Los Alamos Environmental Restoration Facility

ER Record I.D.# 0004874

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LOS ALAMOS NATIONAL LABORATORY

ENVIRONMENTAL RESTORATION
Records Processing Facility
ER Record Index Form
(Side 1 of 2)

Part I: Complete all fields; indicate NA (Not Applicable) if appropriate; please write legibly.

DOCUMENT TO: R.W. Duke DOCUMENT DATE: 11/10/59

ORIGINATOR NAME: R.L. Spalding ORGANIZATION: GMX-7

SYMBOL: — PAGE COUNT: 6

SUBJECT/TITLE: Scrap Disposal

RECORD TYPE (Circle relevant type for primary record; type of attachments should be selected on *Keywords List*):

Analytical Data	FAX	Map	Plan	Study
Chain-of-Custody	Figure	Memo	Procedure	Telephone Record
Computer Output	Form	MSE/Form	Purchase Request	Transcription
Contract	Interview	Notebook	Receipt Acknowledgment	Video
Controlled Distribution	Letter	Personal Notes	Report	Work Plan
Drawing	Logbook	Photo	Review	Other

RECORD CATEGORY: P
(P for Programmatic or R for Reference)

RECORD PACKAGE #: —

Part II: Complete all fields; indicate NA (Not Applicable) if appropriate; please write legibly. Use *ER Record Index Form Attachment Sheet* if needed.

ATTACHMENTS FILMED (Y/N): —
(Were attachments to this record filmed?)

LOCATION: —
(Indicate location of attachments.)

TECH AREA(S)	PRS NO(S)	TOD (ADS) NO(S)	STRUCTURE NO(S)/MDA
LIST RELEVANT TECH AREAS. 7 1 3	LIST RELEVANT PRS NOS. —	LIST RELEVANT TOD/ADS NOS. 1111 1078 1114	LIST RELEVANT STRUCTURE NOS/MDA. —

33033

Part III: Complete all fields; indicate NA (Not Applicable) if appropriate; please write legibly. Use *ER Record Index Form Attachment Sheet* if needed.

WBS NO(S)	DOCUMENT TO	ORIGINATOR NAMES
LIST RELEVANT WBS NO(S).	LIST MULTIPLE RECIPIENTS.	LIST MULTIPLE ORIGINATORS.
1.5.14 1.5.5 1.5.15	—	—

CORRECTION (Y/N): —
(Is this a correction to a record previously processed?)

CORRECTED #: —
(If answer is Yes, please give ER Record # for corrected record.

CORRECTION DESCRIPTION (Optional): _____

SUPERCEDE: — **REPLACE:** — **DELETE:** — **ADD:** — **REVISE:** —

KEYWORDS: Circle relevant KEYWORDS from the list below for ER Record #: 000 45574

MISCELLANEOUS (List other indexing criteria as necessary; please write legibly): Tech Area, SCRAP

Abandon
Aboveground Tank
Absorption
Accelerator
Access
Accident
Accumulation
Acid
Active
Administrative
ADS (Activity Data Sheet)
Adsorption
AEC (Atomic Energy Commission)
Air
Alpha
Americium
Analysis
Analytical
AOC (Area of Concern)
Approval
Aquifer
ARAR (Applicable, Relevant, or Appropriate Requirements)
Archeology
Archive
Area
Arsenic
Asbestos
Asphalt
Assessment
Audit

Bacteria
Barium
Baseline
Beds
Bermed Area
Beryllium
Beta
Biology
Blank
Boiler
Boneyard
[redacted]
Burn Site

Cadmium
Cesson
Calibration
Canyon
Caustic
CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act)
Certification
Cesium
Chain-of-Custody
Chamber
Change Control
Change Order
Chart
Chemical
Chromium
[redacted]
Clothing
Closure
CMI/RA (Corrective Measures Implementation/Remedial Action)
CMS/FS (Corrective Measures Study/ Feasibility Study)
Comment
Committee
Community Relations
Compressed Gas
Computer Modeling
Computer Output
Concrete
Configuration
Construction
Container
Contaminant
[redacted]
Contract
Controlled Distribution
Core
Corrective Action
Correspondence

