pages from Y-12 Plant Quarterly Report for First Quarter, 1963, July-September, 1962," Union Carbide Nuclear Company, Y-12 Plant.

Y/EXT-00060
DEL REV Author not shown, "Selected pages from Y-12 Plant Quarterly Report for Second Quarter, 1963, October-December, 1962," Union Carbide Nuclear Company, Y-12 Plant.

Ms. S. M. Flack
Page 4
February 8, 1995

Y/EXT-00061
DEL REV

Author not shown, "Selected pages from Y-12 Plant Quarterly Report for Third Quarter, 1963, January-March, 1963," Union Carbide Nuclear Company, Y-12 Plant.

Y/HG-0069
Sup Rev

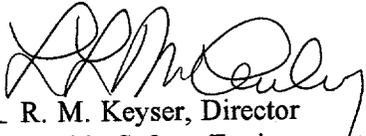
Struxness, E. G., "Health Physics - Industrial Hygiene Progress Report, July 1, 1951 to December 31, 1951," Carbide and Carbon Chemicals Company, Y-12 Plant (March 15, 1952).

Y/TS-1284/2

Flack, S. M., "Handwritten notes taken by ChemRisk during week of January 23, 1995" (January 23-27, 1995).

If you have any questions, please contact L. L. McCauley at (615) 574-7593 or S. W. Wiley at (615) 576-0263.

Very truly yours,


FOR R. M. Keyser, Director
Health, Safety, Environment,
and Accountability Organization

RMK:djl

Enclosures: As Stated

cc/encs: T. W. Joseph, DOE-ORO (2)
S. W. Wiley

cc: D. J. Bostock
T. R. Butz
R. J. Cornwell
C. D. Goins, Jr.
R. M. Keyser
A. K. Lee
L. L. McCauley
W. G. McMillan, DOE-ORO
R. J. Spence, DOE-ORO
File - CPR - RC

<< Pages to be Extracted from Y-12 Plant Quarterlyies >>

M-File	Doc. Date	Pages	EF P. Creek	
			H ₂ O	Air
37 ✓	1st Q 1956	F-3, F-4, F-5	Yrly avg. weekly comp.	2, 4, 5 monthly avgs.
38 ✓	2nd "	F-3, 4, 5, ⑥	"	"
39 ✓	3rd "	F-3, 4, 5	"	"
86 ✓	1st Q 1957	"	"	"
87 ✓	2nd "	"	"	"
88 ✓	3rd "	"	"	" + 8110 no avg.
89 ✓	4th "	"	"	" no avg.
→ 121 ✓	1st Q 1958	"	"	" + 8110 + 9808 no avg.
122 ✓	2nd "	"	"	" no avg.
123 ✓	3rd "	"	"	" no avg.
* 124 ✓	4th "	"	"	" " "
* 125 ✓	1st Q 1959	"	"	" " "
↳ 126 ✓	2nd "	"	"	" " "
↳ 127 ✓	3rd "	"	"	" " "
↳ 128 ✓	4th "	F-3, 4, 5, ⑥	"	" " "
129 ✓	1st Q 1960	F-21, 22, 23, 24	"	" " "
130 ✓	2nd "	F-19, 20, 21, 22	"	" " "
131 ✓	3rd "	F-22, 23, 24	"	" " "
132 ✓	3rd Q 1962	F-29, 30, 31, 32	"	no avgs. no bldg-specific

M-19
Missing *
3rd Q 1956

L-5
shut down
ops

quarters reported retrospectively (June, May, April)

report format changed

See 12593 notes

* 9808 has same magnitude in levels

1-25-95
1 of 1

α-5 shutdown ops

(M-126) A-10 nothing mentioned
C-20 shutdown 3-13 to 5-18-59 because of reduced requirements
D-16 H₂SO₄ system
G-8 ref. to α-5 shutdown!

* (M-125) A-3, 4, 5
C-28, 29, 20 → 2 steps: 3-13-59, 0700 (time)
D-2, 20 " " 1000 "
G-11 → the details of the shutdown procedure
→ nothing added
→ nothing

(M-130) A-2
C-8 α-5 being held in standby
D-3 special metals fabricating plant planned?
in α-5

(M-131) A-2 nothing
C-8 still in standby
D-2 nothing

EXTRACTS cont'd

for
chkpt-4
shutdown
in 1962
4th Q (Dec.)

	Pages	July avg EFPC	α-4, α-5, 8-10, 9008 <small>no avg.</small>
M-132 4 th Q 1960	F-21, 22, 23, 24	✓	✓ ✓
133 1 1961	F-22, 23, 24	✓	✓ disc'd ✓ ✓
134 2	F-25, 26, 27, 28, 29	✓	✓ X ✓ ✓
135 3	F-23, 24, 25, 26, 27	✓	✓ X ✓ ✓
136 4	F-20, 21, 22, 23	✓	nothing
137 1 1962	F-21, 22, 23, 24	✓	"
138 2	F-23, 24, 25, 26	✓	"
139 3 rd Q 1962	F-29, 30, 31, 32	✓	no avg. no bldg specifics
140 4 th	F-25, 26, 27	in text	"
141 1963	F-25, 26, 27, 28	X disc'd	"



Y-12 PLANT QUARTERLY REPORT

Third Fiscal Quarter, 1956

January 1 - March 31, 1956

M-37

EXTRACT

Authorized Derivative Classifier	
 Authorized Signature	<u>2/1/95</u> Date

Authorized Derivative Declassifier	
 Authorized Signature	<u>2/2/95</u> Date

This material has been reviewed by the Y-12 Classification office and has been determined to be UNCLASSIFIED.

APPROVED FOR PUBLIC RELEASE	
_____	_____
Technical Information Office	Date

This document is an EXTRACT from (Y-1013)

THIS PAGE MUST NOT BE SEPARATED FROM THE ATTACHED DOCUMENT

Poplar Creek Water Sampling

Water samples from the East Fork of Poplar Creek were taken daily at random times and composited weekly for analysis of mercury concentration. Daily and random samples were also analyzed for lithium, sodium, potassium and stream pH. The average results of these samples along with the average daily creek flow in gallons are presented in Table F-2.

TABLE F-2

POPLAR CREEK WATER ANALYSES

	This Quarter	Last Quarter
Average Flow	11.7 x 10 ⁶ gals/day	10.8 x 10 ⁶ gals/day
Mercury	0.37 mg/l	0.70 mg/l
Lithium	15 ppm	17 ppm
Sodium	53 ppm	69 ppm
Potassium	10 ppm	6 ppm
Stream pH	8.7	9.4

Noise Studies

Instrumentation for sound survey analysis has been obtained and studies in various Plant locations are being made to determine whether noise hazards exist.

Personnel Exposure to Mercury

The routine urine sampling program for people working with mercury was continued with a marked increase in the number of samples obtained. Reasons for this increase were: (1) to determine if spot samples were adequate excretion criteria, and (2) to use in conjunction with a mercury detector badge study and a shower study.

The maximum allowable concentration for mercury in urine is 0.30 mg/l. Table F-3 lists data relative to the urinary sampling program showing the trend over the past year.

TABLE F-3

URINARY MERCURY DATA

	Third Qt. FY 1956	Second Qt. FY 1956	First Qt. FY 1956	Fourth Qt. FY 1955
Number People Sampled	931	793	756	776
Percent of People Above MAC	27.5	28	32	21.6
Number Samples Taken	1,875	921	868	988
Percent of Samples Above MAC	29.5	26	34	24

Air Analyses

Routine environmental air analyses for the various contaminants found in Plant operating areas were continued. A breakdown of these analyses is found in Table F-4. In addition to these, samples were taken covering stack effluents, source samples, smear data, etc. The number of samples taken under each category is given in Table F-5.

TABLE F-4
ROUTINE ENVIRONMENTAL AIR ANALYSES

Contaminant	MAC	This Quarter		Last Quarter	
		No. of Samples	Percent Above MAC	No. of Samples	Percent Above MAC
Ammonia	100 ppm	6	17	0	
Arsenic	100 $\mu\text{g}/\text{m}^3$	32	0	14	0
Beryllium	2 $\mu\text{g}/\text{m}^3$	423	0	260	0
Cadmium	100 $\mu\text{g}/\text{m}^3$	14	28	3	0
Fluoride (Dust)	2.5 mg/m^3	9	0	0	
Hydrogen Cyanide	10 ppm	41	0	19	0
Hydrogen Fluoride	3 ppm	6	83	0	
Lithium	35 $\mu\text{g}/\text{m}^3$ *	7	28	0	
Mercury	0.10 mg/m^3	73,488	38	50,011	72
Nitrogen Dioxide	5 ppm	29	0	24	0
Ozone	1 ppm**	24	0	24	0
Perchloroethylene	200 ppm	31	0	0	
Rhodium	100 $\mu\text{g}/\text{m}^3$ †	19	0	7	0
Scandium	100 $\mu\text{g}/\text{m}^3$ †	24	0	4	0
Thallium	100 $\mu\text{g}/\text{m}^3$ †	28	0	19	0
Trichloroethylene	200 ppm	22	0	0	
Uranium (Dust)	0.15 mg/m^3 ††	3	0	0	
Yttrium	100 $\mu\text{g}/\text{m}^3$ †	27	0	7	0

* - Based on irritation level.

** - Used by Y-12 plant for exposure of short duration.

† - Arbitrary reporting limit.

†† - Based on chemical toxicity.

TABLE F-5
MISCELLANEOUS AIR AND SMEAR SAMPLES

Contaminant	Type Sample	Number of Samples	
		This Quarter	Last Quarter
Beryllium	Smear	52	37
Lithium	Stack	12	70
Mercury	Source	294	919
Mercury	Clean Laundry	374	245
Mercury	Building Vents		119

Average building concentrations for mercury vapor since July 1955 for Buildings 9201-4 and 9201-5 are presented in Table F-6 and the trends in these air concentrations are shown in Figure F-1. It can be seen that positive results are being realized from the concerted effort which has been put forth in building decontamination.

TABLE F-6
AVERAGE MERCURY VAPOR AIR CONCENTRATIONS

	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
<u>Building 9201-4</u>									
Number of Samples Taken	2,791	4,156	7,534	5,686	5,734	7,073	7,224	8,492	10,373
Percent of Samples Which Exceeded the MAC	93.0%	85.0%	88.0%	83.0%	77.0%	81.0%	72.5%	41.0%	9.7%
Average Building Hg Vapor Air Concentration in mg/m ³	0.32	0.20 .22	0.19 .24	0.19 .24	0.18 .21	0.22 .28	0.16 .20	0.10 .11	0.06
<u>Building 9201-5</u>									
Number of Samples Taken	3,233	4,098	6,064	9,052	7,429	8,379	9,556	13,605	15,026
Percent of Samples Which Exceeded the MAC	88.0%	87.0%	87.0%	85.0%	77.0%	77.0%	69.0%	49.7%	22.5%
Average Building Hg Vapor Air Concentration in mg/m ³	.33 0.30	.33 0.30	.27 0.26	.23 0.21	.21 0.19	.20 0.18		.11 0.10	.09 0.08

AVERAGE BUILDING Hg VAPOR AIR CONCENTRATIONS

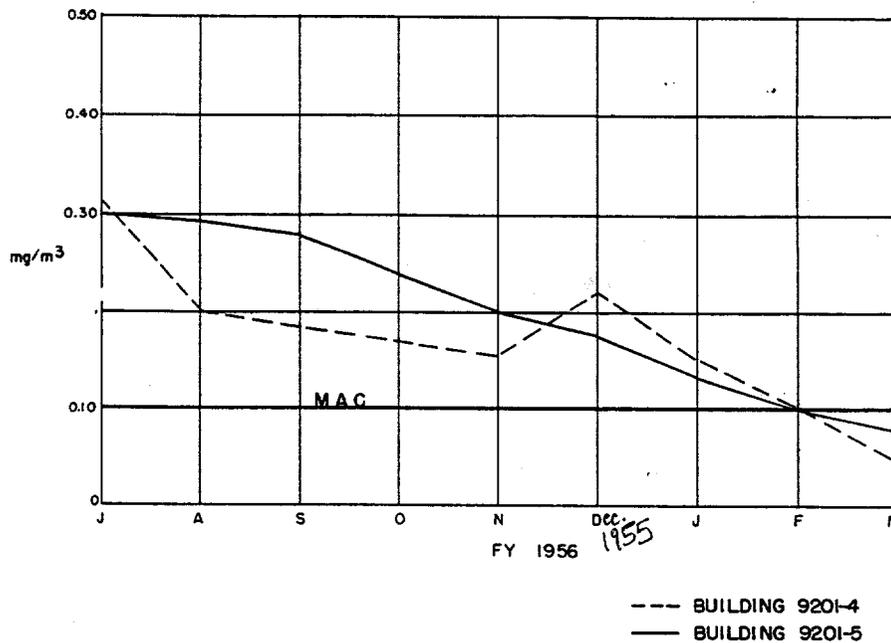


FIGURE F-1

Y-12 PLANT QUARTERLY REPORT

Fourth Fiscal Quarter, 1956

April 1 - June 30, 1956 M-38

EXTRACT

Authorized Derivative Classifier

M. J. [Signature] 2/1/95
Authorized Signature Date

Authorized Derivative Declassifier

R. Bando [Signature] 2/2/95
Authorized Signature Date

This material has been reviewed by the Y-12
Classification office and has been determined
to be UNCLASSIFIED.

APPROVED FOR PUBLIC RELEASE

m. d. Bond 2/6/95
Technical Information Office Date

This document is an EXTRACT from (Y-1014)

THIS PAGE MUST NOT BE SEPARATED FROM THE ATTACHED DOCUMENT

random samples were also analyzed for lithium, sodium, potassium, and stream pH. The average results of these samples along with the average daily creek flow in gallons are presented in Table F-2.

TABLE F-2
POPLAR CREEK WATER ANALYSES

	This Quarter	Last Quarter
Average Flow	11.3 million gals/day	11.7 million gals/day
Mercury	0.66 mg/l	0.37 mg/l
Lithium	13 ppm	15 ppm
Sodium	57 ppm	53 ppm
Potassium	5 ppm	10 ppm
Stream pH	8.8	8.7

Noise Studies

Noise studies are being made in various Plant locations and recommended changes are being accomplished in an attempt to reduce the over-all noise in certain areas.

Personnel Exposure to Mercury

The routine urine sampling program for people working with mercury was continued during the quarter with the exception of one change; the use of a 24-hour, carry-home sampling kit was discontinued in favor of spot samples. These spot samples are being obtained at the end of a work week for some participants and at the beginning of a work week for others to see if there are differences in an individual's excretion rate.

Special studies continue on personnel taking showers and others who are being followed on a weekly sample basis to see what trends, if any, developed.

The maximum allowable concentration for mercury in urine is 0.30 mg/l. Table F-3 lists data relative to the urinary sampling program showing the trend over the past four quarters.

TABLE F-3
URINARY MERCURY DATA

	Fourth Qt. FY 1956*	Third Qt. FY 1956	Second Qt. FY 1956	First Qt. FY 1956
Number People Sampled	900	931	793	756
Percent of People Above MAC	28.5	27.5	28	32
Number of Samples Taken	1,346	1,875	921	868
Percent of Samples Above MAC	32	29.5	26	34

*These are estimated values.

Air Analyses

Routine environmental air analyses for the various contaminants found in Plant operating areas were continued. A breakdown of these analyses is given in Table F-4. In addition to these, samples were taken covering stack effluents, source samples, smear data, etc. The number of samples taken under these categories is given in Table F-5.

TABLE F-4
ROUTINE ENVIRONMENTAL AIR ANALYSES

Contaminant	MAC	This Quarter		Last Quarter	
		No. of Samples	Percent Above MAC	No. of Samples	Percent Above MAC
Ammonia	100 ppm	0		6	17
Arsenic	100 $\mu\text{g}/\text{m}^3$	0		32	0
Benzene	35 ppm	4	0	0	
Beryllium	2 $\mu\text{g}/\text{m}^3$	233	0	423	0
Cadmium	100 $\mu\text{g}/\text{m}^3$	0		14	28
Carbon Monoxide	100 ppm	6	0	0	
Chlorine	1 ppm	51	14	0	
Dust (No free Silica)	50 mppcf	24	0	0	
Fluoride (Dust)	2.5 mg/m^3	0		9	0
Hydrogen Cyanide	10 ppm	51	0	41	0
Hydrogen Fluoride	3 ppm	0		6	83
Lithium	35 $\mu\text{g}/\text{m}^3$ *	0		7	28
Mercury	0.10 mg/m^3	87,942	19	73,488	38
Nitrogen Dioxide	5 ppm	4	0	29	0
Ozone	1 ppm **	4	0	24	0
Perchloroethylene	200 ppm	37	4	31	0
Rhodium	100 $\mu\text{g}/\text{m}^3$ †	0		19	0
Scandium	100 $\mu\text{g}/\text{m}^3$ †	0		24	0
Thallium	100 $\mu\text{g}/\text{m}^3$ †	0		28	0
Trichlorethylene	200 ppm	194	40	21	0
Uranium (Dust)	0.15 mg/m^3 ††	0		3	0
Yttrium	100 $\mu\text{g}/\text{m}^3$ †	0		27	0

*Based on irritation level.

**Used by Y-12 Plant for exposures of short duration.

† Arbitrary reporting limit.

†† Based on chemical toxicity.

Average building concentrations for mercury vapor for fiscal year 1956 for Buildings 9201-4 and 9201-5 are presented in Table F-6 and the trends in these air concentrations are shown in Figure F-1. It can be seen that positive results are being realized from the concerted efforts put forth in building decontamination.

TABLE F-5
MISCELLANEOUS AIR AND SMEAR SAMPLES

Contaminant	Type Sample	Number of Samples	
		This Quarter	Last Quarter
Beryllium	Smear	63	52
Lithium	Stack	9	12
Lithium	Demister	60	
Mercury	Source	207	294
Mercury	Clean Laundry	509	374
Mercury	Fan Rooms & Vent	800	

TABLE F-6
AVERAGE MERCURY VAPOR AIR CONCENTRATIONS

	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
<u>Building 9201-4</u>												
Number of Samples Taken	2,791	4,156	7,534	5,686	5,734	7,073	7,224	8,492	10,373	10,116	11,199	10,943
Percent of Samples which Exceeded the MAC	93.0%	85.0%	88.0%	83.0%	77.0%	81.0%	72.5%	41.0%	9.7%	4.0%	5.0%	4.6%
Average Building Hg Vapor Air Concentration in mg/m ³	0.32	0.20	0.19	0.19	0.18	0.22	0.16	0.10	0.06	0.05 0.04	0.05 0.04	0.05 0.04
<u>Building 9201-5</u>												
Number of Samples Taken	3,233	4,098	6,064	9,052	7,429	8,379	9,556	13,605	15,026	17,027	15,219	14,182
Percent of Samples which Exceeded the MAC	88.0%	87.0%	87.0%	85.0%	77.0%	77.0%	69.0%	49.7%	22.5%	28.0%	26.0%	27.0%
Average Building Hg Vapor Air Concentration in mg/m ³	0.30	0.30	0.26	0.21	0.19	0.18	0.15	0.10	0.08	0.10 0.07	0.10 0.08	0.10 0.08

F-6

AVERAGE BUILDING Hg VAPOR AIR CONCENTRATIONS

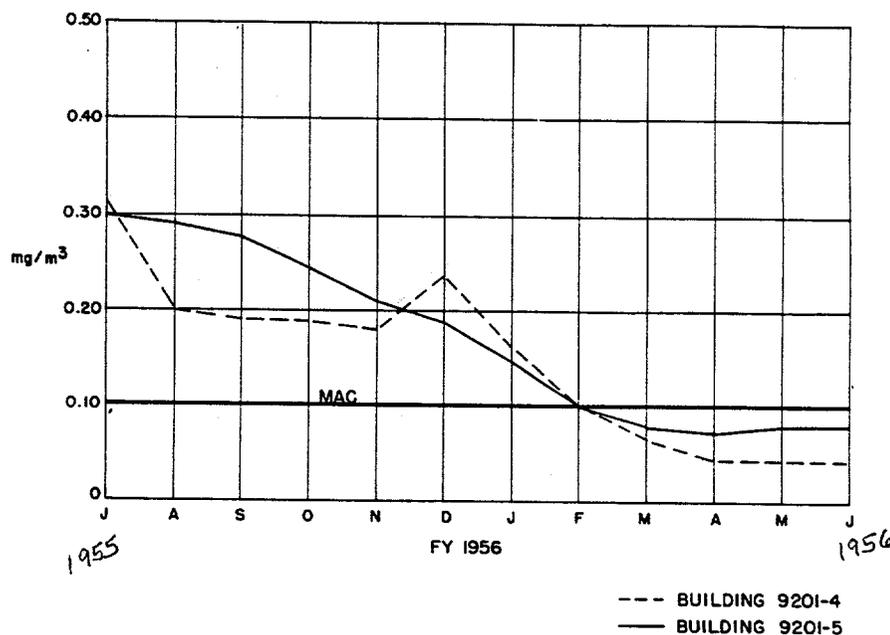


FIGURE F-1

SAFETY

ACCIDENT EXPERIENCE

Two fatalities and eight disabling injuries were experienced during this period resulting in a quarterly frequency rate of 3.25, which represents an increase of approximately 30% over the rate of 2.55 for the previous three months. A total of 1,522 medical treatment (non-disabling) injuries were sustained, giving a frequency rate of 495, as compared with 1,363 medical treatment injuries suffered during the previous quarter, with a frequency rate of 434.

The two fatalities which occurred this quarter resulted from an explosion on the morning of May 14 in the salvage yard located in the far west portion of the area. Three men were engaged in clearing scrap material for a passageway to allow crane operations which were to assist in the disposal of zirconium salvage material. Two of the men died as a direct result of the explosion; the third sustained the loss of an arm but has recovered satisfactorily. All evidence indicates that some finely divided zirconium metal was the exploding material.

Figure F-2 graphically compares the disabling injuries on-the-job and the number of days lost or charged with those experienced off-the-job, while Figure F-3 gives an analysis of on-the-job accident causes. Twenty-six percent of on-the-job injuries were attributed to using unsafe equipment or equipment unsafely. Table F-7 represents a condensed summary of the Plant accident experience for this period.

Poplar Creek Water Sampling

Water samples from the East Fork of Poplar Creek were taken daily at random times and composited weekly for analysis of mercury, lithium, sodium, potassium, and stream pH. The average results of these samples along with the average daily creek flow in gallons are presented in table F-2.

Table F-2

POPLAR CREEK WATER ANALYSES

	This Quarter	Last Quarter
Average Flow	10.8 million gals/day	11.3 million gals/day
Mercury	1.53 mg/l	0.66 mg/l
Lithium	11 ppm	13 ppm
Sodium	54 ppm	57 ppm
Potassium	8 ppm	5 ppm
pH	8.8	8.8

Noise Studies

The program of noise reduction in areas where noise levels are above damage risk criteria is being continued.

Personnel Exposure to Mercury

The routine urine sampling program for people working with mercury was continued during the quarter. Special studies on excretion rates from various groups of people are also being continued.

Table F-3 lists data relative to the urinary sampling program showing the trend over the past four quarters. It is significant that there has been a decrease in the percent of samples greater than the maximum allowable concentration of 0.30 mg/l.

Table F-3

URINARY MERCURY DATA

	First Qt. FY 1957*	Fourth Qt. FY 1956	Third Qt. FY 1956	Second Qt. FY 1956
Number of People Sampled	964	1,090	931	793
Percent of People Above MAC	17.5	29	27.5	28
Number of Samples Taken	1,203	1,948	1,875	921
Percent of Samples Above MAC	14	26.5	29.5	26

*These are estimated values.

Average building concentrations for mercury vapor for the present quarter and for the fourth quarter fiscal year 1956 are presented in table F-6, and the trends in these air concentrations are shown in figure F-1.

Table F-6
AVERAGE MERCURY VAPOR AIR CONCENTRATIONS

	Fourth Quarter FY 1956			First Quarter FY 1957		
	April	May	June	July	August	September
<u>Building 9201-4</u>						
Number of Samples Taken	10,116	11,199	10,943	10,676	11,416	7,417
Percent of Samples which Exceeded the MAC	4.0%	5.0%	4.6%	6.0%	3.0%	1.6%
Average Building Hg Vapor Air Concentration in mg/m ³	0.04	0.04	0.04	0.05	0.04	0.03
<u>Building 9201-5</u>						
Number of Samples Taken	17,027	15,219	14,182	10,838	12,843	15,299
Percent of Samples which Exceeded the MAC	28.0%	26.0%	27.0%	30.0%	30.0%	21.0%
Average Building Hg Vapor Air Concentration in mg/m ³ .	0.07	0.08	0.08	0.08	0.07	0.06

AVERAGE BUILDING Hg VAPOR AIR CONCENTRATIONS

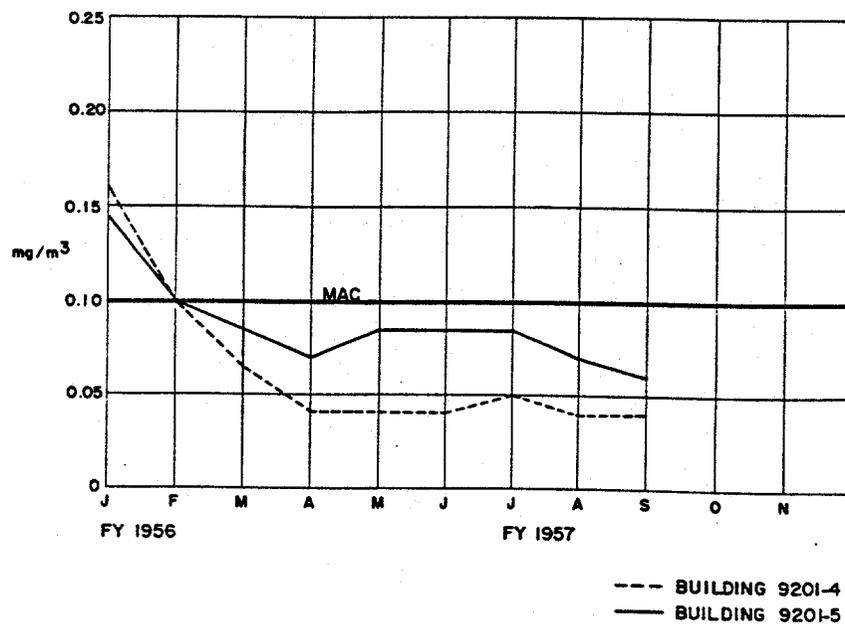


FIGURE F-1

- Building 9736 - Approximately 450 square feet of floor space was remodeled into a laboratory for the Fire resistive materials on combustible studding was used.
- Building 9736 - The 500 kw motor-generator set was enclosed with fire resistive sheet rock on wooden studding.

