H-DIVISION PROGRESS REPORT

November 21 - December 20, 1961

I. ADMINISTRATION (Thomas L. Shipman, M.D., Leader)

A. General Remarks

1. Time-Trend of Cesium^{137} Levels in the United States Population as a Result of Fallout from Nuclear Weapon Tests

In vivo measurements of the Cs^{137} levels in the U. S. population have been carried out since 1956 using the large liquid scintillation counter in the Biomedical Research Group. Subjects measured are visitors to LASL and to the surrounding communities. A total of about 1800 measurements have been made with yearly representation from 30 to 40 states of the Union. Time variation of the national average Cs^{137} level has been as follows: 1956, 58 μμc/g K; 1957, 52 μμc/g K; 1958, 67 μμc/g K; 1959, 83 μμc/g K; 1960, 72 μμc/g K; and 1961 (through August), 49 μμc/g K. Different regions of the United States vary from 0.75 (Southwest) to 1.13 (Northeast) times the nationwide average (population weighted). The spread is surprisingly small and may be a result of the country's broad food distribution system. The data for New Mexico residents during 1960-1961 show a steady decline since the cessation of weapon testing. The apparent half-time of decline is about one year. Measurements of New Mexico residents are being continued to determine the effect of the resumption of testing on the Cs^{137} levels of a rather homogeneous population group.

2. Gamma Ray Spectral Analysis of Meteorites

As a preliminary study for the Ranger lunar probe program, meteorites have been investigated and quantitative results obtained on the radioactivity of 22 chondrites, 4 carbonaceous chondrites, and 6 achondrites. The potassium (naturally-occurring)

and Al^{26} (cosmic ray-inducted) contents were obtained in all cases. The average potassium content for the chondrites was 0.073 per cent with a range of 0.060 to 0.125 per cent: the average concentration of Al^{26} for the chondrites was 49 d/m/kg with a range of 33 to 58 d/m/kg. Shorter-lived cosmic ray-induced activities have been seen in 4 meteorites which were measured fairly soon after fall. A sample of the Bruderheim chondrite (fell in Alberta, Canada, on March 4, 1960, showed 0.089 per cent potassium, 57 d/m/kg Al^{26}, 82 d/m/kg Mn^{54}, and 90 d/m/kg Na^{22}. The Harleton chondrite (fell in Texas on May 30, 1961) showed 0.069 per cent potassium 43 d/m/kg Al^{26}, 45 d/m/kg Mn^{54}, and 64 d/m/kg Na^{22}. The 800-kev line is suspected of containing 12 d/m/kg Sc^{46} + Co^{56} + Co^{58}. The two other samples showing Mn^{54} and Na^{22}, as well as the usual Al^{26} and potassium, are the Ehole (fell in Angola, Africa on August 31, 1961) and the Hamlet chondrite (fell in Indiana on October 13, 1956). Quantitation has just begun on these two samples.

B. Personnel (12/1 - 12/31/61)

1. New Hires

12/4	NEELY, Glenn W.	H-1	General Monitoring
12/4	DEAN, Philip N.	H-4	Low Level Counting
12/11	MULLEN, Philip M.	H-1	General Monitoring
12/22	DeMOUTH, R. Elaine	H-DO	Administration

2. Terminations

None

3. Total Personnel

SM	72
Military	1
SCP	115
ASC	55
TOTAL	243*

*Includes 15 casuals

II. GROUP H-1, HEALTH PHYSICS (Dean D. Meyer, Leader)

A member of the Group attended the Eleventh Nuclear Weapons Medical Symposium at Sandia Base from November 27 through December 1.

The H-1 Group Leader attended the AEC Health and Safety Meeting at Oak Ridge, December 5th and 6th. After the meeting a day was spent with Y-12 Health Physics personnel.

Three Health Physicists spent a weak at NTS working in the Rover area.

Two monitors spent 10 days at NTS assisting REECo Rad-safe in the Rover program and Area 3.

