95-22
DOROTHY

REGIONAL TECHNICAL ASSISTANCE REQUEST FORM

Date: 6/12/95

Mail or E-Mail to: Donald Cool, Director (Mail Stop: TWFN-8-F5)
Division of Industrial and Medical Nuclear Safety, NMSS

From: for John R. Madera, Chief
Nuclear Materials Licensing Section Region III

Licensee: Advanced Medical Systems License No. 34-19089-01

☐ Control No. 98334

☐ Letter dated: 3/22/95 (item 1)

☐ Problem/Issue:

We request your assistance in the review of the licensee's proposal to evaporate water that is stored in their warehouse. Attached is a copy of: 1) the licensee's 3/22/95 letter, (Attachment A); 2) a list of questions we faxed to the licensee (Attachment B); 3) a draft deficiency letter with specific questions concerning evaporation process (Attachment C); and 3) the licensee's response to our FAX (Attachment D).

☐ Action Required:

As noted in the copy of the FAX we sent the licensee, we had some questions regarding their evaporation procedures and equipment. We request that you also review the licensee's 3/22 submittal as well as their response to our FAX and provide additional comments/suggestions. These will be incorporated into a deficiency letter (see draft - Attachment C). These issues have been discussed with you and Joe Decicco of your staff. We ask for a quick turn-around so that we can issue the deficiency letter and the licensee can continue to make strides toward resolving the water problem in the basement.

☐ Recommended Action (with revisions): X Approve or ☐ Reject

Based upon the permit for installation and operation of the evaporator system granted by EPA, we recommend that approval to install the device be authorized. However, there are additional questions the licensee has not addressed that we asked in the FAX and draft deficiency letter. In addition, their response to our FAX, which contained information they submitted to EPA pertaining to their application for permit to install and operate the evaporator system (see Attachment

6/15

D) may not reflect recent changes in the water processing project as it relates to the concentration and volume of processed water subject to evaporation. This is expanded upon in Item A of our draft letter (Attachment C). We will alert the licensee to the need to resubmit the application to the EPA in the event the current evaporation permit does not reflect the appropriate cobalt-60 source term. Unless 10 CFR 20 compliance issues or other evaporator use concerns are identified by NMSS, we feel that operation of the device should be granted.

Remarks:

Headquarters Reviewer: _____
Regional Reviewer: Wayne Slawinski and Kevin Null
Reviewer Code: R2
Reviewer Phone No.: (708)829-9820 or 9854 Fax No.: (708)515-1259
quest Needed by: ASAP Form TAR-10
8/93

Advanced Medical Systems, Inc.

121 North Eagle Street • Geneva, Ohio 44041
(216) 466-4671 FAX (216) 466-0186

Attachment A
030-16055

March 22, 1995

Mr. John A. Grobe, Chief
Nuclear Materials Inspection
Section II
U.S. Nuclear Regulatory Commission
Region III
801 Warrenville Road
Lisle, Illinois 60532-4351

RE: Application to Amend License No. 34-19089-01

Dear Mr. Grobe:

Advanced Medical Systems, Inc. (AMS) requests amendment of License No. 34-19089-01 to permit the following actions in addition to those items contained in Amendment No. 32 (March 17, 1995):

1. Evaporation of water stored in the warehouse of the London Road facility;

2. Installation of a sampling device in the new lateral connection between the AMS facility and the NEORSD's London Road Interceptor; and

3. Re-connection of the AMS foundation underdrain system to a new manhole and lateral.

4. Discharge of ground, waste and surface water that contains less than 200 pCi per liter of soluble 60-Co as defined in Information Notice 94-07, "Solubility Criteria for Liquid Effluent Release to Sanitary Sewerage Under the Revised 10 CFR Part 20".

Supplement 1 contains a brief listing of the water treatment and sewer remediation activities authorized under Amendment No. 32, as well as evaporation, installation of the sampler, and final recovery of the foundation drainage system. Supplement 2 contains a brief description of the proposed evaporation process along with equipment specifications, performance information and copies of permit applications. Supplement 3 contains a description of the composite sampler and flow meter that will be installed in the new lateral connection. Supplement 4 contains a description of when and under what conditions the underdrain system will be reconnected to the new lateral.

9503060206 22pp.