Important Occupancy Changes

- Buildings 9720-15
9723-14
9723-16
9723-21 - The H. K. Ferguson Construction Company occupied these buildings as warehouses, shops, and offices in relation to the construction of building 9215. A first aid station was built in building 9723-14 and several temporary construction shacks were placed in the area around North First Street and "G" Road.
- Building 9204-4 - The H. K. Ferguson Construction Company occupied and began stripping this building preparatory to converting it to a new operation.
- Building 1501-2 - The bulk storage of NaK, sodium fluoride, zirconium fluoride and sodium was changed from buildings 9201-3 and 9998 into this building.
- Building 9201-3 - The scale, lock and key shop moved from this building into the Butler-type building on the east side of building 9201-5.
- Building 9720-13 - Salvage Department moved from building 9929-1 into this non-combustible Butler-type building. Building 9929-1 is to be occupied by a salvage contractor.
- Building 9401-3 - This large coal burning steam plant was converted to natural gas for the summer months. The conversion piping and burners are equipped with approved safety controls.
- Building 9211 - H. K. Ferguson Construction Company installed depleted metal salvage dust collectors, air supply system, and exhaust system in this building.
- Building 9201-3 - A large emergency generator set was moved from building 9204-4 into this building.

Installation of Fixed Fire Protection Equipment

- Building 9202 - Five sprinkler heads were installed to protect the new addition to the combustible pent house in this building.
- Building 9720-8 - Twelve fire hose stations were installed in this building.

with a Yorkmesh demister in the vent line the over-all efficiency was about 80%. These results indicate that the plastic blanket does upgrade the size of the entrained droplets but not to a sufficient degree to make such a device attractive. A spray tower made by arranging four spray nozzles in series in a four-inch diameter pipe was tested. Efficiency of this device was essentially 100% when used with the plastic blanket in the tray. Such a tower could be used with the present ventilation system to serve two trays with only slight modifications.

Mercury Recovery

A small plate-and-frame filter press was set up to filter a portion of the waste stream which is pumped from the sump in back of Alpha-4 to the creek. The filter medium was paper and the filter effluent was sparkling clean. Pressure drop across the filter was very low and did not increase appreciably with time. The analytical results are somewhat in doubt but indicate that a good portion of the mercury can be removed by filtration.

LABORATORY STUDIES

Cascade Feed

In line with efforts to improve the quality of feed salt, tests were made at the request of LCA to determine whether a proposed change in activated carbons used in their purification process would adversely affect the amalgam stability characteristics of their feed salt.

Y-12 PLANT QUARTERLY REPORT

Second Fiscal Quarter, 1957

October 1 - December 31, 1956

M-39

EXTRACT

Authorized Derivative Classifier

[Signature] 2/1/95
Authorized Signature Date

Authorized Derivative Declassifier

[Signature] 2/2/95
Authorized Signature Date

This material has been reviewed by the Y-12
Classification office and has been determined
to be UNCLASSIFIED.

APPROVED FOR PUBLIC RELEASE

m. d. Bond 2/6/95
Technical Information Office Date

This document is an EXTRACT from (Y-1016)

THIS PAGE MUST NOT BE SEPARATED FROM THE ATTACHED DOCUMENT

Poplar Creek Water Sampling

Water samples from the East Fork of Poplar Creek were taken daily and composited weekly for the analysis of mercury. Daily samples at random times were analyzed for lithium, sodium, potassium, and stream pH. The average results of these samples along with the average daily creek flow in gallons are presented in Table F-2.

Table F-2

POPLAR CREEK WATER ANALYSES

	This Quarter	Last Quarter
Average flow	8.1 million gals/day	10.8 million gals/day
Mercury	1.26 mg/l	1.53 mg/l
Lithium	9 ppm	11 ppm
Sodium	66 ppm	54 ppm
Potassium	8 ppm	8 ppm
pH	8.7	8.8

Noise Studies

The program of noise studies and reduction is being continued in areas where noise levels are in excess of damage risk criteria.

Personnel Exposure to Mercury

The routine urine sampling program for people working with mercury was continued during the quarter. Special studies on excretion rates from various groups of people were also continued.

Table F-3 lists data relative to the urinary sampling program showing the trend over the past four quarters. A further significant decrease has been noted over the previous quarter in the percent of samples and people above the maximum allowable concentration of 0.30 mg/l.

Table F-3

URINARY MERCURY DATA

	Second Qt. FY 1957	First Qt. FY 1957	Fourth Qt. FY 1956	Third Qt. FY 1956
Number of People Sampled	863	888	1,090	931
Percent of People Above MAC	12	18.2	29	27.5
Number of Samples Taken	1,202	1,301	1,948	1,875
Percent of Samples Above MAC	9.6	15	26.5	29.5

Air Analyses

Routine environmental air analyses for the various contaminants found in Plant operating areas were continued. A break down of these analyses is given in Table F-4. In addition to these, samples were taken covering stack effluents, atmospheric samples, smear data, etc. The number of samples taken under the various categories is given in Table F-5.

Table F-4

ROUTINE ENVIRONMENTAL AIR ANALYSES

Contaminant	MAC	This Quarter		Last Quarter	
		No. of Samples	Percent Above MAC	No. of Samples	Percent Above MAC
Benzene	35 ppm	0	0	18	0
Beryllium	2 $\mu\text{g}/\text{m}^3$	329	0	182	2
Cadmium	100 $\mu\text{g}/\text{m}^3$	26	0	20	10
Carbon Monoxide	100 ppm	62	26	0	
Chromium	0.10 mg/m^3	0		4	0
Fluoride (Dust)	2.5 mg/m^3	6	0	0	
Hydrogen Cyanide	10 ppm	61	0	34	0
Lead	0.15 mg/m^3	0		6	0
Magnesium	15 mg/m^3	0		150	0
Mercury	0.10 mg/m^3	73,185	9	86,126	18
Nitrogen Dioxide	5 ppm	0		33	0
Perchloroethylene	200 ppm	19	16	28	3
Thallium*	100 $\mu\text{g}/\text{m}^3$	58	0	246	0
Trichloroethylene	200 ppm	52	17	14	0
Uranium** (Dust)	0.15 mg/m^3	6	66	0	

*Arbitrary reporting limit.

**Based on chemical toxicity.

Table F-5

MISCELLANEOUS AIR AND SMEAR SAMPLES

Contaminant	Type Sample	Number of Samples	
		This Quarter	Last Quarter
Beryllium	Smear	84	59
Lithium	Demister	37	41
Lithium	Dust	0	58
Lithium	Atmospheric	0	23
Lithium	Stack	22	0
Mercury	Clean Laundry	680	306
Mercury	Wind Tunnels	553	334
Mercury	Miscellaneous	276	39
Sodium	Atmospheric	0	23
Potassium	Atmospheric	0	23

Average building concentrations for mercury vapor for the present quarter and for the first quarter fiscal year 1957 are presented in Table F-6, and the trends in these air concentrations are shown in Figure F-1.

Table F-6

	AVERAGE MERCURY VAPOR AIR CONCENTRATIONS					
	^{3rd} First Quarter FY 1957			⁵⁶ Second Quarter FY 1957		
	July	August	September	October	November	December
	<u>Building 9201-4</u>					
Number of Samples Taken	10,676	11,416	7,417	7,569	8,962	8,132
Percent of Samples which Exceeded the MAC	6.0%	3.0%	1.6%	5.2%	3.2%	3.8%
Average Building Hg Vapor Air Concentration in mg/m ³	0.05	0.04	0.03	0.04	0.04	0.04
	<u>Building 9201-5</u>					
Number of Samples Taken	10,838	12,843	15,299	15,868	15,017	13,131
Percent of Samples which Exceeded the MAC	30.0%	30.0%	21.0%	16.7%	10.2%	8.3%
Average Building Hg Vapor Air Concentration in mg/m ³	0.08	0.07	0.06	0.07	0.05	0.05

SAFETY

ACCIDENT EXPERIENCE

Three disabling injuries occurred during this period resulting in a quarterly frequency rate of 1.06. This represents a decrease of approximately 39 percent from the rate of 1.73 for the previous quarter. A total of 894 medical treatment (non-disabling) injuries were sustained, with a frequency rate of 315, as compared with 1,119 injuries for the previous quarter, with a frequency rate of 394.

The first safety award period for 1956 was terminated during this quarter with a total of 2,185,455 man-hours worked without a disabling injury. A second disabling accident free period in excess of 1,500,000 man-hours was still in progress at the close of this report period. December of this quarter was a disabling-free month and was one of only three Decembers, since the inception of Carbide's contract at Y-12, that have been experienced without a disabling injury.

Y-12 PLANT QUARTERLY REPORT

Third Fiscal Quarter, 1957

January 1 - March 31, 1957

M-86

EXTRACT

Authorized Derivative Classifier

[Handwritten Signature] 2/1/95
Authorized Signature Date

Authorized Derivative Declassifier

[Handwritten Signature] 2/2/95
Authorized Signature Date

This material has been reviewed by the Y-12 Classification office and has been determined to be UNCLASSIFIED.

APPROVED FOR PUBLIC RELEASE

m. d. Bond 2/6/95
Technical Information Office Date

This document is an EXTRACT from (Y-1017)

THIS PAGE MUST NOT BE SEPARATED FROM THE ATTACHED DOCUMENT

Poplar Creek Water Sampling

Water samples from the East Fork of Poplar Creek were taken daily and composited weekly for the analysis of mercury. Daily samples were analyzed for lithium, sodium, potassium, and stream pH. The average results of these samples along with the average daily creek flow in gallons are presented in Table F-2.

Table F-2

POPLAR CREEK WATER ANALYSES

	This Quarter	Last Quarter
Average flow	13.2 million gals/day	11.9 million gals/day
Mercury	1.54 mg/liter	1.02 mg/liter
Lithium	7.6 ppm	9 ppm
Sodium	58 ppm	66 ppm
Potassium	15.4 ppm	8 ppm
pH	8.6	8.7

Noise Studies

The program of noise studies and reduction is being continued in areas where noise levels are in excess of damage risk criteria.

Personnel Exposure to Mercury

The routine urine sampling program for people working with mercury was continued during the quarter. Special studies on excretion rates from various groups of people were also continued.

Table F-3 lists data relative to the urinary sampling program showing the trend over the past four quarters. A further significant decrease has been noted over the previous quarter in the percent of samples and people above the maximum allowable concentration of 0.30 mg/l.

Table F-3

URINARY MERCURY DATA

	Third Qt. FY 1957	Second Qt. FY 1957	First Qt. FY 1957	Fourth Qt. FY 1956
Number of People Sampled	860	889	888	1,090
Percent of People Above MAC	7.5	12	18.2	29
Number of Samples Taken	1,066	1,213	1,301	1,948
Percent of Samples Above MAC	6.6	9.6	15	26.5

Air Analyses

Routine environmental air analyses for the various contaminants found in Plant operating areas were continued. A breakdown of these analyses is given in Table F-4. In addition to these, samples were taken covering stack effluents, atmospheric samples, and smear data. The number of samples taken under the various categories is given in Table F-5.

Table F-4

ROUTINE ENVIRONMENTAL AIR ANALYSES

Contaminant	MAC	This Quarter		Last Quarter	
		No. of Samples	Percent Above MAC	No. of Samples	Percent Above MAC
Beryllium	2 $\mu\text{g}/\text{m}^3$	423	0	182	2
Cadmium	100 $\mu\text{g}/\text{m}^3$	21	24	26	0
Carbon Monoxide	100 ppm	0	0	62	26
Chlorine	1 ppm	12	0	0	0
Fluorine	0.1 ppm	14	14	0	0
Hydrogen Cyanide	10 ppm	23	0	61	0
Lead	0.15 mg/m^3	8	0	0	0
Mercury	0.10 mg/m^3	77,078	4.1	73,185	9
Perchloroethylene	200 ppm	27	26	19	16
Thallium*	100 $\mu\text{g}/\text{m}^3$	0	0	58	0
Trichloroethylene	200 ppm	41	17	52	17
Uranium** (fume)	0.15 mg/m^3	3	0	6	66
Zinc	15 mg/m^3	7	0	0	0

*Arbitrary reporting limit

**Based on chemical toxicity

Table F-5

MISCELLANEOUS AIR AND SMEAR SAMPLES

Contaminant	Type Sample	Number of Samples	
		This Quarter	Last Quarter
Beryllium	Smear	63	84
Lithium	Stack	18	22
Mercury	Stack	5	0
Mercury	Clean Laundry	493	680
Mercury	Wind Tunnels	0	553
Mercury	Miscellaneous	515	276
Mercury	Change Houses	449	0

As shown in Table F-6, the average building concentrations for mercury vapor for the present quarter and for the second quarter fiscal year 1957 remained well below the MAC of 0.1 mg/m³.

Table F-6

AVERAGE MERCURY VAPOR AIR CONCENTRATIONS

	Second Quarter FY 1957			Third Quarter FY 1957		
	October	November	December	January	February	March
<u>Building 9201-4</u>						
Number of Samples Taken	7,569	8,962	8,132	11,104	9,450	9,619
Percent of Samples Which Exceeded the MAC	5.2	3.2	3.8	7.9	4.6	2.0
Average Building Hg Vapor Air Concentration in mg/m ³	0.04	0.04	0.04	0.04	0.04	0.03 ✓
<u>Building 9201-5</u>						
Number of Samples Taken	15,868	15,017	13,131	15,726	13,601	14,103
Percent of Samples Which Exceeded the MAC	16.7	10.2	8.3	3.7	3.4	2.8
Average Building Hg Vapor Air Concentration in mg/m ³	0.07	0.05	0.05	0.04	0.04	0.04 ✓

SAFETY

ACCIDENT EXPERIENCE

Three disabling injuries occurred during this period resulting in a quarterly frequency rate of 1.05. This represents no substantial change in frequency from the previous quarter. A total of 928 medical treatment (non-disabling) injuries was sustained, with a frequency rate of 323, as compared with 894 injuries for the previous quarter, with a frequency rate of 315.

Two award periods, in excess of 1,500,000 man-hours each, were reached during this quarter. These periods accounted for total accident-free as shown in Table F-7.

Table F-7

ACCIDENT-FREE HOURS ATTAINED DURING AWARD PERIODS

Period Number	Man-Hours Reached
18	2,239,139
19	1,844,567

Y-12 PLANT QUARTERLY REPORT

Fourth Fiscal Quarter, 1957

April 1 - June 30, 1957

M-87

EXTRACT

Authorized Derivative Classifier

[Handwritten Signature] 2/1/95
Authorized Signature Date

Authorized Derivative Declassifier

[Handwritten Signature] 2/2/95
Authorized Signature Date

This material has been reviewed by the Y-12 Classification office and has been determined to be UNCLASSIFIED.

APPROVED FOR PUBLIC RELEASE

[Handwritten Signature] 2/6/95
Technical Information Office Date

This document is an EXTRACT from (Y-1018)

THIS PAGE MUST NOT BE SEPARATED FROM THE ATTACHED DOCUMENT

Poplar Creek Water Sampling

Water samples from the East Fork of Poplar Creek were taken daily (with the exception of the last three weeks in June due to inoperability of the sampling device) and composited weekly for the analysis of mercury. Daily samples were analyzed for lithium, sodium, potassium, and stream pH. The average results of these samples along with the average daily creek flows in gallons are presented in Table F-2.

Table F-2

POPLAR CREEK WATER ANALYSIS

	This Quarter	Last Quarter
Average Flow	10.6 million gals/day	13.2 million gals/day
Mercury	2.4 mg/liter	1.54 mg/liter
Lithium	5.5 ppm	7.6 ppm
Sodium	68 ppm	58 ppm
Potassium	7.6 ppm	15.4 ppm
pH	8.8	8.6

Noise Studies

The program of noise studies and its reduction is being continued in areas where noise levels are in excess of damage risk criteria.

Personnel Exposure to Mercury

The routine urine sampling program for people working with Hg was continued during this quarter. Special studies on excretion rates from various groups of people were also continued.

Table F-3 lists data relative to the urinary sampling program showing the trend over the past four quarters. A decrease has been noted over the previous quarter in the percent of samples and people above the maximum allowable concentration of 0.30 mg/liter.

Table F-3

URINARY MERCURY DATA

	Fourth Qtr. ⁽¹⁾ FY 1957	Third Qtr. ⁽²⁾ FY 1957	Second Qtr. FY 1957	First Qtr. FY 1957
Number of People Sampled	907	905	889	888
Percent of People Above MAC	5.7	6.6	12	18.2
Number of Samples Taken	921	1,104	12.3	1,301
Percent of Samples Above MAC	5.6	6.1	9.6	15

⁽¹⁾ Estimated as explained in the Introduction.

⁽²⁾ Corrected as explained in the Introduction.

Air Analysis

Routine environmental air analyses for the various contaminants found in Plant operating areas were continued. A breakdown of these analyses is given in Table F-4.

Table F-4

ROUTINE ENVIRONMENTAL AIR ANALYSIS

Contaminant	MAC	This Quarter		Last Quarter	
		No. of Samples	Percent Above MAC	No. of Samples	Percent Above MAC
Beryllium	2 $\mu\text{g}/\text{m}^3$	562	1.6 ⁽¹⁾	423	0
Cadmium	100 $\mu\text{g}/\text{m}^3$	6	0	21	24
Carbon Monoxide	100 ppm	0	0	0	0
Chlorine	1 ppm	0	0	12	0
Fluorine	0.1 ppm	0	0	14	14
Hydrogen Cyanide	10 ppm	13	0	23	0
Lead	0.15 mg/m^3	20	0	8	0
Mercury	0.10 mg/m^3	73,856	2.1	77,078	4.1
Perchloroethylene	200 ppm	235	6.4	27	26
Thallium ⁽²⁾	100 $\mu\text{g}/\text{m}^3$	0	0	0	0
Trichloroethylene	200 ppm	343	18.4	41	17
Uranium ⁽³⁾ (fume)	0.15 mg/m^3	26	19.2	3	0
Zinc	15 mg/m^3	8	25	7	0

⁽¹⁾ Results due to leaky booster blower - discontinued use.

⁽²⁾ Arbitrary reporting limit.

⁽³⁾ Based on chemical toxicity.

In addition to these, samples were taken covering stack effluents, atmospheric samples, and smear data. The number of samples taken under the various categories is given in Table F-5.

Table F-5

MISCELLANEOUS AIR AND SMEAR SAMPLES

Contaminant	Type Sample	Number of Samples	
		This Quarter	Last Quarter
Beryllium	Smear	76	63
Lithium	Stack	32	18
Mercury	Stack	21	5
Mercury	Clean Laundry	403	493
Mercury	Wind Tunnels	0	0
Mercury	Miscellaneous	284	515
Mercury	Change Houses	403	449

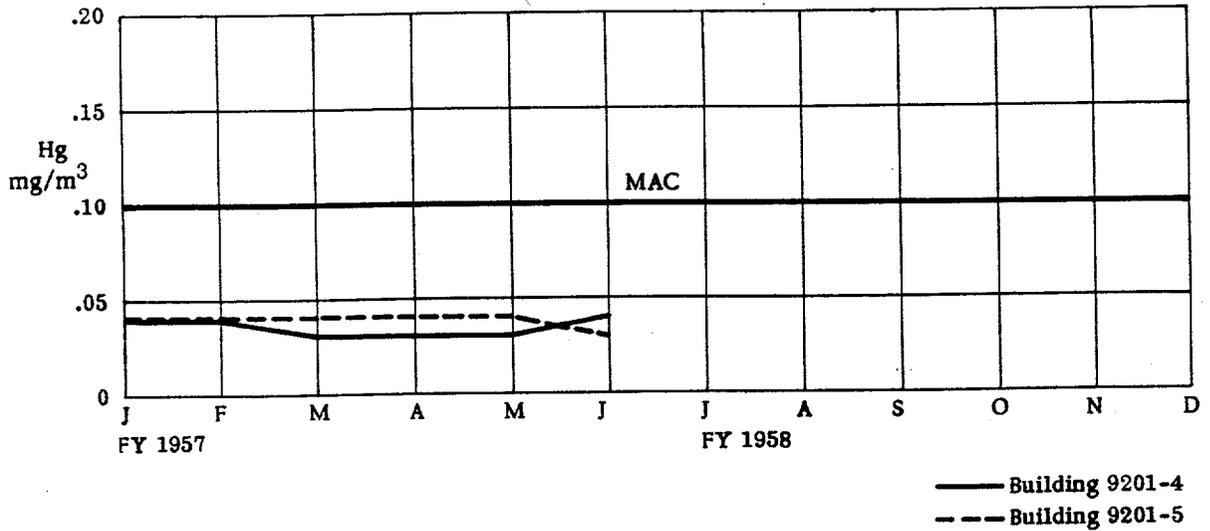
F-5
M-87

Average building concentrations for mercury vapor for the present and third quarters are presented in Table F-6 and the trend in these concentrations is shown in Figure F-1.

Table F-6
AVERAGE MERCURY VAPOR AIR CONCENTRATIONS

	This Quarter			Last Quarter		
	April	May	June	January	February	March
<u>Building 9201-4</u>						
Number of Samples	9,690	10,132	9,278	11,104	9,450	9,619
Percent of Samples Above the MAC	2.1	0.9	2.7	7.9	4.6	2.0
Average Building Hg Vapor Air Concentration in mg/m ³	0.03	0.03	0.04	0.04	0.04	0.03
<u>Building 9201-5</u>						
Number of Samples	13,973	14,237	12,582	15,726	13,601	14,103
Percent of Samples Above the MAC	1.3	1.6	1.1	3.7	3.4	2.8
Average Building Hg Vapor Air Concentration in mg/m ³	0.04	0.04	0.03	0.04	0.04	0.04

Figure F-1
AVERAGE BUILDING Hg VAPOR AIR CONCENTRATIONS



Y-12 PLANT QUARTERLY REPORT

First Fiscal Quarter, 1958

July 1 - September 30, 1957

M-88

EXTRACT

Authorized Derivative Classifier
M. J. J. King 2/1/95
Authorized Signature Date

Authorized Derivative Declassifier
R. B. ... 2/2/95
Authorized Signature Date

This material has been reviewed by the Y-12 Classification office and has been determined to be UNCLASSIFIED.

APPROVED FOR PUBLIC RELEASE
m. d. ... 2/6/95
Technical Information Office Date

This document is an EXTRACT from (Y-1019)

THIS PAGE MUST NOT BE SEPARATED FROM THE ATTACHED DOCUMENT

F-3
M-88
✓

Poplar Creek Water Sampling

Water samples from the East Fork of Poplar Creek were taken daily and composited weekly for the analysis of mercury. Daily samples were analyzed for lithium, sodium, potassium, and stream pH. The average results of these samples along with the average daily creek flows in gallons are presented in Table F-2.

Table F-2

POPLAR CREEK WATER ANALYSIS

	This Quarter	Last Quarter
Average Flow	9.5 million gals/day	10.6 million gals/day
Mercury	3.1 mg/liter	2.4 mg/liter
Lithium	5.5 ppm	5.5 ppm
Sodium	56.3 ppm	68.0 ppm
Potassium	6.5 ppm	7.6 ppm
pH	9.0	8.8

Noise Studies

The program of noise studies and reduction is being continued in areas where noise levels are in excess of damage risk criteria.

Personnel Exposure to Mercury

The routine urine sampling program for people working with mercury was continued during this quarter. Special studies on excretion rates from various groups of people were also continued.

Table F-3 lists data relative to the urinary sampling program showing the trend over the past four quarters. A 40% increase has been noted over the previous quarter in the percent of samples and people above the maximum allowable concentration of 0.30 mg/l.

Table F-3

URINARY MERCURY DATA

	First Qtr. ⁽¹⁾ FY 1958	Fourth Qtr. ⁽²⁾ FY 1957	Third Qtr. FY 1957	Second Qtr. FY 1957
Number of People Sampled	797.0	748.0	905.0	889.0
Percent of People Above MAC	8.9	6.4	6.6	12.0
Number of Samples Taken	1,020.0	936.0	1,104.0	1,213.0
Percent of Samples Above MAC	7.5	5.4	6.1	9.6

⁽¹⁾Estimated.

⁽²⁾Corrected.

Air Analysis

Routine environmental air analyses for the various contaminants found in Plant operating areas were continued. A breakdown of these analyses is given in Table F-4. In addition to these, samples were taken covering stack effluents, atmospheric samples, smear data, etc. The number of samples taken under the various categories is given in Table F-5.

Table F-4

ROUTINE ENVIRONMENTAL AIR ANALYSIS

Contaminant	MAC/8 hrs	This Quarter		Last Quarter	
		No. of Samples	Percent Above MAC	No. of Samples	Percent Above MAC
Beryllium	2.0 $\mu\text{g}/\text{m}^3$	543	0.0	562	1.6
Boron ⁽¹⁾	0.20 mg/m^3	10	40.0	0	0.0
Cadmium	100.0 $\mu\text{g}/\text{m}^3$	28	28.6	6	0.0
Carbon Monoxide	100.0 ppm	0	0.0	0	0.0
Chlorine	1.0 ppm	0	0.0	0	0.0
Fluorine	0.1 ppm	0	0.0	0	0.0
Hydrogen Cyanide	10.0 ppm	0	0.0	13	0.0
Lead	0.20 mg/m^3	33	24.2	20	0.0
✓ Mercury	0.10 mg/m^3	58,483	1.9	73,856	2.1
Perchloroethylene	200.0 ppm	422	19.9	235	6.4
Trichloroethylene	200.0 ppm	0	0.0	343	18.4
Uranium ⁽²⁾	0.15 mg/m^3	2	0.0	26	19.2
Zinc Oxide	15.0 mg/m^3	6	0.0	8	25.0

⁽¹⁾Arbitrary reporting limit.

⁽²⁾Based on chemical toxicity.

Table F-5

MISCELLANEOUS AIR AND SMEAR SAMPLES

Contaminant	Type Sample	Number of Samples	
		This Quarter	Last Quarter
Beryllium	Smear	40	76
Lithium	Stack	0	32
Mercury	Stack	0	21
Mercury	Misc.	460	1,090

Average building concentrations for the present and previous quarters are presented in Table F-6, and the trend in these concentrations are shown in Figure F-1.