Mr. Joseph Brown, USPHS, Bethesda, Maryland, finished his six-month training period with the Health Division. Mr. Brown was very easy to work with, and more than repaid in work the time we spent with him.

Wing 9 - Hot Cells CM Building, were put into operation this month. So far they have been very satisfactory, no unusual health problems have developed and the personnel exposure has been low.

N-5 radiographed a plasma thermocouple in the OWR. The fission product activity of the thermocouple was estimated to be between 1000 and 2000 curies. The operation was successful, the highest exposure being 20 mr. This operation was well planned by P-2 and N-5 and demonstrates that the time spent in planning an experiment is well worthwhile in terms of radiation exposure.

Another experiment, which was not planned, nearly resulted in an over exposure. A CMF-00 technician prepared a $Sr^{90} + Y^{90}$ source

using as source material 200 mc of material purchased from Oak Ridge. Because of failure to consider proper handling techniques, she received an estimated dose to her hand of 13.7 rad. This is under the permissible exposure for hands which is 18.7 rad per quarter. To reduce the occurrence of this type incident, Supply and Property is going to furnish H-1 with a copy of purchase orders for radioactive isotopes and we will check with the person making the order to see if they are aware of the radiation problem.

Continuing assistance has been given H-5 in (1) evaluating $AgNO_3$ impregnated paper for I^{131} collection, (2) determining the efficiency of HV-70 for I^{131} collection under various conditions.

A suggestion received through AEC channels to load drybox gloves with D-38 was evaluated. We believe the suggestion to be impractical.

Several months ago, the local AEC received a suggestion regarding the installation of hand and foot counters in Station 100. They were advised that we believed this to be a good idea. A beta-gamma portal monitor has been installed and the alpha unit is on order. H-1 has set up the alarm levels, and will include these instruments in our routine instrument maintenance program.

A number of questions have been asked regarding the use of tuff for shielding in construction of fallout shelters. The effectiveness of tuff as a gamma shield (Co^{60}) was studied briefly. To a good approximation, dry tuff has the same gamma shielding properties as water.

Pu^{239} calibration standards for filter paper counting instruments were received from Eberline Instrument Company and distributed to H-1 Section Leaders with instructions for their use.

A report (LA-2641) entitled Control of Small Radioactive Sources Based on Maximum Permissible Intake of Radioactive Materials from Single Acute Exposures was prepared.

One of the Health Physicists completed the 7090 coding class.

Installation of new contamination warning signs on the DP West contaminated waste pit fence was completed during the month.

The plenum on the main air exhaust system at DP West (Bldg. 12) was cleaned out. Fourteen drums of dust were removed and sent to the contaminated disposal pit. This operation required the use of supplied air suits and was carried out without mishap.

A Health and Safety Newsletter on tritium was prepared for H-3.

A program for the weekly sampling of OWR water and the fuel element transfer pool was set up. To date, only Na^{24} has appeared in the reactor water and no activity in the pool water.

Argon leaks at the OWR were become more expensive; therefore, the makeshift gas sampler was rebuilt. A strong source of the gas was found and plugged, reducing the room background by a factor of 2.

The Title I plans for the Fast Reactor Core Test Facility were reviewed.

Considerable time was spent in the Neutron instrument study. Studies using the Water Boiler Reactor indicate the converted Pee Wee is very rate dependent even at low fluxes. The correction factor for thermal neutrons will be changed from 1.25 to 0.17. Mrs. Graves, P-6, has been very helpful in this study. This study will be continued using commercially available instruments.

III. GROUP H-3, SAFETY (Roy Reider, Leader)

A. Accident Record	Jan. 1 to Dec. 1, 1961	1960
Manhours Worked	5,943,398	6,318,954
Number of Disabling Injuries	14	11
Number of Days Lost	12,210*	96
Frequency (Accidents per 1,000,000 Manhours)	2.4	1.7
Severity (Days Lost per 1,000,000 Manhours)	2060	15

*This includes 12,000 days which is the ASA charge for two fatalities but does not include the [redacted] accident.