AMS understands that the license amendment fee is $680.00. The fee is enclosed. If you have any questions, please contact me at 216/466-4671. Your urgent attention to this matter is appreciated.

Sincerely,

DAVID CESAR
Treasurer

DC/cs
Enclosures

cc: D. A. Miller, Esq., Stavole & Miller
H. Billingsley, Esq., Arter & Hadden

SUPPLEMENT 1
WATER TREATMENT AND SEWER REMEDIATION ACTIVITIES

Activity	Status as of March 20, 1995
Purchase and calibrate an in-house gamma spectroscopy system for quick screening of water and soil samples.	Completed (March 14, 1995).
Generate and implement a Standard Operating Procedure for sample analysis.	Instructions sent by Fed-X to the AMS Radiation Safety Officer on March 16, 1995
Establish contract with DTS for treatment of accumulated water.	Completed (March 20, 1995).
Establish services agreement with Project Manager	Completed (March 20, 1995).
Obtain specifications and issue purchase orders for collapsible storage containers, water evaporator, and ancillary equipment.	Bids and specs in hand; containers purchased and two delivered on March 10, 1995; awaiting permit and purchase authorization for evaporator.
Obtain License Amendment to permit water treatment and sewer remediation to proceed.	Completed (March 17, 1995).
Obtain City of Cleveland air permit to install and operate equipment to evaporate water.	Application to install and operate submitted on March 21, 1995.
Obtain License Amendment to permit evaporation of stored water, installation of composite sampler and connection of remediated foundation drainage system to the London Road Interceptor.	Application submitted on March 21, 1995.
Install collapsible storage containers.	Containers delivered and staged on March 13, 1995. Will not be installed until needed.
Mobilize project manager and water treatment contractor to the AMS site, and notify analytical laboratory of pending sample receipt schedule.	Completed (March 17, 1995).
Provide training in radiological protection to all on-site personnel pursuant to AMS license requirements.	
Provide personnel dosimetry for all on-site personnel pursuant to AMS license requirements.	
Treat water that exists in above-ground storage tanks.	
Obtain confirmatory sampling results from treated water.	
Pump water that meets the release criteria to collapsible storage containers in the AMS warehouse.	

Activity	Status as of March 20, 1995
Simultaneously process water that currently exists in the manhole, the lateral, the sump and the basement. Treated water is pumped to a sampling tank.	
Obtain confirmatory sampling results from treated water.	
Pump water that meets the release criteria to collapsible storage containers in the AMS warehouse.	
Prepare a sampling plan for collection and analysis of soil samples in the vicinity of the old lateral connection.	
Mobilize excavation contractor, issue personnel dosimetry, and provide general employee training.	
Perform gross decontamination of the residual sludge in the basement	
When the areas are de-watered, excavate soils in the vicinity of the four-inch line and the footer drains, disconnect the footer drains from the sump, grout in the four-inch line, and grout in the lateral connection to the interceptor.	Permit application submitted.
Obtain and analyze soil and water samples during excavation activities. (Soils containing > 8pCi/g of cobalt will be packaged and stored on-site.	
Evaluate the contamination status of the footer drains, decontaminate or remove as necessary, and reconnect to the sump.	
Process any remaining water beneath the AMS facility by pumping from the sump into an above-ground storage tank.	
Obtain confirmatory sampling results from treated water.	
Pump water that meets the release criteria to collapsible storage containers in the AMS warehouse.	
Obtain permits and remove underground fuel oil storage tank	Permit application submitted.
Install a new lateral connection to the NEORSD interceptor.	Permit application submitted.
Purchase and install a composite sampler and flow monitor into the new lateral connection.	Purchase Order issued on March 21, 1995.

Activity	Status as of March 20, 1995
When sampling results indicate that no cobalt above the release criteria is present, demobilize the treatment contractor.	
When sampling results for 3,000 continuous gallons of water pumped from the foundation drainage system demonstrate that no cobalt above the release criteria is present, connect the footer drainage system, the sanitary drainage system and the roof drain system to the new lateral connection.	
Back-fill all excavated areas with AMS soil (containing <8 pCi/g of cobalt) or clean fill.	
De-mobilize the excavation contractor	
Collect biological samples from NEORSD's interceptor and evaluate decontamination methods	
De-mobilize the on-site project manager.	
Install/test water evaporation system.	
Begin slow evaporation of water in the collapsible storage containers.	
Complete basement decontamination	
Decontaminate NEORSD's interceptor (**)	
Collect and analyze core samples in the vicinity of the old lateral connection pursuant to the sampling plan.	
Complete a remediation report.	
Forward a copy of the remediation report to the USNRC.	

