

# Exhibit I

SECTION II

Exhibit "A"  
General Plan of Operation

SPOKANE REGIONAL  
WASTE TO ENERGY FACILITY

SOLID WASTE DISPOSAL SITE PERMIT

EXHIBIT "A"  
GENERAL PLAN OF OPERATION

August, 1987

Prepared by:  
Century West Engineering Corporation  
East 429 Third Avenue  
Spokane, Washington 99202

Funded in part by a grant from the Washington Department of Ecology under  
Referendum 39.

## PREFACE

This General Plan of Operation is being submitted as a part of the Solid Waste Disposal Site Permit. It is being developed, along with other requirements of the permit, before the Waste to Energy Facility's final design is completed. The Solid Waste Disposal Site Permit is renewed yearly and this General Plan of Operation will be subsequently updated to reflect any changes in procedures prior to the start of plant operations.

Other regulations, which may affect plant operations and permit requirements, are under development. Subsequent permit applications/renewals will reflect those new laws when they become effective.

## TABLE OF CONTENTS

PAGE

Preface.....	i
Table of Contents.....	ii
List of Figures.....	iv
<b>PART 1</b>	<b>CONSTRUCTION</b>
1.1	Site Layout.....1-1
1.2	Site Preparation.....1-1
1.3	Road Construction.....1-1
1.4	Surface Water Management.....1-2
1.5	Revegetation Procedures.....1-2
1.6	Security Fence.....1-2
<b>PART 2</b>	<b>OPERATION</b>
2.1	Designation of Unloading Areas.....2-1
2.2	Handling of Solid Waste.....2-1
2.2.1	Hazardous/Dangerous Waste Inspection Procedure.....2-1
2.2.2	Radioactive Waste Monitoring.....2-2
2.3	Alternative Storage Plan.....2-2
2.4	Disposal of Ash and Solid Waste.....2-2
2.5	Traffic Control.....2-2
2.6	Noise Control.....2-2
2.7	Litter Control.....2-3
2.8	Dust and Odor Control.....2-3
2.9	Vector Control.....2-4
2.10	Facility Staffing.....2-4
<b>PART 3</b>	<b>MAINTENANCE</b>
3.1	Maintenance of Equipment.....3-1
3.2	Cleaning of Storage Areas.....3-1
3.4	Erosion Control.....3-1
<b>PART 4</b>	<b>SAFETY/EMERGENCY ACTIONS</b>
4.1	Fire/Explosions.....4-1
4.2	Leaks/Spills of Nonregulated Dangerous Wastes.....4-1
4.3	Groundwater Contamination.....4-2
4.4	Air or Miscellaneous Releases.....4-3
4.5	Safety Plan for Liquid Containment.....4-3
4.6	Safety Manual.....4-4
<b>PART 5</b>	<b>RECORD SYSTEMS</b>
5.1	Inspection and Monitoring.....5-1
5.2	Inspection Schedule and Logging.....5-1
5.2.1	Boiler Maintenance.....5-1
5.2.2	Short-Term Maintenance.....5-2
5.2.3	Annual Turnaround.....5-2

## TABLE OF CONTENTS

	<u>PAGE</u>
5.2.4 Equipment Maintenance.....	5-3
5.2.4.1 Maintenance of Fans.....	5-3
5.2.4.2 Maintenance of Chimney.....	5-3
5.2.4.3 Pollution Control Equipment Maintenance.....	5-3
5.2.4.4 Maintenance of Boiler Feedwater Treatment System.....	5-3
5.2.5 General Repairs.....	5-3
5.3 Record Keeping.....	5-4
5.4 Compliance Inspections.....	5-4
<b>PART 6 CLOSURE PLAN</b>	
6.1 Estimate of Closure Year and Cost.....	6-1
6.2 Methods of Closure.....	6-1
6.3 Closure Timing and Notification Procedures.....	6-1
6.4 Final Inspection by Regulatory Agencies.....	6-1
 Appendix A	
Corporate Manual on Health Safety, Environmental Protection, and Loss Control for Operating Facilities	
 Appendix B	
Chemical Compounds	
 Appendix C	
Work Orders	

## LIST OF FIGURES

### Figure No.

- |   |                                       |
|---|---------------------------------------|
| 1 | Plot Plan                             |
| 2 | Receiving Floor Plan                  |
| 3 | Changing Floor Plan                   |
| 4 | Ground Floor Plan                     |
| 5 | Flue Gas Cleaning System Flow Diagram |

## PART 1. CONSTRUCTION

### 1.1 Site Layout

Figure 1, Plot Plan, shows the basic layout of the Facility. The plan shows that the Facility, including roadways, employee parking area, and cooling tower structure, will only require approximately 30 acres of the 75 acre site. The minimum use of site area by the Facility permits sufficient development of buffer areas around the Facility.

Access to the Facility is provided by a single entrance roadway. Traffic enters the site and travels to the scales prior to entering the reception area. Once the vehicles have been weighed, they proceed via a raised roadway section into the reception area and unload.

After unloading, the vehicles exit the building and proceed down a ramp and exit from the site. When a vehicle requires that a tare weight be taken, it travels through the scale after unloading and is weighed once again. Then the vehicle exits the Facility site.