B. Industrial Accident Experience

On October 6, 1961 [redacted] GMX-3, was tightening a lever and strained the tendon of his left thumb which required surgery. Lost time was 6 days.

C. Fires

On December 6, 1961 a minor fire occurred at the Sherwood Building, SM-105, when the insulation between the walls ignited from a cutting torch.

D. Motor Vehicle Accidents	Jan. 1 to Dec. 1, 1961	1960
Miles Driven	1,561,191	1,920,108
Number of Accidents	19	27
Rate (Accidents per 1,000,000 Miles)	12	14
Total Cost	$1202.00	$1810.00
Accident Cost per 100,000 Miles	$78.00	$94.00

There was one motor vehicle accident in November involving Laboratory personnel. This occurred when a truck backed into another truck. Damage: $30.00.

E. General

1. James Stearns was at the Nevada Test Site from November 25 until December 17.

2. Roy Reider was at the Nevada Test Site on November 30 and December 1 to attend special meetings on liquid hydrogen operations.

3. Eight talks on "NTS Motor Vehicle Safety" were given to personnel at NTS and to personnel at LASL that will be going to NTS.

4. J. W. Cruickshank, AEC Fire Protection Engineer from Albuquerque, was at Los Alamos from November 27 until December 8 making annual and semi-annual surveys of LASL facilities.

5. Two talks were given to new employees as part of their orientation program.

6. Three talks were given on "Winter Driving".

7. The following films were shown during this report period:

a) "Alkali Metals Reactions and Fire Control" was shown 7 times.

b) "Criticality" was shown once.

c) "Safety Precautions for Electronics Personnel" was shown 7 times.

d) "The Saga of Safety Sam" was shown once.

8. A survey was made of emergency showers and similar protective equipment for TA-46.

9. Health and Safety Newsletter 61-12, "Inorganic Compounds" prepared by H-5, was distributed during this report period.

10. Weekly reviews of GMX-7 SOP's by the Safety Office are being continued.

11. "Precautionary Measures for Aircraft Carrying Hazardous Cargo" was written for the Department of Supply and Property.

12. A report was written and distributed describing two rupture disc incidents. One incident occurred at TA-33, the other at TA-46. Neither resulted in personal injury.

13. On December 19, Roy Reider present a colloquim "LASL Accidents - A Decade".

14. On Tuesday afternoon, December 5, a 50 pound explosives shot at Building 15, DF-Site, apparently broke three plate glass windows in the Thunderbird Shoe Store in the Community Center. A detailed report is on file.

15. On Saturday and Sunday, December 16 and 17, residents of Los Alamos were allowed to drive to their assigned emergency fallout shelters. A system of one-way street traffic was also in effect. The operation was apparently successful; no untoward incidents were reported. A report will be available later.

16. An electrical safety talk was given to J-7 personnel on December 4th.

IV. GROUP H-5, INDUSTRIAL HYGIENE (Harry F. Schulte, Leader)

A. Evaluation and Control Work

1. Beryllium

Forty air samples were collected during the month, all of which were below permissible levels. In addition to the Beryllium Shop, investigations were made at the Cryogenics Building and the Physics Building. At the Cryogenics Building, an experiment was performed by Group N-4 involving exposure of beryllium metal to liquid nitrogen. A white material formed on the outside of the pipe and, when swiped with Kleenex, yielded beryllium quantities of 20-30 $\mu g/ft^2$. However, no health hazards were encountered. Group P-4 has initiated work on beryllium foils using the newly installed large evaporator. Additional work will be done on this problem as production increases.

2. Sulfur Dioxide

Air samples collected in the basement of the old Sigma Building during pouring of melted sulfur to set bolts showed air concentration slightly in excess of permissible levels. The spread of this material to other parts of the building led to a rumor that a refrigeration pipe had burst.

