

## CHAPTER IV

### RECOMMENDED RESIDUALS MANAGEMENT PLAN FOR PETC

#### 4.0 Introduction

Any recommended waste management plan for the Pittsburgh Energy Technology Center must be capable of attaining the primary objectives of the Center by its implementation. We see the objective for the plan as management of all waste streams generated by the Center's activities in total compliance with statutes and in the safest manner possible with minimum cost. The goals (regulatory compliance, safety and low cost) are not arranged in any order of priority. In order to develop an implementable system, all of the constraints acting on the available choices must be taken into account. Some criteria for measurement of goal achievement is also necessary.

The recommended plan is structured to address the following elements: (a) management resources of the Center covering an administrative structure, communications network, and data requirements; (b) components to be covered in the on-site portion of the management plan; (c) short term measures for handling laboratory waste chemicals and indeterminate waste streams; (d) long term planning for future implementation needed to comply with proposed federal regulations; (e) on-site processing and disposal alternatives; (f) strategies for developing off-site processing and disposal resources; and (g) potential systems which could provide reliability and economy if institutional and political constraints are eased.

Protection of the environment from undesirable impacts (with reasonable costs) is the major objective of the plan. Present practices appear

to attain this objective when processing the laboratory waste chemicals. Present methodology utilizing single disposal contractor consignment of all small waste streams generated at the Center, with subsequent transport of some residuals 800 miles via common carrier for final disposition, engenders (what are now considered) reasonable costs. On-site disposal (in an uncontrolled manner) of the slags, chars and coal dusts have not resulted in any serious environmental impacts (of which we are aware of at the present time). This technique has been acceptable only due to a low assigned priority by responsible enforcement agencies. Both of the above practices will be in jeopardy and most likely will not be acceptable with strict enforcement of federal RCRA regulations.

Storage, transport, processing and disposal of solid waste streams is not the total content of the management plan. An administrative effort must be defined with regard to making the system function properly. Policies, administrative responsibilities, individual capabilities of the relevant personnel are all involved. A clear delineation of authority is essential in the relationships between the Center and headquarters operations (DOE), departments and divisions within the facility and external dealings with federal, state and local environmental enforcement authorities.

#### 4.1 Recommended Management Plan

Major components of the internal portion of the residuals management plan proposed for the Pittsburgh Energy Technology Center are centered on a management organization with clear lines of authority and responsibility, detailed data base and communications network to transfer information to the users, and a central storage unit to provide

physical control of hazardous residues as long as they are at the Center.

A. (1) Management Structure

Figure 4-1 is a conceptualized organization chart designed specifically for management of all waste streams generated at the Center. It is a basic concept that can be modified to fit the circumstances and present operations policy of the Center. A description of the authority and responsibilities of the individual elements in the organizational structure are detailed as follows:

DUTIES AND RESPONSIBILITIES

**DIRECTOR (TECH. CENTER):** In the context of the proposed waste management system, the Director of the Pittsburgh Energy Technology Center must delegate the necessary authority (through the appropriate divisions and levels of management) eventually to the Administrator of the Residuals Management Plan.

**DIVISION DIRECTOR (Environmental and Conservation Division):** Same as above. Main function is to delineate the line of authority coming from the Director of the Technology Center.

**ADMINISTRATOR-Residuals Management:** Note: We envision this position as part time, which may create conflicts in objectives between this individual's major activity and those associated with the residuals management plan. Consequently, the person chosen to be responsible for the plan (this is the key operator who will influence the success or failure of the recommended system) must have minimal or no conflicting job requirements. The Branch Chief for Environmental Monitoring may be the logical choice