As shown on Figure 1, and further represented in Figures 2, 3, and 4, floor plans of the Facility, a number of process elements are contained in a unified building structure. The refuse reception area, storage pit, water treatment, turbine and generator, switch gear, boilers, and air pollution control equipment are all linked architecturally in one basic structure. Only the cooling tower, administration offices, and ash handling and truck loading are separate structures. This aspect of the design not only enhances the appearance of the Facility, but also the Facility's daily operations by permitting access to critical equipment within one building.

### 1.2 Site Preparation

On-site materials will be utilized for embankments and for structural backfill under buildings and roadways where material is suitable. Off-site materials will be imported as required.

Embankment material will be compacted to a density of 95 percent of maximum density at optimum moisture content as determined by ASTM D1557. In areas that are to receive pavement or building slabs, the top 12 inches will be compacted to at least 98 percent of maximum density.

All site grading will be accomplished so as to ensure positive surface drainage at all times. During grading operations, temporary control measures will be used as necessary to control erosion and/or sediments. Diversion structures, silt fences, sediment barriers and/or temporary grassing will be installed, if required, as a means of control.

### 1.3 Road Construction

Roadways will be provided for ingress and egress of refuse trucks, ash disposal trucks, the general public, and plant employees. Primary roads will be 24 feet



wide and one-way roads will be 15 feet wide. Shoulder width will be 4 feet in both cases.

All roads and parking areas will be constructed of a crushed aggregate base course and bituminous concrete binder and surface course.

Subbase, base course and surface course thickness will be determined by anticipated traffic requirements, from test data from appropriate soil borings and from recommendations from the Soils Geotechnical Engineer.

#### 1.4 Surface Water Management

All process areas are under roof; therefore, stormwater run-off from the plant site is uncontaminated and does not require treatment. Stormwater run-off will be collected and disposed of in accordance with Spokane County Stormwater Management Guidelines.

Stormwater run-off will be collected by a system of open ditches where possible. Culverts will be utilized under roadways or other obstructions. The storm drainage system will be designed on the basis of the run-off of a ten year storm of one-hour duration. The stormwater will be routed to an on-site storage pond (existing quarry area) for disposition by evaporation and infiltration.

Where culverts are required, reinforced concrete or bituminous coated corrugated metal pipe will be used. Yard areas will be graded to provide positive drainage.

#### 1.5 Revegetation Procedures

All disturbed areas, with the exception of building sites and paved areas, will receive a minimum of 4 inches of topsoil and will be seeded to reduce erosion.

Additional vegetation will be added to the site as buffers along the east and southern property boundaries. This vegetation will be indigenous materials to reduce maintenance and improve site aesthetics to match the surrounding area.

#### 16. Security Fence

An eight (8) foot high galvanized chain link fence, topped with barbed wire, will be constructed to encompass the plant boundary area. An electrically operated slide type chain link gate will be provided at point of entry into the plant site. Chain link fences, with gates, will also be provided for the electrical substation and the switchyard.

## PART 2. OPERATION

### 2.1 Designation of Unloading Areas

Two independent refuse receiving areas are provided (see Figure 2). One area is used primarily by self-unloading trucks. The other area is used primarily for hand unloading. Scales are located so that both types of incoming refuse may be weighed.

Refuse will be delivered directly to the storage pit by the self-unloading trucks. The delivery trucks will cross one of the platform scales. After leaving the scale, the trucks will proceed to the reception floor and tipping area. Refuse will be discharged from self-loading trucks into the refuse storage pit. From the dumping area, the trucks will return down the ramp to grade level.

A separate receiving area is provided in order to keep self-unloading vehicles separate from the pick-up trucks and automobiles expected in the manual unloading area. Refuse will be pushed from the manual receiving pit to the storage pit by the Facility's front-end loader. A ramp is provided from the outside grade to the bottom of the manual receiving pit for front-end loader access. An emergency load-out chute is located at one end of the refuse storage pit to allow transfer trailer loading in the event that refuse must be bypassed to the landfill.

### 2.2 Handling of Solid Waste

Refuse haulers will enter the site and proceed to the weigh scales. Once weighed they will travel to the reception area where they will discharge the refuse into the refuse receiving pit or refuse storage pit. After this is completed they proceed back to the scales (if necessary), thereby establishing tonnage delivered, then exit the site.

#### 2.2.1 Hazardous/Dangerous Waste Inspection Procedures

During the unloading procedure, the random screening for dangerous waste will take place. The standard procedure is:

1. Truck designated for inspection will be directed to a designated area of the receiving area.
2. The load will be discharged on to the pavement.
3. The Operations Manager and Shift Supervisor will visually inspect the contents for unacceptable waste.
4. If questionable waste is found, the Operations Manager will notify the appropriate agencies and assist them in any way in attempting to discover point of origin.
5. Operations Manager will document all findings and report to the Plant Manager.

Upon initial operation of the Facility, staff shall conduct very thorough observations of refuse deliveries via random

pavement discharges in order to gain knowledge of what trucks are carrying what type of refuse. Once we are confident which hauler would be the most likely candidate to deliver unwanted wastes, we would concentrate most of our future random sampling efforts on these haulers. If a hauler continues to deliver unwanted wastes after being warned, they would be barred from using the facility.

### **2.2.2 Radioactive Waste Monitoring**

In a completely separate procedure there will be a constant monitoring for radioactive waste. Each of the incoming weigh scales will be monitored by a radioactive material detector, and if any is ever found, the truck and driver will be detained until the appropriate agency can be contacted. Upon their arrival we will assist them in any way to determine the origin of the radioactive waste and assist in the removal of the material from the site.