3. Lead

Air samples were collected at Kappa Site during an experiment involving the explosion of lead wires. Excessive concentrations of lead were found and recommendations were made that the operation be stopped pending installation of adequate ventilation and other control measures. Additional sampling will be done when the tests are resumed.

4. Carbon Tetrachloride

Air concentrations of 1 to 3 times permissible levels were found near the glove opening of a dry box in which large quantities of carbon tetrachloride were being used. The gloves were old and, presumably, the vapor penetrated them and, probably, also through the surgeon's gloves worn by the operator. New gloves have been installed and additional air samples will be taken. Recommendations have also been made for the use of less toxic solvents.

5. Chlorine

Tests were made for chlorine and hydrochloric acid vapor in the work area at DP East, where Rover fuel elements were being treated. Chlorine concentrations were low but hydrochloric acid vapors were excessive.

6. TNT

Air concentrations of TNT were measured during melting of various mixtures at S Site. No detectable TNT found in the breathing zone or in the general air of the workroom. Tests at the mouth of the melting kettle were far above permissible levels, indicating that the exhaust system was controlling the TNT in a satisfactory manner.

7. Enriched Uranium

A total of 74 air samples for enriched uranium were collected in Shop 15, where Rover fuel elements were being fabricated. Several of these samples showed concentrations above permissible levels in the breathing areas. Intensive studies are being made to improve control measures and to determine individual exposures. Particule size studies are being made with the Casella and the UNICO Cascade impactors, and two-stage air samples will be utilized in future studies. No excessive urinary excretion levels have been noted in this Shop despite the frequent high air samples.

8. Miscellaneous Exposures

Miscellaneous exposures investigated included ammonia at S Site, ethyl alcohol at Sigma Building, trichloroethylene in the Main Shop, hydrogen fluoride in the Physics Building, free silica at W Site, and cyanides in Group P-1. Air samples were taken where necessary and recommendations and instructions for adequate control measures were given.

9. Noise

Noise studies were made in the Ceramics Section at Sigma Building, detonator testing at DF Site, and fuel element treating at DP East. The measurements at Sigma Building indicate considerable improvement following the introduction of baffling in the plenum of the ventilation duct. Further studies will be made as additional control measures are adopted. Ear-muffs for the control of the noises at DF Site and DP East were issued to the operators.

10. Respirators - Protective Equipment

Twenty-nine employees were fitted for full face and half mask respirators during this period. Several ACFI employees were fitted with respirators at Building 96 in TA-1 for use during the operation of spray testing of fuel elements. A supply air suit was provided for the operator cleaning the degreaser tank at the Main Shop Building, and the air pumps in Wing 9 were calibrated to determine whether they would supply adequate air for air supplied suits. One member of the Group trained operators at the Nevada Test Site in the use of supplied air equipment and another member of the Group attended a training course in the maintenance and repair of Scott Air Paks, which was held in Lancaster, New York.

11. Ventilation

Nine sets of plans for ventilation modifications were reviewed and approved during this period. An Anemotherm for measuring flow rates was calibrated in the wind tunnel.

B. Research and Development

1. Studies are being made on the solubility of powdered uranium-graphite dust in water, nitric acid and buffer systems. These studies are being undertaken in connection with investigations of the hazard of exposure to the dust from Rover fuel elements.

2. An investigation is being made of the efficiency of various techniques for the collection of iodine vapor in air samples. Under laboratory conditions, a commercially made silver nitrate

treated paper was found to be 90-95 per cent efficient: however, on the Omega stack, efficiencies of less than 5 per cent were found. The reason for this difference is being studied.

3. Studies are continuing on the effect of low temperatures on respiratory protective equipment. The cold chamber at TA-9 was used for three days for this work and a preliminary report has been prepared.

C. Miscellaneous

Two trade name products were analyzed during the month. Silisol, a proprietary window cleaner, was found to be essentially ammonium bifluoride. The volatile solvents in Pixcheck, an aerosol product, was found to be ether and isopropyl alcohol. An apparatus and technique are under development for the sampling and fractionation of aerosol products generally, since these are being widely used now.