SUPPLEMENT 2
WATER EVAPORATION PROCEDURE

Water held in the collapsible storage tanks in the AMS warehouse will be evaporated at a nominal rate of 35 gallons per hour using a Power Plant Services Model E-300 "Hot Tube" Natural Gas Powered Evaporator. The evaporator will be installed in the AMS warehouse at a specific location to be determined by the installer. At this time, it is anticipated that it will be installed in the immediate vicinity of the collapsible storage tanks. The following are general specifications for the system:

Dimensions: 96" by 54" by 50" tank height or 70" top of blower enclosure.

Heat Exchanger: Schedule 40 pipe burner tube, stainless steel (316).

Burner: Power burner, rating to 950,000BTU

Electrical Requirements: 240-460V 3-phase

Construction: Tank is 3/16" stainless steel (316); insulation is 2" dense, high temperature batting; lid is counter-weighted safety lid stainless steel on all wetted parts.

Cleanout: Four inch NPT, external thread.

Stack: Ten inch O.D.

Tank Capacity: 300 gallons (approx.)

Blower: Stainless steel Radial Blade Wheel Blower, 500 SCFM, 1.5 HP.

Level Control: Float activated ball valve.

Sensors: Low fluid level, high fluid level, stack temperature monitor, flame safety monitor, fluid temperature monitor.

Control Panel: Industrial panel with disconnect, on/off, safety circuit for automatic shutdown.

Guards: Safety cages around all moving parts.

Fluid Transfer Pump: Air operated, 80 PSI at 11 GPM

Access: Counter weighted, air-cooled, full width lid.

Additional specifications, along with an operational description and a flow chart, are enclosed herein.

Solids removed from the evaporator pursuant to manufacturer's instructions will be screened for radiological constituents.[1] A standard operating procedure for monitoring and surveillance of the evaporator will be prepared, reviewed by the AMS Isotope Committee, and implemented shortly after installation is complete.

City of Cleveland Permits to Install/Operate the system were filed on March 21, 1995. Enclosed herein are copies of the permits, including the output from the COMPLY code, used to demonstrate compliance with applicable portions of 40 CFR 61.

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[1] If the solids contain detectable ^{60}Co, they will be retained at AMS. If the concentrations are not detectable, the solids will be disposed of pursuant to the manufacturer's instructions.

LAKEVIEW
WASTE-WATER EVAPORATOR

LAKEVIEW ENGINEERED PRODUCTS from
POWER PLANT SERVICE, INC.

RESPONSIBLE WASTE MANAGEMENT AND REDUCTION

OPTIONS: E-Series Evaporators

Stainless Steel Construction For the "Hot-Bottom"® both the tank and heat exchanger are constructed of SS. For the "Hot Tube"® both the tank and the burner tube are constructed of SS. For the "Hot Shot" tank is constructed of SS.

Grade 304 Offers excellent resistance to a wide range of corrosives and atmospheric exposures.

Grade 316 Best corrosion resistance of the standard stainless steels. Resists pitting and most chemicals used in paper, textile and photographic industries. High temperature strength

NB: Standard to all models is stainless steel of all wetted part of the top and lid, including the blower and blower housing.

Dual Stack Ducting Stack within a stack for "Hot Tube"® models that exhaust water vapor through the inner stack and the burner exhaust through the outer stack. This prevents water vapor from condensing and prevents the unlikely occurance of stack fires. Used as burner exhaust stack and water vapor stack, venting to outside atmosphere. 10" O.D. Available in stainless steel. Offered @ $___ x ___ft.

Exhaust Stack Single walled stack used to exhaust water vapor to the atmosphere from "Hot Bottom"® or "Hot Shot" models. May be used as burner exhaust on the "Hot Tube"® model. Offered in either carbon steel or stainless steel @ $___ x ___ft.