### **2.3 Alternative Storage Plan**

Self-unloading trucks will normally unload directly into the refuse storage pit. Hand unloading vehicles will discharge into the receiving pit. Refuse will be pushed from the refuse storage pit to the storage pit by the Facility's front-end loader. A refuse loadout hopper is provided in one end of the refuse storage pit to allow loading refuse trailers in the event of a Facility shut-down.

Storage is provided for approximately four days of Municipal Solid Waste throughput at 1,200 tons per day. This will be adequate to ensure continuous operation of the facility and acceptance of refuse with minimal use of backup landfill during facility outages. If for some reason the facility was unable to process the required tonnage, or the additional storage pit was full, then the excess municipal solid waste would have to be landfilled.

### **2.4 Disposal of Ash and Solid Waste**

Fly ash, boiler bottom ash, and other processed solid wastes will be disposed of in a monofill cell of a lined landfill.

### **2.5 Traffic Control**

All vehicles will enter the Facility site from Geiger Boulevard (see Figure 1). The site layout provides space for vehicles to queue along site roadways and onto Park Drive during peak delivery periods. All vehicles will be weighed at the entry scales prior to discharging their loads into the refuse storage pit or receiving pit. Tare weights of the empty vehicles, both public and private, will be recorded as the vehicles exit the facility.

### **2.6 Noise Control**

The primary noise sources for a combustion facility are the waste-delivery and combustion-byproduct trucks. Other primary noise

sources are the induced draft (ID) fans, ID fan housing, ID fan motors, and the cooling towers. It is not expected that any of this equipment would contribute, alone or in combination, to noise levels in excess of applicable noise standards.

Construction noise impacts would be minimized by using mitigation measures described in the U.S. Environmental Protection Agency Region X noise guidelines (USEPA Region X, 1975). Some of these measures include the use of electrically-powered equipment rather than pneumatic, ensuring that all vehicle mufflers are in good working order, avoid prolonged idling of pumps and compressors, and utilizing portable barriers for shielding specific equipment items.

Several mitigation strategies will be incorporated in the design of the proposed waste to energy facility to further reduce noise impacts. The cooling towers will be located to take optimum advantage of site attenuation, and fans will be silenced to a practicable extent. Design of the facility will minimize the need for packer trucks to queue for excessive periods. Acoustic material will be applied to stationary equipment which might produce noise such as ID, induced draft, fans, fan motors, etc. In addition, reduction of cooling tower noise at night may be implemented. This could involve a slower cooling tower fan speed used at night, or a reduction in the number of fans used. Additional noise control techniques which may be included in the facility design are:

- o Silencers on all steam and air vents
- o Air intake filter/mufflers for compressors
- o Wrap stack breechings and induced draft fans
- o Locate all steam system equipment with buildings

Earthen berms will also be placed where needed to minimize noise dispersed at ground level. Consideration of noise impact would be given at all stages of facility design to assure negligible noise impact with respect to existing ambient noise levels and Washington State noise regulations.

## 2.7 Litter Control

Personnel stationed in the receiving, residue removal and scale areas will be responsible for removing all litter and debris that falls from the incoming and outgoing vehicles. Appropriately placed speed bumps and roadway design will slow traffic and decrease the amount of site litter. Facility personnel will also have use of motorized yard or aisle sweepers to keep all Facility roads clear of litter and dirt.

## 2.8 Dust and Odor Control

Dust and odors will be minimized by drawing primary combustion air from the tipping floor and storage pit area, creating a slightly negative draft in these areas and preventing the escape of dust and odors outside the Facility. Air from this area, including any odor that may be present, will be ducted to the boiler and used as combustion air. The odors will be destroyed by incineration in the furnace.



Bottom ash from the boiler will be handled in a moist condition eliminating a potential fugitive dust problem. Fly ash will be transported in closed conveyors to the ash conditioners where it will be wetted and added to the boiler bottom ash. The boiler bottom ash is conveyed to a "grizzly scalper", which is a coarse vibrating screen. The damp ash falls through the grizzly scalper onto a conveyor where a magnet removes ferrous metal. The non-magnetic ash can be loaded directly into a truck, or placed in storage by the front-end loader. The larger objects, usually metallic, that go over the grizzly scalper are stored in the ash building with the ferrous metal. A manual wetdown system is provided to dampen the metal and ash prior to loadout.

## 2.9 Vector Control

The Facility will contract out with a local exterminator to provide pest control. This system has worked well at other facilities as the exterminator will make scheduled inspections and correct any problems. Another control is that the refuse is being stored in the pit and the lowering of the refuse level in the pit every week (ie: Monday a.m. after the weekend).

## 2.10 Facility Staffing

The Facility will be operated by approximately 37 employees. The employees can be categorized according to three major functional groups: 4 administrative personnel, 24 operating personnel, and 9 maintenance personnel. The following table shows an organizational chart of the facility staffing:

### PLANT STAFFING

#### Administration

*General Manager/Operations Manager	1
*Controller	1
Bookkeeper/Records Clerk	1
Secretary/Receptionist	1
SUBTOTAL	<u>4</u>

#### General Operations

*Operations Supervisor	1
Purchasing Agent	1
Laborers	4
SUBTOTAL	<u>6</u>

#### Shift Operations

#Lead Plant Operators	4
Assistant Plant Operators	4
Furnace Feeders	4
Utility Operators	6
SUBTOTAL	<u>18</u>

Maintenance

*Superintendent	1
Maintenance Personnel	8
SUBTOTAL	9
TOTAL PLANT PERSONNEL	37

\*Indicates Operating Plant Management  
#Performs Shift Supervisor Function

The Facility will be operated 365 days per year, 24 hours per day. Continuous operations will be maintained by establishing four working teams of personnel. On any one day there will be three working shifts, so that over the course of a year each team will work 13 weeks at 6 days per week and 39 weeks at 5 days per week.