Data
Deadline
[redacted]
Decision Analysis
Decommission
Decontamination
Deficiency
Deliverables
Demolition
Description
Detection
Determination
Development
Discharge
Disposal
Documentation
DOE (Department of Energy)
DQO (Data Quality Objectives)
Draft
Drainage
Drainline
Drawing
Drilling
Drop Tower
Drum
Dry Well
Dump
Duplicates

Ecology
Effluent
EIS (Environmental Impact Statement)
Emission
Engineering
Environmental
EPA (Environmental Protection Agency)
Equipment
ERDA (Energy Research and Development Administration)
Erosion
Error
ES&H (Environment, Safety, and Health)
Estimate
Evaluation
Evaporator
Excavation
Exclusion
Exhaust
Experiment
Explosive
Extension
Extraction

Facility
Farm
FAX
Fence
Field
Figure
Filter
FIMAD (Facility for Information Management, Analysis, and Display)
Finding
Fire
Firing Site
Fiscal
Five Year Plan
Flowchart
Fluid
Form
Framework
Fuel

Gamma
Gas
Generation
Generic
Geochemistry
Geology
Geophysics
Glass Breaker
Glove Box
Graph
Guidance
Gun

Hazardous
Health
HE (High Explosive)
History
Hole
Home Owner
HSWA (Hazardous and Solid Waste Amendments)
Hydrology

Implementation
Implosion
Impoundment
Inactive
Incinerator
Injection Well
Inorganic
Interim
Interim Action
Internal
Interview
Inventory
Investigation
IRM (Interim Remedial Measure)
Isotope
IWP (Installation Work Plan)

Lab Job
Lagoon
Land
Landfill
Laundry
Leach
Lead
Leak
Legal
Letter
Limit
Liner
Liquid
List
Logbook

Management
Manhole
Map
Material
MDA (Material Disposal Area)
Meeting
Memo
Mercury
Metal
Microform
Minimization
Minutes
MIS (Management Information System)
Mixed Waste
MOA (Memo of Agreement)
Model
Modification
Money (Allocation, Appropriation, Budget, Cost, Funding, etc.)
Monitoring
Monthly Report
Mortar Impact Area
MOU (Memo of Understanding)
MSA (Major System Acquisition)

NEPA (National Environmental Policy Act)
Nitrate

NMED (New Mexico Environmental Division)
NMEID (New Mexico Environmental Improvement Division)
NOD (Notice of Deficiency)
Non-explosive
Notebook
Notification
NPDES (National Pollutant Discharge Elimination System)
NRC (Nuclear Regulatory Commission)

Off-gas
Oil
Open
Open Burning
Operation
Order
Organic
Organization
OSHA (Occupational Safety & Health Administration)
OU (Operable Unit)
Outfall
Outline

PA/RFA (Preliminary Assessment /RCRA Facility Assessment)
PCB (Polychlorinated Biphenyl)
Permit
Personal Notes
Personnel
Personnel Qualification
Photo
Pilot Study
Pipe
Pit
Plan
Plant
Plutonium
Pollution
Polonium
Potential
Priority
Procedure
Programmatic
Project
Project Leader
Propellant
Property
Proposal
Protocol
PRS (Potential Release Site)
Public
Pump
Purchase Request

Quality
QA (Quality Assurance)
QP (Quality Procedure)
Quarterly Report

Radioactive
Radiochemistry
Radionuclide
Rationale
RCRA (Resource, Conservation, and Recovery Act)
Reactor
Receipt
Acknowledgment
Records
Recovery
Recycle
Reduction
Reference
Regulation
Release
Remediation
Removal
Report
Request
Requirements
Research
Resin Bed
Resolution
Response
Restoration
Restriction
Results
Review
Revision
RFI/RI (RCRA Facility Investigation/Remedial Investigation)
Risk
RPF (Records Processing Facility)