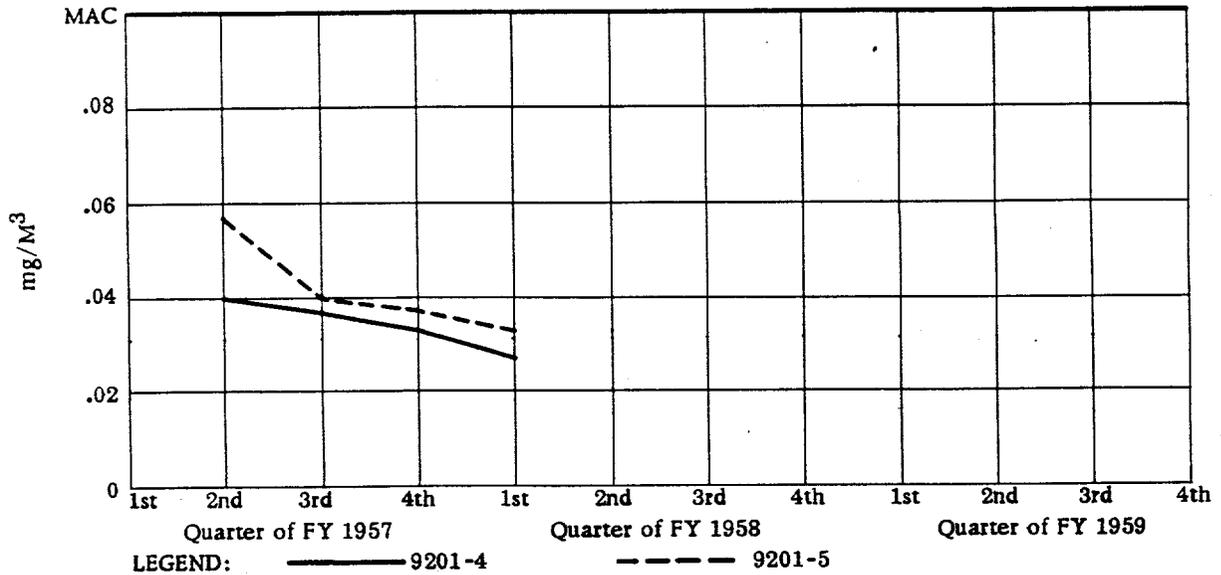
Table F-6

AVERAGE MERCURY VAPOR AIR CONCENTRATIONS

	This Quarter			Last Quarter		
	July	August	September	April	May	June
<u>Building 9201-4</u>						
Number of Samples	9,457	7,470	5,509	9,690	10,132	9,278
Percent of Samples Above the MAC	1.31	1.05	2.08	2.1	0.9	2.7
Average Building Hg Vapor Air Concentration in mg/m ³	0.03	0.02	0.03	0.03	0.03	0.04
<u>Building 9201-5</u>						
Number of Samples	13,277	11,017	7,938	13,973	14,237	12,582
Percent of Samples Above the MAC	0.20	0.31	0.53	1.3	1.6	1.1
Average Building Hg Vapor Air Concentration in mg/m ³	0.04	0.03	0.03	0.04	0.04	0.03
<u>Building 8110 - Sludge Burner</u>						
Number of Samples	515	801	610			
Percent of Samples Above the MAC	23.1	23.6	31.2			

Figure F-1

AVERAGE BUILDING Hg VAPOR AIR CONCENTRATIONS



Y-12 PLANT QUARTERLY REPORT

Second Fiscal Quarter, 1958

October - December 31, 1957

M-89

EXTRACT

Authorized Derivative Classifier	
<u><i>[Signature]</i></u>	<u>2/1/95</u>
Authorized Signature	Date

Authorized Derivative Declassifier	
<u><i>[Signature]</i></u>	<u>2/2/95</u>
Authorized Signature	Date

This material has been reviewed by the Y-12 Classification office and has been determined to be UNCLASSIFIED.

APPROVED FOR PUBLIC RELEASE	
<u><i>[Signature]</i></u>	<u>2/6/95</u>
Technical Information Office	Date

This document is an EXTRACT from (Y-1020)

THIS PAGE MUST NOT BE SEPARATED FROM THE ATTACHED DOCUMENT

Poplar Creek Water Sampling

Water samples from the East Fork of Poplar creek were taken daily and composited weekly for the analysis of mercury. Daily samples were analyzed for lithium, sodium, potassium, and stream pH. The average results of these samples along with the average daily creek flows in gallons are presented in table F-2.

Table F-2

POPLAR CREEK WATER ANALYSIS

	This Quarter	Last Quarter
Average Flow	10.8 million gals/day	9.5 million gals/day
Mercury	1.8 mg/liter	3.1 mg/liter
Lithium	3.5 ppm	4.8 ppm
Sodium	17.0 ppm	56.3 ppm
Potassium	7.2 ppm	6.5 ppm
pH	8.3	9.0

Noise Studies

The program of noise studies and reduction is being continued in areas where noise levels are in excess of damage risk criteria.

Personnel Exposure to Mercury

The routine urine sampling program for people working with mercury was continued during this quarter. Special studies on excretion rates from various groups of people were also continued.

Table F-3 lists data relative to the urinary sampling program showing the trend over the past four quarters. A decrease has been noted over the previous quarter in the percent of samples and people above the maximum allowable concentration of 0.30 mg/l.

Table F-3

URINARY MERCURY DATA

	Second Qtr. FY 1958	First Qtr. FY 1958	Fourth Qtr. FY 1957	Third Qtr. FY 1957
Number of People Sampled	730	730	748	905
Percent of People Above MAC	3.2	5.8	6.4	6.6
Number of Samples Taken	880	1,017	936	1,104
Percent of Samples Above MAC	4.2	7.6	5.4	6.1

Air Analyses ✓

Routine environmental air analyses for the various contaminants found in Plant operating areas were continued. A breakdown of these analyses is given in table F-4. In addition to these, samples were also taken covering stack effluents, atmospheric samples, smear data, etc. The number of samples taken under the various categories is given in table F-5.

Table F-4

ROUTINE ENVIRONMENTAL AIR ANALYSIS

Contaminant	MAC/8 hrs	This Quarter		Last Quarter	
		No. of Samples	Percent Above MAC	No. of Samples	Percent Above MAC
Beryllium	2 $\mu\text{g}/\text{m}^3$	706	0	543	0
Boron ⁽¹⁾	0.20 mg/m^3	11	72.7	10	40
Cadmium	100 $\mu\text{g}/\text{m}^3$	0	0	28	28.6
Carbon Monoxide	100 ppm	7	0	0	0
Chlorine	1 ppm	0	0	0	0
Fluorine	0.1 ppm	0	0	0	0
Hydrogen Cyanide	10 ppm	36	0	0	0
Lead	0.20 mg/m^3	86	2.3	33	24.2
Mercury	0.10 mg/m^3	40,507	2.2	58,483	1.9
Perchloroethylene	200 ppm	232	2.5	422	19.9
Trichloroethylene	200 ppm	0	0	0	0
Uranium ⁽²⁾	0.15 mg/m^3	0	0	2	0
Zinc Oxide	15 mg/m^3	0	0	6	0

⁽¹⁾ Arbitrary reporting limit.

⁽²⁾ Based on chemical toxicity.

Table F-5

MISCELLANEOUS AIR AND SMEAR SAMPLES

Contaminant	Type Sample	Number of Samples	
		This Quarter	Last Quarter
Beryllium	Smear	187	40
Lithium	Misc.	22	0
Mercury	Stack	0	0
Mercury	Misc.	210	460

Average building concentrations for mercury vapor for the present and first quarters of fiscal year 1958 are presented in table F-6, and the trend in these concentrations are shown in figure F-1.

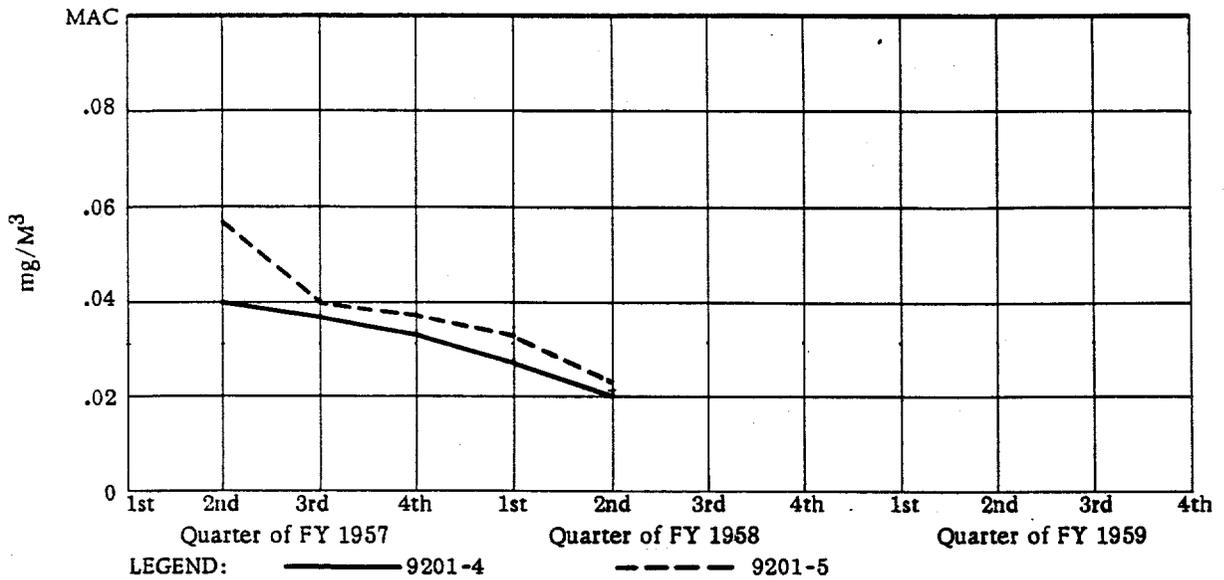
Table F-6

AVERAGE MERCURY VAPOR AIR CONCENTRATION

	This Quarter			Last Quarter		
	October	November	December	July	August	September
<u>Building 9201-4</u>						
Number of Samples	5,782	4,679	4,416	9,457	7,470	5,509
Percent of Samples Above the MAC	1.17	2.33	0.88	1.31	1.05	2.08
Average Building Hg Vapor Air Concentration in mg/m ³	.02	.02	.02	.03	.02	.03
<u>Building 9201-5</u>						
Number of Samples	8,616	7,331	6,430	13,277	11,017	7,938
Percent of Samples Above the MAC	0.56	1.47	1.56	.20	.31	.53
Average Building Hg Vapor Air Concentration in mg/m ³	.02	.03	.02	.04	.03	.03
<u>Building 8110 - Sludge Burner</u>						
Number of Samples	524	680	610	515	801	610
Percent of Samples Above the MAC	16.6	9.4	9.83	23.1	23.6	31.2

Figure F-1

AVERAGE BUILDING Hg VAPOR AIR CONCENTRATIONS



Poplar Creek Water Sampling

Water samples from the East Fork of Poplar Creek were taken daily and analyzed for lithium, sodium, potassium, and stream pH. Samples were also composited weekly for the analysis of mercury. The average results of these samples along with the average daily creek flow in gallons are presented in Table F-2.

Table F-2

POPLAR CREEK WATER ANALYSIS

	This Quarter	Last Quarter
Average Flow	9.6 million gals/day	10.8 million gals/day
Mercury	3.6 mg/liter	1.8 mg/liter
Lithium	4.4 ppm	3.5 ppm
Sodium	42.3 ppm	35.1 ppm ^(a)
Potassium	7.5 ppm	7.2 ppm
pH	8.6	8.3

^(a) Correction

Noise Studies

The program of noise studies and reduction is being continued in areas where noise levels are in excess of damage risk criteria.

Personnel Exposure to Mercury

The routine urine sampling program for personnel working with mercury was continued during this quarter.

Table F-3 gives information pertaining to the over-all mercury uranalysis program. No significant change was noted over the previous quarter in the percent of samples and people above the maximum allowable concentration of 0.30 mg/l.

Table F-3

URINARY MERCURY DATA

	Third Qtr. FY 1958	Second Qtr. FY 1958	First Qtr. FY 1958	Fourth Qtr. FY 1957
Number of People Sampled	730	689	730	748
Percent of People Above MAC	3.2	3.9	5.8	6.4
Number of Samples Taken	880	799	1,017	936
Percent of Samples Above MAC	4.2	3.9	7.6	5.4

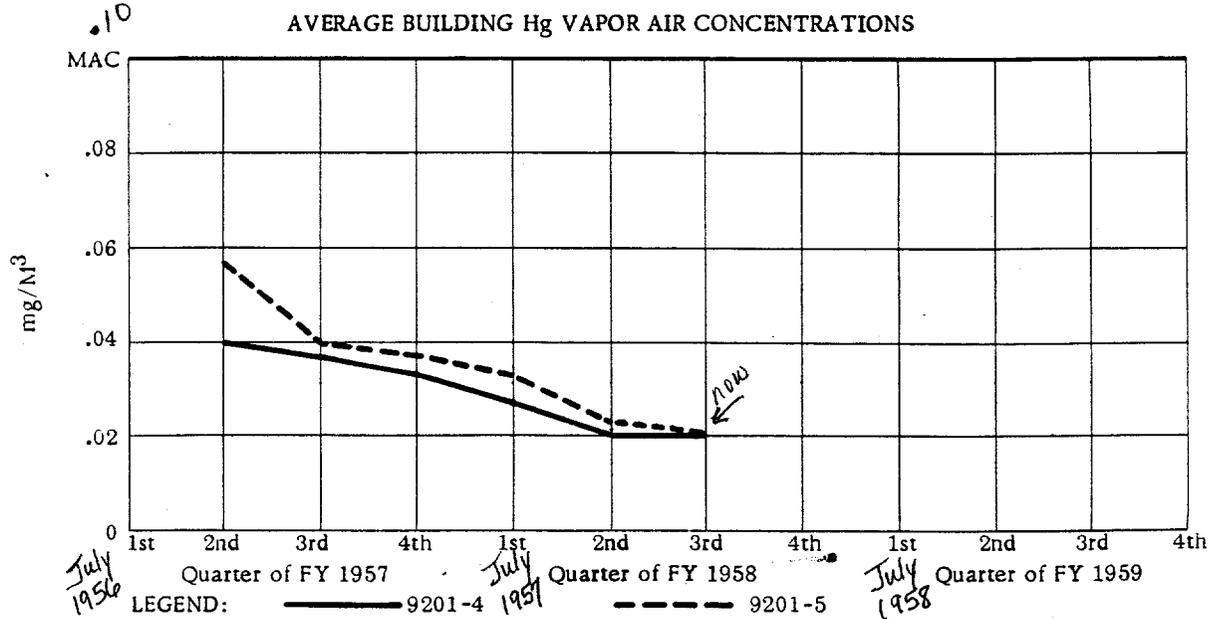
F-5
M-121

The average building concentrations of mercury vapor for the second and third quarters, FY 1958 are presented in Table F-6 and the trends in these concentrations are shown in Figure F-1.

Table F-6
AVERAGE MERCURY VAPOR AIR CONCENTRATION

	This Quarter			Last Quarter		
	January	February	March	October	November	December
<u>Building 9201-4</u>						
Number of Samples	5,544	5,416	5,581	5,782	4,679	4,416
Percent of Samples Above the MAC	2.13	1.03	1.22	1.17	2.33	0.88
Average mg/m ³	0.02	0.02	0.02	0.02	0.02	0.02
<u>Building 9201-5</u>						
Number of Samples	7,899	7,271	7,823	8,616	7,331	6,430
Percent of Samples Above the MAC	1.88	1.18	0.97	0.56	1.47	1.56
Average mg/m ³	0.02	0.02	0.02	0.02	0.03	0.02
<u>Building 8110 - Sludge Burner</u>						
Number of Samples	634	584	551	524	680	610
Percent of Samples Above the MAC	8.05	7.29	19.2	16.6	9.4	9.8
<u>Building 9808 - Pump Repair</u>						
Number of Samples	264	240	252	0	0	0
Percent of Samples Above the MAC	2.65	3.75	7.1	0	0	0
Average mg/m ³	.02	.03	.04	0	0	0

Figure F-1



M-122

Poplar Creek Water Sampling

Water samples from the East Fork of Poplar Creek were taken daily and composited weekly for mercury analysis. Daily samples were analyzed for lithium, sodium, potassium, and stream pH. The average results of these samples along with the average daily creek flow in gallons are presented in Table F-2.

Table F-2

POPLAR CREEK WATER ANALYSIS

Test	This Quarter	Last Quarter
Average Flow	9.4 million gals/day	9.6 million gals/day
Mercury	3.1 mg/l	3.6 mg/l
Lithium	3.2 ppm	4.4 ppm
Sodium	41.0 ppm	42.3 ppm
Potassium	5.4 ppm	7.5 ppm
pH	8.7	8.6

Noise Studies

The program of noise studies and reduction was continued in areas where noise levels are in excess of damage risk criteria.

Urine Sampling Programs

The routine urine sampling program for personnel working with mercury was continued this quarter. The urine sampling programs for lead and fluorides were started and the results are included in Table F-3.

One urine sample was submitted for selenium analysis which was reported to be less than .15 mg per liter.

Air Analyses

Routine environmental air analyses for the various contaminants found in Plant operating areas were continued. A breakdown of these analyses is given in Table F-4. In addition to these, samples were taken covering stack effluents, atmospheric samples, smear data, etc. The number of samples taken under the various categories is given in Table F-5.

Table F-5

MISCELLANEOUS AIR AND SMEAR SAMPLES

Contaminant	Type Sample	Number of Samples	
		This Quarter	Last Quarter
Beryllium	Air	82	18
Beryllium	Smear	257	164
Bromine	Air	3	0
Cadmium	Air	10	0
Lead	Air	0	20
Lithium	Air	6	16
Mercury	Stack	0	3
Mercury	Air	0	142
Ozone	Air	3	0
Selenium	Air	0	5
Tungsten	Air	0	1
Trichloroethylene	Air	4	0
Xylene	Air	0	7
Metals (Oak Ridge Processing Company)	Misc.	8	--

The average building concentrations of mercury vapor for the third and fourth quarters of FY 1958 are presented in Table F-6, and the trends in these concentrations for Buildings 9201-4 and -5 are shown in Figure F-1.

Table F-6

AVERAGE MERCURY VAPOR AIR CONCENTRATION

	This Quarter			Last Quarter		
	April	May	June	January	February	March
	<u>Building 9201-4</u>					
Number of Samples	3,877	2,828	2,893	5,544	5,416	5,581
Percent of Samples Above the MAC	0.95	3.50	4.77	2.13	1.03	1.22
Average mg/m ³	0.02	0.03	0.04	0.02	0.02	0.02
	<u>Building 9201-5</u>					
Number of Samples	5,371	3,861	3,872	7,899	7,271	7,823
Percent of Samples Above the MAC	0.95	0.60	1.40	1.88	1.18	0.97
Average mg/m ³	0.03	0.02	0.02	0.02	0.02	0.02
	<u>Building 81-10</u>					
Number of Samples	619	589	589	634	584	551
Percent of Samples Above the MAC	11.47	28.52	28.52	8.05	7.29	19.2
Average mg/m ³	Values for this area would be insignificant.					
	<u>Building 9808</u>					
Number of Samples	216	252	259	264	240	252
Percent of Samples Above the MAC	6.48	9.13	10.81	2.65	3.75	7.1
Average mg/m ³	0.04	0.05	0.04	0.02	0.03	0.04

Y-12 PLANT QUARTERLY REPORT

Third Fiscal Quarter, 1958

January - March, 1958

M-121

EXTRACT

Authorized Derivative Classifier
M. J. Gidley 2/1/95
Authorized Signature Date

Authorized Derivative Declassifier
R. Bandoi Sr. 2/2/95
Authorized Signature Date

This material has been reviewed by the Y-12
Classification office and has been determined
to be UNCLASSIFIED.

APPROVED FOR PUBLIC RELEASE
m. d. Bond 2/6/95
Technical Information Office Date

This document is an EXTRACT from (Y-1200)

THIS PAGE MUST NOT BE SEPARATED FROM THE ATTACHED DOCUMENT

Lead Uranalysis Program

A lead uranalysis program was started to determine the possible lead exposure received by personnel working in areas where melting and burning is performed. The present program includes foundry personnel in Building and some of the welders who work in the lead burning room, A tentative Maximum Allowable Concentration of 0.1 mg per liter of urine is being used in this Plant. Sixty-seven samples were analyzed with 2 samples exceeding the tentative MAC.

Air Analysis

Routine environmental air analyses for the various contaminants found in Plant operating areas were continued. A breakdown of these analyses is given in Table F-4. In addition to these, samples were taken covering stack effluents, atmospheric samples, smear data, etc. The number of samples taken under the various categories is given in Table F-5.

Table F-4

ROUTINE ENVIRONMENTAL AIR ANALYSIS

Contaminant	MAC/8 hrs	This Quarter		Last Quarter	
		No. of Samples	Percent Above MAC	No. of Samples	Percent Above MAC
Beryllium	2 $\mu\text{g}/\text{m}^3$	998	0	706	0
Boron	200 $\mu\text{g}/\text{m}^3$ ⁽¹⁾	0	0	11	72.7
Carbon Monoxide	100 ppm	5	0	7	0
Hydrogen Cyanide	10 ppm	30	0	36	0
Lead	200 $\mu\text{g}/\text{m}^3$	11	0	86	2.3
Methyl Chloroform	500 ppm	15	.07	0	0
Mercury	100 $\mu\text{g}/\text{m}^3$	42,742	2.05	40,507	2.2
Perchloroethylene	200 ppm	189	14.8	232	2.5

(1) Arbitrary reporting limit.

Table F-5

MISCELLANEOUS AIR AND SMEAR SAMPLES

Contaminant	Type Sample	Number of Samples	
		This Quarter	Last Quarter
Beryllium	Miscellaneous	18	0
Beryllium	Smear	164	187
Lead	Miscellaneous	20	0
Lithium	Miscellaneous	16	22
Mercury	Stack	3	0
Mercury	Miscellaneous	142	210
Selenium	Air	5	0
Tungsten	Air	1	0
Xylene	Air	7	0

Y-12 PLANT QUARTERLY REPORT

Fourth Fiscal Quarter, 1958

April ~~January - March~~, 1958
EXTRACT *June*

M-122

Authorized Derivative Classifier
M. J. [Signature] *2/1/95*
Authorized Signature Date

Authorized Derivative Declassifier
R. Bayliss [Signature] *2/2/95*
Authorized Signature Date

This material has been reviewed by the Y-12 Classification office and has been determined to be UNCLASSIFIED.

APPROVED FOR PUBLIC RELEASE
M. L. Bort *2/6/95*
Technical Information Office Date

This document is an EXTRACT from (Y-1201)

THIS PAGE MUST NOT BE SEPARATED FROM THE ATTACHED DOCUMENT

Table F-3

URINARY DATA
(Mercury, Lead, and Fluorides)

	Fourth Qtr. FY 1958	Third Qtr. FY 1958	Second Qtr. FY 1958	First Qtr. FY 1958
<u>Mercury⁽¹⁾</u>				
Number of People Sampled	658	689	730	730
Percent of People Above the MAC	6.8	3.9	3.2	5.8
Number of Samples Taken	928	799	880	1,017
Percent of Samples Above the MAC	8.8	3.9	4.2	7.6
<u>Lead⁽²⁾</u>				
Number of Samples Taken	210			
Percent of Samples Above .15 mg/l	0			
<u>Fluorides</u>				
Number of Samples Taken	17			
Percent of Samples Above 4 ppm	5.9			

⁽¹⁾ 183 samples that were analyzed for Ferguson personnel are not included in this table.

⁽²⁾ 55 of these samples were for Oak Ridge Processing Company personnel.

Table F-4

ROUTINE ENVIRONMENTAL AIR ANALYSIS

Contaminant	MAC/8 hrs	This Quarter		Last Quarter	
		No. of Samples	Percent Above MAC	No. of Samples	Percent Above MAC
Beryllium	2 $\mu\text{g}/\text{m}^3$	1,849	0	998	0
Carbon Monoxide	100 ppm	3	0	5	0
Chromic Acid	100 $\mu\text{g}/\text{m}^3$	15	0	-	-
Hydrogen Cyanide	10 ppm	32	0	30	0
Lead	200 $\mu\text{g}/\text{m}^3$	100	12.0	11	0
Methyl Chloroform	500 ppm	4	0	15	.07
Mercury	100 $\mu\text{g}/\text{m}^3$	26,468	3.25	42,742	2.05
Perchloroethylene	200 ppm	118	29.6	189	14.8

Y-12 PLANT QUARTERLY REPORT

First Fiscal Quarter, 1959

July - September, 1958

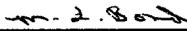
EXTRACT

M-123

Authorized Derivative Classifier	
	<u>2/1/95</u>
Authorized Signature	Date

Authorized Derivative Declassifier	
	<u>2/2/95</u>
Authorized Signature	Date

This material has been reviewed by the Y-12 Classification office and has been determined to be UNCLASSIFIED.

APPROVED FOR PUBLIC RELEASE	
	<u>2/6/95</u>
Technical Information Office	Date

This document is an EXTRACT from (Y-1202)

THIS PAGE MUST NOT BE SEPARATED FROM THE ATTACHED DOCUMENT

Poplar Creek Water Sampling

Water samples from the East Fork of Poplar Creek were taken daily and composited weekly for mercury analysis. Daily samples were also analyzed for lithium, sodium, potassium, and stream pH. The average results of these samples along with the average daily creek flow in gallons are presented in Table F-2.

Table F-2

POPLAR CREEK WATER ANALYSIS

Test	This Quarter	Last Quarter
Average Flow	8.3 million gals/day	9.4 million gals/day
Mercury	1.3 mg/l	3.1 mg/l
Lithium	4.8 ppm	3.2 ppm
Sodium	43.3 ppm	41.0 ppm
Potassium	5.0 ppm	5.4 ppm
pH	8.6	8.7

Noise Studies

The program of noise studies and reduction was continued in areas where noise levels are in excess of damage risk criteria.

Personnel Exposure

The routine urine sampling programs for personnel working with mercury, lead, and fluorides were continued this quarter. Table F-3 gives the current information on these programs.