New employees will be trained at other Signal waste to energy facilities prior to completion of construction. Some positions will be filled by transferring experienced operators from other Signal facilities on a full-time basis.

## PART 3. MAINTENANCE

### 3.1 Maintenance of Equipment

The comprehensive program of preventive maintenance which has significantly improved plant reliability in our other projects, will be used in this project. A key to its success has been the development of an annual maintenance plan and the implementation of an inspection/repair program that conforms to the annual plan.

The annual maintenance plan is developed at the beginning of the operating year. The overall objective of the plan is to bring boilers down when waste flow is at a minimum. Thus, over the duration of a year, the cumulative effect of downtime should be minimized, allowing continual disposal of all contract waste.

The keys to a successfully managed plant are preventative maintenance and the inspection repair programs. During the course of the day, the operating personnel observe all unit operations in the plant and complete a daily report to summarize plant problems. The repairs report is submitted to the maintenance department for its review. The maintenance department daily reviews each problem area to determine if the repair falls into one of three categories:

- o Repair is minor and can be made without affecting plant performance;
- o Repair is substantial and can be made without affecting plant performance, and
- o Repair is substantial but cannot be made without affecting plant performance.

After this determination the formalized repair scheduled is updated and prioritized.

Further detailed information is found in Part 5.2 Inspection Schedule and Logging.

### 3.2 Cleaning of Storage Area

Refuse is stored in a pit. This pit will be used for short-term storage before the refuse is fed to the boiler. Any wash down coming off the tipping floor flows to the pit and is absorbed by the refuse.

Cleanup in the boiler and air pollution control buildings are hosed down on a predetermined schedule with all wash water being routed to cleanup sump. From this sump the water is then reused in the plant's process.

### 3.3 Erosion Control

As previously identified in Part 1.5 Revegetation Procedures, all areas of the site disturbed by plant construction will be seeded to reduce

erosion. Irrigation of the seeded areas will be continually required to ensure establishment of the seed and longevity of the ground cover. Maintaining the ground cover in a good condition will prevent any wind and water erosion.



## PART 4. SAFETY/EMERGENCY ACTIONS

Part 4 Safety/Emergency Actions is a condensed version of the Corporate Manual on Health Safety, Environmental Protection, and Loss Control for Operating Facilities, Signal Environmental Services, Inc. The entire copy of this manual is included in Appendix A.

### 4.1 Fire/Explosions

Fire fighting at the Spokane Facility shall conform to the following requirements.

All employees shall be trained in the use of fire extinguishers and Class II (1-1/2") standpipe and hose systems. Training shall be conducted at least once a year by the local fire department or other qualified organization.

Upon discovery of a fire, the local fire department shall be summoned immediately. While the fire is in its initial or beginning stage, employees shall respond, as directed, to fight the fire using extinguishers, Class II standpipe, and hose systems. If the fire cannot be controlled by this equipment, or if fighting the fire requires protective clothing or breathing apparatus, all employees shall evacuate the Facility. If the employees succeed in extinguishing the fire before the arrival of the fire department, the fire department shall be contacted so that it may recall its equipment.

For internal structural fires, the local fire department shall be summoned and all employees shall immediately evacuate the Facility.

The Facility shall develop a fire response plan listing general procedures in the event of a fire and also identifying specific individuals and their responsibilities. Copies of the plan shall be posted at conspicuous locations throughout the facility.

Similar contingency plans will be used for explosions.

### 4.2 Leaks/Spills of Nonregulated Dangerous Wastes

It will be mandatory for all Spokane plant employees to complete a hazardous/dangerous waste program that will teach them what to look for and familiarize them with emergency procedures and equipment for handling hazardous/dangerous waste, if the need should arise. The following is some of the information that will be included in the operation training sessions:

1. Information and Training Sessions.
  - a. The requirements of OSHA or state standards.
  - b. All operations in the employee's work area involving hazardous/dangerous chemicals.

- c. All hazardous chemicals present in the employees' work area.
- d. The location and availability of hazardous/dangerous materials list, operating procedures and material safety data sheets.
- e. Methods and observations that may be used to detect the presence of release of a hazardous/dangerous chemical in the work area.
- f. The physical and health hazards of the chemical in the work area.
- g. The measures employees should take to protect themselves from the physical and health hazards.
- h. An explanation of warning labels and material safety data sheets systems and requirements.
- i. How hazard information can be obtained and should be used.

2. Documentation of Training.

- a. Information and training sessions shall be documented and the compliance managers shall maintain a file of all records.
- b. Information and training certificates shall be completed for each participating employee and the compliance manager shall maintain a file of all completed certificates.
- c. Written hazard communication program required by OSHA or state standards.

There will be a designated area on the receiving floor to store any hazardous/dangerous materials that might be accidentally delivered to the Facility. Once safely stored, the City will be immediately contacted upon the disposition of said waste. Storage time and handling will be kept at an absolute minimum.