Safety
Sample
Sampling Plan
Sanitary
Satellite
Schedule
Scope
Scrap Detonation Site
Screening
Scrubber
Seep
Seminar
Semivolatile
Septic
Sewer
Shaft
Shell
Silver
Site
Soil
Solid
Solvent
SOP (Standard Operating Procedure)
SOW (Statement or Scope of Work)
Specific
Spill
Stack
Standard
Statistics
Steamline
Steel
Storage
Strontium
Structure
Study
Subcontractor
Subsurface
Summary
Sump
Support
Surface
Surveillance
Survey
Swipe
SWMU (Solid Waste Management Unit)
System

Tank
Task
TCLP (Toxicity Characteristic Leaching Procedure)
TDD (Technical Document Description)
Technical
Technical Team
Technology
Telephone Record
Test Area
Testing
TLD (Thermoluminescent Dosimeter)
TOC (Table of Contents)
Townsite
Toxic Metal
Tracking
Training
Transcription
Transfer
Transport
Treatment
Trench
Trip Report
Tritium
TRU (Transuranic)
TSCA (Toxic Substances Control Act)
Tuff

Underground
Uranium
USGS (United States Geological Survey)
UST (Underground Storage Tanks)

Validation
Variance
VE (Value Engineering)
Ventilation
Video
Volatile
Volume

Waste
Water
WBS (Work Breakdown Structure)
Weapon
Well
Work
Working Group

Zinc

TE 6050

LA-UR-10-0610

LOS ALAMOS SCIENTIFIC LABORATORY
UNIVERSITY OF CALIFORNIA
LOS ALAMOS, NEW MEXICO

OFFICE MEMORANDUM

TO: R. W. Drake

DATE: November 18, 1959

FROM: R. L. Spaulding

SUBJECT: SCRAP DISPOSAL

SYMBOL: GMX-7

Reference: Memo dated November 18, 1959, from J. C. Anderson and John L. Tucker to R. L. Spaulding, subject "Comments Concerning Scrap Disposal at the Pit East of DF-15"

As you are aware, scrap disposal in GMX-7 has been done in various ways and in various places, and in many instances we have not conformed to the letter of the OSM. The intent of this memorandum is to outline briefly our recent methods of disposing of scrap, to describe the condition of the sites which we believe either are available or could be made available for disposing of scrap, to propose action with regard to cleaning up the contaminated sites, and to propose action for establishing a suitable place for future scrap disposal in GMX-7. I will not outline in detail the procedures to be used, but such procedures must be written and approved before GMX-7 will be in a position to dispose of scrap even before January 1, 1960.

A few years ago we disposed of scrap HE and detonators by mixing in a quantity of Comp. B scraps or flaked TNT and detonating the mixture at Gomez Ranch. In general, this procedure seemed to work very well in destroying the detonators, I suspect principally because the number of detonators was small in comparison with the quantity of pellets and other high explosives in the mixture. We never had any indication that approximately intact detonators were being thrown out of the disposal pit, and a recent survey of the area did not turn up any undestroyed detonators. However, it must be said that any reasonable survey of the area around Gomez Ranch could not guarantee that every square inch within, say, a 200-foot radius had been searched. There is too much brush, loose soil, gullies, rocks, and general debris in the area to allow any statement of this kind.

The detonation of the high explosive mixtures in this locality produced considerable unhappiness in TA-1 and TA-3. Even when our shots were held to 25 pounds, there were occasions when cloud cover and/or thermal inversions acted to reflect the noise from the shot into Tech Area with enough intensity to produce numerous phone calls, and we finally gave up trying to detonate material in this location and moved over to a shelf of a mesa about 450 feet east of DF-15. It was at about this time that a question arose regarding the method Mound Laboratory might use to dispose of their scrap. We continued to use Gomez Ranch for experiments to answer this question, and for a considerable time succeeded in burning scrap HE and detonators without having a detonator detonate. (I am speaking here of WR-type detonators; 1E15 detonators have always been burned separate from other detonators, have always detonated when burned, but the charge is too small, apparently, to throw the other 1E15 detonators out of the fire.) Partly on the basis of