Table F-3

URINARY DATA
(Hg, Pb, and F⁻)

	First Qtr. FY 1959	Fourth Qtr. FY 1958	Third Qtr. FY 1958	Second Qtr. FY 1958
	<u>Mercury</u>			
Number of People Sampled	593	658	689	730
Percent of People Above the MAC	8.4	6.8	6.9	3.2
Number of Samples	953	928	799	880
Percent of Samples Above the MAC	11.1	8.8	3.9	4.2

Table F-3 (Continued)

	First Qtr. FY 1959	Fourth Qtr. FY 1958	Third Qtr. FY 1958	Second Qtr. FY 1958
<u>Lead</u>				
Number of Samples	7	210		
Percent of Samples Above .15 mg/l	0	0		
<u>Fluorides</u>				
Number of Samples	33	17		
Percent of Samples Above .15 mg/l	0	5.9		

Air Analysis

Routine environmental air analyses for the various contaminants found in Plant operating areas were continued. A breakdown of these analyses is given in Table F-4. In addition to these, samples were taken covering stack effluents, atmospheric samples, smear data, etc. The number of samples taken under the various categories is given in Table F-5.

Table F-4

ROUTINE ENVIRONMENTAL AIR ANALYSIS

Contaminant	MAC/8 hrs	This Quarter		Last Quarter	
		No. of Samples	Percent Above MAC	No. of Samples	Percent Above MAC
Beryllium	2 $\mu\text{g}/\text{m}^3$	3,195	0	1,849	0
Carbon Monoxide	100 ppm	12	0	3	0
Chromic Acid	100 $\mu\text{g}/\text{m}^3$	15	0	15	0
Hydrogen Cyanide	10 ppm	22	0	32	0
Lead	200 $\mu\text{g}/\text{m}^3$	5	0	100	12.0
Methyl Chloroform	500 $\mu\text{g}/\text{m}^3$	4	0	4	0
Mercury	100 $\mu\text{g}/\text{m}^3$	25,557	6.6	26,468	3.25
Perchloroethylene	200 ppm	73	8.2	118	29.6

The average building concentrations of mercury for this and the preceding quarters are presented in Table F-6, and the trends of these concentrations since the third quarter of FY 1957 are shown in Figure F-1.

Table F-5

MISCELLANEOUS AIR AND SMEAR SAMPLES

Contaminant	Type Sample	Number of Samples	
		This Quarter	Last Quarter
Barium	Air	3	0
Beryllium	Air	59	82
Beryllium	Smear	466	257
Bromine	Air	0	3
Fluorine	Air	12	0
Cadmium	Air	6	10
Lithium	Air	0	6
Nitric Acid	Stack	6	0
Mercury	Stack	5	0
Mercury	Air	126	0
Ozone	Air	0	3
Sodium Hydroxide	Air	5	0
Trichloroethylene	Air	0	4
Metals (Oak Ridge Processing Company)	Air	0	8
Plant (environmental pollutants-metallic)	Air	74	75
Uranium	Air	5	0

Table F-6

AVERAGE MERCURY VAPOR AIR CONCENTRATION

	This Quarter			Last Quarter		
	July	August	September	April	May	June
<u>Building 9201-4</u>						
Number of Samples	4,135	2,916	3,028	3,877	2,828	2,893
Percent of Samples Above the MAC	11.78	0.99	1.02	0.95	3.50	4.77
Average mg/m ³	0.05	0.03	0.03	0.02	0.03	0.04
<u>Building 9201-5</u>						
Number of Samples	4,008	4,002	3,842	5,371	3,861	3,872
Percent of Samples Above the MAC	1.17	1.20	1.07	0.95	0.60	1.40
Average mg/m ³	0.02	0.02	0.02	0.03	0.02	0.02
<u>Building 81-10</u>						
Number of Samples	785	681	651	619	589	589
Percent of Samples Above the MAC	50.45	45.38	23.81	11.47	28.52	28.52
<u>Building 9808 (Pump Repair)</u>						
Number of Samples	164	161	204	216	252	259
Percent of Samples Above the MAC	3.66	.00	.98	6.48	9.13	10.81
Average mg/m ³	0.03	0.02	0.04	0.04	0.05	0.04

Y-12 PLANT QUARTERLY REPORT
Second Fiscal Quarter, 1959
October - December, 1958
EXTRACT

M-124

Authorized Derivative Classifier
[Signature] 2/1/95
Authorized Signature Date

Authorized Derivative Declassifier
[Signature] 2/2/95
Authorized Signature Date

This material has been reviewed by the Y-12
Classification office and has been determined
to be UNCLASSIFIED.

APPROVED FOR PUBLIC RELEASE
m. d. Bow 2/6/95
Technical Information Office Date

This document is an EXTRACT from (Y-1203)

THIS PAGE MUST NOT BE SEPARATED FROM THE ATTACHED DOCUMENT

M-124

Poplar Creek Water Sampling

Water samples from the East Fork of Poplar Creek were taken daily and composited weekly for mercury analysis. Daily samples were analyzed for lithium, sodium, potassium, and stream pH. The average results of these samples along with the average daily creek flow in gallons are presented in Table F-2.

Table F-2

POPLAR CREEK WATER ANALYSIS

Test	This Quarter	Last Quarter
Average Flow	7.8 million gals/day	8.3 million gals/day
Mercury	1.4 mg/l	1.3 mg/l
Lithium	5.4 ppm	4.8 ppm
Sodium	43.5 ppm	43.4 ppm
Potassium	11.6 ppm ⁽¹⁾	5.0 ppm
pH	8.5	8.6

⁽¹⁾ The analysis on 12/12/58 indicated the presence of 400 ppm.

Noise Studies

The program of noise studies and reduction was continued in areas where noise levels are in excess of damage risk criteria.

Personnel Exposure

The routine urine sampling programs for personnel working with mercury, lead, and fluorides were continued this quarter. Table F-3 gives information pertaining to these programs and to a special program for cadmium.

Table F-3

URINARY DATA
(Hg, Pb, F⁻, and Cd)

	Second Qtr. FY 1959	First Qtr. FY 1959	Fourth Qtr. FY 1958	Third Qtr. FY 1958
<u>Mercury</u>				
Number of People Sampled	588	593	658	689
Percent of People Above the MAC	5.8	8.4	6.8	6.9
Number of Samples	888	953	928	799
Percent of Samples Above the MAC	5.9	11.1	8.8	3.9
Number of Samples for Ferguson Personnel	55			

Table F-3 (Continued)

	Second Qtr. FY 1959	First Qtr. FY 1959	Fourth Qtr. FY 1958	Third Qtr. FY 1958
<u>Lead</u>				
Number of Samples	76 ⁽¹⁾	7	210	
Percent of Samples Above .15 mg/l	.13	0	0	
<u>Fluorides</u>				
Number of Samples	46	33	17	
Percent of Samples Above 4 ppm	0	0	5.9	
<u>Cadmium</u>				
Number of Samples	54			
Percent of Samples Above .15 µg/ml	0			

⁽¹⁾ This figure includes 39 samples for Oak Ridge Processing personnel.

Air Analysis

Routine environmental air analyses for the various contaminants found in Plant operating areas were continued. A breakdown of these analyses is given in Table F-4. In addition to these, samples were taken covering stack effluents, atmospheric samples, smear data, etc. The number of samples taken under the various categories is given in Table F-5.

Table F-4

ROUTINE ENVIRONMENTAL AIR ANALYSES

Contaminant	MAC/8 hrs	This Quarter		Last Quarter	
		No. of Samples	Percent Above MAC	No. of Samples	Percent Above MAC
Beryllium	2 µg/m ³	3,248	0.3	3,195	0
Carbon Monoxide	100 ppm	68	13.2	12	0
Chromic Acid	100 µg/m ³	10	0	15	0
Hydrogen Cyanide	10 ppm	29	0	22	0
Lead	200 µg/m ³	12	41.7	5	0
Methyl Chloroform	500 ppm	16	0	4	0
Mercury	100 µg/m ³	24,064	3.8	25,557	6.6
Perchloroethylene	200 ppm	89	9.0	73	8.2

Table F-6 shows the average building concentrations of mercury vapor for the first quarter FY 1959 and second quarter FY 1959; the trends of these concentrations are shown in Figure F-1.

Table F-5

MISCELLANEOUS AIR AND SMEAR SAMPLES

Contaminant	Type Sample	Number of Samples	
		This Quarter	Last Quarter
Barium	Air	0	3
Beryllium	Air	56	59
Beryllium	Smear	448	466
Fluorine	Air	0	12
Cadmium	Air	0	6
Cadmium	Smear	4	0
Lead	Air	6	0
Lithium	Air	1	0
Magnesium	Air	1	0
Nitric Acid	Stack	0	6
Mercury	Stack	0	5
Mercury	Air	87	126
Phosgene	Air	8	0
Sodium Hydroxide	Air	0	5
Plant Pollutants (metallic)	Air	75	74
Uranium	Air	3	5
Yttrium	Air	1	0

Table F-6

AVERAGE MERCURY VAPOR AIR CONCENTRATIONS

	This Quarter			Last Quarter		
	October	November	December	July	August	September
<u>Building 9201-4</u>						
Number of Samples	3,189	2,659	3,012	4,135	2,916	3,028
Percent of Samples Above the MAC	0.17	1.20	.76	11.78	0.99	1.02
Average mg/m ³	0.02	0.03	0.02	0.05	0.03	0.03
<u>Building 9201-5</u>						
Number of Samples	4,236	3,473	4,014	4,008	4,002	3,842
Percent of Samples Above the MAC	1.77	2.33	4.16	1.17	1.20	1.07
Average mg/m ³	0.02	0.03	0.03	0.02	0.02	0.02
<u>Building 81-10</u>						
Number of Samples	713	572	681	785	681	651
Percent of Samples Above the MAC	20.61	34.44	12.63	50.45	45.38	23.81
<u>Building 9808</u>						
Number of Samples	253	228	263	164	161	204
Percent of Samples Above the MAC	4.35	3.95	7.74	3.66	0	.98
Average mg/m ³	0.04	0.04	0.04	0.03	0.02	0.04

Poplar Creek Water Sampling

Water samples from the East Fork of Poplar Creek were taken daily and composited weekly for mercury analysis. Daily samples were analyzed for lithium, sodium, potassium, and stream pH. The average results of these samples along with the average daily creek flow in gallons are presented in table F-2.

Table F-2

POPLAR CREEK WATER ANALYSIS

	This Quarter	Last Quarter
Average Flow	8.4 million gals/day	7.8 million gals/day
Mercury	1.0 mg/l	1.4 mg/l
Lithium	6.0 ppm	5.4 ppm
Sodium	55.4 ppm	43.5 ppm
Potassium	6.4 ppm	11.6 ppm
pH	8.6	8.5

Noise Studies

The program of noise studies and reduction was continued in areas where noise levels are in excess of damage risk criteria.

Personnel Exposure

The routine urine sampling programs for personnel working with mercury, lead, and fluorides were continued this quarter. Table F-3 presents information pertaining to these programs.

Table F-3

URINARY DATA
(Hg, Pb, and F⁻)

	Third Qtr. FY 1959	Second Qtr. FY 1959	First Qtr. FY 1959	Fourth Qtr. FY 1958
<u>Mercury</u>				
Number of People Sampled	575	588	593	658
Percent of People Above the MAC	3.8	5.8	8.4	6.8
Number of Samples	793	888	953	928
Percent of Samples Above the MAC	5.2	5.9	11.1	8.8
<u>Lead</u>				
Number of Samples	23	76	7	210
Percent of Samples Above 0.15 mg/l	8.7	.13	0	0
<u>Fluorides</u>				
Number of Samples	80	46	33	17
Percent of Samples Above 4 ppm	0	0	0	5.9

(1) Includes 39 samples for ~~the Oak Ridge Processing Company.~~

Air Analyses

Routine environmental air analyses for the various contaminants found in plant operating areas were continued. A breakdown of the analyses is shown in table F-4. In addition to these, table F-5 shows the number of samples taken at stack effluents, for atmospheric samples, smear data, etc.

Table F-4

ROUTINE ENVIRONMENTAL AIR ANALYSES

Contaminant	MAC/8 hrs	This Quarter		Last Quarter	
		No. of Samples	Percent Above MAC	No. of Samples	Percent Above MAC
Beryllium	2 $\mu\text{g}/\text{m}^3$	4,156	.05	3,248	0.3
Carbon Monoxide	100 ppm	43	7.0	68	13.2
Chromic Acid	100 $\mu\text{g}/\text{m}^3$	12	0	10	0
Hydrogen Cyanide	10 ppm	22	0	29	0
Lead	200 $\mu\text{g}/\text{m}^3$	0	0	12	41.7
Methyl Chloroform	500 ppm	12	0	16	0
Mercury	100 $\mu\text{g}/\text{m}^3$	22,289	7.6	24,064	3.8
Perchloroethylene	200 ppm	47	14.9	89	9.0

Table F-5

MISCELLANEOUS AIR AND SMEAR SAMPLES

Contaminant	Type Sample	Number of Samples	
		This Quarter	Last Quarter
Beryllium	Air	252	56
Beryllium	Smear	1,694	448
Cadmium	Smear	0	4
Lead	Air	6	6
Lithium	Air	0	1
Magnesium	Air	0	1
Mercury	Air	775	87
Phosgene	Air	0	8
Selenium	Air	3	0
Sodium Hydroxide	Air	0	0
Thorium	Air	9	0
Thorium	Smear	12	0
Plant Pollutants (metallic)	Air	14	75
Uranium	Air	0	3
Yttrium	Air	0	1

Table F-6 shows the average building concentrations of mercury vapors for the second and third quarters of FY 1959; the trends for these concentrations are shown in figure F-1.

Table F-6

AVERAGE MERCURY VAPOR AIR CONCENTRATION

	This Quarter			Last Quarter		
	January	February	March	October	November	December
<u>Building 9201-4</u>						
Number of Samples	2,989	2,717	2,730	3,189	2,659	3,012
Percent of Samples Above MAC	2.37	2.76	3.44	0.94 ⁽¹⁾	1.20	.76
Average mg/m ³	0.03	0.03	0.02	0.02	0.03	0.02
<u>Building 9201-5</u>						
Number of Samples	3,853	3,490	3,827 ⁽²⁾	4,236	3,473	4,014
Percent of Samples Above MAC	11.14	7.13	16.54	1.77	2.33	4.16
Average mg/m ³	0.04	0.03	0.04	0.02	0.03	0.03
<u>Building 81-10</u>						
Number of Samples	341	⁽³⁾	310	713	572	681
Percent of Samples Above MAC	4.69		12.26	20.61	34.44	12.63
<u>Building 9808</u>						
Number of Samples	252	228	252	253	228	263
Percent of Samples Above MAC	8.73	6.58	1.98	4.35	3.95	7.74
Average mg/m ³	0.04	0.03	0.03	0.04	0.04	0.04

⁽¹⁾ Corrected from 0.17.

⁽²⁾ Includes reading involving shut-down beginning 3-13-59.

⁽³⁾ Sampling was discontinued after 1-16-59 due to temporary shut-down.

SAFETY

ACCIDENT EXPERIENCE

Since no disabling injuries occurred during this period, the frequency rate was 0.0 compared with 0.70 for the previous quarter, with two disabling injuries.

Another accident-free period in excess of 3 million man-hours was officially reached during this quarter. This period had accumulated to 4,404,085 accident-free man-hours as of March 31.

Y-12 PLANT QUARTERLY REPORT
Fourth Fiscal Quarter, 1959
April - June, 1959
EXTRACT

M-126

Authorized Derivative Classifier
M. J. J. [unclear] 2/1/95
Authorized Signature Date

Authorized Derivative Declassifier
R. Bawdon [unclear] 2/2/95
Authorized Signature Date

This material has been reviewed by the Y-12
Classification office and has been determined
to be UNCLASSIFIED.

APPROVED FOR PUBLIC RELEASE
m. d. Bond 2/3/95
Technical Information Office Date

This document is an EXTRACT from (Y-1205)

THIS PAGE MUST NOT BE SEPARATED FROM THE ATTACHED DOCUMENT

Ninety-three water samples were taken at water fountains throughout the area and checked for total residual chlorine, free available chlorine, and combined available chlorine. These samples were sent to the Public Health Department laboratory for 37° standard agar plate count and gas in lactose broth determination. One fountain showed no chlorine in the water and three fountains showed high bacteria count. The plant sanitary engineer was notified and corrective measures were initiated.

Poplar Creek Water Sampling

Water samples from the East Fork of Poplar Creek were taken daily and composited weekly for mercury analysis. Daily samples were analyzed for lithium, sodium, potassium, and stream pH. The average results of these samples along with the average daily creek flow in gallons are presented in Table F-2.

Table F-2

POPLAR CREEK WATER ANALYSIS

	Quarter	Last Quarter
Average Flow	9.7 million gals/day	8.4 million gals/day
Mercury	0.7 mg/l	1.0 mg/l
Lithium	2.7 ppm	6.0 ppm
Sodium	59.1 ppm	55.4 ppm
Potassium	6.2 ppm	6.4 ppm
pH	8.5	8.6

Noise Studies

A program of noise studies and reduction was continued in areas where noise levels are considered in excess of damage risk criteria. A few local conditions were corrected to provide more favorable conditions.

Personnel Exposure

Routine urine sampling programs for personnel working with mercury, lead, and fluorides were continued this quarter. Table F-3 presents information pertaining to these programs.

Air Analyses

Routine environmental and smear analyses for the various contaminants and in plant operating areas were continued. A breakdown of the analysis is shown in Table F-4. In addition to this, Table F-5 shows the number of samples taken at stack effluent, as atmospheric samples, and as smear

Table F-3
URINARY DATA
(Hg, Pb, & F)

	Fourth Qtr. FY 1959	Third Qtr. FY 1959	Second Qtr. FY 1959	First Qtr. FY 1959
<u>Mercury</u>				
Number of People Sampled	454	565(1)	588	593
Percent of People Above the MAC	7.5	5.7(2)	5.8	8.4
Number of Samples	677	793	888	953
Percent of Samples Above the MAC	7.1	5.2	5.9	11.1
Number of Samples for Ferguson Construction Company	38	0	55	0
<u>Lead</u>				
Number of Samples	30	23	37	7
Percent of Samples Above 0.15 mg/1	0	8.7	.13	0
Number of Samples for Oak Ridge Pro- cessing Company	34	0	39	0
<u>Fluorides</u>				
Number of Samples	97	80	46	33
Percent of Samples Above 4 ppm	0	0	0	0
Percent of Samples Above 2 ppm	8.6	--	--	--

(1) Corrected from 575

(2) Corrected from 3.8

Table F-4
ROUTINE ENVIRONMENTAL AIR ANALYSES

Contaminant	MAC/8 hrs	This Quarter		Last Quarter	
		No. of Samples	Percent Above MAC	No. of Samples	Percent Above MAC
Beryllium Air	2 $\mu\text{g}/\text{m}^3$	8,806	.2	4,156	.05
Beryllium Smear	25 $\mu\text{g}/12 \text{ in}^2$	3,584	6.1	1,694	--
Carbon Monoxide	100 ppm	0	0	43	7
Chromic Acid	100 $\mu\text{g}/\text{m}^3$	5	0	12	0
Hydrogen Cyanide	10 ppm	12	0	22	0
Lead	200 $\mu\text{g}/\text{m}^3$	32	0	0	0
Methyl Chloroform	500 ppm	0	0	12	0
Mercury	100 $\mu\text{g}/\text{m}^3$	17,750	10.5	22,289	7.6
Perchloroethylene	200 ppm	44	20.5	47	14.9

M-126

Table F-5
MISCELLANEOUS AIR AND SMEAR SAMPLES

Contaminant	Type Sample	Number of Samples	
		This Quarter	Last Quarter
Beryllium	Air	103	252
Fluorine	Air	6	0
Iodine	Stack	6	0
Lead	Air	52	6
Mercury	Air	612	775
Nitrates	Air	1	0
Phosgene	Air	16	0
Plant Pollutants (metallic)	Air	18	14
Selenium	Air	0	3
Thorium	Air	4	9
Thorium	Smear	0	12

Table F-6 shows the average building concentrations of mercury vapor for the third and fourth quarters of FY 1959; trends for the concentrations in Building 9201-4 and 9201-5 are shown in Figure F-1.

Table F-6
AVERAGE MERCURY VAPOR AIR CONCENTRATION

	This Quarter			Last Quarter		
	June	May	April	March	February	January
<u>Building 9201-4</u>						
Number of Samples	2,512	2,539	2,958	2,730	2,717	2,989
Percent of Samples Above MAC	3.58	5.04	3.45	3.44	2.76	2.37
Average mg/m ³	0.03	0.03	0.03	0.02	0.03	0.03
<u>Building 9201-5</u>						
Number of Samples	745	1,653	2,208	3,827(1)	3,490	3,853
Percent of Samples Above MAC	14.02	20.20	24.28	16.54	7.13	11.14
Average mg/m ³	0.04	0.07	0.05	0.04	0.03	0.04
<u>Building 81-10</u>						
Number of Samples	669	620	682	310	(2)	341
Percent of Samples Above MAC	22.42	25.97	20.97	12.26	--	4.69
<u>Building 9808</u>						
Number of Samples	120	240	204	252	228	252
Percent of Samples Above MAC	0.83	5.42	2.94	1.98	6.58	8.73
Average mg/m ³	0.03	0.03	0.03	0.03	0.03	0.04

(1) Includes readings taken in connection with shutdown operations beginning 3-13-59.

(2) Sampling was discontinued after 1-16-59 due to temporary shutdown.

Y-12 PLANT QUARTERLY REPORT

First Fiscal Quarter, 1960

July - September, 1959

EXTRACT

M-127

Authorized Derivative Classifier
M. J. [Signature] 2/1/95
Authorized Signature Date

Authorized Derivative Declassifier
R. B. [Signature] 2/2/95
Authorized Signature Date

This material has been reviewed by the Y-12 Classification office and has been determined to be UNCLASSIFIED.

APPROVED FOR PUBLIC RELEASE
m. d. Bond 2/3/95
Technical Information Office Date

This document is an EXTRACT from (Y-1206)

THIS PAGE MUST NOT BE SEPARATED FROM THE ATTACHED DOCUMENT

Public Health Department laboratory for 37° C standard agar plate count and gas-in-lactose broth determination. One fountain showed no chlorine and high bacteria count while another showed high bacteria count only. The plant sanitary engineer was notified and corrective measures were initiated.

Poplar Creek Water Sampling

Water samples from the East Fork of Poplar Creek were taken daily and composited weekly for mercury analysis. Daily samples were analyzed for lithium, sodium, potassium, and stream pH. The average results of these samples along with the average daily creek flow in gallons are presented in Table F-2.

Table F-2
POPLAR CREEK WATER ANALYSIS

	This Quarter	Last Quarter
Average Flow	9.4 x 10 ⁶ gals/day	9.7 x 10 ⁶ gals/day
Mercury	0.6 mg/l	0.7 mg/l
Lithium	1.9 ppm	2.7 ppm
Sodium	45.2 ppm	62.1 ppm
Potassium	4.8 ppm	6.2 ppm
pH	8.6	8.5

Noise Studies

The program of noise studies and reduction was continued in areas where noise levels are considered in excess of damage risk criteria. Ear plugs were recommended for personnel working in one additional area being used temporarily where noise was greater than the risk criteria. A few local situations were corrected to provide more favorable conditions.

Personnel Exposure

Routine urine sampling programs for personnel working with mercury, lead, or fluorides were continued this quarter. Table F-3 presents information pertaining to these programs.

Air Analyses

Routine environmental air and smear analyses for the various contaminants found in plant operating areas were continued. A breakdown of the analyses is shown in Table F-4. In addition to this, Table F-5 shows the number of samples taken at stack effluents, as atmospheric samples, and as smear data.

Table F-6 shows the average building concentrations of mercury vapor for the fourth quarter of FY 1959 and the first quarter of FY 1960; trends for the concentrations in Buildings 9201-4 and 9201-5 are shown in Figure F-1.

Table F-3
URINARY DATA
(Hg, Pb, & F⁻)

	First Quarter FY 1960	Fourth Quarter FY 1959	Third Quarter FY 1959	Second Quarter FY 1959
<u>Mercury</u>				
Number of People Sampled	345	454	565	588
Percent of People Above the MAC	5.8	7.5	5.7	5.8
Number of Samples	481	677	793	888
Percent of Samples Above the MAC	5.0	7.1	5.2	5.9
Number of Samples for Ferguson Construction Company	0	38	0	55
<u>Lead</u>				
Number of Samples	20	30	23	37
Percent of Samples Above 0.15 mg/l	0	0	8.7	.13
Number of Samples for Oak Ridge Pro- cessing Company	37	34	0	39
Number of Samples in Laboratory Backlog	36			
<u>Fluorides</u>				
Number of Samples	84	97	80	46
Percent of Samples Above 4 ppm	8.3	0	0	0
Percent of Samples Above 2 ppm	36.9	8.6	-	-

Table F-4
ROUTINE ENVIRONMENTAL AIR ANALYSES

Contaminant	MAC/8 hrs	This Quarter		Last Quarter	
		No of Samples	Percent Above MAC	No of Samples	Percent Above MAC
Beryllium Air	2 $\mu\text{g}/\text{m}^3$	9,462	.08	8,806	.2
Beryllium Smear	25 $\mu\text{g}/12 \text{ in}^2$	3,516	5.9	3,584	6.1
Carbon Monoxide	100 ppm	7	0	0	0
Chromic Acid	100 $\mu\text{g}/\text{m}^3$	16	0	5	0
Hydrogen Cyanide	10 ppm	30	0	12	0
Lead	200 $\mu\text{g}/\text{m}^3$	13	0	32	0
Mercury	100 $\mu\text{g}/\text{m}^3$	12,878	6.6	17,750	10.5
Perchloroethylene	200 ppm	18	22.2	44	20.5

Table F-5
MISCELLANEOUS AIR AND SMEAR SAMPLES

Contaminant	Type Sample	Number of Samples	
		This Quarter	Last Quarter
Beryllium	Air	164	103
Beryllium	Water	5	0
Fluorine	Air	3	6
Iodine	Stack	0	6
Lead	Air	0	52
Mercury	Air	32	612
Nitrates	Air	3	1
Nitric Acid	Stack	6	0
Phosgene	Air	0	16
Plant Pollutants (metallic)	Air	11	18
Plant Pollutants	Smear	2	--
Thorium	Air	0	4

Table F-6
AVERAGE MERCURY VAPOR AIR CONCENTRATION

	This Quarter			Last Quarter		
	September	August	July	June	May	April
<u>Building 9201-4</u>						
Number of Samples	2,278	2,320	2,504	2,512	2,539	2,958
Percent of Samples Above MAC	2.72	5.43	3.72	3.58	5.04	3.45
Average mg/m ³	.03	.04	.03	0.03	0.03	0.03
<u>Building 9201-5</u>						
Number of Samples	770	691	695	745	1,653	2,208
Percent of Samples Above MAC	4.16	7.67	3.47	14.02	20.20	24.28
Average mg/m ³	.04	.05	.04	0.04	0.07	0.05
<u>Building 81-10</u>						
Number of Samples	641	651	682	669	620	682
Percent of Samples Above MAC	19.82	21.65	19.35	22.42	25.97	20.97
<u>Building 9808</u>						
Number of Samples	120	108	108	120	240	204
Percent of Samples Above MAC	0.83	11.11	1.84	0.83	5.42	2.94
Average mg/m ³	.02	.04	.02	0.03	0.03	0.03

and checked for total residual chlorine, free available chlorine, and combined available chlorine. These samples were sent to the Public Health Department laboratory for 37° C standard agar plate count and gas in lactose broth determination. Five samples showed no chlorine and gave indications of significant bacteria count. The plant sanitary engineer was notified and corrective measures were initiated.