4.3 Groundwater Contamination

We do not expect to have a groundwater contamination problem because all water collected from the boilers, spray dryers, and fabric filters will be collected and flow to the contact water sump and reused as process water. All major areas of the Facility (e.g., reception, refuse boiler, air pollution control, ash handling) are enclosed, so no contaminants from these areas should be introduced into any area of stormwater run-off.

Also, no contaminants from leakage of the refuse pit shall occur because its design and operation; it should also be noted that the storage pit floor will be approximately 4'-0" thick and the walls approximately 2'-0" thick. A vapor barrier would be installed prior to installation of the pit floor, and the refuse pit walls would be waterproofed at all elevations below finished grade.

Also the refuse has a capability to absorb water. Any free water that may be introduced into the pit would be quickly absorbed, and thus the residence time for potential leaks will be short.

#### 4.4 Air or Miscellaneous Releases

The Waste to Energy Facility is designed to control all discharges and emissions that might occur when operating. As described in Section 4.3, there will be no contamination of soil or groundwater because only surface water to leave site is storm run-off. The only normal process water that shall leave the site in the sewer system will be from the Facility sanitary system. Under upset conditions, small amounts of clean water from the cooling tower blowdown will also be discharged into the sewer system.

As far as airborne emissions leaving the Facility, there are two contributors, flue gas leaving the stack and fugitive dust. Fugitive dust is controlled by all process equipment being housed in buildings not allowing it outside and using the sweeper to contain dust on the roads and the tipping floors.

Control of emissions leaving the stack are accomplished by spray dryer/absorber and fabric filter (see Figure 5). Each spray dryer/absorber will be a steel vessel 20 feet in diameter by 84 feet high from the gas inlet at the top to dust outlet at the bottom. Lime slurry will be sprayed into the hot flue gas through multiple two-fluid nozzles using compressed air for atomization. Each fabric filter will be the shake-deflate type with two rows of filtering compartments, each row containing 3 compartments (6 compartments per boiler). Filter bags will be constructed of fiberglass fabric treated with acid resistant finish. The fabric filter hoppers will be heated over their bottom one-third and will be provided with:

- o Hopper door with key interlock
- o Hopper ash level probe
- o Vibrator/Thumper
- o Insulation

Fly ash rapped from each field will fall into a trough type hopper serving that field for removal via screw conveyors and double dump valves.

#### 4.5 Safety Plan for Liquid Containment

The hazardous/dangerous chemicals that will be kept on-site are to be stored in one designated area that has the proper safety measures built-in. Bulk chemicals such as sulfuric acid and sodium hydroxide used for water treatment are stored in tanks that are located inside containment walls to contain any spills.

If there is a spill inside the facility, it can be swept or washed into the cleanup sump. From there it will be pumped to a truck for disposal.

Appendix B, Chemical Compounds, shows a list of chemicals that might be found on the site during construction and operations. Also, in the same Appendix is a typical Materials Data Sheet that will be completed for each chemical and our Standard Hazard Communication Program.

#### 4.6 Safety Manual

The Facility will have a comprehensive safety program with the objective of providing a safe and healthful place of employment for the plant's employees.

A safety manual has been developed, and enclosed as Appendix A, incorporating experience gained at other Signal facilities. This document includes a comprehensive discussion of such matters as first aid, personnel protection, safety record requirements, fire protection and prevention, laboratory safety, chemical and gas precautions, and special safety procedures.

## PART 5. RECORD SYSTEMS

### 5.1 Inspection and Monitoring

Since this is a City owned facility they will have access to it at any time. A formal inspection will be performed by the City and/or its consultant a minimum of one (1) time per year. At this time each piece of equipment will be reviewed and a written report with any recommendations will be made.

### 5.2 Inspection Schedule and Logging

The comprehensive program of preventative maintenance which has significantly improved plant reliability in our other projects will be used in this project. A key to its success has been the development of an annual maintenance plan and the implementation of an inspection/repair program that conforms to the annual plan. See Appendix B, Work Orders, for an example of daily maintenance/repair orders.

The annual maintenance plan is developed at the beginning of the operating year. The overall objective of the plan is to bring boilers down when waste flow is at a minimum. Thus, over the duration of years, the cumulative effect of down time should be minimized, allowing continual disposal of all contract waste.

The keys to a successful management plan are preventative maintenance and the inspection repair programs. During the course of a day, the operating personnel observe all unit operations in the plant and complete a daily report to summarize plant problems. The repairs report is submitted to the maintenance department for its review. The maintenance department reviews each problem area to determine if the repair falls into one of three categories:

- o Repair is minor and can be made without affecting plant performance;
- o Repair is substantial and can be made without affecting plant performance, and
- o Repair is substantial and cannot be made without affecting plant performance.

#### 5.2.1 Boiler Maintenance

Proper boiler shutdown is a critical process that requires operations skills and experience. A boiler shutdown checklist is used to assure that proper procedures are followed. Once the boiler has cooled to the required temperature, an inspection team consisting of the maintenance superintendent, shift supervisor and plant engineer enter the boiler. Upon entry, they complete an inspection report for each major component of the boiler system. Similar reports are completed for the boiler tubes, ash handling, conveyors, superheater rappers, emission control equipment, residue, feed water system



and other operating subsystems. The repair requirements noted by the inspection team are summarized and added to the original list of repairs that were to be completed by the maintenance staff.