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our experience with burning, Mound Laboratory established a burning ground and used it for some months before they had a detonation of a detonator. They subsequently had several incidents where detonators detonated rather than burned, and it was only after we had copied their procedure in some detail that we were able to get detonators to detonate rather than burn. It is our conclusion from our burning experience that if detonators are put in a pan and more or less covered with a diesel fuel, occasionally a detonator will be oriented so that the flames from the burning oil will heat the head of the detonator while the still unburned oil keeps the booster pellet cool. Eventually the PETN becomes heated to the point where it detonates. When this happens, apparently the tetryl and the booster pellet also detonate. The detonation of the booster pellet produces a disturbance severe enough to throw detonators immediately adjacent outside of the burning fuel and sometimes outside of the burning pit. We have not so far experienced anything approaching a mass detonation of the material being burned.

We believe that detonators can be supported on a special rack in such a way that the burning can be accomplished with substantially a guarantee that the detonators will burn and not detonate. The proper placement of detonators on a rack or other support is, of course, a time-consuming operation and the burning process is even more so; but aside from this, I believe it can be made to be a safe and, on the whole, satisfactory method of disposing of detonators. Scrap HE can be burned without requiring such careful placement on a rack, since there is no confinement around the pellets and when they become hot enough from the fire they simply burn. I know of no instance where a pellet of either tetryl or PBX has detonated in one of our fires.

When we decided about a year ago to dispose of large quantities of detonators no longer suitable for inclusion in WR, we considered several alternative schemes. One of these was to ship the detonators to Mound Laboratory and ask them to do the dirty work. We felt, however, that the quantity was so large that this would be a major undertaking for Mound and for us if we burned them. We tried several shots at the disposal ground east of Chamber 15 with apparently good success, after a fiasco in late 1958, described in the referenced memorandum. An insufficient quantity of boostering HE was mixed in with the detonators, and as a result a substantial number of the detonators were not destroyed, but were scattered about the landscape in the vicinity of the pit. In some instances, detonators were thrown 100 yards or more. Following this fiasco, a search was made up and down the mesa shelf around the pit to pick up the detonators that had not been destroyed, and it was believed at the time that all of them had been found. As recent events have shown, this search was not exhaustive enough; but in view of the weeds, deadfall, rocks, and generally rugged and debris-strewn character of the area, it is not hard for me to see how such an error could have been made. Subsequent attempts to dispose of detonators involved the use of considerably larger ratios of flaked TNT to detonators, and we believe that these shots indeed did destroy the detonators as intended.

It was felt by those most closely connected with the work that burning as we were then practising it was far too slow for the quantities involved and detonation of the mixture of TNT and detonators was not a wholly satisfactory method because, like burning, it required a great deal of detailed preparation at the destruction point. We, therefore, hit on the idea of covering the detonators with nitromethane and detonating it. This procedure was tested by a shot involving three cans full of detonators of various types at Lower Slobbovia. The results were gratifying. The shot preparation was very easy and quick compared to the method we had been using. The destruction seemed to be very complete, reducing the metallic components of detonators to small shards of metal; and the fact that GMX-8 was willing to help with the job and carry it out in an area suitable for shooting large charges, made it possible to destroy considerable quantities of material at a time. In comparison, it would have taken us perhaps 15 to 30 shots (because of HE weight limitations) to accomplish what was done in one shot at Lower Slobbovia. We used this method there to destroy the bulk accumulation of detonators no longer suitable for use.

Following the discovery of undestroyed detonators in the area east of DF-15, some of our people undertook a detailed search of the area around the firing point at Lower Slobbovia recently. They were unable to find any evidence whatsoever of undetonated detonators. They found only shards of metal, and we conclude that if there are, indeed, undestroyed detonators around Lower Slobbovia firing point, they are few and far between; although, again, because of the brush, rocks, and generally debris-strewn character of the ground around the point, no one can guarantee that there are none.