Poplar Creek Water Sampling

Water samples from the East Fork of Poplar Creek were taken daily and composited weekly for mercury analysis. Daily samples were analyzed for lithium, sodium, potassium, and stream pH. The average results of these samples along with the average daily creek flow in millions of gallons are presented in Table F-2.

Table F-2

POPLAR CREEK WATER ANALYSIS

	This Quarter	Last Quarter
Avg Flow	10.5 × 10 ⁶ gals/day	9.4 × 10 ⁶ gals/day
Mercury	0.2 mg/l	0.6 mg/l
Lithium	1.2 ppm	1.9 ppm
Sodium	40.7 ppm	45.2 ppm
Potassium	3.6 ppm	4.8 ppm
pH	8.1	8.6

Noise Studies

The program of noise studies and reduction was continued in areas where noise levels are considered in excess of damage risk criteria. Ear plugs were recommended in one additional area until the noise level is reduced and ear muffs were recommended in another area where the noise is continuously greater than the risk criteria.

Personnel Exposure

Routine urine sampling programs for personnel working with mercury, lead, or fluorides were continued this quarter. Table F-3 presents information pertaining to these programs.

Table F-3

URINARY DATA
(Hg, Pb, and F⁻)

	Second Quarter FY 1960	First Quarter FY 1960	Fourth Quarter FY 1959	Third Quarter FY 1959
<u>Mercury</u>				
Number of People Sampled	324	345	454	565
Percent of People Above the MAC	3.1	5.8	7.5	5.7
Number of Samples	450	481	677	793
Percent of Samples Above the MAC	4.9	5.0	7.1	5.2
Number of Samples for Ferguson Construction Company	0	0	38	0

Table F-5

MISCELLANEOUS SAMPLES

Contaminant	Type Sample	Number of Samples	
		This Quarter	Last Quarter
Beryllium	Air	101	164
Beryllium	Water	0	5
Fluorine	Air	0	3
Lead	Air	4	0
Mercury	Air	12	32
Methyl Chloroform	Air	9	0
Nitrates	Air	0	3
Nitric Acid	Stack	0	6
Plant Pollutants (metallic)	Air	8	11
Plant Pollutants	Smear	0	2

Figure F-1

AVERAGE BUILDING Hg VAPOR AIR CONCENTRATIONS

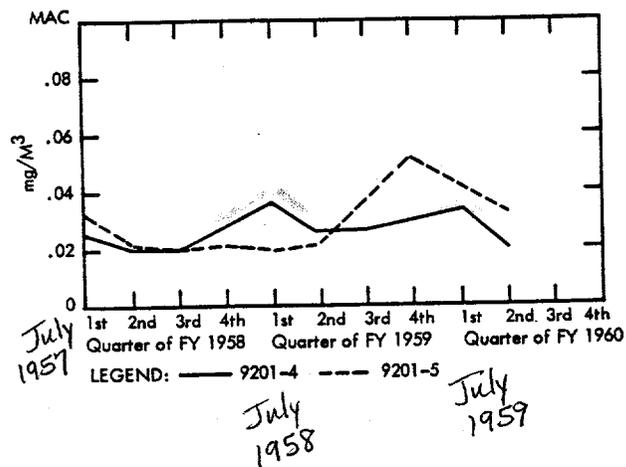


Table F-6

AVERAGE MERCURY VAPOR AIR CONCENTRATION

	This Quarter			Last Quarter		
	December	November	October	September	August	July
<u>Building 9201-4</u>						
Number of Samples	2,537	2,173	2,258	2,278	2,320	2,504
Percent of Samples Above MAC	3.78	2.35	1.33	2.72	5.43	3.72
Average mg/m ³	0.02	0.02	0.02	0.03	0.04	0.03
<u>Building 9201-5</u>						
Number of Samples	693	644	639	770	691	695
Percent of Samples Above MAC	23.09	4.19	3.81	4.16	7.67	3.47
Average mg/m ³	0.03	0.04	0.03	0.04	0.05	0.04
<u>Building 81-10</u>						
Number of Samples	578	551	609	641	651	682
Percent of Samples Above MAC	9.34	9.08	16.42	19.82	21.65	19.35

Table F-6 (Continued)

	December	This Quarter November	October	September	Last Quarter August	July
<u>Building 9808</u>						
Number of Samples	180	180	180	120	108	108
Percent of Samples Above MAC	1.11	1.11	3.91	0.83	11.11	1.84
Average mg/m ³	0.03	0.03	0.03	0.02	0.04	0.02

SAFETY

ACCIDENT EXPERIENCE

Disabling Injuries

Five disabling injuries occurred during this period, producing a frequency rate of 1.66 compared with 0.34 for the previous quarter. These injuries, which resulted in the loss of 256 days or an average of 51 days per injury, were as follows:

- Outside Machinist - Infected abrasion - right ankle.
- Pipefitter - Contused back.
- Material Handler - Severe sprain - left ankle.
- Machinist - Fractured ribs - multiple lacerations.
- Electrician - Sprain - right foot and ankle.

The plant's 25th disabling injury-free period was reached on October 6 when a total of 3,075,427 manhours was accumulated since the last lost-time injury. This period began on July 2 and reached a total of 97 days.

Y-12 PLANT QUARTERLY REPORT

Second Fiscal Quarter, 1960

October - December, 1959

M-128

EXTRACT

Authorized Derivative Classifier
M. J. [Signature] 2/2/95
Authorized Signature Date

Authorized Derivative Declassifier
R. Baughman [Signature] 2/2/95
Authorized Signature Date

This material has been reviewed by the Y-12 Classification office and has been determined to be UNCLASSIFIED.

APPROVED FOR PUBLIC RELEASE
m. d. [Signature] 2/2/95
Technical Information Office Date

This document is an EXTRACT from (Y-1207)

THIS PAGE MUST NOT BE SEPARATED FROM THE ATTACHED DOCUMENT

~~SECRET~~

M-128

Table F-3 (Continued)

	Second Quarter FY 1960	First Quarter FY 1960	Fourth Quarter FY 1959	Third Quarter FY 1959
<u>Lead</u>				
Number of Samples	102	20	30	23
Percent of Samples Above 0.15 mg/l	0	0	0	8.7
Number of Samples for Oak Ridge Processing Company	37	37	34	0
<u>Fluorides</u>				
Number of Samples	81	84	97	80
Percent of Samples Above 4 ppm	4.9	8.3	0	0
Percent of Samples Above 2 ppm	39.5	36.9	8.6	-

Air Analyses

Routine environmental air and smear analyses for the various contaminants found in plant operating areas were continued. A breakdown of the analytical results is shown in Table F-4. In addition to this, Table F-5 shows the number of samples taken at stack effluents, as atmospheric samples, and as smear data.

Table F-4

ROUTINE ENVIRONMENTAL AIR ANALYSES

Contaminant	MAC/8 hrs	This Quarter		Last Quarter	
		Number of Samples	Percent Above MAC	Number of Samples	Percent Above MAC
Beryllium Air	2 $\mu\text{g}/\text{m}^3$	8,787	.02	9,462	.08
Beryllium Smear	25 $\mu\text{g}/12 \text{ in}^2$	4,014	7.8	3,516	5.9
Carbon Monoxide	100 ppm	11	18.2	7	0
Chromic Acid	100 $\mu\text{g}/\text{m}^3$	12	0	16	0
Hydrogen Cyanide	10 ppm	56	0	30	0
Lead	200 $\mu\text{g}/\text{m}^3$	0	0	13	0
Mercury	100 $\mu\text{g}/\text{m}^3$	11,444	4.8	12,878	6.6
Perchloroethylene	200 ppm	57	31.6	18	22.2
Trichloroethylene	200 ppm	10	0	0	0

Table F-6 shows the average building concentrations of mercury vapor for the first and second quarters of FY 1960; trends for the concentrations in Buildings 9201-4 and 9201-5 are shown in Figure F-1.

~~SECRET~~

Y-12 PLANT QUARTERLY REPORT

Third Fiscal Quarter, 1960

January - March, 1960

M-129

EXTRACT

Authorized Derivative Classifier
M. J. Guley 2/2/95
Authorized Signature Date

Authorized Derivative Declassifier
R. B. Anderson 2/2/95
Authorized Signature Date

This material has been reviewed by the Y-12
Classification office and has been determined
to be UNCLASSIFIED.

APPROVED FOR PUBLIC RELEASE
m. d. Bond 2/2/95
Technical Information Office Date

This document is an EXTRACT from (Y-1208)

THIS PAGE MUST NOT BE SEPARATED FROM THE ATTACHED DOCUMENT

Dosimetry Experiments at the ORNL Critical Experiment Facility (CEF) and Godiva III Facility at the LASL - Two members of the Radiation Safety Department assisted the Engineering Physics Department in conducting experiments to further evaluate the emergency monitoring devices currently in use in the Y-12 Plant. Primary and secondary threshold detector units, personnel dosimeter badges, and Na-24 activation of phantoms containing tissue-equivalent solutions and/or aqueous NaCl solutions were used to evaluate neutron exposures. Silver activated metaphosphate glass and chemical dosimeters were used to evaluate neutron exposures. Silver activated metaphosphate glass and chemical dosimeters were used to evaluate gamma doses. Proposed devices for determining the orientation of persons relative to a nuclear burst were also included in the experiments. Such devices were first tested on January 29 at the ORNL Critical Experiments Facility (CEF) fueled with enriched uranyl nitrate.

A similar experiment was conducted at the Los Alamos Scientific laboratory during the week of March 7 - 12. Two exposures were made during this week to fission bursts from a bare metal reactor in the order of 10^{16} fissions, which is an order of magnitude that would be expected to occur in an accidental excursion in the Y-12 Plant. Following each of the exposures, all components contained in the various devices were counted and recorded using the facilities of the Health Research Laboratory Division of the LASL. The information collected is being evaluated.

INDUSTRIAL HYGIENE

Potable Water Sampling

The routine program of sampling potable water from various plant locations was continued on a limited scale. Fifty-one water samples were taken at water fountains throughout the area and checked for total residual chlorine, free available chlorine, and combined available chlorine. These samples were sent to the Public Health Department Laboratory for 37°C standard agar plate count and gas in lactose broth determination. One sample did not show chlorine but gave no indication of significant bacteria count.

Poplar Creek Water Sampling

Water samples from the East Fork of Poplar Creek were taken daily and composited weekly for mercury and complete spectrographic analyses. Stream pH and creek flow were taken daily. The average results for mercury, stream pH, and creek flow are presented in Table F-7. Due to the number of materials involved, the spectrographic results are not shown.

Table F-7
POPLAR CREEK ANALYSIS

	This Quarter	Last Quarter
Avg Flow	10.7 million gals/day	10.5 million gals/day
Mercury	0.2 mg/l	0.2 mg/l
pH	8.1	8.1

Noise Studies

The program of noise studies and reduction was continued in areas where noise levels are considered in excess of damage risk criteria. Ear muffs were recommended in an area where the noise is greater than the risk criteria during operations.

Personnel Exposure

Routine urine sampling programs for personnel working with mercury, lead, or fluorides were continued this quarter. Table F-8 presents information pertaining to these programs.

Table F-8
URINARY DATA
(Hg, Pb, and F⁻)

	Third Qtr FY 1960	Second Qtr FY 1960	First Qtr FY 1960	Fourth Qtr FY 1959
<u>Mercury</u>				
Number of People Sampled	289	324	345	454
Percent of People Above the MAC	2.8	3.1	5.8	7.5
Number of Samples	426	450	481	677
Percent of Samples Above the MAC	2.1	4.9	5.0	7.1
Number of Samples for Ferguson Construction Co	9	0	0	38
<u>Lead</u>				
Number of Samples	64	102	20	30
Percent of Samples Above 0.15 mg/1	0	0	0	0
Number of Samples for Oak Ridge Processing Co	45	37	37	34
<u>Fluorides</u>				
Number of Samples	81	81	84	97
Percent of Samples Above 4 ppm	2.5	4.9	8.3	0
Percent of Samples Above 2 ppm	56.8	39.5	36.9	8.6

Air Analyses

Environmental air and smear analyses for the various contaminants found in plant operating areas were taken. A breakdown of the analytical results is shown in Table F-9. In addition

M-129

to this, Table F-10 shows the number of samples taken at stack effluents, as atmospheric samples, and as smear data.

Table F-9
ROUTINE ENVIRONMENTAL ANALYSES

Contaminant	MAC/8 hrs	This Quarter		Last Quarter	
		Number of Samples	Percent Above MAC	Number of Samples	Percent Above MAC
Beryllium Air	2 $\mu\text{g}/\text{m}^3$	8,952	0.06	8,787	0.02
Beryllium Smear	25 $\mu\text{g}/12 \text{ in}^2$	3,909	12.2	4,014	7.8
Carbon Monoxide	100 ppm	0	0	11	18.2
Chromic Acid	100 $\mu\text{g}/\text{m}^3$	18	0	12	0
Hydrogen Cyanide	10 ppm	42	0	56	0
Mercury	100 $\mu\text{g}/\text{m}^3$	12,345	3.5	11,444	4.8
Perchloroethylene	200 ppm	85	16.5	57	31.6
Trichloroethylene	200 ppm	32	9.4	10	0

Table F-10
MISCELLANEOUS SAMPLES

Contaminant	Type Sample	Number of Samples	
		This Quarter	Last Quarter
Beryllium	Air	116	101
Beryllium	Smear	119	-
Cadmium	Air	5	0
Lead	Air	0	4
Mercury	Air	119	12
Methyl Chloroform	Air	0	9
Plant Pollutants (metallic)	Air	161	8

Table F-11 shows the average building concentrations of mercury vapor for the second and third quarters of FY 1960; trends in the concentrations of Buildings 9201-4 and 9201-5 are shown in Figure F-7.

Table F-11
AVERAGE MERCURY VAPOR AIR CONCENTRATION

	This Quarter			Last Quarter		
	March	February	January	December	November	October
	Building 9201-4					
Number of Samples	2,695	2,122	1,955	2,537	2,173	2,258
Percent of Samples Above MAC	2.67	2.88	1.69	3.78	2.35	1.33
Average mg/m^3	0.02	0.02	0.02	0.02	0.02	0.02

M-129

Table F-11 (Continued)

	This Quarter			Last Quarter		
	March	February	January	December	November	October
<u>Building 9201-5</u>						
Number of Samples	748	681	797	693	644	639
Percent of Samples Above MAC	.00	0.29	7.40	2.31	4.19	3.81
Average mg/m ³	0.02	0.02	0.04	0.03	0.04	0.03
<u>Building 81-10</u>						
Number of Samples	638	585	580	578	551	609
Percent of Samples Above MAC	15.36	6.33	7.76	9.34	9.08	16.42
<u>Building 9808</u>						
Number of Samples	273	207	192	180	180	180
Percent of Samples Above MAC	1.83	1.93	0.52	1.11	1.11	3.91
Average mg/m ³	0.02	0.02	0.02	0.03	0.03	0.03

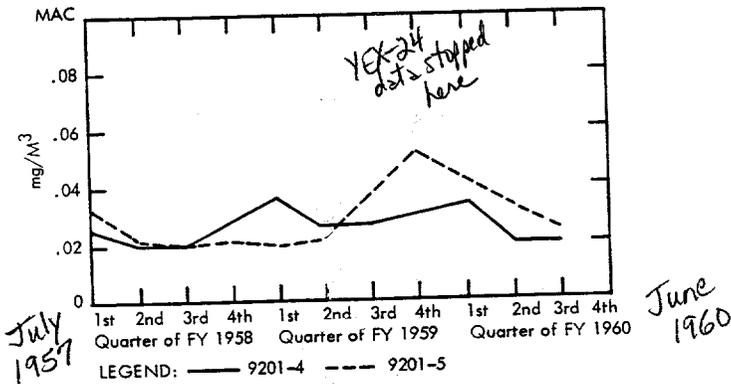


Figure F-7. AVERAGE BUILDING Hg VAPOR AIR CONCENTRATIONS.

Y-12 PLANT QUARTERLY REPORT

Fourth Fiscal Quarter, 1960

April - June, 1960

M-130

EXTRACT

Authorized Derivative Classifier	
<u><i>M. J. Kelly</i></u>	<u>2/2/95</u>
Authorized Signature	Date

Authorized Derivative Declassifier	
<u><i>R. B. ...</i></u>	<u>2/2/95</u>
Authorized Signature	Date

This material has been reviewed by the Y-12 Classification office and has been determined to be UNCLASSIFIED.

APPROVED FOR PUBLIC RELEASE	
<u><i>m. d. Bond</i></u>	<u>2/7/95</u>
Technical Information Office	Date

This document is an EXTRACT from (Y-1209)

THIS PAGE MUST NOT BE SEPARATED FROM THE ATTACHED DOCUMENT

Building 9998 - Plans have been completed for the installation of a continuous radiation monitoring system for the in Z Area of Building 9998. Installation should be completed within two weeks.

Emergency Program

Mobile Radiation Dosimetry Facility - Acceptance inspection of the new Mobile Radiation Dosimeter facility at the site of the vendor has been scheduled for July 5. Delivery is expected during July. The unit will be stationed at Building 9203 until the electronic equipment is installed, after which it will be parked at the southwest corner of Building 9711-1.

Emergency Monitoring Team - The five emergency monitoring teams in the Radiation Safety Department have reviewed their respective procedures which are to be used in combating and evaluating the consequences of a radiation emergency. Each team is in the process of rewriting their procedures using uniform formats.

Emergency Monitoring Equipment - Comment prints showing the location of emergency monitoring equipment in Y-12 have been reviewed and returned to the Engineering Department. The complete set of prints should be available within the next 30 days.

INDUSTRIAL HYGIENE

Potable Water Sampling

The routine program of sampling potable water from various Plant locations was continued through the week ending May 15, after which the Public Health Department was unable to continue its services. Fifty-five samples were checked for total residual chlorine, free available chlorine, and combined available chlorine, while forty-six of these were sent to the Public Health Department for 37°C standard agar plate count and gas in lactose broth determination. Three samples did not show chlorine and two showed significant bacteria count.

Poplar Creek Water Sampling

Water samples from the East Fork of Poplar Creek were taken daily for spectrographic analysis and pH and composited weekly for mercury. Stream pH and creek flow were taken daily on charts at the weir. The average results for mercury, stream pH, and creek flow are presented in Table F-7. Results are available for thirty-nine inorganic materials included in the spectrographic determination.

Noise Studies

The program of noise studies and reduction was continued in areas where noise levels are considered in excess of damage risk criteria. A program to survey all buildings located has

Table F-7
POPLAR CREEK ANALYSIS

	This Quarter	Last Quarter
Avg Flow	9.8 million gals/day	10.7 million gals/day
Mercury	0.2 mg/1	0.2 mg/1
pH	8.8	8.1

been started in order to better evaluate potential exposures to all personnel. This is necessary to keep current with the revised medical program of checking the hearing loss of employees.

Personnel Exposure

Routine urine sampling programs for personnel working with mercury, lead or fluorides were continued this quarter. Table F-8 presents information pertaining to these programs.

Table F-8
URINARY DATA
(Hg, Pb, and F⁻)

	Fourth Quarter FY 1960	Third Quarter FY 1960	Second Quarter FY 1960	First Quarter FY 1960
<u>Mercury</u>				
Number of People Sampled	262	289	324	354
Percent of People Above the MAC	2.3	2.8	3.1	5.8
Number of Samples	398	426	450	481
Percent of Samples Above the MAC	2.0	2.1	4.9	5.0
Number of Samples for Ferguson Construction Co	0	9	0	0
<u>Lead</u>				
Number of Samples	112	64	102	20
Percent of Samples Above 0.15 mg/1	0	0	0	0
Number of Samples for Oak Ridge Processing Co	37	45	37	34
<u>Fluorides</u>				
Number of Samples	43	81	81	84
Percent of Samples Above 4 ppm	0	2.5	4.9	8.3
Percent of Samples Above 2 ppm	53.5	56.8	39.5	36.9

Air Analyses

Environmental air and smear analyses for the various contaminants found in Plant operating areas were taken. A breakdown of the analytical results is shown in Table F-9. In addition to this, Table F-10 shows the number of samples taken at stack effluents, as atmospheric samples, and as smear data.

M-130

Table F-9
ROUTINE ENVIRONMENTAL ANALYSES

Contaminant	MAC/8 hrs	This Quarter		Last Quarter	
		Number of Samples	Percent Above MAC	Number of Samples	Percent Above MAC
Beryllium Air	2 $\mu\text{g}/\text{m}^3$	9,116	0.06	8,952	0.06
Beryllium Smear	25 $\mu\text{g}/12 \text{ in}^2$	3,623	9.58	3,909	12.2
Carbon Monoxide	100 ppm	44	9.09	0	0 0
Chromic Acid	100 $\mu\text{g}/\text{m}^3$	12	0	18	0
Hydrogen Cyanide	10 ppm	48	0	42	0
Mercury	100 $\mu\text{g}/\text{m}^3$	11,746	6.01	12,345	3.5
Perchloroethylene	200 ppm	52	21.15	85	16.5
Trichloroethylene	200 ppm	11	0	32	9.4

Table F-11 shows the average building concentrations of mercury vapor for the third and fourth quarters of FY 1960; trends in the concentrations of Buildings 9201-4 and 9201-5 are shown in Figure F-7.

Table F-10
MISCELLANEOUS SAMPLES

Contaminant	Type Sample	Number of Samples	
		This Quarter	Last Quarter
Beryllium	Air	62	116
Beryllium	Smear	879	119
Beryllium	Water	2	0
Cadmium	Air	0	5
Lead	Air	16	0
Mercury	Air	73	119
Osmium	Air	12	0
Osmium	Stack	3	0
Plant Pollutants (metallic)	Air	149	161
Non-Specific (information)	Air and Smear	4	0

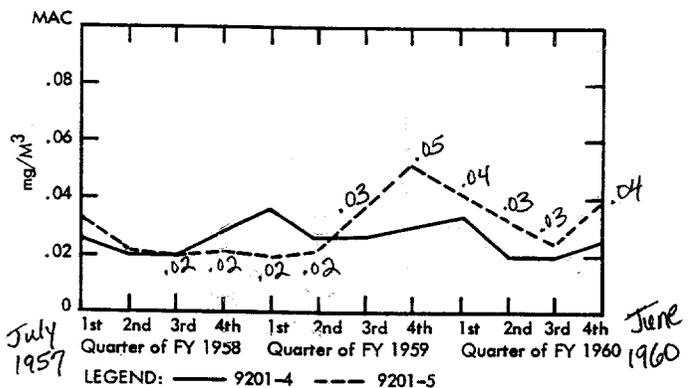


Figure F-7. AVERAGE BUILDING Hg VAPOR AIR CONCENTRATIONS.

UNCLASSIFIED

M-130

Table F-11
 AVERAGE MERCURY VAPOR AIR CONCENTRATION

	This Quarter			Last Quarter		
	June	May	April	March	Feb	Jan
<u>Building 9201-4</u>						
Number of Samples	2,604	2,434	2,305	2,695	2,122	1,955
Percent of Samples Above MAC	6.45	4.27	3.90	2.67	2.88	1.69
Average mg/m ³	0.03	0.03	0.02	0.02	0.02	0.02
<u>Building 9201-5</u>						
Number of Samples	683	748	620	748	681	797
Percent of Samples Above MAC*	11.42	3.07	3.22	0.00	0.29	7.40
Average mg/m ³	0.05	0.03	0.04	0.02	0.02	0.04
<u>Building 81-10</u>						
Number of Samples	418	357	568	638	585	580
Percent of Samples Above MAC	18.66	13.72	14.79	15.36	6.33	7.76
<u>Building 9808</u>						
Number of Samples	308	278	247	273	207	192
Percent of Samples Above MAC	2.60	0.72	0.81	1.83	1.93	0.52
Average mg/m ³	0.03	0.03	0.03	0.02	0.02	0.02

UNCLASSIFIED

Y-12 PLANT QUARTERLY REPORT
First Fiscal Quarter, 1961
July - September, 1960
EXTRACT

M-131

Authorized Derivative Classifier
[Signature] 2/2/95
Authorized Signature Date

Authorized Derivative Declassifier
[Signature] 2/2/95
Authorized Signature Date

This material has been reviewed by the Y-12
Classification office and has been determined
to be UNCLASSIFIED.

APPROVED FOR PUBLIC RELEASE
[Signature] 2/7/95
Technical Information Office Date

This document is an EXTRACT from (Y-1210)

THIS PAGE MUST NOT BE SEPARATED FROM THE ATTACHED DOCUMENT

INDUSTRIAL HYGIENE

Potable Water Sampling

The routine program of sampling potable water for bacteriological count was re-established on August 15, with the ORNL performing work previously done by the Oak Ridge Public Health Department. Eighty samples were checked for total residual chlorine, free available chlorine, and combined available chlorine, with one sample giving no indication. Sixty-six samples showed negative results for coil-aerogenes as determined by the Direct Membrane Filter Test.

Table F-8

POPLAR CREEK ANALYSIS

	This Quarter	Last Quarter
Avg Flow	8.9 million gals/day	9.8 million gals/day
Mercury	0.4 mg/l	0.2 mg/l
pH	8.4	8.8

Poplar Creek Water Sampling

Water samples were taken daily from the East Fork of Poplar Creek for pH and composited weekly for spectrographic and mercury analyses. Stream pH and creek flow were taken daily on charts at the weir. The average results for mercury, stream pH, and creek flow are presented in Table F-8.