Special Application PLC Controls Remote operating controls or remote reading. Request special requirements or specific types

Holding Tank Custom built to your size requirements. Available in carbon steel or stainless steel. Fiberglass or cement tank linings available

Skimmer/Sludge Pump and controls 2" inlet Air operated diaphragm pump plumbed into clean-out and oil skimmer, all piping and ball valves for easy operation, transfer and removal of skimmed oils and evaporator residue. Ready to pipe to your final waste tank.

Modulating Steam Valve Installed in your steam line to control volume of steam entering steam chamber. This controls the heat input, the boiling and the rate of evaporation within the unit. Linked and controlled by a steam pressure monitor to maintain a preset, steady temperature in the steam chamber. It will also be connected to a foaming sensor. In this application the steam valve will modulate the heat input to control foaming.

Modulating Gas Valve Installed in the gas line to control the volume of fuel entering the burner. This controls the heat input, the boiling and the rate of evaporation within the unit. Linked to and controlled by a temperature monitor. It can also be connected to a foaming sensor. In this application the gas valve will modulate the heat input to control foaming.

Vapor Recovery Condenser Sized specifically the evaporation rate of your unit. Condenser will recover the water vapor coming off the evaporator. This clean water can then be used within your facility. Requires cooling medium and increases your operational costs. Closely assess your real needs for this option.

Replacement fan assembly One of the few wear parts on the unit. Fan assembly is designed for easy replacement. Standard impeller on this fan assembly has a 5 year warranty.

Anti-Foam Dispenser A waste stream may be subject to severe foaming problems. Addition of an anti-foam agent may be indicated. The dispenser will automatically add the anti-foam agent to the waste solution in the evaporator. It operates in conjuction with a foam sensor that detects the presense of foam in the space above the normal operating fluid level in the eavaporator tank.

F.M. (Factory Mutual) Rating Burner controls and gas train set up to comply with requirements

I.R.I. (Industrial Risk Insurers) Rating Burner controls and gas train set up to comply with requirements

Over-spray System, Foam Control Electric operated centrifugal pump that pumps hot waste from the evaporator and sprays it over the surface of the liquid waste. This helps to break up surface tension and allow the water to evaporate through any surface film. It also exposes more surface area to the air being pulled across the surface of the fluid assisting in the evaporative rate. Foam sensor operates in the area above the normal operating fluid level and detects foaming conditions as they occur in the tank. This sensor then activates ovespray system to break down the foam. All components, pump, strainers, nozzles, piping and controls included.

Remote Tank Sensing System The feed tank that supplies the evaporator also works as a settling tank and an oil separator tank. Pumping sludge or oil to the evaporator will not only reduce its efficiencies but also will end up requiring more operator time and maintenance to remove them from the evaporator. (1) The feed tank can be set up with sensors to determine oil and sludge layers and permit pumping only aqueous wastes to the evaporator. (2) The feed tank can be set up with level controls to determine presence of fluid.

Transfer Pump & Controls (Standard on E-300 & above) An option only on the E-100 and E-150. An air operated diaphragm pump set up to automatically transfer fluid to the evaporator. This process controlled by level controls and appropriate valves

Tank Fluid Temp. Monitor/Controler Monitors and reports on temperature of fluid in evaporator tank. This sensor is tied into control circuitry to control and monitor the temperature of the fluid in the evaporator tank. It is specifically recommended if low temperature evaporation is desired. It also functions to shut down the unit if elevated temperature condition exits due to concentration of fluid other than water.

Misc. Diaphragms for pumps - Buna-N standard, options include Viton, Teflon. Specific nature of the waste stream will determine the appropriate specification.

Installation Installation may be accomplished by the buyer, a qualified service company or by the factory.

LAKE VIEW

WASTE-WATER EVAPORATOR

LAKEVIEW ENGINEERED PRODUCTS from

POWER PLANT SERVICE, INC.

RESPONSIBLE WASTE MANAGEMENT AND REDUCTION

REDUCE WATER-BASED WASTE UP TO 98%

REDUCE DISPOSAL COSTS

LIMIT LIABILITY

ECONOMICAL OPERATION

ELIMINATE SEWER DISCHARGE

EASY CLEAN OUT

SOLID STATE PLC CONTROLS

MANUFACTURER SUPPORT

"HOT TUBE"
"HOT BOTTOM"
"HOT SHOT"

E-SERIES EVAPORATOR OPERATION

Method of Operation: 1) A heavy duty, NEMA 12 rated control panel with an industrial safety disconnect functions as the control center for the entire evaporation process. All burner controls, fill controls, level controls, temperature controls and safety devices are installed and factory tested for an assurance of safe and efficient operation

2) Water based waste is pumped into the evaporator tank until the operational level has been reached. If operating in an automatic mode the unit will fill itself through its mounted fill pump, automatically controlled by fluid level controls. If operated in a batch mode filling may be accomplished by another method. In automatic operation, fluid level is consistently maintained by high and low level controls which operate the machine mounted transfer pump.