In destroying pellets and other scrap HE accumulated in GMX-7, but excluding detonators, we believe that detonation can be accomplished with considerable certainty by mixing the scrap with a generous amount of flaked TNT but, as noted above, the scrap can also be burned, and the process of mixing miscellaneous HE, while not carried out in the manner of tossing a salad, nevertheless possibly introduces a hazard of some small dimension.

To summarize my feelings about methods of destruction, I believe that we can accomplish the destruction by burning at Gomez Ranch both detonators and scrap HE, and that by the use of suitable frames to hold detonators in proper orientation, this can be done without scattering detonators. We would much prefer to destroy detonators by immersing them in nitromethane and detonating the nitromethane, primarily because this is less demanding of man-hours and because any material remaining is of no security interest whatever. We would somewhat prefer having a single method of disposing of scrap HE including detonators in GMX-7, rather than two or more methods depending on the exact character of the material to be destroyed. We would therefore prefer to use nitromethane to destroy scrap HE as well as detonators. In any event, we would like to avoid having to establish more than one disposal ground in GMX-7.

As I have mentioned above, both Gomez Ranch and the disposal pit east of DF-15 are surrounded by debris, weeds, deadfall, etc. to an extent that makes the finding of unexploded HE or detonators very difficult. Our recent searches at both of these locations have revealed that there is unexploded HE around both pits. Again, let me point out that we found no unexploded detonators around Gomez Ranch, but we did find several PBX pellets there. Around the DF Site pit, we found unexploded pellets and unexploded detonators. At the DF disposal point, I feel that we have picked up a considerable fraction of the HE and a large fraction of the detonators lying on the surface of the ground. However, we suspect that each rain washes fresh detonators into view, and in the pit itself we are relatively certain that there are a fair number (how many is anybody's guess) buried in the rim of the pit. We have seen several washed out and we know that when the unsuccessful shots were made the soil in and immediately around the pit was extremely dry and composed of dust perhaps a foot or more thick.

I believe the DF destruction point can be cleaned up without much difficulty. On November 13, 1959, in company with Roy Reider, Albro Rile, and Earl Rutledge, we inspected the area and mutually concluded that a method we had considered -- namely, washing down the soil with high pressure water streams -- was impractical because the water pressure available from the nearest fire hydrant (something like 1,000 feet away) is too low. However, we could bring in two or three tank trucks full of water and wet the ground thoroughly. Following this, a D-8 bulldozer provided with a simple shield, could work over the area without any danger of injuring the operator even if he should succeed in detonating an undestroyed detonator. Roy Reider, Earl Rutledge, and I looked at such a bulldozer, and we are convinced that this is a reasonable way to scrape off the top couple of feet in the area of the pit and around the pit to effectively clean up the area. If we do not propose to use this place as a permanent destruction site, it will become a matter of policy whether we wish to clean up the deadfall, weeds, rocks, etc. in the area in order to be more certain than we now are that there are no undestroyed detonators in the vicinity.

If we decide not to do this, then it would be necessary to fell only a few trees in the immediate vicinity of the disposal point and burn them -- (this at the request of Rile who would prefer that we not simply push them over the canyon wall before we wet down the ground and bulldozed the area). This would be preceded by a further careful cleanup of the area immediately around the pit in which we would attempt to pick up all chunks of HE that might be found lying on the ground. This could be done in short order by GMX-7 technicians who understand the necessity of keeping their eyes open for HE. I imagine that both of these tasks (picking up HE and felling and burning the trees) could be accomplished in not more than two days by the same group who searched the area for unexploded detonators. Following the scraping of the ground by the bulldozer, we would propose to do nothing further unless we decide to use this area for subsequent scrap disposal. Should we wish to do that, then we should dump several truckloads of dirt over the scraped-out area and roll it down.