Noise Studies

The program of noise studies and reduction was continued in areas where noise levels are considered in excess of damage risk criteria. Two areas were checked, due to complaints from personnel, but were found to be well below the damage risk criteria.

Personnel Exposure

Routine urine sampling programs for personnel working with mercury, lead, or fluorides were continued this quarter. Table F-9 presents information pertaining to these programs.

Air Analyses

Environmental air and smear analyses for the various contaminants found in Plant operating areas were taken. A breakdown of the analytical results is shown in Table F-10. In addition, Table F-11 shows the number of samples taken at stack effluents, as atmospheric samples, and as smear data.

Table F-12 shows the average building concentrations of mercury vapor for the fourth quarter FY 1960 and first quarter FY 1961; trends in the concentrations of Buildings 9201-4 and 9201-5 over the past eight quarters are shown in Figure F-8.

M-131

Table F-9
URINARY DATA
(Hg, Pb, and F⁻)

	First Quarter FY 1960	Fourth Quarter FY 1960	Third Quarter FY 1960	Second Quarter FY 1960
<u>Mercury</u>				
Number of People Sampled	277	262	289	324
Percent of People Above MAC	2.2	2.3	2.8	3.1
Number of Samples	408	398	426	450
Percent of Samples Above MAC	1.7	2.0	2.1	4.9
<u>Lead</u>				
Number of Samples	17	112	64	102
Percent of Samples Above 0.15 mg/l	0	0	0	0
<u>Fluorides</u>				
Number of Samples	0	43	81	81
Percent of Samples Above 4 ppm	0	0	2.5	4.9
Percent of Samples Above 2 ppm	0	53.5	56.8	39.5

Table F-10
ROUTINE ENVIRONMENTAL ANALYSES

Contaminant	MAC/8 hrs	This Quarter		Last Quarter	
		Number of Samples	Percent Above MAC	Number of Samples	Percent Above MAC
Beryllium Air	2 $\mu\text{g}/\text{m}^3$	9,203	0.57	9,116	0.06
Beryllium Smear	25 $\mu\text{g}/12 \text{ in}^2$	4,222	3.88	3,623	9.58
Carbon Monoxide	100 ppm	0	0	44	9.09
Chromic Acid	100 $\mu\text{g}/\text{m}^3$	6	0	12	0
Hydrogen Cyanide	10 ppm	14	0	48	0
Mercury	100 $\mu\text{g}/\text{m}^3$	11,334	6.10	11,746	6.01
Perchloroethylene	200 ppm	167	14.37	52	21.15
Trichloroethylene	200 ppm	0	0	11	0

Table F-11
MISCELLANEOUS SAMPLES

Contaminant	Type Sample	Number of Samples	
		This Quarter	Last Quarter
Beryllium	Air	108	62
Beryllium	Smear	361	879
Beryllium	Water	0	2
Cadmium	Air	0	0
Lead	Air	0	16
Mercury	Air	48	73
Osmium	Air	8	12
Osmium	Stack	0	3
Perchloroethylene	Air	23	0
Plant Pollutants (metallic)	Air	143	149
Non-Specific (for information)	Air and Smear	0	4
Thallium	Air	3	0

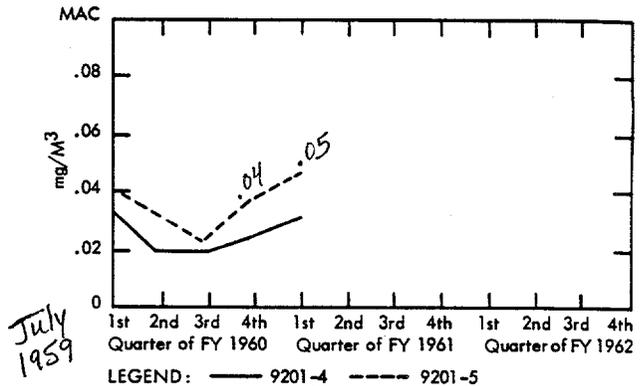


Figure F-7. AVERAGE BUILDING Hg VAPOR AIR CONCENTRATIONS.

PLANT EMERGENCY PLANNING

GENERAL ACTIVITIES

Plant Public Address System

A Plant public address system has been

Table F-12
AVERAGE MERCURY VAPOR AIR CONCENTRATION

	This Quarter			Last Quarter		
	September	August	July	June	May	April
<u>Building 9201-4</u>						
Number of Samples	2279	2766	2126	2604	2434	2305
Percent of Samples Above MAC	2.98	4.27	6.96	6.45	4.27	3.90
Average mg/m ³	0.03	0.03	0.04	0.03	0.03	0.02
<u>Building 9201-5</u>						
Number of Samples	729	741	641	683	748	620
Percent of Samples Above MAC	7.96	13.22	11.54	11.42	3.07	3.22
Average mg/m ³	0.04	0.05	0.05	0.05	0.03	0.04
<u>Building 81-10</u>						
Number of Samples	354	390	322	418	357	568
Percent of Samples Above MAC	6.78	12.56	9.01	18.66	13.72	14.79
<u>Building 9808</u>						
Number of Samples	294	289	252	308	278	247
Percent of Samples Above MAC	1.70	2.08	5.16	2.60	0.72	0.81
Average mg/m ³	0.03	0.03	0.04	0.03	0.03	0.03

Y-12 PLANT QUARTERLY REPORT

Second Quarter, FY 1961

October - December, 1960

M-132

EXTRACT

Authorized Derivative Classifier
[Signature] 2/2/95
Authorized Signature Date

Authorized Derivative Declassifier
[Signature] 2/2/95
Authorized Signature Date

This material has been reviewed by the Y-12
Classification office and has been determined
to be UNCLASSIFIED.

APPROVED FOR PUBLIC RELEASE
m. d. Bond 2/7/95
Technical Information Office Date

This document is an EXTRACT from (Y-1211)

THIS PAGE MUST NOT BE SEPARATED FROM THE ATTACHED DOCUMENT

M-132

Change in Method of Uranalyses - The Statistical Services Department compared data obtained by the microtometer and electroplating methods of extracting uranium from urine. On the basis of this study, a decision was made to change the method of uranalyses from the presently used small cell to a larger cell with an automated method of controlling plating current. This method is more precise and has greater sensitivity than the present one.

Radiation Survey Instrument Study - A study is being made of various types and models of radiation survey instruments to evaluate them from the standpoints of field use, efficiency, and maintenance. Results of the study will be used as a guide to bring the operating inventory up to date.

Evaluation of Plant Security-Dosimeter as Personnel Monitoring Meter - Preliminary studies in comparing results from the new security-dosimeters with those from routine monitoring badges show reasonably close agreement. Studies of additional data will be made to evaluate the possibility of using the Plant security-dosimeter as a personnel monitoring meter to replace the present routine monitoring badge.

INDUSTRIAL HYGIENE

Potable Water Sampling

The routine program of sampling potable water was continued this quarter. 52 samples were checked for total residual chlorine, free available chlorine, and combined available chlorine; one sample indicated no chlorine. All bacteriological count of these samples for coliforms as determined by direct membrane filter test were negative.

Table F-8

POPLAR CREEK ANALYSIS

	This Quarter	Last Quarter
Avg Flow	8.9 million gals/day	9.8 million gals/day
Mercury	0.4 mg/l	0.2 mg/l
pH	8.4	8.8

Poplar Creek Water Sampling

Water samples were taken daily from the East Fork of Poplar Creek for pH, and composited weekly for spectrographic and mercury analyses. Stream pH and creek flow were taken daily on charts at the weir. The average results for mercury, pH, and creek flow are presented in Table F-8.

Noise Studies

The program of noise studies and reduction was continued in areas where noise levels are considered in excess of damage risk criteria. Three areas were checked and recommendations were made in locations where high readings were received.

Personnel Exposure

Routine urine sampling programs for personnel working with mercury, lead, and fluorides were continued this quarter. Table F-9 presents information pertaining to these programs.

Table F-9
URINARY DATA
(Hg, Pb, and F⁻)

	Second Quarter FY 1961	First Quarter FY 1961	Fourth Quarter FY 1960	Third Quarter FY 1960
<u>Mercury</u>				
Number of People Sampled	225	277	262	289
Percent of People Above MAC	0.9	2.2	2.3	2.8
Number of Samples	228	408	398	426
Percent of Samples Above MAC	0.9	1.7	2.0	2.1
<u>Lead</u>				
Number of Samples	27	17	112	64
Percent of Samples Above 0.15 mg/l	0	0	0	0
<u>Fluorides</u>				
Number of Samples	66	0	43	81
Percent of Samples Above 4 ppm	1.5	0	0	2.5
Percent of Samples Above 2 ppm	12.1	0	53.5	56.8
<u>Miscellaneous (Cd and F⁻)</u>				
Number of Samples	1			

Air Analyses

Environmental air and smear analyses for the various contaminants found in Plant operating areas were made. A breakdown of the analytical results is shown in Table F-10. In addition, Table F-11 shows the number of samples taken at stack effluents, as atmospheric samples, and as smear data.

Table F-12 shows the average building concentrations of mercury vapor for the first and second quarters of FY 1961; trends in the concentrations of Building 9201-4 and 9210-5 are shown in Figure F-7.

Table F-12
AVERAGE MERCURY VAPOR AIR CONCENTRATION

	This Quarter			Last Quarter		
	December	November	October	September	August	July
Building 9201-4						
Number of Samples	2379	2455	2432	2279	2766	2126
Percent of Samples Above MAC	3.95	2.73	2.59	2.98	4.27	6.96
Average mg/m ³	0.03	0.02	0.02	0.03	0.03	0.04
Building 9201-5						
Number of Samples	733	830	782	729	741	641
Percent of Samples Above MAC	3.41	5.78	4.73	7.96	13.22	11.54
Average mg/m ³	0.03	0.03	0.03	0.04	0.05	0.05
Building 81-10						
Number of Samples	346	357	339	354	390	322
Percent of Samples Above MAC	1.16	6.16	6.19	6.78	12.56	9.01
Building 9808						
Number of Samples	182	266	266	294	289	252
Percent of Samples Above MAC	1.10	2.26	3.38	1.70	2.08	5.16
Average mg/m ³	0.02	0.03	0.03	0.03	0.03	0.04

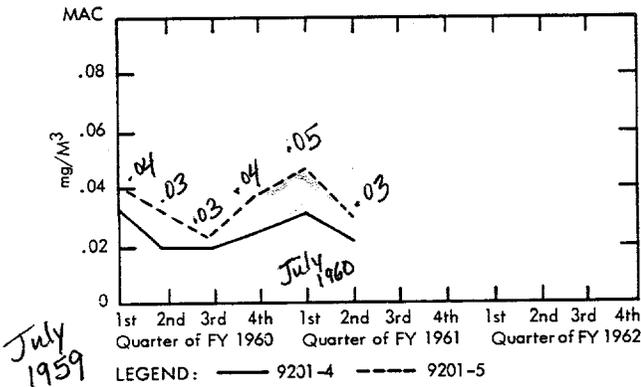


Figure F-7. AVERAGE BUILDING Hg VAPOR AIR CONCENTRATIONS.

various Y-12 emergency groups have been conducted at the new facility for orientation of emergency controls directed by that office.

Simulated Drill

The Y-12 forces participated in the simulated critical accident drill at the ORGDP, Building 1420, held on December 1. Y-12 responded to emergency requests by dispatching the mobile counting laboratory unit, 16 health physics technicians, and two observers.

Local Emergency Squad

New schedules for squad training and new instruction outlines have been released for squad participation in the next quarter.

Y-12 PLANT QUARTERLY REPORT

Third Quarter, FY 1961

January - March, 1961

M-133

EXTRACT

Authorized Derivative Classifier
W. J. D. King 2/2/95
Authorized Signature Date

Authorized Derivative Declassifier
R. Bayliss 2/2/95
Authorized Signature Date

This material has been reviewed by the Y-12
Classification office and has been determined
to be UNCLASSIFIED.

APPROVED FOR PUBLIC RELEASE
m. d. Bond 2/7/95
Technical Information Office Date

This document is an EXTRACT from (Y-1212)

THIS PAGE MUST NOT BE SEPARATED FROM THE ATTACHED DOCUMENT

INDUSTRIAL HYGIENE

Potable Water Sampling

The routine program of sampling potable water was continued this quarter. 83 samples were checked for total residual chlorine, free available chlorine, and combined available chlorine. Six samples indicated no chlorine. Bacteriological count by direct membrane filter test for coliforms was done on all these samples. One sample contained colonies of coliform bacteria. The Plant sanitary engineer was notified and corrective action was taken.

Poplar Creek Water Sampling

Water samples were taken daily from the East Fork of Poplar Creek for pH and composited weekly for spectrographic and mercury analyses. Stream pH and creek flow were taken daily on charts at the weir. The average results for mercury, pH, and creek flow for this and the preceding quarters are presented in Table F-8.

Table F-8
POPLAR CREEK ANALYSES

	This Quarter	Last Quarter
Average Flow	Approximately 9.5 ⁽¹⁾ million gals/day	8.9 million gals/day
Mercury	0.1 mg/liter	0.4 mg/liter
pH	8.3	8.4

⁽¹⁾Off scale on chart week beginning 2-20-61.

Noise Studies

The program of noise studies and reduction was continued. Four areas checked by request of the Medical Department showed readings below the damage risk criteria. A noise survey for each area in the Plant was started in January. Eighty-one areas were checked in eight buildings and recommendations were made to the appropriate supervision where high readings were obtained.

Personnel Exposures

Routine urine sampling programs for personnel working with mercury, lead, or fluorides were continued this quarter. Table F-9 presents information about these programs for this and the preceding three quarters.

Table F-9
URINARY DATA
(Hg, Pb, and F⁻)

	Third Quarter FY 1961	Second Quarter FY 1961	First Quarter FY 1961	Fourth Quarter FY 1960
<u>Mercury</u>				
Number of People Sampled	181	225	277	262
Percent of People Above MAC	2.2	0.9	2.2	2.3
Number of Samples	194	228	408	398
Percent of Samples Above MAC	3.6	0.9	1.7	2.0
<u>Lead</u>				
Number of Samples	15	27	17	112
Percent of Samples Above 0.15 mg/l	0	0	0	0
<u>Fluorides</u>				
Number of Samples	55	66	0	43
Percent of Samples Above 4 ppm	0	1.5	0	0
Percent of Samples Above 2 ppm	18.1	12.1	0	53.5

Air Analyses

Environmental air and smear analyses for the various contaminants found in Plant operating areas were made. A breakdown of the analytical results is shown in Table F-10. In addition, Table F-11 shows the number of samples taken at stack effluents, as atmospheric samples, and as smear data.

Table F-10
ROUTINE ENVIRONMENTAL ANALYSES

Contaminant	MAC/8 hrs.	This Quarter		Last Quarter	
		Number of Samples	Percent Above MAC	Number of Samples	Percent Above MAC
Beryllium Air	2 $\mu\text{g}/\text{m}^3$	8,398	0.90	8,911	0.91
Beryllium Smear	25 $\mu\text{g}/12 \text{ in.}^2$	4,327	3.54	4,050	2.62
Carbon Monoxide	100 ppm	18	22.2	11	9.09
Hydrogen Cyanide	10 ppm	16	0	0	0
Mercury	100 $\mu\text{g}/\text{m}^3$	11,217	3.08	11,529	3.45
Perchloroethylene	200 ppm	41	7.3	49	14.29

Table F-11
MISCELLANEOUS SAMPLES

Contaminant	Type Sample	Number of Samples	
		This Quarter	Last Quarter
Beryllium	Air	147	110
Beryllium	Smear	1,706	625
Copper	"	4	0
Fluoride	"	0	3
Hydrogen Cyanide	"	23	0
Mercury	"	40	21
Ozone	"	0	6
Perchloroethylene	"	0	40
Plant Pollutants (metallic)	"	143	132
Silicon	"	14	0
Tellurium	Smear	0	8

Table F-12 shows the average building concentrations of mercury vapor for the second and third quarters of FY 1961; trends in the concentrations for Building 9201-4 are shown in Figure F-8.

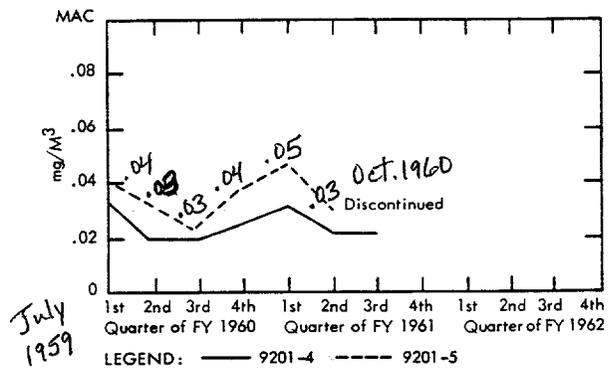


Figure F-8. AVERAGE BUILDING Hg VAPOR AIR CONCENTRATIONS.

Table F-12
AVERAGE MERCURY VAPOR AIR CONCENTRATION

	This Quarter			Last Quarter		
	March	February	January	December	November	October
<u>Building 9201-4</u>						
Number of Samples	2557	1880	2415	2379	2455	2432
Percent of Samples Above MAC	0.86	2.02	3.77	3.95	2.73	2.59
Average mg/m ³	0.02	0.02	0.03	0.03	0.02	0.02
<u>Building 81-10</u>						
Number of Samples	334	249	349	346	357	339
Percent of Samples Above MAC	9.58	5.22	0.86	1.16	6.16	6.19
<u>Building 9808</u>						
Number of Samples	315	205	238	182	266	266
Percent of Samples Above MAC	1.27	0.90	1.68	1.10	2.26	3.38
Average mg/m ³	0.02	0.02	0.02	0.02	0.03	0.03

Y-12 PLANT QUARTERLY REPORT

Fourth Quarter, FY 1961

April - June, 1961

M-134

EXTRACT

Authorized Derivative Classifier
M. J. G. King 2/2/95
Authorized Signature Date

Authorized Derivative Declassifier
R. B. Borden 2/2/95
Authorized Signature Date

This material has been reviewed by the Y-12
Classification office and has been determined
to be UNCLASSIFIED.

APPROVED FOR PUBLIC RELEASE
M. J. Borden 2/7/95
Technical Information Office Date

This document is an EXTRACT from (Y-1213)

THIS PAGE MUST NOT BE SEPARATED FROM THE ATTACHED DOCUMENT

M-134

INDUSTRIAL HYGIENE

Potable Water Sampling

The routine program of sampling potable water was continued this quarter. 99 samples were checked for total residual chlorine, free available chlorine, and combined available chlorine. Two samples indicated that no chlorine was present. Bacteriological count by direct membrane filter test for coliforms was done on all these samples. One sample contained a colony of coliform bacteria. The Plant sanitary engineer was informed and corrective action was initiated.

Poplar Creek Water Sampling

Water samples were taken daily from the East Fork of Poplar Creek for pH, and composited weekly for spectrographic and mercury analysis. The composite samples that were analyzed spectrographically for 39 metals showed evidence of very little contamination. The results for beryllium were less than 0.01 micrograms per milliliter, which may be compared with the Ohio Public Health Department value of one part per million as the control limit for beryllium in streams from production plants.

Creek flow measurements were not taken due to a malfunction of the equipment. The average results for mercury, pH, and last quarter's creek flow are presented in Table F-8.

Table F-8

POPLAR CREEK ANALYSES

	This Quarter	Last Quarter
Average Flow	Not Operating	Approximately 9.5 ⁽¹⁾ million gals/day
Mercury	0.1 mg/liter	0.1 mg/liter
pH	8.4	8.3

⁽¹⁾Off scale on chart week beginning 2-20-61.

Bear Creek Water

Samples were taken from Bear Creek to determine the pH. The water from this creek was consistently at a pH of 7.0 to 7.2, which indicates that there is no detectable leakage from pits and that acids or caustics were not dumped into it during times of measurement.

~~CONFIDENTIAL~~

M-134

Noise Studies

The program of noise studies and reduction was continued in selected areas where levels are considered in excess of damage risk criteria. Surveys were made in two areas, Building 9204-3 and the beryllium shop in Building 9201-5. All areas surveyed in these buildings had readings below the damage risk criteria. The plant-wide program of checking the noise level in all areas was temporarily discontinued due to concentrated efforts being expended with the 9201-5 beryllium facility.

Beryllium Program

Several problems developed during the startup of the beryllium facilities in Building 9201-5. Ruptures developed in the cyclone chip collectors that required additional sampling to determine the level of contamination. Good housekeeping and quick action on the part of personnel working in the area controlled and kept the beryllium contamination at a low level in the shops.

The filter pots used to filter the exhaust from the chip collector system were found to be leaking. Engineering modification of the pots was made and new filters installed. Production was not affected, and good control of the contaminant was maintained. Emission of beryllium was reduced greatly and is well within the limits of control.

The permanent air samplers located in the chip grinding area were consistently greater than 2 micrograms per cubic meter. Personnel wear respiratory equipment as part of the work procedure. Maintenance resulting from equipment failure in the chip cleaning and grinding areas contributed most to these high results. Redesign and improvement of some equipment was made, and less maintenance should result in a cleaner area.

Two types of monitors were put into operation. The instantaneous beryllium air monitor built in Y-12 has been operating with some success. Two personnel air filter monitors were put into use. The filter paper analyzed from these monitors correlate the high results that were reported for the permanent air samplers in the chip grinding area.

Particle size studies were made on the dust in the beryllium facilities to determine whether or not the particles are of the respirable size. The majority of the particles were in the range of 3 to 10 microns, with very few of one micron size.

The program of checking beryllium parts caused a sharp rise in the number of smears due to the increase in production.

Air sampling and smears taken in the Y-12 Area for ORNL operations decreased markedly due to the movement of many of the operations to the ORNL Area.

~~CONFIDENTIAL~~

M-134

Miscellaneous

Samples were taken in Building 9204-2 to determine the amount of air-borne lithium and sodium in a humidity control area while removing material from reactor pots. This study, made to determine whether CWS absolute filters would remove the contaminants, showed that the filters will not remove all of the material.

Letters of recommendations and industrial hygiene information were written about sodium silicofluoride, anisole, boron trifluoride, potassium fluoride, potassium chloride, powdered boron, beryllium, and perchloroethylene. Information related to the disposal of TBP, butyl sulfide, Sinclair odorless solvent, and other materials was discussed with the Safety Department and others.

Surveys were made for lead during a test run of the smelting operations in Building 9401-1. When the area goes into production (heat-stress studies), lead-in-air surveys will be made and additional recommendations will be submitted. A routine lead-in-urine program is planned for the operation.

Personnel Exposures

Routine urine sampling programs for personnel working with mercury and lead were continued this quarter. Table F-9 presents information about these programs.

Table F-9
URINARY DATA
(Hg, Pb, and F⁻)

	Fourth Quarter FY 1961	Third Quarter FY 1961	Second Quarter • FY 1961	First Quarter FY 1961
<u>Mercury</u>				
Number of People Sampled	207	181	225	277
Percent of People Above MAC	1.0	2.2	0.9	2.2
Number of Samples	257	194	228	408
Percent of Samples Above MAC	1.2	3.6	0.9	1.7
<u>Lead</u>				
Number of Samples	12	15	27	17
Percent of Samples Above 0.15 mg/l	0	0	0	0
<u>Fluorides</u>				
Number of Samples	0	55	66	0
Percent of Samples Above 4 ppm	0	0	1.5	0
Percent of Samples Above 2 ppm	0	18.1	12.1	0

M-134

Air Analyses

Environmental air and smear analyses for the various contaminants found in Plant operating areas were performed. A breakdown of the analytical results is shown in Table F-10. In addition, Table F-11 shows the number of samples taken at stack effluents, as atmospheric samples, and as smear data.

Table F-10
ROUTINE ENVIRONMENTAL ANALYSES

Contaminant	MAC/8 hrs.	This Quarter		Last Quarter	
		Number of Samples	Percent Above MAC	Number of Samples	Percent Above MAC
Beryllium Air	2 $\mu\text{g}/\text{m}^3$	12,026	3.38	8,398	0.90
Beryllium Smear	25 $\mu\text{g}/12 \text{ in.}^2$	4,659	5.86	4,327	3.54
Carbon Monoxide	100 ppm	13	7.7	18	22.2
Chromic Acid	100 $\mu\text{g}/\text{m}^3$	16	0	--	--
Hydrogen Cyanide	10 ppm	16	0	16	0
Mercury	100 $\mu\text{g}/\text{m}^3$	9,813	0.94	11,217	3.08
Perchloroethylene	200 ppm	17	17.6	41	7.3

Table F-11
MISCELLANEOUS SAMPLES

Contaminant	Type Sample	Number of Samples	
		This Quarter	Last Quarter
Beryllium	Air	419	147
Beryllium	Smear	2,547 ⁽¹⁾	1,706
Beryllium	Stack	18	0
Copper	Air	0	4
Fluoride	Air	3	--
Hydrogen Cyanide	Air	0	23
Lead	Air	18	--
Mercury	Air	0	40
Phosgene	Air	6	0
Plant Pollutants (metallic)	Air	143	143
Silicon	Air	0	14
Sodium-Lithium	Air	6	--
Trichloroethylene	Air	9	0

⁽¹⁾ Increase due to the startup of 9201-5 Beryllium Shop.

Table F-12 shows the average building concentrations of mercury vapor for the third quarter and fourth quarters of FY 1961. Trends in the concentrations for Building 9201-4 are shown in Figure F-7.

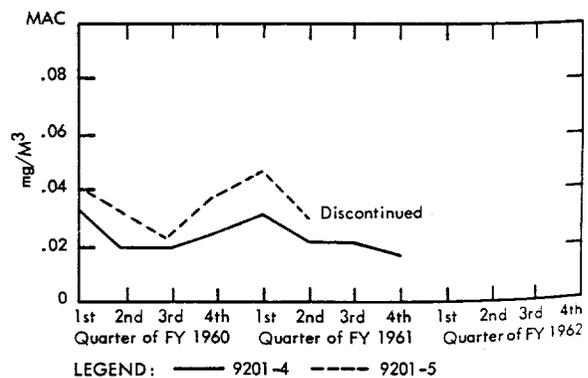


Figure F-7. AVERAGE BUILDING Hg VAPOR AIR CONCENTRATIONS.