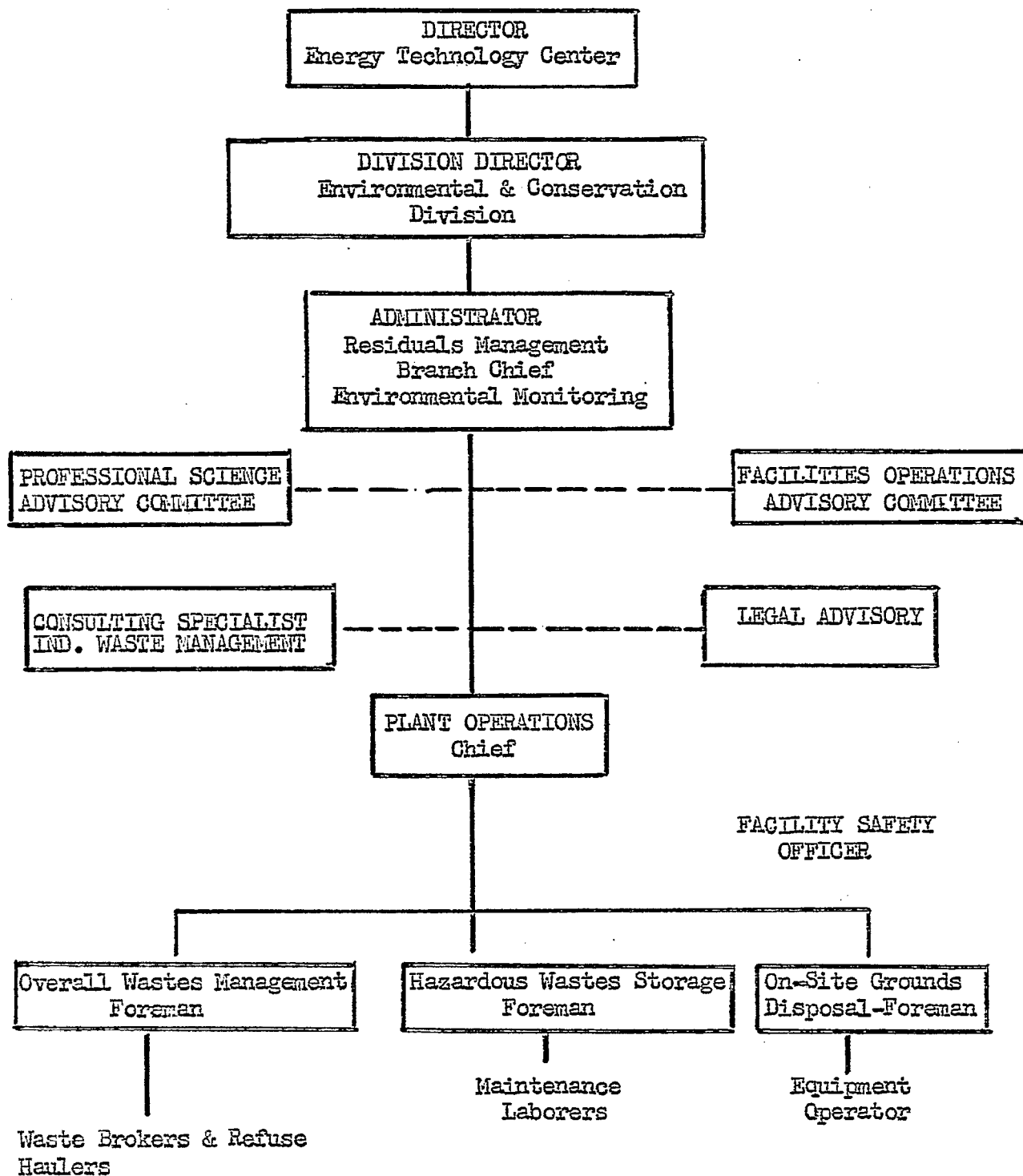


Figure 4-1 Organization Chart for Recommended Residuals Management System

for this position as his present duties have the least inherent conflicts.