Once all of the required repairs are completed, the operations staff completes a 65-step boiler prestart-up checklist to check grates and hydraulics, furnace, boiler, emission control equipment, conveyors, rapers, ash system, fans, motors and airlocks. When this checklist is completed, the operating staff prepares for the critical startup process. The startup process, like the shutdown process, must be performed in a specified sequence of actions.

Under the first condition, the maintenance staff will complete the repair immediately. The second condition requires that the maintenance department complete a work order (W.O.) describing the extent of the required repair and the resources required to complete the repair. Once a week the operations manager and staff meet to discuss the nature of the required repair. During these weekly meetings, the management group also decides on priorities for the various repairs. The third condition of repair is unique because it requires a boiler to be shutdown.

Other repairs included on the shutdown list are completed during the scheduled shutdown period.

### **5.2.2 Short-Term Maintenance**

Each boiler is scheduled for periodic maintenance during the year ranging from 2 to 4 days. These short-term maintenance periods are scheduled for Friday through Monday. These periods usually represent times when waste delivery and energy demand are lowest.

During each period, the maintenance crews will perform functions such as grate cleaning, crane maintenance, adjusting the feed system, making minor refractory repairs, repairing auxiliary equipment, checking instrumentation and other minor work on the various systems.

### **5.2.3 Annual Turnaround**

Once a year each boiler is scheduled for an intensive one-to-two week servicing. Scheduled outages are planned when waste processing requirements are at a minimum. During these periods, the maintenance staff performs complex repairs and replacements. Examples of these repairs include complete boiler inspection, grate realignment, grate castings rotations, replacement of fan bearings, cleaning of motors, overhaul of faulty equipment and crane repairs.

Plant availability requires a coordinated interface between

operations, maintenance and plant management. This coordination has been developed over an 11 year period at our various facilities.

#### **5.2.4 Equipment Maintenance**

The following sections provide an overview of the maintenance plan for all major components of the Facility.

##### **5.2.4.1 Maintenance of Fans**

Fans are expected to last the life of the project with normal or manufacturer's recommended maintenance programs. Normal maintenance on a fan would include an annual inspection with a semi-annual bearing inspection. Bearing life on a fan normally is 4 to 5 years. The rotor itself would be expected to last 10 years. The fan motors are cleaned annually then rebaked and painted on a 5 year basis. Normal life of these motors should be 20 years.

##### **5.2.4.2 Maintenance of Chimney**

The chimney for the Facility has a life expectancy of approximately 50 years. There should be no need for maintenance to the chimney other than periodic inspections and painting as required.

##### **5.2.4.3 Pollution Control Equipment Maintenance**

The pollution control equipment will require annual shutdown maintenance for inspection and repair and will be carefully scheduled for such with other required maintenance items. Each scrubber will require monthly cleaning for proper operation.

##### **5.2.4.4 Maintenance of Boilers Feed Water Treatment System**

The boiler feed water treatment system uses potable water which is demineralized to form boiler feed water. Very little maintenance is required to the system other than that due to 5 year life expectancy of the resin exchange material and periodic annual inspection of the chemical feed system that generates the resin.

#### **5.2.5 General Repairs**

Repair of the equipment will be made when the problems are first discovered and repair costs are small. Uncorrected can problems create major problems and major expenses for the facility. Each piece of equipment selected from the manufacturer has a manufacturer's standard recommendation for inspection and repair routine. Our maintenance philosophy is simple:

- o Protect the warranties set forth by the manufacturer, and;
- o Insure that availability of the Facility to fulfill contract obligations.

As a record keeping system, Signal uses the ELKE system which is a computerized data base which keeps track of spare parts and maintenance on each piece of equipment in the Facility. See Appendix B, Work Orders, for an example of this system's printouts.

Operation log will be kept on an hourly basis that shows present operating parameters of each boiler train plus the turbine generator.

### 5.3 Record Keeping

The City of Spokane Refuse Division personnel will staff the incoming and exiting scale houses. Records will be kept for the following:

- o number of vehicles using the facilities
- o types of vehicles using the facilities
- o tare weights of all loads
- o description of wastes
- o incidences of radioactive waste deliveries
  - by what type of carrier
  - when delivered
  - action taken
- o Incidence of hazardous/dangerous waste deliveries
  - process same as for radioactive waste deliveries

### 5.4 Compliance Inspection

The Facility's air quality will be monitored by CEM's (continuous emission monitors) that will prepare hourly, daily, and quarter reports in the correct format to be submitted to the Department of Ecology. Also, the City will perform its own audit throughout the operation of the Facility.



## PART 6. CLOSURE PLAN

### 6.1 Estimate of Closure Year and Cost

The Facility is current being designed for a minimum of a 20 year operation life. It is expected that at the end of the initial design life, the Facility will undergo any necessary rehabilitation and remain in service. As per regulations, a cost estimate will be prepared for closure of the plant. At this time, however, the final design has not been completed in sufficient detail to accurately determine the extent of and costs associated with closure of the Facility.

### 6.2 Methods of Closure

At the time of closure, all refuse will be removed from the receiving pit, all tanks will be drained, and any remaining ash will be disposed of. All ash and cleanup wastes will be disposed of at the landfill. Following cleanup and final inspection by regulatory agencies, all entrances will be locked and/or barricaded.