Interest continued to be active in Civil Defense and fallout. Daily air sampling for fallout was continued but will be changed to weekly sampling after January 1. Talks on fallout were given in Taos, Albuquerque, and Santa Fe. The Group Leader is serving as Alternate Shelter Manager for HRL Building and has attended several meetings in connection with this activity.

Group GMX-7 plans to prepare ozone mixtures with various gases. The equipment and procedure for this work has been reviewed and approved. Operations with epoxy resins have been inspected in Groups P-1, P-4 and P-14. Inspections of areas of limited egress were made in the pits at GMX-7, the pit used by GMX-6, and the air gun device at S Site. Standard operating procedures are being written for entry into these areas.

Three members of the Group spent several weeks at the Nevada Test Site during this period assisting Group H-8 in their studies. Talks on solvents were given at Safety meetings of three different Laboratory Groups. A talk on Industrial Hygiene was

was given to members of an Explorer Scout Troop at a meeting in HRL Building. Following the talk, various types of industrial hygiene equipment were demonstrated. One member of the Group gave a talk on respirators before the annual Health and Safety Meeting of the AEC in Oak Ridge, Tennessee. Two groups of students from the University of New Mexico toured HRL Building during this period and were shown industrial hygiene equipment and techniques.

D. Statistical Summary

1. Air samples collected or field tests made for:

Beryllium, air	40
Beryllium, swipe	23
Ammonia	2
Sulfur dioxide	2
Lead	5
Carbon tetrachloride	4
Chlorine	2
TNT	8
Enriched uranium	74
Fallout	20

2. Plans Approved 9

3. Sanitation

Water samples collected	13

4. Analyses completed

Air

Beryllium	48

Biological (urine)

Plutonium	218
Uranium (fluorescimetric)	79
Uranium (radiometric)	97
Tritium	22
Trichloroacetic acid	9

Miscellaneous

Uranium in water (fluorescimetric)	35
Uranium in tissue (fluorescimetric)	8
Radioiodine in milk	88
Beryllium in swipes	23

V. GROUP H-6, RADIOLOGICAL PHYSICS (Harvey I. Israel, Leader)

A. Special Problems (S. Shlaer)

1. General

a. E. Bemis spent a considerable amount of time working on the H-Division fallout panel.

2. Work in Progress

a. An attempt to calibrate the Eastman Kodak wedge for the densitometer showed the wedge to be quite non-linear at the thick end. The thin portion of the wedge was more satisfactory. For consecutive equal increments of rotation the density differences ran as follow: .25, .31, .32, .28, .30, .20, and .35. The same differences within .005 were obtained in a second run of this wedge. Another wedge of somewhat different dispersion material showed similar non-linearities at its thick end.

For this reason it was decided to substitute a neutral glass wedge for the cast gelatin wedge in the densitometer. From careful measurements of plane parallel filters the thickness per unit density was determined for a batch of neutral glass, and a pair of wedges having one density unit change per inch of length was ordered fabricated through GMX-9. These will be 4" long and have a total range of 7 density units over a field 1/2" diameter.

The mechanism of moving these wedges has been designed and partly fabricated. Each wedge will be mounted in a dural frame which will be driven by a 1/4" - 20 threaded rod. The two driving screws will rotate in opposite directions so that the two wedges will slide in opposing directions.

b. The study of the energy-dependent characteristics of H-1 monitoring instruments is still in progress. At the present time, curves covering 8 to 1250 kev have been finished on 7 out of 12 instruments. A report will be written for H-1 when this work is completed.

c. There is nothing to report this month on the Phermex project, because the machine has been inoperative. It is expected to be back in operation about the second week of January.