Authority:

1. Can ban any toxic chemical (or dictate a substitute) from laboratory or research project use (also outside contractor's chemical usage), with concurrence of the professional science advisory committee.
2. Can ban any toxic chemical (or dictate a substitute) which is used for general household and processing operations. This includes solvents, cleaners, rodenticides, insecticides, etc.
3. Can cancel or alter any contractual arrangements with waste brokers and refuse haulers for good cause (within the legal limitations).
4. Can assign or remove Center personnel from the Residuals Management System for good cause (within union, legal and organizational limitations determined by overall Center policies and procedures).
5. Can determine policies and procedures in the operation of the Residuals Management System with the concurrence of the professional science advisory and facilities operations committees (within budgetary limitations set by the Center Director).

Responsibilities:

- A. Handle all liason with environmental enforcement agencies and OSHA where the Residuals Management System is involved. This refers to all site specific matters.
- B. Serve on the professional scientific advisory and plant operations committees to provide communications in both directions.
- C. Select and evaluate consulting specialists services (and in-house staff) providing support functions to the residuals management organization in a staff capacity.

- D. Supervise the implementation and operation of the Residuals Management System by in-house personnel (especially in the physical operation, design and safety procedures needed for the recommended chemical residues storage facility).
- E. Determine and develop long range goals and alternatives for the management of relatively non-hazardous wastes streams (present and future) originating from the Center's operations.
- F. Act as liason with other Technology Centers for information transfer in residuals management.

The above listing is not intended to be all inclusive.

PROFESSIONAL SCIENCE ADVISORY COMMITTEE (Staff Function):

Authority: None.

Responsibilities:

1. Advise the Administrator of the Residuals Management System on the feasibility of eliminating specific hazardous chemicals and substances from the Center's research activities.
2. Provide input into the detailed chemical waste data sheet system which must perform as the heart of the information system.
3. Furnish advance information on new chemicals and potential chemical residues from laboratory and project operations.
4. Give general scientific support to the Administrator as required.

FACILITY OPERATIONS COMMITTEE (Staff Function):

Authority: None

Responsibilities:

1. Provide advice on feasibility of toxic chemical substitution for general operations.
2. Give overall support to the Administrator with research contractor operations and liason with other Center personnel.
3. Give general operations support for facilities construction and equipment (and manpower) needs.

SPECIAL CONSULTANTS (INDUSTRIAL WASTE MANAGEMENT):

Outside consulting services can be utilized to establish and maintain the detailed chemical residues and indeterminate waste streams data sheets. Initial assistance in implementing the round-trip manifest system recommended can also be provided (this is a minimal task). Outside services should also be obtained in the following aspects: (a) assistance to the Administrator in his relations with the various environmental control and occupational safety enforcement agencies; (b) treatment and disposal concepts and systems specially tailored to the Center's operations. Vendors do provide this service, but in some instances it may not be in the best interests of the Center, it will always be in the vendor's best interests; (c) design and construction of the recommended storage area; and (d) studies relating to on-site processing and disposal alternatives for the indeterminate waste streams, as well as characterization of those residuals.

LEGAL SERVICES: Legal services (either in-house or as part of the general legal services employed by the Center) should be available to the Administrator as required.

The implementation and operations arm (operations and plant services) to actually run the day-to-day affairs of the residuals management organization is not conceived as full-time employment for the individuals involved, but as an adjunct duty of the qualified and trained personnel that are now performing some of the functions described.

## (2) Information Network

The heart of the information network is the individual chemical waste data sheet which is illustrated in Figure 2-1 and 2-2. The purpose of this detailed information is to provide specific identification of the substance, possible health effects, its hazardous nature, safety and first aid procedures and recommended processing and disposal data. It is expected to be of great assistance to the Administrator and operating personnel in case of accidents and to aid in monitoring proper handling and disposal of the residues generated at the Center.

Another document which must be installed as part of the residuals management information system is the round-trip manifest for all wastes that leave the Center. This manifest can be modeled on the form used in California, Illinois, New York, or the sample document published in the proposed RCRA regulations. The routing and procedures for return of the form should be made mandatory on the part of the waste broker. The manifest system will provide the information needed to ascertain compliance with all existing environmental regulations.