### 6.3 Closure Timing and Notification Procedures

No later than 180 days prior to receipt of the final volume of waste, the Owner will notify the Spokane County Health District of its intent to implement the closure plan. Implementation of the closure plan will begin within 30 days following receipt of the final volume of waste.

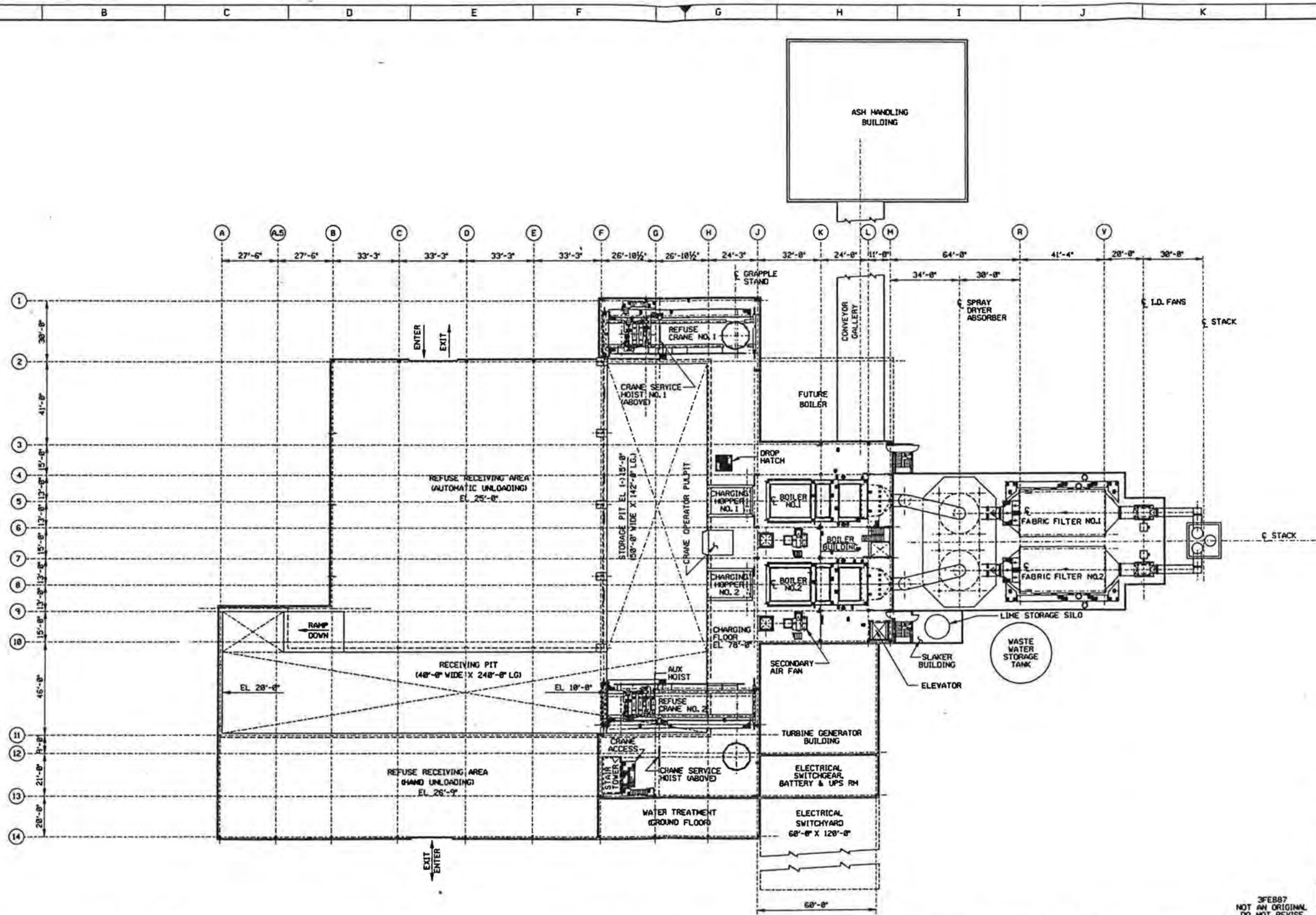
### 6.4 Final Inspection by Regulatory Agencies

Upon completion of the closure procedures, the Owner will submit to the Spokane County Health District an affidavit signed by the Owner's authorized representative and a professional engineer, licensed in the State of Washington, stating that the site has been closed in accordance with the specifications of the closure plan. When the health district finds the Facility to be adequately closed, it will issue to the Owner a Certificate of Closure.