3) The water based waste is heated to boiling via A) [Hot Tube] a burner tube heat exchanger that is elevated above the bottom of the tank. This allows solids and sludges to fall past the heat exchanger to the bottom of the tank. A power burner which is unaffected by ambient building pressure is used to provide the heat. The exhaust gases from combustion are exhausted through a stack to the atmosphere. B) [Hot Bottom] an A.S.M.E. code heat exchanger that forms the bottom of the evaporator. Steam is provided from a remote boiler. The waster based waste can be heated to a temperature lower than boiling and maintained at a preset temperature if low temperature evaporation is desired.

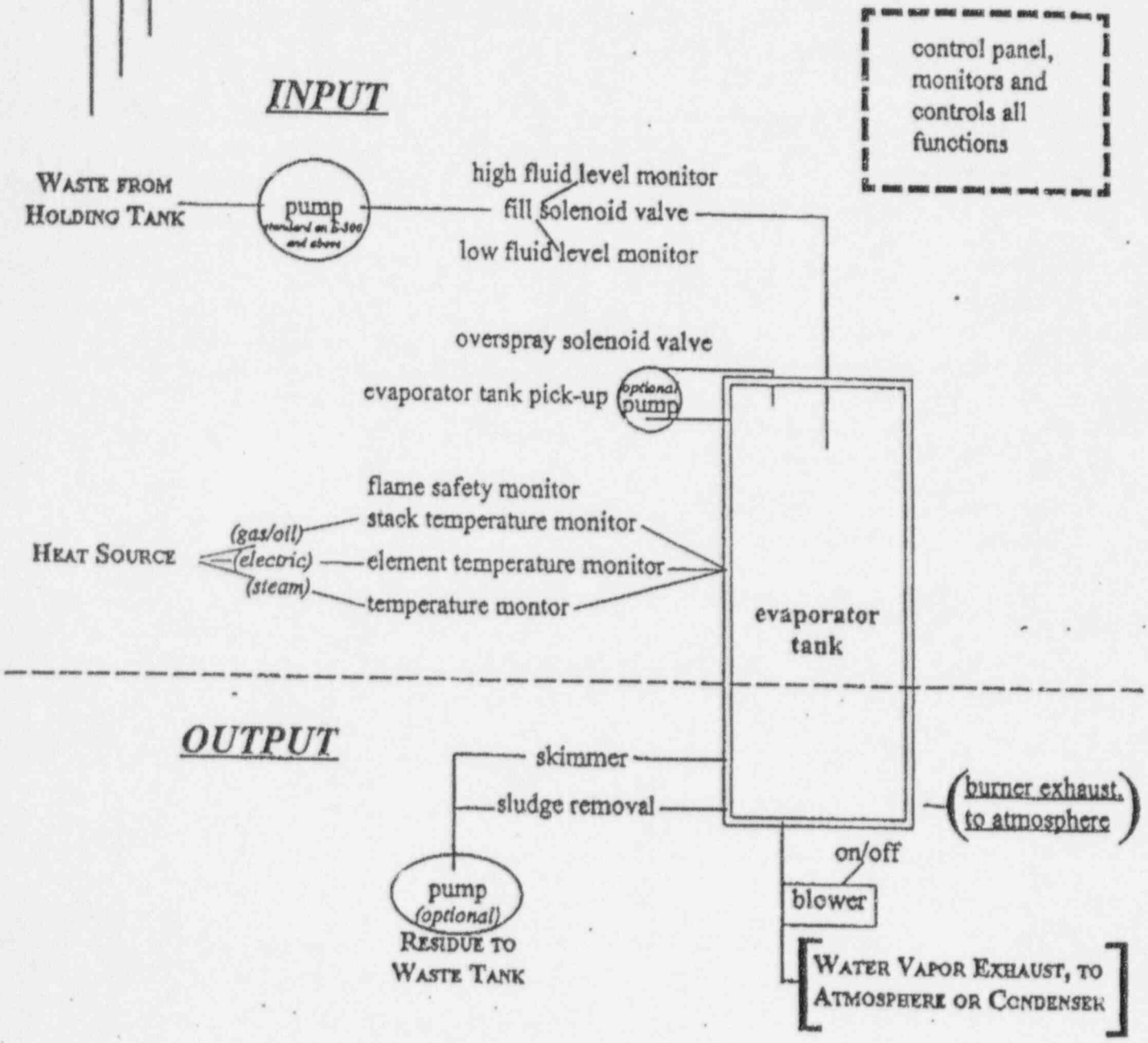
4) As the water vapor rises off the surface of the water based waste the water vapor is drawn out of the evaporator via a powerful blower that exhausts the water vapor via a stack to the atmosphere. In the Hot Tube model, the water vapor exiting the evaporator and exhaust gases exiting the heat exchanger can be combined to one stack outside of the unit.