It is only a matter of time before Pennsylvania required the manifest operation. Establishment of the manifest for the Center's residues will be in-place and operating for early compliance with the proposed federal regulations. A minimum effort (by the Center) will be needed



to close the loop on information flow. The returned manifest form will be checked off by the overall waste management foreman and be dispatched to central files. Policy and procedures should be set with respect to the length of time and form (microform) the records will be stored. Figure 4-2 depicts the information networks envisioned for the Residuals Management Plan.

#### B. Immediate On-Site Recommendations

Immediate implementation of the recommended residuals management system is initiated by establishing (or erection) an on-site storage area for the laboratory waste chemicals and household wastes with hazardous characteristics. Also, very detailed procedures must be developed to insure safe and systematic operation of the storage area. Space requirements should be determined and the storage operation installed.

##### (1) Storage Area Requirements:

As detailed in Section 2.2B of this report, a central storage facility should be established with the attributes listed on page 62 and 64. This may take the form of already existing storage space in one of the Center's buildings, but preferably it should be a small separate building located some distance from the main personnel concentrations. Detailed layouts should be conceived for proper temporary storage of the hazardous residues.

##### (2) Management Procedures

Detailed step-by-step procedures should be developed to detail the movement of all chemicals and household wastes to the above storage area. Authority and responsibility should be delegated as required and assigned

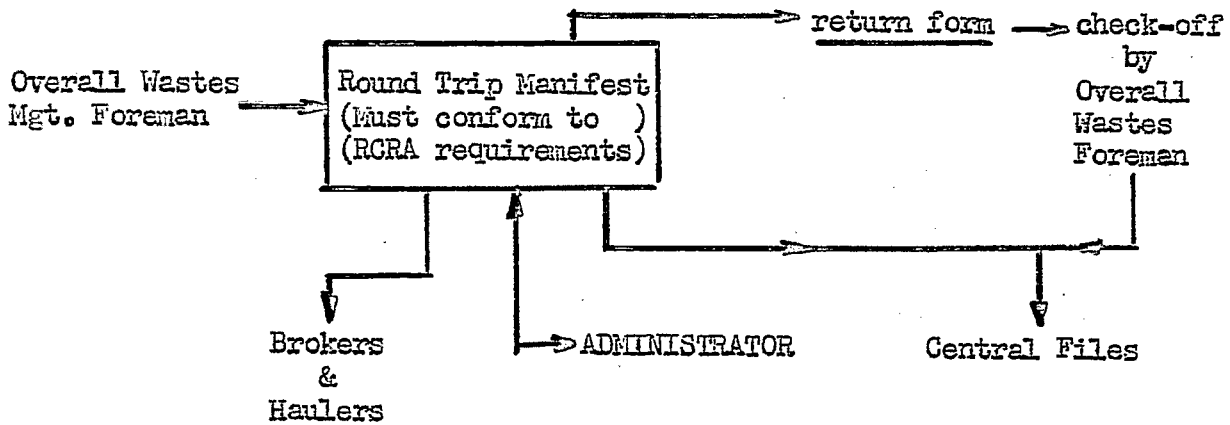
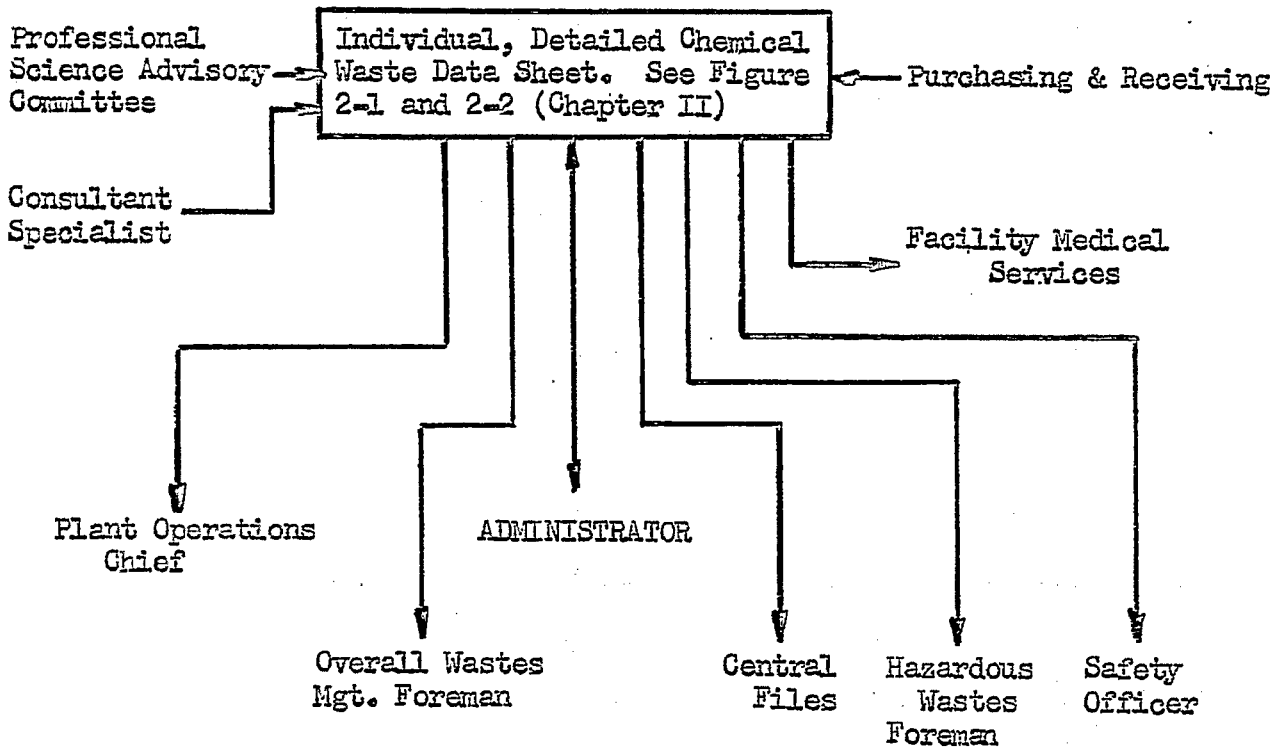