3. Work Completed

a. The three month study of the latent image fading of Du Pont 508 and 555 emulsions has been completed. Films were calibrated to Co^{60} after which they were stored in a non-air conditioned room in the Administration building. All films were then developed together. The 555 faded 15 per cent the first month, 5 per cent the second month, and 3 per cent the third month for a total of 23 per cent. The 508 faded a total of only 7 per cent in three months.

b. An abstract of a paper titled "A Study of the Diffusion and Mixing of Tritium Gas in Air" by Morris Engelke, H-1, and Edwin Bemis, H-6, has been submitted to the AIHA and has been accepted for presentation at their meeting in May 1962, at Washington, D. C.

B. Weather Section (O. W. Stopinski)

1. General

a. O. W. Stopinski returned from Washington, D. C., November 22.

b. O. W. Stopinski left for NTS November 27 and returned December 8.

c. O. W. Stopinski left for NTS December 16 and returned December 18.

2. Work in Progress

a. Work continues on the local climatological studies.

b. Work continues on computing fallout probabilities on various communities around the state.

c. Work continues on the weather summary for overseas and continental shots.

3. Work Completed

a. Field support for testing Kiwi B-1A was provided by O. W. Stopinski at NTS.

b. Field support for J-Division activities at NTS was provided by O. W. Stopinski.

c. A lecture on weather was given to the fourth grades at Canyon School, December 9, by W. B. Sayer.

d. An instrument shelter containing a hygrothermograph, a combination snow and rain gauge, was installed at the ski run on December 9. This station will help provide information for water studies done by the U.S.G.S. and also aid the local climatological study.

e. A fallout study for Kiwi B-2 was completed and forwarded to J-Division.

f. The fallout probabilities for Albuquerque from nuclear detonations on the Titan bases at Roswell and Tucson were computed and forwarded to H-DO.

C. Environmental Radiation Section (W. R. Kennedy)

1. General

a. None of the alpha particulate air samplers during the month gave values in excess of 0.4×10^{-14} μc/cc.

b. Beta gamma activity in air and precipitation continues to be high. The maximum figures per day counted seven days after collection were: air, 14.8×10^{-12} μc/cc from December 13 to December 14: water, 7,432 μμc/M^2/day from December 8 to December 11.

c. The continuously recording gamma rate meter showed a few short time rises, which correlate with Omega stack gas activity. There has been no noticeable increase due to fallout.

A new air particulate beta activity recording monitor has been ordered.

d. At the request of GMX-5, arrangements were made for the U.S.G.S. to core three holes in the bottom of Bayo Canyon. Three 3" holes were drilled through the Bandelier tuff to the Puye

conglomerate. The Puye was found at depths ranging from 78 to 92 feet. No water was encountered in any of the holes. The first 15 feet of each consisted of weathered tuff.

e. Summaries of film badge data for the first three quarters of 1961 were completed. Significant readings were found only immediately adjacent to the East Gate Laboratory radiation facility.

The highest reading for the three quarters, at a station alongside the road at approximately 800 feet from the Laboratory, was 6.60 R. The source was removed from the area on December 13, 1961, and the use of this area as a radiation facility has been permanently discontinued.

2. Laboratory

a. Waste from CM Building was routinely assayed for excessive alpha activity. All batches were released to H-7 for disposal.

b. Drinking water at CM Building showed no plutonium. Circulating water at DP West continues to show trace amounts of plutonium. The maximum was less than 4/1000 ppm.

c. Results of analyses of LASL-USGS water samples are still in progress.

VI. GROUP H-7, INDUSTRIAL WASTE (C. W. Christenson)

A. Plant Operation

1. TA-45, Tech Area

Cold weather, snow, broken water lines, and re-circulating water systems have contributed to an abnormal high flow to the acid sewer system and excessive high flows to the plant. These malfunctions have occurred in the HRL Building, CMR, the Old Sigma Building in TA-1, SM-700 and recently a broken hot water line was found in WD-1 (the decontaminating building at TA-45). 70-1/2 man-hours overtime operation were required.