M-134

Table F-12
AVERAGE MERCURY VAPOR AIR CONCENTRATION

	This Quarter			Last Quarter		
	June	May	April	March	February	January
<u>Building 9201-4</u>						
Number of Samples	2321	2453	2286	2557	1880	2415
Percent of Samples Above MAC	0.99	0.08	0.83	0.86	2.02	3.77
Average mg/m ³	0.02	0.01	0.02	0.02	0.02	0.03
<u>Building 81-10</u>						
Number of Samples	68	85	340	334	249	349
Percent of Samples Above MAC	0	3.53	8.24	9.58	5.22	0.86
<u>Building 9808</u>						
Number of Samples	120	180	300	315	205	238
Percent of Samples Above MAC	0	0	0.67	1.27	0.90	1.68
Average mg/m ³	0.01	0.01	0.01	0.02	0.02	0.02

Y-12 PLANT QUARTERLY REPORT

First Quarter, FY 1962

July - September, 1961

M-135

EXTRACT

Authorized Derivative Classifier

Stan J. Dickey 2/2/95
Authorized Signature Date

Authorized Derivative Declassifier

R. B. ... 2/2/95
Authorized Signature Date

This material has been reviewed by the Y-12
Classification office and has been determined
to be UNCLASSIFIED.

APPROVED FOR PUBLIC RELEASE

m. d. Bond 2/7/95
Technical Information Office Date

This document is an EXTRACT from (Y-1214)

THIS PAGE MUST NOT BE SEPARATED FROM THE ATTACHED DOCUMENT

M-135

of the 68 samples contained one or more colonies of coliform bacteria by the direct membrane filter test. The three samples showed chlorine, and resamples gave no indication of coliform bacteria. The Plant sanitary engineer was informed of all results.

Poplar Creek Water Sampling

Water samples were taken daily from the East Fork of Poplar Creek. The pH was determined on the daily sample, and a weekly composite sample was analyzed spectrographically and for mercury. The spectrograph results for 39 metals showed very little contamination. Beryllium results were less than 0.01 microgram per milliliter, which is less than the limits established for beryllium in streams from production plants. The pH of the daily sample ranged from 7.7 to 10.1.

Creek flow measurements were not taken until September 7, at which time the equipment was put in operating condition. The average results for mercury, pH, and creek flow for this quarter are presented in Table F-7.

Table F-7
POPLAR CREEK ANALYSES

	This Quarter	Last Quarter
Average Flow	10.9 ⁽¹⁾ million gals/day	Not operating
Mercury	0.28 mg/liter	0.1 mg/liter
pH	9.0	8.4

⁽¹⁾ Beginning 9-7-61.

Noise Studies

The plant-wide noise survey that was started in 1960 was continued this quarter. Readings were taken in eleven buildings not previously checked, and one area in Building 9201-5 beryllium shop was rechecked. The noise in this area was considered in excess of damage risk criteria, and it was recommended by the Medical Department that all employees working in the immediate vicinity of the source wear ear plugs. The operation is expected to be temporary; therefore, the cost to reduce the noise to a safe level is not considered justified.

Beryllium Program

The beryllium shops in Building 9201-5 showed sporadic results that exceeded the limit of two micrograms per cubic meter of air during eight hours of exposure. These results have, in most cases, been caused by poor techniques used by operating personnel such as, using a brush to clean hood exhaust screens or opening the hood while cutting. Several

~~CONFIDENTIAL~~

M-135

high results were received on the two horizontal lathes that are used to cut beryllium logs to chips. The contamination level was reduced by removing the screen and installing a chip collecting barrel on the hood exhaust for each machine. Ruptures continue to develop in the cyclone chip collector system and create a continuous potential hazard. Good housekeeping and quick action on the part of personnel working in the area continue to keep the contamination average well within limits.

The chip upgrading and grinding facility on the second floor of Building 9201-5 continues to show results above the limit for beryllium because such activities as breakdowns and maintenance work continue to keep the contamination level high. Personnel wear respiratory equipment as part of the work procedure. One of the problems presently confronting this operation is keeping the contamination confined to the enclosed area.

Sporadic high results were received in the beryllium shop, Building 9766. The majority of these were due to such situations as opening barrels of chips, removing chips from collectors, and spills. The chip vacuum lines in the VTL's used to cut chips were sources of some high results. Chips were plugging the lines, and failure to keep the lines clear resulted in high readings. Recommendations were made to correct these conditions.

A small lathe was set up in the northwest corner of the tool and die shop in Building 9201-1 to machine beryllium parts. Recommendations were made, air samples were taken daily, and smears were taken to determine the level of surface contamination. Some high air sample results were received during the evening and night shifts. There were no apparent reasons for these results other than operational techniques.

Rolling of beryllium was performed in Building 9215. Air samples and smears verified that no beryllium was released during the rolling operation.

The program of checking beryllium parts that are shipped to Rocky Flats was continued. Approximately were smeared to certify that they contained less than the contamination specification of four micrograms per twelve inches of surface area checked.

A flame photometric attachment which was designed to analyze beryllium was checked to determine the amount of beryllium it released at the breathing zone of the operator and exhausted to the filter. It was found that the initial design released beryllium in quantities that would be hazardous to the operator. An improved design showed no beryllium release, but personnel were informed that good technique and housekeeping will be important when using this equipment.

The installation of zone melting equipment for beryllium in Building 9203 is under surveillance. This operation should begin during the earlier part of October. Recommendations were made, and information related to beryllium was given to personnel responsible for this equipment.

~~CONFIDENTIAL~~

M-135

A particle size selector has been purchased that consists of a 1 1/2-inch cyclone with a membrane filter attachment. This equipment simulates particle sizes retained in the upper and lower respiratory system. Future studies will be made with this device.

Mercury

The routine program for checking mercury has been reduced. The mercury recovery operation was shut down during the summer, and vapor levels in production areas have remained at a level that required less frequent sampling.

Table F-8 shows the average building concentration of mercury vapors for the fourth quarter, FY 1961 and first quarter, FY 1962. Trends in the concentration for Building 9201-4 are shown in Figure F-7.

Table F-8
AVERAGE MERCURY VAPOR AIR CONCENTRATION

	This Quarter			Last Quarter		
	September	August	July	June	May	April
<u>Building 9201-4</u>						
Number of Samples	1554	1910	955	2321	2453	2286
Number of Samples Above MAC	16	20	4	23	2	19
Average mg/m ³	0.02	0.02	0.02	0.02	0.01	0.02
<u>Building 81-10</u>						
Number of Samples	17	34	17	68	85	340
Number of Samples Above MAC	0	1	0	0	3	28
<u>Building 9808</u>						
Number of Samples	30	45	15	120	180	300
Number of Samples Above MAC	0	0	0	0	0	2
Average mg/m ³	0.01	0.01	0.01	0.01	0.01	0.01

A survey was made at Oak Ridge Processing Company while smelting mercury-contaminated scrap to determine the amount of mercury vapors evolved during melting. A total of six melts were made during the period July 31 to September 6, and air samples were taken during each melt. One hundred and fifteen samples were taken and submitted to the laboratory for analysis. The findings indicate that it is feasible to smelt such scrap metal. Details were reported to personnel involved with the program on September 20 in a memo entitled, "Smelting Mercury-Contaminated Metal at the ORPC".

M-135

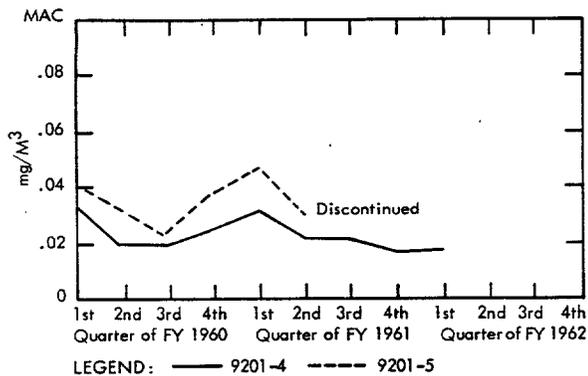


Figure F-7. AVERAGE BUILDING Hg VAPOR AIR CONCENTRATIONS.

Personnel Exposure

The Medical Department made requests for an investigation of seven complaints. These complaints were concerned with Gil-Strip paint remover, copper, welding fumes, Temperex HD, coolants, solvents, and fluorides. Safeguards such as respiratory protection, increased ventilation, and protective clothing were recommended where materials were found to be the offenders, and conditions warranted.

Programs of urine sampling for mercury and lead were continued this quarter. Urine results were within the limits established for these two metals. Table F-9 presents information about these programs.

Table F-9

URINARY DATA
(Hg, Pb, and F)

	First Quarter FY 1962	Fourth Quarter FY 1961	Third Quarter FY 1961	Second Quarter FY 1961
<u>Mercury</u>				
Number of People Sampled	200	207	181	225
Number of People Above MAC	1	3	4	2
Number of Samples	212	257	194	228
Number of Samples Above MAC	1	3	7	2
<u>Lead</u>				
Number of Samples	14	12	15	27
Number of Samples Above 0.15 mg/l	1	0	0	0
<u>Fluorides</u>				
Number of Samples	0	0	55	66
Number of Samples Above 4 ppm	0	0	0	1
Number of Samples Above 2 ppm	0	0	10	8

Air Analyses

Environmental air and smear analyses were performed for the various contaminants found in

M-135

Plant operating areas. A breakdown of the analytical results is shown in Table F-10. In addition, Table F-11 shows the number of samples taken at stack effluents, as atmospheric samples, and as smear data.

Table F-10
ROUTINE ENVIRONMENTAL ANALYSES

Contaminant	MAC/8 hrs	This Quarter		Last Quarter	
		Number of Samples	Number Above MAC	Number of Samples	Number Above MAC
Beryllium Air	2 $\mu\text{g}/\text{m}^3$	14,344	1,476	12,026	406
Beryllium Smear	25 $\mu\text{g}/12 \text{ in}^2$	3,965	275	4,659	273
Carbon Monoxide	100 ppm	0	0	13	1
Chromic Acid	100 $\mu\text{g}/\text{m}^3$	13	0	16	0
Hydrogen Cyanide	10 ppm	16	0	16	0
Mercury	100 $\mu\text{g}/\text{m}^3$	5,029	42	9,813	92
Perchloroethylene	200 ppm	82	5	17	1

Table F-11
MISCELLANEOUS SAMPLES

Contaminant	Type Sample	Number of Samples	
		This Quarter	Last Quarter
Beryllium	Air	280	419
Beryllium	Smear	2,369	2,547 ⁽¹⁾
Beryllium	Stack	0	18
Fluoride	Air	0	3
Lead	Air	14	18
Mercury	Air	115	0
Phosgene	Air	0	6
Plant Pollutants (metallic)	Air	143	143
Plant Pollutants (special analyses)	Air	6	0
Sodium-Lithium	Air	0	6
Trichloroethylene	Air	0	9

⁽¹⁾ Increase due to startup of the beryllium shop in building 9201-5.

Miscellaneous

Air samples were taken with impingers at six selected outside air sampler stations. These were taken from August 24 through September 1 to compare the air sample filter paper results with the impinger analyses, and to determine the amounts of soluble materials that were not retained on the filter paper. The findings of this survey and results of other periods of time compared with the contamination levels in the state of Tennessee are being processed and will be reported soon.

During the quarter, information and letters of recommendation were given to various personnel about Gil-Strip paint remover, Turco pretreat for metals, beryllium handling, tar, fumes of various solvents, and tungsten.

Y-12 PLANT QUARTERLY REPORT

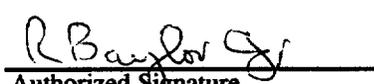
Second Quarter, FY 1962

October - December, 1961

M-136

EXTRACT

Authorized Derivative Classifier	
 Authorized Signature	<u>2/2/95</u> Date

Authorized Derivative Declassifier	
 Authorized Signature	<u>2/2/95</u> Date

This material has been reviewed by the Y-12 Classification office and has been determined to be UNCLASSIFIED.

APPROVED FOR PUBLIC RELEASE	
 Technical Information Office	<u>2/2/95</u> Date

This document is an EXTRACT from (Y-1215)

THIS PAGE MUST NOT BE SEPARATED FROM THE ATTACHED DOCUMENT

M-136

relationship between air-borne contamination, surface contamination, and uranium urinalysis results indicate significant correlation. A more thorough study has been initiated.

Evaluation of Thorium Chip Processing - An evaluation was made of the thorium chip pressing operation in Building 9204-4. Results from air and surface contamination samples were in the order of the plant acceptable limits for samples of this type. However, on the basis of this evaluation, some design criteria for more effective controls have been forwarded to the Engineering Department and will be incorporated in the Delta facility.

INDUSTRIAL HYGIENE

Potable Water Sampling

The program of sampling potable water from various water fountains within the area was continued this quarter. A total of 104 checks were made for total residual chlorine, and an equivalent number of samples were taken to be tested for coliform bacteria by the direct membrane filter method. One fountain showed no chlorine, and five samples contained one or more colonies of coliform bacteria. The Plant sanitary engineer was notified of findings, corrective action was initiated, and resamples were free of coliform bacteria.

Poplar Creek Water Sampling

Daily water samples were taken at the weir in the East Fork of Poplar Creek. The pH was determined on the daily sample, and semiquantitative spectrograph analyses of 39 cations, chemical analyses of four anions, and mercury determinations were made on weekly composite samples. The cations showed very little concentration, but chlorides showed a high of 1530 ppm for the week ending November 24, and nitrates were 1459 ppm for the week ending December 1. Sulfates and fluorides indicated a high of 129 ppm and 5 ppm, respectively, for the quarter. The pH of the daily sample ranged from 7.2 to 11.2.

The average results for mercury, pH, and creek flow for this quarter are presented in Table F-7.

Table F-7
POPLAR CREEK ANALYSES

	This Quarter	Last Quarter
Average Flow	11.7 million gals/day	10.9(1) million gals day
Mercury	0.12 mg/liter	0.28 mg/liter
pH	9.3	9.0

(1) Beginning 9-7-61.

M-136

Noise Studies

The plant-wide program of noise survey was continued this quarter. Readings were taken in 89 buildings with the small sound-survey meter. Areas that showed overall readings of 85 decibels or greater were rechecked with the MSA Sound Scope to determine octave band pressure levels. The Medical Department was informed of all readings, and a thorough evaluation study is being made of areas involved in the recheck.

Beryllium Program

The beryllium shops in Building 9201-5 continued to show sporadic results that exceeded the limit of two micrograms per cubic meter of air. The majority of these high results were caused by ruptures in the elbows of the chip collecting system and in the cyclone collectors. The elbows are being replaced with a hard steel, replaceable unit. The cyclone collectors are to be sprayed with a clear, plastic material to detect and contain beryllium released through ruptures. A periodic, visual inspection can be made to detect ruptures before the beryllium is released into the room.

The chip upgrading and grinding facility on the second floor of Building 9201-5 continues to show results greater than the limits for beryllium. Respiratory protection continues to be mandatory for personnel entering the area.

Beryllium rolled in Building 9215. Air samples and smears indicated that no beryllium was released during the rolling operation.

The zone melting equipment for beryllium in Building 9203 proved successful with respect to contamination. Even though the interior of the chamber becomes highly contaminated during experiments, the air samples and smears indicate that beryllium is not getting air borne or scattered on the floor. Good handling techniques by personnel performing the operations are responsible for such good control of the contamination.

Mercury

The routine program of checking mercury vapors was continued this quarter. A total of 4591 readings were made with 80 of these exceeding the limit of 0.10 milligram of mercury vapor per cubic meter of air.

Startup of the mercury recovery operation is scheduled for January. There should be no health problems from mercury vapors due to the outside temperatures; however, an increased frequency of sampling will be started.

Since the averages have remained low and relatively constant, the table and figure that

~~CONFIDENTIAL~~

M-136

show air concentrations of mercury vapors are being deleted beginning this quarter.

Personnel Exposure

On three occasions the Medical Department requested that investigations be made to determine the reasons for dermatitis. The suspected agent in each case included lithium, epoxy, methyl chloroform, or personal cleanliness. Reports of findings were made to the Medical Department.

The programs of urine sampling for mercury and lead were continued this quarter. Two samples exceeded the limit established for mercury, and one exceeded the limit for lead. The Medical Department was informed and resamples were below the established limits. Table F-8 presents information pertaining to these programs.

Table F-8
URINARY DATA
(Hg, Pb, and F⁻)

	Second Quarter FY 1962	First Quarter FY 1962	Fourth Quarter FY 1961	Third Quarter FY 1961
<u>Mercury</u>				
Number of People Sampled	186	200	207	181
Number of People Above MAC	2	1	3	4
Number of Samples	191	212	257	194
Number of Samples Above MAC	2	1	3	7
<u>Lead</u>				
Number of Samples	10	14	12	15
Number of Samples Above 0.15 mg/l	2	1	0	0
<u>Fluorides</u>				
Number of Samples	0	0	0	55
Number of Samples Above 4 ppm	0	0	0	0
Number of Samples Above 2 ppm	0	0	0	10

Air Analyses

Environmental air and smear analyses for various contaminants were performed. A breakdown of the analytical results is shown in Table F-9. In addition, Table F-10 shows the number of samples taken as atmospheric samples and as smear data.

Miscellaneous

A report was issued showing the results that were received for samples taken on six outside

~~CONFIDENTIAL~~

M-136

Table F-9
ROUTINE ENVIRONMENTAL ANALYSES

Contaminant	MAC/8 hours	This Quarter		Last Quarter	
		Number of Samples	Number Above MAC	Number of Samples	Number Above MAC
Beryllium Air	2 µg/m ³	15,609	1323	14,344	1476
Beryllium Smear	25 µg/12 in ²	4,224	243	3,965	275
Carbon Monoxide	100 ppm	23	0	0	0
Chromic Acid	100 µg/m ³	18	0	13	0
Hydrogen Cyanide	10 ppm	93	0	16	0
Mercury	100 µg/m ³	4,591	80	5,029	42
Perchloroethylene	100 ppm (1)	293	4	82	5

(1) Threshold limit for 1961.

Table F-10
MISCELLANEOUS SAMPLES

Contaminant	Type Sample	Number of Samples	
		This Quarter	Last Quarter
Beryllium	Air	72	280
Beryllium	Smear	1,686	2,369
Carbon Monoxide	Air	13	0
Lead	Air	0	14
Lithium	Air	2	0
Mercury	Air	91	115
Plant Pollutants (metallic)	Air	143	143
Plant Pollutants (specials)	Air	0	6

air samples. A comparison of various contaminants that were collected by impingers and on filter paper during the summer months of 1961 was shown. The results were compared with contaminants reported for the state of Tennessee to show that the level of inorganic materials is within safe limits for an industrial area.

Talks were made at three safety meetings for various departments by request of supervision. Topics for discussion included respiratory equipment and beryllium.

A resurvey was undertaken to determine the condition of the Comfo and Gasfo-type respiratory protection equipment. The findings showed that our respiratory protection program may be improved. Respirators were checked for rips, positioning straps torn out, and other defects that will decrease the efficiency of protection. Further studies are being made to evaluate and make improvements in this program.

Information was given to various personnel about Rust-Oleum, phosphorous oxychloride, methyl chloride, methylene chloride, vythene, and materials routinely used in this plant.

Y-12 PLANT QUARTERLY REPORT

Third Quarter, FY 1962

January - March, 1962

M-137

EXTRACT

Authorized Derivative Classifier
M. J. Bond 2/2/95
Authorized Signature Date

Authorized Derivative Declassifier
M. J. Bond 2/2/95
Authorized Signature Date

This material has been reviewed by the Y-12
Classification office and has been determined
to be UNCLASSIFIED.

APPROVED FOR PUBLIC RELEASE
M. J. Bond 2/7/95
Technical Information Office Date

This document is an EXTRACT from (Y-1216)

THIS PAGE MUST NOT BE SEPARATED FROM THE ATTACHED DOCUMENT

M-137

INDUSTRIAL HYGIENE

Potable Water Sampling

The program of sampling potable water from various water fountains within the area was continued this quarter. A total of 93 samples were checked for total residual chlorine. Bacteriological count by direct membrane filter test for coliforms was performed on all these samples. One of the 93 samples contained one or more colonies of coliform bacteria. The Plant sanitary engineer was informed and corrective action was initiated. A resample was free of coliform bacteria.

Poplar Creek Water Sampling

Water samples were taken daily from the east fork of Poplar Creek for pH and composited weekly for spectrographic analysis of 39 cations, chemical analysis of four anions, and mercury determinations. The cations continue to remain at low concentrations. The anions ranged as follows: nitrates, from a high of 1500 ppm to a low of 16 ppm; sulfates, from 103 ppm to 15 ppm; fluorides, 5 ppm to 0.4 ppm; chlorides 62 ppm to 6 ppm.

The average results for mercury, pH, and creek flow are presented in Table F-7 for the quarter.

Table F-7
POPLAR CREEK ANALYSES

	This Quarter	Last Quarter
Average Flow	13.2 million gals/day	11.7 million gals/day
Mercury	0.17 mg/liter	0.12 mg/liter
pH	9.1	9.3

Noise Studies

The Plant-wide noise survey program was continued this quarter. Readings were taken in 32 buildings with the MSA Soundscope to determine octave band pressure levels.

During this quarter a proposal entitled, "A Y-12 Noise Control and Hearing Conservation Program" was submitted by the Medical Department and approved by Y-12 management. The program establishes levels for the control of noise problems and the protection of personnel working in these areas.

Beryllium Program

The beryllium shops in Building 9201-5 showed sporadic results that exceeded the limit of $2 \mu\text{g}/\text{M}^3$ of air during eight hours of exposure. These results have, in most cases, been caused by poor techniques such as polishing a part at high speed or opening a hood while cutting. Good housekeeping on the part of personnel working in the area continues to keep the contamination average well within limits.

Although the chip upgrading and grinding facility has been terminated, the air samples continue to show concentrations of beryllium in excess of the MAC of $2 \mu\text{g}/\text{M}^3$.

Rolling of beryllium was performed in Building 9215. Air samples and smears verified that no beryllium was released during the operation.

The program of checking beryllium parts that are shipped to Rocky Flats continued. A total were smeared to certify that they contained less than the contamination specification of $4 \mu\text{g}$ per twelve inches of surface checked.

A fire on March 21 in the filter house of the Building 9766 beryllium shop caused average concentrations of beryllium in the shop to exceed the short exposure limit of $25 \mu\text{g}/\text{M}^3$ by a factor of two. However, outside air samples showed results well below this level, most likely due to high dilution produced by the 20 - 25 mile per hour wind occurring at the time of the fire. A well coordinated program of decontamination and repair brought the shop back in operation in approximately 10 days.

Mercury

The program of checking mercury vapors was continued this quarter. A total of 5430 readings were made with 90 of these exceeding the limit of 0.10 milligrams of mercury vapor per cubic meter of air.

The mercury recovery operation was started during the quarter. Outside temperatures remain low which has assisted in controlling the mercury vapor concentration.

Personnel Exposure

Seven cases of dermatitis during the quarter were investigated upon the request of the Medical Department to determine the cause. Recommendations were made, and corrective action was initiated in all cases where possible.

The programs of urine sampling for mercury and lead were continued this quarter. Urine results were within the limits established for both mercury and lead. Table F-8 presents information about these programs.

M-137

Table F-8
URINARY DATA
(Hg, Pb and Cd)

	Third Quarter FY 1962	Second Quarter FY 1962	First Quarter FY 1962	Fourth Quarter FY 1961
<u>Mercury</u>				
Number of People	179	186	200	207
Number of People Above MAC	0	2	1	3
Number of Samples	180	191	212	257
Number of Samples Above MAC	0	2	1	3
<u>Lead</u>				
Number of Samples	15	10	14	12
Number of Samples Above 0.15 mg/l	0	2	1	0
<u>Cadmium</u>				
Number of Samples	2	0	0	0
Number of Samples Above 0.10 mg/l	0	0	0	0

Air Analysis

Environmental air and smear analyses for the various contaminants found in Plant operating areas were performed. A breakdown of the analytical results is given in Table F-9. In addition, Table F-10 shows the number of samples taken at stack effluents, as atmospheric samples, and as smear data.

Table F-9
ROUTINE ENVIRONMENTAL ANALYSES

Contaminant	MAC/8 hours	This Quarter		Last Quarter	
		Number of Samples	Number Above MAC	Number of Samples	Number Above MAC
Beryllium Air	2 $\mu\text{g}/\text{M}^3$	12,630	913	15,609	1323
Beryllium Smear	25 $\mu\text{g}/12 \text{ in}^2$	4,726	238	4,224	243
Carbon Monoxide	100 ppm	12	6	23	0
Chromic Acid	100 $\mu\text{g}/\text{M}^3$	12	0	18	0
Hydrogen Cyanide	10 ppm	49	7 ⁽¹⁾	93	0
Mercury	100 $\mu\text{g}/\text{M}^3$	5,342	87	4,591	80
Perchloroethylene	100 ppm	233	25	293	4

⁽¹⁾ Obtained during a controlled experiment.

Table F-10
MISCELLANEOUS SAMPLES

Contaminant	Type Sample	Number of Samples	
		This Quarter	Last Quarter
Beryllium	Air	132	72
Beryllium	Smear	1749	1686
Carbon Monoxide	Air	19	13
Lead	Air	8	0
Lithium	Air	0	2
Mercury	Air	88	91
Plant Pollutants (metallic)	Air	165	143
Hydrogen Sulfide	Air	6	0
Cadmium	Air	3	0
Ozone	Air	15	0
Lithium Tetraborate	Air	3	0

Miscellaneous

A trip was made to the LASL and Sandia to investigate the respiratory protection programs established at these facilities. A trip report was written, as well as a report concerning a program to improve the use and prevent the misuse of respiratory protection equipment. A centrally located cleaning facility in the Y-12 Plant was recommended.

A literature search was made concerning the "boranes". A report concerning the toxicology and the hazards of these compounds was issued to those concerned.

At the request of supervision, three safety meetings were conducted by the Industrial Hygiene group on subjects concerning the toxicity of various materials in their respective areas.

Y-12 PLANT QUARTERLY REPORT

Fourth Quarter, FY 1962

April - June, 1962

M-138

EXTRACT

Authorized Derivative Classifier
[Signature] 2/2/95
Authorized Signature Date

Authorized Derivative Declassifier
[Signature] 2/2/95
Authorized Signature Date

This material has been reviewed by the Y-12
Classification office and has been determined
to be UNCLASSIFIED.