Figure 4-2 Information System Flow Network

to insure close supervision of this element of the Residuals Management Plan.

### C. Short Term Management Recommendations

For the intermediate time (present to passage and enforcement of RCRA regulations), the following recommendations are offered for the management of laboratory waste chemicals and the indeterminate wastes:

- (1) The present set-up for consignment and handling of laboratory waste chemicals by an outside waste broker who certifies the disposal of the materials in a legally permitted facility is the best available choice. Due to the small volumes and relatively small total costs to maintain this option, the transport of the residuals to very distant locations is economically feasible. Continued use of Ecology Chemical and Recycling Co. (as long as their prices are competitive and they can provide certification) is recommended.
- (2) A manifest system complying with all of the new federally proposed regulations should be installed as soon as possible.
- (3) A study should be conducted of potential for resource recovery in the form of heat from the flammable residues. The pricing mechanism (with respect to consignment and off-site handling) should be included in the study. It may be feasible to install a bulk storage unit (tank), aggregate the flammable liquids, and enter into agreements with a waste oil recycling company for the sale of this liquid waste. This aspect must be within the institutional and policy constraints imposed by the Center's management.
- (4) Indeterminate waste streams should be characterized in the context

of proposed federal regulations. Based on the findings, a management plan must be developed for this residual category. Present alternatives to be considered include: (a) on-site disposal in accordance with acceptable present day methodology without going through a permitting procedure (with PennDER), but with their assistance; (b) if the volumes are not excessive (with concomitant high costs of off-site processing) and the physical nature of the residuals permit easy storage and transport, develop a mechanism for transport to a nearby disposal site. Municipal and Industrial Disposal operations in West Elizabeth appear to have the greatest feasibility if the details can be negotiated.