**FIGURE NO. 3**

FOR PERMITTING PURPOSES ONLY

PRELIMINARY ISSUE NO. \_\_\_\_\_  
Date: \_\_\_\_\_

**SIGNAL ENVIRONMENTAL SYSTEMS INC.**  
Hampton, New Hampshire

**RUST** Rust International Corporation  
Birmingham, Alabama  
Contract 21-9789-06

3FEB97  
NOT AN ORIGINAL  
DO NOT REVISE  
HAND REVISED 8/2/07

**SITE DEVELOPMENT  
REFUSE HANDLING FACILITY  
CHARGING FLOOR PLAN**  
SPOKANE REGIONAL  
SOLID WASTE DISPOSAL PROJECT  
SPOKANE, WASHINGTON

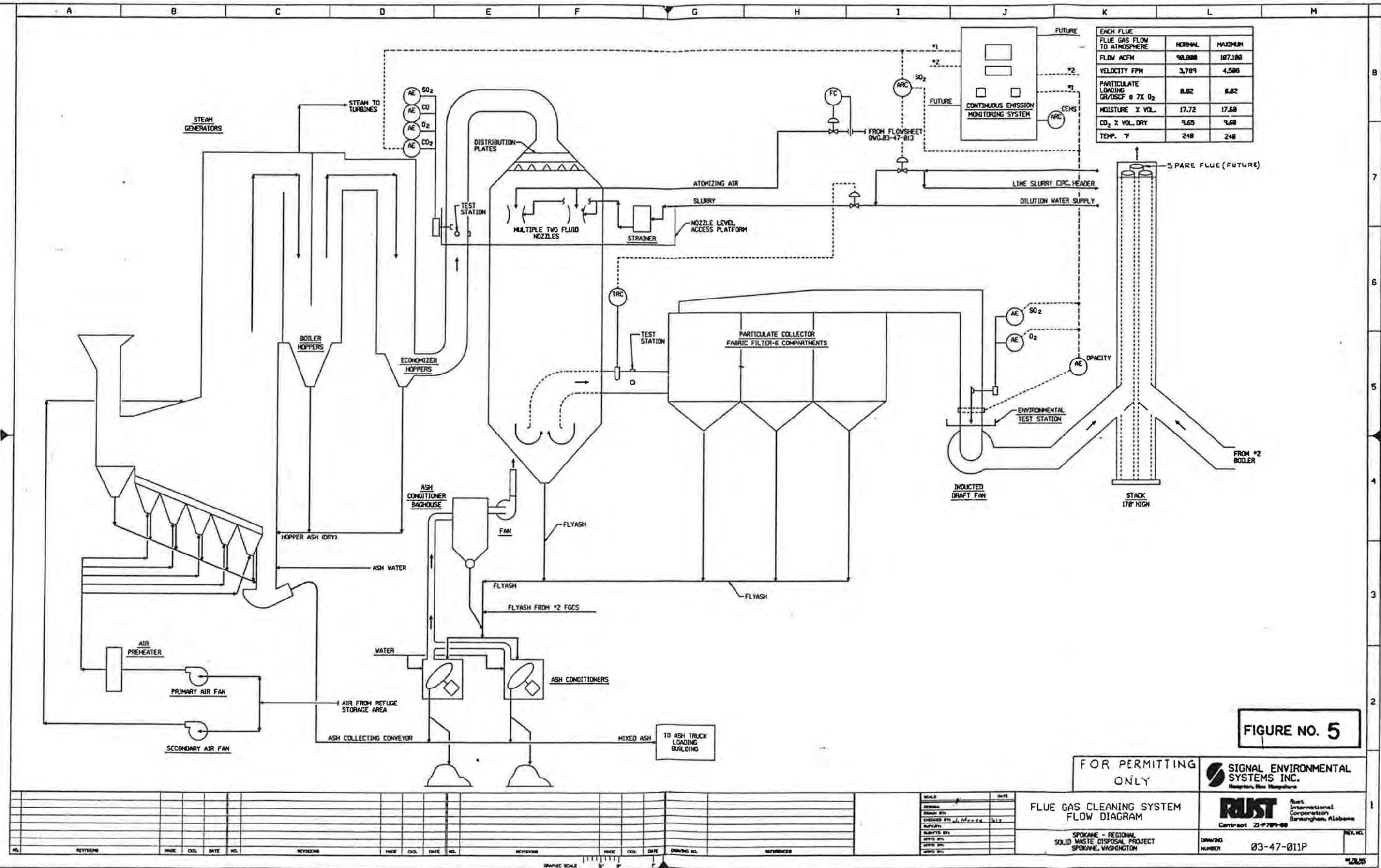
DRAWING NUMBER **03-27-003P** REV. NO. \_\_\_\_\_

NO.	REVISION	DATE	BY	DATE	BY

NO.	REVISION	DATE	BY	DATE	BY

GRAPHIC SCALE





EACH FLUE		
FLUE GAS FLOW TO ATMOSPHERE	NORMAL	MAXIMUM
FLOW ACFM	98,800	107,100
VELOCITY FPM	3,789	4,586
PARTICULATE LOADING GR/SCF @ 7% O <sub>2</sub>	8.82	8.82
MOISTURE % VOL.	17.72	17.58
CO <sub>2</sub> % VOL. DRY	9.65	9.60
TEMP. °F	248	248

**FIGURE NO. 5**

FOR PERMITTING ONLY

**SIGNAL ENVIRONMENTAL SYSTEMS INC.**  
Hampden, New Hampshire

**FLUE GAS CLEANING SYSTEM FLOW DIAGRAM**

**RUST** Rust International Corporation  
Birmingham, Alabama  
Contract ZI-P789-88

SPOKANE - REGIONAL SOLID WASTE DISPOSAL PROJECT  
SPOKANE, WASHINGTON

DRAWING NUMBER 03-47-011P

NO.	REVISION	DATE	BY	CHKD.	DATE	NO.	REVISION	DATE	BY	CHKD.	DATE	NO.	REVISION	DATE	BY	CHKD.	DATE	NO.	REVISION	DATE	BY	CHKD.	DATE	

GRAPHIC SCALE 1" = 10'