I would now like to discuss the actions that might be taken to establish a site for future destruction of detonators and HE. It would be my first choice to have our scrap disposal done by someone else. From my point of view, it would be very desirable to have suitable containers designated into which we could put the scrap, these containers to be stored in a magazine and picked up either on call or at regular intervals by some one who would undertake the job of destroying the material safely. Since we will probably have to make certain arrangements for disposal of scrap at S-Site, I think it would be worth inquiring if the additional complications entailed by setting up such a place to handle GMX-7 type of scrap as well, would not in the long run be cheaper than having GMX-7 set up its own disposal ground. If, however, you feel that we should have our own disposal ground, my first choice of site would be a cove about 800 feet east of the present DF disposal point on the same shelf. This appears to be far enough away from inhabited buildings to comply with the OSM, and is surrounded by a continuous hill in the shape of a horseshoe perhaps 40 feet high. This area is completely undeveloped, but could be denuded of trees and weeds, scraped with a bulldozer, and the soil rolled down to a condition recommended by the OSM. We would have to run power lines and a communication system would have to be established (this possibly could be done with walkie-talkies) and it would be necessary to arrange for a water supply (R. Reider specified a reservoir full of salt water) in order to effect compliance with the OSM. We would also have to construct a rudimentary "bomb proof" to contain the firing controls, and a road would have to be scraped along the shelf of the mesa a distance of perhaps 1,000 feet beyond its present termination. This location might (subject to trial) allow us to detonate 200 or 300 pounds of scrap per shot and would almost certainly not throw shrapnel as far as DF Building 1.

My second choice of site location would be the present DF destruction site. There is already a road down to this pit but it is not, I believe, adequate to comply with safety requirements. Its primary defect is that it is very steep in one spot and, being gravel covered, vehicles skid and have considerable difficulty climbing out of the pit area when the road is either wet or dry. It is essentially unusable when there is snow on the road. For either this location or the one mentioned above, this particular section of road should be regraded and probably should be black-topped on the steep portion. Here again, it will be necessary to clear out debris for the requisite distance around the destruction point. We will also have to lay power and control lines, establish communication, and provide for a water supply in order to conform to the OSM. In addition, as mentioned above, it will be necessary to dump dirt on the area bulldozed out, and roll this to a surface in keeping with the OSM description of the ground around a disposal point. In addition, the shelf is here too narrow to allow conformance with the 800-foot radius called out in the OSM 2709C. At both of the locations just described, we would detonate our scrap with nitromethane. If the site is located in its present location, we probably could not shoot more than 100 pounds at a time, and I believe there is some chance of shrapnel being thrown as far as Building 1.

My third choice of site location would be Gomez Ranch. Here there is no question of detonating scrap; we must burn as our only method of destruction. This location would need to be cleaned up around the point to the distance recommended in the OBM, filling in gullies, and rolling down the dirt. We would have to install communications and possibly build a somewhat better control point. We would also have to install a water supply. This site would obviously be the cheapest one to develop. It would also be very much slower in operation than the other sites mentioned.

Perhaps a word should be said about the use of nitromethane as an adjunct to scrap disposal. I have discussed the question of sensitivity of nitromethane and its possible sensitization by various components in detonators and our HE scrap, with both L. C. Smith and A. W. Campbell. We have so far not been able to imagine how nitromethane could be sensitized by any of the components that it might see in our material, nor have we so far been able to think of any sense-making experiments to determine the degree of sensitization that might be given to the nitromethane by our components. This question is still under study and, hopefully, we will either be able to decide on sense-making experiments or be able to conclude that there are no grounds for worry in this area. I understand that nitromethane is still regarded by the I.C.C. as a solvent rather than a high explosive -- that it is indeed very difficult to initiate by ordinary mechanical mistreatment, and that even when sensitized with amines it is still not as sensitive as cast TNT. It would appear that nitromethane is the least sensitive of any of the explosives we would be handling in a scrap disposal operation. I believe that, if deemed desirable, we could devise a scheme which would allow us to introduce nitromethane remotely into the bed of detonators or scrap HE. This might be done with a siphon, operated by a low pressure pump (bicycle pump) from a distance, or by actuating a solenoid valve which would allow nitromethane, in a container suspended above the scrap, to drain into the scrap contained in a can.

I would welcome your comments on the above.

R. L. Spaulding

R. L. Spaulding

RLS/eel

Distribution:

R. W. Drake
Roy Reider
Earl Rutledge
L. C. Smith
A. W. Campbell