On November 28 the SM-700 holding tanks overflowed into the new, partially completed pumping station through a newly installed non-sealing sleeve. This required extra monitors and decontaminating procedures at this construction site.

2. TA-21, DP West

Raw flows were normal during this period with satisfactory effluent quality and no recirculation or overtime operation was necessary.

Americium raffinate production continues at 100 gallons per day. There is no backlog of this waste at present.

Some trouble has been experienced with defective drums. During tightening of the filling lines prior to tumbling, the bungs of several drums have come loose. A new shipment of drums is due at the warehouse, which will be inspected prior to delivery at TA 21.

Insulation and heating of the chemical storage room is still in the planning stage as well as the installation of an additional 350 gallon tank and mixer in this building.

3. TA-35, Ten Site

Low flows were experienced to the tank farm at 7600 gallons for the period. No treatment has been necessary with some 130,000 gallons of storage space still available.

4. TA-48, J-11

One lift pump, recently replaced, has been put in service and the tank mixer has been repaired.

B. Research and Development

1. TA-45, Tech Area

Nothing to report.

2. TA-21, DP West

Nothing to report.

3. TA-35, Ten Site

Nothing to report.

4. TA-50, Central Treatment Plant

Black & Veatch reports 11% completion on complete construction contract as of December 22, 1961.

A meeting was held with representatives from this office, the A.E., AEC, and ENG-1, to discuss corrections, changes and additions to shop drawings.

5. TA-1, Delta Building - Ceramic Sponge Program

D. A. Stone, Chief Engineer and factory representative for Harrop Precision Furnace Company, was here for 8-1/2 days to start up the tunnel kiln and supervise wiring and placing of the Super Kanthal heating elements. During this time most of the mechanical difficulties were corrected. The heating elements were installed satisfactorily but it was determined that redesign of the power circuitry was necessary. The revised design of this equipment and installation instructions have been received and the additional equipment will be shipped shortly after the first of the year. All of this, including installation and final start-up and inspection, will be done at no cost to the Project (estimated at $2,500).

Coors Porcelain Company has shipped 47 ceramic trays for the tunnel kiln cars and completion of this order will be after the first of the year.

The soaking and drying equipment is about 90% assembled. Trial runs should start before New Year's Day.

C. Laboratory Section

1. Routine Laboratory

The quality of both the laundry raw weekly composite and TA-45 final effluent has been excellent for the period.

2. Clinoptilolite Studies

The clinoptilolite column continues to remove more than 90% of the radium from the feed solution. Some difficulty has been encountered with an accumulated "sludge". The column was back-washed and settled by vacuum. The removed sludge contained about

4500 c/m/ml of radium and about 9 ppm of iron. Removal of the sludge did not change the efficiency of radium removal by the column. Increased removals of radium may be provided by a second column in series with the first; such an experiment is being planned.

3. Rover Reactor Waste

New construction at J-11 has necessitated a change in plans for disposal of Rover reactor waste. Recent waste is relatively low in activity and is being disposed of in one liter packages by burial.

4. Ceramic Sponge Studies

Ruthenium volatility from ceramic sponges has been further studied in the laboratory. Contrary to expectations, ruthenium is not readily volatilized from either the waste-soaked sponge or from liquid waste. Since RuO_4 added to the waste is not volatilized under the above conditions, it is probable that a ruthenium complex is formed in the presence of the synthetic waste and that the complex is not volatile. If the lack of volatility is observed with an actual waste, one serious problem of disposal will be disposed of.

5. TNT Disposal Studies

An enhanced degradation of TNT in the presence of ethyl alcohol has been reported previously. A materials balance now indicates that 70 mg of TNT are degraded for every 100 mg of ethyl alcohol used. In long time (20 to 30 days) experiments with this system, there is a gradual decrease in bacterial population. This may be caused by the accumulation of toxic end products. "Fill and Draw" disposal will be initiated to investigate this possibility.

1/11/62
mjt