#### D. Management Plan Recommendations - Long Term

Some long term elements of the recommended management plan (after implementation of RCRA regulations) must be considered. Greatest impact of the regulations will be felt by the disposal component of management of the residuals from the Energy Technology Centers.

(1) Establish the waste category to be assigned in accordance with the final form of the RCRA regulations. This is especially critical in the case of the mixed wastes that may not end up in the "hazardous" category. The recommendation should be documented during the installation phase of the detailed chemical waste data sheets.

(2) Determine the feasibility of establishing an on-site disposal operation that will comply with RCRA regulations. This installation can be designed to process the residuals from two or more Energy Technology Centers. A joint venture with the Morgantown Center (with the disposal site at Bruceton) may be desirable because: (a) it will insure the

least disturbance or constraints on the Centers' primary research goals; (b) share the costs of the operation; (c) avoid delays in mounting new research efforts due to lack of disposal options for expected residuals from that research; and (d) Bruceton possesses some very important attributes - remote location and available land - which will minimize social and political constraints. This recommendation is especially relevant to the large indeterminate waste streams.

(3) Determine the conditions which would make an on-site liquid or solid/liquid waste incinerator feasible. The unit can be installed in two or three phases. First, a liquid waste incinerator without the air pollution control auxiliaries (scrubber or baghouse) could be erected. This unit would be limited to processing the hydrocarbon liquids, toluene and solvents (acetone) that make up the major portion of liquid residuals generated at the Center. Some of the solid flammable materials could be dissolved (this must be determined) and processed as liquid residues. Potential for heat recovery should be assessed. Feasibility of later addition of air pollution control devices (if necessary) to expand the spectrum of residuals that can be processed should be analyzed. Joint venture arrangements with Morgantown and other Technology Centers should be explored. There will be very strong incentives to implement this recommendation at some future date. They include: (a) easier compliance with RCRA regulations and the EPA avowed goal of encouraging incineration as a disposal alternative; (b) removal of impediments in fulfilling the primary mission of the Energy Technology Center; (c) reduction in costs with increase in utilization of the incinerator, (d) use of existing technology thereby avoiding risk of failure of the chosen system if it is not a proven technology.

(4) Development of an acceptable land disposal methodology by installing an on-site experimental disposal area which possesses the necessary hydro-geological and physical design features for compliance with RCRA rules. The size (or capacity) of the experimental land operation can be adjusted for joint venture opportunities mentioned above, or for PETC use only. Residuals to be processed will cover the entire range of residuals generated at the Center.

(5) Encapsulation, solidification (and stabilization of project waste streams) and pre-processing of some residues should be explored and assessed to derive a least cost solution to residuals management.

#### 4.2 Summary of the Plan

A. Establish a management organization at the Energy Technology Center which can be designed to administer the whole spectrum (size, volume, and class of residual) of wastes generated at the present time (under present regulatory conditions) and in the future (with new federal statutes).

B. Develop and create an information (and data) network which includes a detailed waste chemical characteristic data sheet for use by operations, management, safety and disposal personnel. A round-trip manifest system should be installed as soon as possible.

C. Install a hazardous waste chemicals holding area at the Center for close supervision and safe storage of the residuals prior to consignment and transport off the facility.

D. Continue the present methodology (waste broker consignment) for management of residuals generated at the Center, at least for the short term.

Establish requirements for a reliable system to comply with expected federal regulations.

E. Check the feasibility of acquiring and utilizing a liquid waste incinerator (on-site) to process the flammable liquid residuals produced at the Center.

F. Assess the economic and institutional feasibility of a joint venture with other Technology Centers for processing residuals from both installations at the Pittsburgh Energy Technology Center.

G. Determine the viability of constructing an experimental land disposal operation at PETC to handle all residuals in accordance with the federal statutes.

H. Explore the feasibility of off-site disposal of the wide spectrum of residuals by land disposal techniques.