APPROVED FOR PUBLIC RELEASE
[Signature] 2/6/95
Technical Information Office Date

This document is an EXTRACT from (Y-1217)

THIS PAGE MUST NOT BE SEPARATED FROM THE ATTACHED DOCUMENT

M-138

INDUSTRIAL HYGIENE

Potable Water Sampling

The routine program of sampling potable water from various water fountains within the area was continued this quarter. A total of 97 samples were checked for total residual chlorine, and an equivalent number of samples were taken to be tested for coliform bacteria by the direct membrane filter method. Twelve locations indicated that no chlorine was present; however, no coliform bacteria were revealed upon analysis. The Plant Sanitary Engineer was informed of all results.

Poplar Creek Water Sampling

Daily water samples were taken at the weir in the East Fork of Poplar Creek. The pH was determined on the daily sample; spectrographic analyses of 39 cations, chemical analyses of 4 anions, and mercury determinations were made on weekly composite samples. Cations continue to remain at low concentrations; anions ranged as follows: nitrates from a high of 30 ppm to a low of 7 ppm, sulfates from 39 to 5 ppm; fluorides from 14 to 0.8 ppm, and chlorides from 658 to 10 ppm.

The average results for mercury, pH, and creek flow are presented for the quarter in Table F-7.

Table F-7
POPLAR CREEK ANALYSIS

	This Quarter	Last Quarter
Average Flow	13.4 million gals/day	13.2 million gals/day
Mercury	0.11 mg/liter	0.17 mg/liter
pH	9.6	9.0

Noise Studies

The Plant-wide noise survey program was completed this quarter. Surveys made during this period were in those areas which normally run at their peak capacity in the summer months only, such as the utilities air conditioning areas. Areas in Buildings 9998, 9212, 9204-3, 9207, 9767-3, and 9995 were found to exceed the noise criteria for the Plant and will be posted as a "Noise Area".

All new operations plus periodic rechecks will be made throughout the Plant as a continuation of the noise survey program.

Two types of ear plugs which do not require fitting by the Medical Department have been stocked in Stores. These plugs are the required protection necessary for employees assigned to any area posted as a "Noise Area".

~~CONFIDENTIAL~~

M-138

Beryllium Program

All beryllium areas continue under good control. Occasional air and smear samples did exceed the established control limits and corrective action was taken immediately to prevent a recurrence or continuation of the problem.

The startup and expansion of the beryllium oxide facility in the beryllium shop in Building 9766 required the locating of new air samplers, improvement of old machine enclosures, and the fabrication of new ones. Additional expansion will call for an extension to the present ventilation system to adequately cover any new machines.

Special air samples for beryllium were taken during this quarter in Building 9204-2 during a test experiment with the use of remote controlled machine tools. These machines are to be used in the repair of tubing in the molten salt reactor presently under construction in the ORNL plant.

Rolling of beryllium was performed again this quarter in Building 9215. Air samples and smears indicated that no beryllium was released during the operation and presented no health problems.

The total number of beryllium parts smeared this quarter for surface contamination were checked. This was a slight increase over the previous quarter in which

The total number of beryllium samples, both air and smear, showed a decrease this quarter. The primary reason for this decrease was the moving of the ORNL Chemistry and Ceramics Groups to their new facilities at the ORNL.

Mercury

The program of checking mercury vapors was continued this quarter. A total of 4316 readings were made with 94 of these exceeding the limit of 0.10 milligrams of mercury vapors per cubic meter of air.

As in previous years, the mercury recovery operation in Building 81-10 was curtailed during the summer months due to the high temperatures that make the control of mercury vapors very difficult.

Personnel Exposure

The programs of urine sampling for mercury and lead were continued this quarter. One person exceeded the limit of 0.3 milligrams of mercury per liter of urine. The Medical Department was informed and a resample showed the person to be below the established limit. The urine results for lead were within the established limits. Table F-8 presents information about these programs.

~~CONFIDENTIAL~~

M-138

Table F-8
URINARY DATA
(Hg, Pb, and Cd)

	Fourth Quarter FY 1962	Third Quarter FY 1962	Second Quarter FY 1962	First Quarter FY 1962
Mercury				
Number of People	146	179	186	200
Number of People Above MAC	1	0	2	1
Number of Samples	147	180	191	212
Number of Samples Above MAC	1	0	2	1
Lead				
Number of Samples	15	15	10	14
Number of Samples Above 0.15 mg/l	0	0	2	1
Cadmium				
Number of Samples	0	2	0	0
Number of Samples Above 0.10 mg/l	0	0	0	0

Twelve cases were investigated at the request of the Medical Department to evaluate work environs. Four of these cases were found to be caused by materials used by the employees outside of the Plant area. The other eight cases involved the following materials: ozone, perchloroethylene, lithium hydride, fluorides, rubber smoke, Truscon Paint, and trichloroethylene.

Air Analyses

Environmental air and smear analyses were performed for the various contaminants found in Plant operating areas. A breakdown of the analytical results is given in Table F-9. In addition, Table F-10 shows the number of samples taken at stack effluents and atmospheric samples, and smears taken on miscellaneous equipment.

Miscellaneous

Respiratory Protection - In conjunction with the Safety Department, the Industrial Hygienist has participated in formalizing a respiratory protection program for the Y-12 Plant which will afford maximum protection to Plant employees and meet all safety codes set forth by the American Standards Association.

Toxicity of Tracer Elements - Aside from the many verbal communications dealing with the toxicity of various chemical compounds, including commercial products, the Industrial Hygiene Group prepared a letter to supervision dealing with the toxicology of the tracer elements added to lithium salt.

Safety Meetings - During the quarter, six safety meetings were conducted dealing with such subjects as the hazards of solvents and beryllium, and the use of respiratory protection

~~CONFIDENTIAL~~

M-138

Table F-9
ROUTINE ENVIRONMENTAL ANALYSES

Contaminant		This Quarter		Last Quarter	
		Number of Samples	Number Above MAC	Number of Samples	Number Above MAC
Beryllium Air	2 $\mu\text{g}/\text{M}^3$	9495	288	12,630	913
Beryllium Smear	25 $\mu\text{g}/12 \text{ in}^2$	3602	290	4,726	238
Carbon Monoxide	100 ppm	0	0	12	6
Chromic Acid	100 $\mu\text{g}/\text{M}^3$	0	0	12	0
Hydrogen Cyanide	10 ppm	0	0	49	7(1)
Mercury	.10 mg/M^3	4261	94	5,342	87
Perchloroethylene	100 ppm	10	5	233	25

(1) Obtained during a controlled experiment.

Table F-10
MISCELLANEOUS SAMPLES

Contaminant	Type Sample	Number of Samples	
		This Quarter	Last Quarter
Benzene	Air	10	0
Beryllium	Air	89	132
Beryllium	Smear	1601	1749
Cadmium	Air	0	15
Carbon Monoxide	Air	0	19
Hydrogen Sulfide	Air	0	6
Lead	Air	4	8
Lithium Fluoride	Air	3	0
Lithium Hydride	Air	32	0
Lithium Tetraborate	Air	0	3
Mercury	Air	55	88
Ozone	Air	0	3
Plant Pollutants (metallic)	Air	143	165

~~CONFIDENTIAL~~

Y-12 PLANT QUARTERLY REPORT

First Quarter, FY 1963

July - September, 1962

M-139

EXTRACT

Authorized Derivative Classifier

[Handwritten Signature] 2/2/95
Authorized Signature Date

Authorized Derivative Declassifier

[Handwritten Signature] 2/2/95
Authorized Signature Date

This material has been reviewed by the Y-12
Classification office and has been determined
to be UNCLASSIFIED.

APPROVED FOR PUBLIC RELEASE

m. d. Bond 2/6/95
Technical Information Office Date

This document is an EXTRACT from (Y-1218)

THIS PAGE MUST NOT BE SEPARATED FROM THE ATTACHED DOCUMENT

M-139

INDUSTRIAL HYGIENE

Potable Water Sampling

The routine program of sampling potable water was continued this quarter. A total of 93 fountains were checked for total residual chlorine. Two samples indicated that no chlorine was present. Bacteriological count by direct membrane filter test for coliforms was done on all these samples. Three samples contained one or more colonies of coliform bacteria. The Plant sanitary engineer was informed and corrective action was initiated. Resamples gave no indication of coliform bacteria.

Poplar Creek Water Sampling

Water samples were taken daily from the East Fork of Poplar Creek for pH and composited weekly for spectrographic analysis, chemical analysis of four anions, and mercury analysis. The composite samples that were analyzed spectrographically for 39 metals showed evidence of very little contamination. The anions ranged as follows: nitrates from 216 to 12 ppm; sulfates from 45 to 5 ppm; fluorides from 4 to 1 ppm; and chlorides from 170 to 7 ppm. The average results for mercury, pH, and creek flow are presented in Table F-7 for the quarter.

Table F-7
POPLAR CREEK ANALYSIS

	This Quarter	Last Quarter
Average Flow	12.4 million gals/day	13.4 million gals/day
Mercury	0.16 mg/liter	0.11 mg/liter
pH	9.3	9.6

Noise Studies

Noise surveys this quarter were made in those areas which had previously been determined as borderline problem areas and where new equipment had been installed.

In conjunction with Plant Shift supervision, noise measurements were taken in the E wing basement of Building 9212 to check the efficiency of the evacuation sirens. As a result of these tests it was determined that additional sirens were needed to override the background noise of the operating equipment. It was also demonstrated that ear plugs enhance the ability of the personnel in this area to hear the sirens above the background noise of the equipment.

~~CONFIDENTIAL~~

M-139

Beryllium Program

The total number of both beryllium air and smear samples remains approximately the same as for the previous quarter. However, the percentage of the number of samples exceeding the air or smear limits has decreased from 4 to 2%. This decrease can be attributed, primarily, to the constant improving of housekeeping and co-operation of supervision in the correction of improper techniques.

A new facility in Building 9202, which involves the purification of beryllium by the conversion to the chloride, started operations this quarter. Considerable difficulty with the ventilation system produced a few high air samples. Although the personnel were protected with fresh air respiratory equipment, every effort has been made to alter and improve this system. To prevent problems from skin contact with the beryllium chloride, fresh-air-supplied plastic suits have been acquired for the personnel in this facility.

Mercury Program

A total of 4120 air measurements for mercury concentrations were made this quarter in both operational and standby areas. A total of 125 exceeded the threshold limit of 0.1 mg/M^3 , as compared to 94 for the previous quarter. The increase was the result of the rise of the ambient temperature in the areas.

Personnel Exposure

The urine sampling programs this quarter for mercury and lead revealed that two employees exceeded the mercury limit of 0.3 milligrams/liter, but no one exceeded the limit of 0.15 milligrams/liter for lead. The Medical Department was notified of the two high mercury samples, and resamples were below the established limits. Table F-8 presents data concerning the urine programs for this and the previous quarters.

At the request of the Medical Department, twelve cases of illness were investigated this quarter. These investigations were made to ascertain the cause in order that proper medication or treatment could be applied. The cases involved both inhalation and skin contact, primarily; however, one case was the result of a high-frequency, low-sound pressure noise. The other eleven cases were caused or suspected by the following compounds or elements: sodium hypochlorite, welding fumes, phenolic acid, cresylic acid, Plyguard spray paint, lithium hydride, chlorine, sodium metaphosphate, carbolic acid, and nuisance dust.

~~CONFIDENTIAL~~

M-139

Table F-8
URINARY DATA
(Hg, Pb, and Cd)

	First Quarter FY 1963	Fourth Quarter FY 1962	Third Quarter FY 1962	Second Quarter FY 1962
<u>Mercury</u>				
Number of People	141	146	179	186
Number of People Above MAC	2	1	0	2
Number of Samples	143	147	180	191
Number of Samples Above MAC	2	1	0	2
<u>Lead</u>				
Number of Samples	7	15	15	10
Number of Samples Above 0.15 mg/l	0	0	0	2
<u>Cadmium</u>				
Number of Samples	0	0	2	0
Number of Samples Above 0.10 mg/l	0	0	0	0

Air Analysis

Environmental air and smear analysis were performed for the various contaminants found in the Plant operating areas. A breakdown of the analytical results is shown in Table F-9. In addition, Table F-10 shows the number of samples taken at stack effluents, atmospheric samples, and smears taken on miscellaneous equipment.

Table F-9
ROUTINE ENVIRONMENTAL ANALYSES

Contaminant	Threshold Limit Value/8 Hours	This Quarter		Last Quarter	
		Number of Samples	Number Above TLV	Number of Samples	Number Above TLV
Beryllium Air	2 $\mu\text{g}/\text{M}^3$	9923	81	9495	288
Beryllium Smear	25 $\mu\text{g}/12 \text{ in}^2$	3675	215	3602	290
Carbon Monoxide	100 ppm	5	0	0	0
Chromic Acid	100 $\mu\text{g}/\text{M}^3$	6	0	0	0
Hydrogen Cyanide	10 ppm	11	0	0	0
Mercury	? .10 mg/M^3	4120	125	4261	94
Perchloroethylene	100 ppm	42	3	10	5

Table F-10

MISCELLANEOUS SAMPLES

Contaminant	Type Samples	Number of Samples	
		This Quarter	Last Quarter
Benzene	Air	0	10
Beryllium	Air	40	89
Beryllium	Smear	568	1601
Diborane	Air	21	0
Lead	Air	10	4
Lithium Fluoride	Air	0	3
Lithium Hydride	Air	0	32
Mercury	Air	0	55
Plant Pollutants (metallic)	Air	143	143

Miscellaneous

A joint letter or recommendation was drafted by the Medical and Industrial Hygiene Departments to prevent future cases of injuries acquired during the removal of old roofing.

Toxicological information was prepared and given to the requestor on the use of the following compounds: perchloroethylene, carbon tetrachloride, methylene dichloride, dibutyl carbitol, butyl cellosolve, dibutyl cellosolve, methyl chloroform, gadolinium chloride and oxalate, and beryllium chloride.

A trip was taken to evaluate a prototype respirator washing machine for use in the new Central Respiratory Cleaning Facility. The machine was judged to be adequate for the cleaning facility.

Y-12 PLANT QUARTERLY REPORT

Second Quarter, FY 1963

October - December, 1962

M-140

EXTRACT

Authorized Derivative Classifier	
 Authorized Signature	<u>2/2/95</u> Date

Authorized Derivative Declassifier	
 Authorized Signature	<u>2/2/95</u> Date

This material has been reviewed by the Y-12 Classification office and has been determined to be UNCLASSIFIED.

APPROVED FOR PUBLIC RELEASE	
_____	_____
Technical Information Office	Date

This document is an EXTRACT from (Y-1219)

THIS PAGE MUST NOT BE SEPARATED FROM THE ATTACHED DOCUMENT

M-140

INDUSTRIAL HYGIENE

Potable Water Sampling

The program of sampling potable water from various water fountains and sinks within the Y-12 area was continued this quarter. A total of 121 samples were tested for total residual chlorine and bacteriological count. Two of the samples contained one or more colonies of coliform bacteria. The Plant sanitary engineer was informed and corrective action was initiated. Resamples were free of coliform bacteria.

Poplar Creek Water Sampling

Daily water samples were taken from the east fork of Poplar Creek for pH and composited weekly for spectrographic analysis of 39 cations, chemical analysis of four anions, and mercury determinations. The cations, including mercury, continue to remain at low concentrations. The anions ranged as follows: nitrates from 22 to 53 ppm; sulfates from 12 to 74 ppm; chlorides from 11 to 57 ppm, and fluorides from 2 to 6 ppm. The average mercury concentration dropped from 0.16 mg/l for the last quarter to 0.07 mg/l for this period.

The average results for pH and creek flow are presented in Table F-7 for the quarter.

Table F-7
POPLAR CREEK ANALYSIS

	This Quarter	Last Quarter
Average Flow	11.1 million gals/day	12.4 million gals/day
pH	8.6	9.3

Noise Studies

Miscellaneous noise measurements were made in the Plant operating areas this quarter. Recommendations were made to supervision when levels were above the Plant criteria.

A noise questionnaire was prepared during this quarter which will be given to each employee during his or her routine physical examination. It is hoped that the results of this questionnaire will provide information that can be used to pick out employees who are prone to hearing loss beyond the normal range.

Beryllium Program

The number of both air and smear samples above the Threshold Limit Values (TLV) decreased significantly this quarter. The continued efforts of operating personnel to correct sources of contamination are largely responsible for this decrease.

M-140

Studies were made this quarter to determine minimum sampling frequency without affecting the necessary health protection. A reduction was found to be possible in several areas, which will allow more concentrated effort on other industrial hygiene surveys.

Mercury Program

A total of 3661 air measurements for mercury concentrations were made this quarter with 176 samples exceeding the threshold limit of 0.1 mg/M^3 , as compared to 125 for the previous quarter.

During the quarter the Alpha-4 operation was shut down and placed in standby. Cascade in Alpha-5 was started up during the latter part of the quarter for special production. Routine air measurements are being taken in both facilities, and special measurements as requested by supervision.

Personnel Exposure

Three cases of dermatitis were investigated at the request of the Medical Department. Recommendations were made, and corrective action was taken by supervision in all cases where possible.

A total of nine cases of illness were investigated where industrial agents were suspected to have been the cause. Two cases were found not to be job connected. The agents in the other seven cases were found to be caused by the following materials: lithium, roofing tar (phenol or cresylic acid), chlorine gas, methyl chloroform, and beryllium. Recommendations for corrective action were made in all cases.

The program of urine sampling for mercury and lead was continued. Two samples for mercury exceeded the 0.3 mg/l limit and the Medical Department was notified. Followup samples revealed that the levels in both cases had dropped below the permissible limit. Table F-8 presents data concerning the urine programs for this and the preceding three quarters.

Air Analysis

Environmental air and smear analyses were performed for the various contaminants found in Plant operating areas. A breakdown of the analytical results is shown in Table F-9. In addition, Table F-10 gives the number of samples taken at stack effluents, atmospheric samples, and smears taken on miscellaneous equipment.

Miscellaneous

During the month of November the Plant-wide safety agenda concerned the industrial hygiene program. Lectures on this topic were presented at ten safety meetings.

M-140

Table F-8
URINARY DATA
(Hg and Pb)

	Second Quarter FY 1963	First Quarter FY 1963	Fourth Quarter FY 1962	Third Quarter FY 1962
<u>Mercury</u>				
Number of people	146	141	146	179
Number of people above TLV ⁽¹⁾	2(2)	2	1	0
Number of samples	148	143	147	180
Number of samples above TLV	2	2	1	0
<u>Lead</u>				
Number of samples	45	7	15	15
Number of samples above TLV	0	0	0	0

(1) Threshold Limit Values (TLV): Hg - 0.3 mg/l; Pb - 0.15 mg/l.
(2) Resamples were within the TLV.

Table F-9
ROUTINE ENVIRONMENTAL ANALYSES

Contaminant	Threshold Limit Value/8 hours	This Quarter		Last Quarter	
		Number of Samples	Number Above TLV	Number of Samples	Number Above TLV
Beryllium air	2 µg/M ³	9654	225	9923	288
Beryllium smear	25 µg/12 in ²	3926	156	3675	290
Carbon monoxide	100 ppm	14	0	5	0
Chromic acid	100 µg/M ³	12	0	6	0
Hydrogen cyanide	10 ppm	43	0	11	0
Mercury	.10 mg/M ³	3616	176	4120	125
Perchloroethylene	100 ppm	113	12	42	5

Table F-10
MISCELLANEOUS SAMPLES

Contaminant	Type Sample	Number of Samples	
		This Quarter	Last Quarter
Ammonia	Air	7	0
Beryllium	Air	56	40
Beryllium	Smear	866	568
Carbon Monoxide	Air	4	0
Diborane	Air	2	21
Lead	Air	10	0
Mercury	Air	45	0
Plant pollutants (metallic)	Air	146	143
Silicon	Air	6	0

Toxicological information was given to various members of supervision on the safe use of the following: chlorine, carbon dioxide, methyl chloroform, lithium, beryllium, xylene, amyl acetate, and iso amyl acetate.

Y-12 PLANT QUARTERLY REPORT
Third Quarter, FY 1963
January - March, 1963
EXTRACT

M-141

Authorized Derivative Classifier
M. J. Orley 2/2/95
Authorized Signature Date

Authorized Derivative Declassifier
R. B. ... 2/2/95
Authorized Signature Date

This material has been reviewed by the Y-12
Classification office and has been determined
to be UNCLASSIFIED.

APPROVED FOR PUBLIC RELEASE
m. d. Bond 2/6/95
Technical Information Office Date

This document is an EXTRACT from (Y-1220)

THIS PAGE MUST NOT BE SEPARATED FROM THE ATTACHED DOCUMENT

M-141

INDUSTRIAL HYGIENE

Potable Water Sampling

The program of sampling potable water from various water fountains within the Y-12 area was continued this quarter. A total of 131 samples were tested for total residual chlorine and bacteriological count. Five of the samples contained one or more colonies of coliform bacteria. The Plant sanitary engineer was informed and corrective action was initiated. Resamples were free of coliform bacteria.

Poplar Creek Water Sampling

Daily water samples were taken from the east fork of Poplar Creek for pH and composited weekly for spectrographic analysis of 39 cations, chemical analysis of four anions, and mercury determinations. The mercury and cations continue to remain at low concentrations. The anions ranged as follows: nitrates from 9 to 41 ppm; sulfates from 24 to 111 ppm; chlorides from 15 to 23 ppm, and fluorides from 1 to 4 ppm.

The average results for pH and creek flow are presented in Table F-6 for the quarter.

Table F-6
POPLAR CREEK ANALYSIS

	This Quarter	Last Quarter
Average Flow	14.1 million gals/day	11.1 million gals/day
pH	8.4	8.6

Noise Studies

Noise measurements this quarter were made in those areas in which new equipment had been installed and placed in service. Only one area was found to exceed the Y-12 Plant criteria for noise. Recommendations were made to supervision in this area that a noise sign be posted and ear protection worn by all personnel. This recommendation was made in lieu of acoustical treatment because of the temporary nature of the operation.

A noise questionnaire, described in the last quarterly report, was placed in use at the beginning of this quarter. It was learned from the results of several hundred of these questionnaires that changes in the wording of several questions are necessary before useful information can be gained.

Beryllium Program

The decrease in activity in various beryllium production and development facilities has resulted in a significant reduction in the number of air samples necessary for adequate health protection this quarter. A sharp decrease in the number of air samples above the threshold limit value (TLV) was noted. Continued efforts to control the release of beryllium contamination and maintaining good housekeeping was largely responsible for these results.

Mercury Program

A total of 5520 air measurements for mercury were made this quarter with 223 samples exceeding the threshold limit of 0.1 mg/M^3 of air. Both the total number of samples taken and the number exceeding the threshold limit have increased as compared to the number last quarter. This increase is due to the startup, at the end of last quarter, of the Marble production facility in Building 9201-5.

A total of 558 miscellaneous mercury measurements were made in buildings throughout the Plant not routinely involved with a mercury process.

Personnel Exposure

A total of 13 investigations were made this quarter at the request of the Medical Department. Three of these investigations were cases of dermatitis and were found to have been caused by soap, Rust-Lick coolant, and foam plastic. Four cases involved vythene, alkali metal, or unheated work areas. The remaining cases were not job connected.

The urine sampling program for mercury and lead was continued this quarter. No sample exceeded the limit for lead, but three persons submitted samples which slightly exceeded the limit for mercury. Resamples on these persons continued to show results above the limit. The Medical Department was informed of these results and additional samples have been scheduled for further evaluation.

A total of 38 urine samples were taken for fluoride analysis during the quarter with no results above the threshold limit value.

Table F-7 presents data concerning the urine programs for this and the preceding three quarters.

Air Analysis

Environmental air and smear analyses were performed for the various contaminants found in the Plant operating areas. A breakdown of the analytical results is shown in Table F-8. In addition, Table F-9 gives the number of samples taken at stack effluents, as atmospheric samples, and by smears on miscellaneous equipment.

M-141

Table F-7
URINARY DATA
(Hg and Pb)

	Third Quarter FY 1963	Second Quarter FY 1963	First Quarter FY 1963	Fourth Quarter FY 1962
<u>Mercury</u>				
Number of People	101	146	141	146
Number of People above TLV(1)	3	2	2	1
Number of Samples	107	148	143	147
Number of Samples above TLV	9	2	2	1
<u>Lead</u>				
Number of Samples	41	45	7	15
Number of Samples above TLV	0	0	0	0

(1) Threshold Limit Values (TLV): Hg - 0.3 mg/l; Pb - 0.15 mg/l.

Table F-8
ROUTINE ENVIRONMENTAL ANALYSES

Contaminant	Threshold Limit Value/8 hours	This Quarter		Last Quarter	
		Number of Samples	Number Above TLV	Number of Samples	Number Above TLV
Beryllium Air	2 µg/M ³	6380	46	9654	225
Beryllium Smear	25 µg/12 in ²	4120	183	3926	156
Carbon Monoxide	100 ppm	21	0	14	0
Chromic Acid	100 µg/M ³	18	0	12	0
Hydrogen Cyanide	10 ppm	80	0	43	0
Mercury	? • 10 mg/M ³	4962	223	3616	176
Perchloroethylene	100 ppm	261	53	113	12

Table F-9
MISCELLANEOUS SAMPLES

Contaminant	Type Sample	Number of Samples	
		This Quarter	Last Quarter
Ammonia	Air	0	7
Beryllium	Air	93	56
Beryllium	Smear	257	866
Carbon Monoxide	Air	5	4
Carbon Tetrachloride	Air	6	0
Cyanogen	Air	3	0
Diborane	Air	0	2
Fluoride	Air	24	0
Hydrogen Sulfide	Air	12	0
Lead	Air	15	10
Mercury	Air	558	45
Methylene Chloride	Air	8	0
Miscellaneous Dust	Air	11	0
Perchloroethylene	Air	19	0
Phosgene	Air	8	0
Plant Pollutants (metallic)	Air	143	146
Silicon	Air	0	6

Miscellaneous

In conjunction with members of the Safety, Engineering Mechanics, Fire, Development, and various operating departments, the Industrial Hygienist participated in six meetings for the purpose of identification and labeling the hazards of all tanks in the Y-12 Plant. These tanks are labeled with respect to four different categories: Health, Fire, Stability, and Criticality. The labels will serve as a guide for safety precautions to be taken during normal contact or emergency situations.

To provide an adequate toxicological information file, the Industrial Hygiene Group acquired a complete care system from the National Poison Control Center in Washington, DC. Each file card provides information on a specific commercial product with regard to medical treatment and toxicology.