5) During the evaporation process free oils will float to the surface, emulsified oils that will break out of solution with the addition of heat should also float to the surface where they can be skimmed off into a tank or barrel. Sludges, solids and precipitates will fall to the bottom of the tank where they can be removed through the large diameter clean-out. Both final waste streams, those that settle out and those that float can be more easily eliminated through a skimmer/sludge pumping system facilitating clean-out and disposal of oils and sludges

8-1-93

POWER PLANT SERVICE, INC.
2300 West Jefferson Boulevard
Fort Wayne Indiana
46802-4824

EVAPORATOR FLOW CHART



SUPPLEMENT 3
DESCRIPTION OF THE COMPOSITE SAMPLING AND FLOW METER SYSTEM

An ISCO Model 3710 Portable Wastewater Sampler and an ISCO Model 3240 Variable Gate Flow Meter will be installed in the new lateral connection from the AMS facility to the NEORSD's London Road Interceptor. This equipment will provide a flow-proportional sample of all water leaving the AMS facility. By operating in a flow-proportional mode, the equipment will provide samples that are representative of the water that AMS has actually discharged.

The sampler will be programmed to provide one water sample each week. This sample will be analyzed for ^{60}Co concentration by the methodology of gamma spectroscopy. The solubility of any detectable ^{60}Co will also be determined. The flow meter/sampler will also permit quantification of the water volume discharged.

The Model 3240 was selected to ensure accurate measurement of flow over a wide variety of flow rates. It will be mounted directly into the new lateral connection between the AMS facility and the Interceptor. When coupled with the Model 3710 sampler, the flow meter will give AMS the ability to maintain detailed records of radionuclide discharges, if any, as they occur. The following are the technical specifications of the Model 3710:

Dimensions: Height, 28 3/4 in.: Diameter, 19 1/4 in.

Liquid presence detection: A non-wetted, non-conductive sensor detects when liquid sample reaches the pump to automatically compensate for changes in head height.

Controller watertightness: Self certified NEMA 4x and 6 ratings (submersible, watertight, dust--tight and corrosion resistant).

Sampling Modes: Uniform time, non-uniform time, flow (Flow mode is controlled by eternal flow meter pulses.)

Sample Frequency: Selectable in hours and minutes between consecutive samples in one minute increments up to 99 hours 50 minutes, or from 1 to 9,999 flow pulses in single pulse intervals. Non-uniform time may be entered in minute intervals up to 999 minutes or clock time.

Flow Meter Signal Requirements: Five to 15 volt DC pulse or isolated contact closure of at least 25 milliseconds duration.

Rinse Cycles: Suction line automatically rinsed with source liquid before sample collection, 0 to 3 rinses.

Sample Retries: Sampling cycle automatically repeated if sample not obtained on initial attempt, 0 to 3 retries.

Program Lock: Provides password protection for input displays.

Tubing Life Indicator: Provides a warning to change pump tubing.

Intake purge: Adjustable air purge before and after each sample.

Number of composite Samples to Shutoff: Up to 999 samples (Fail-safe float shutoff).

Sample Volume: 10 to 9990 ml in one ml increments. (Automatically limited by programmed bottle size and number of composite samples.)

Sample Volume Repeatability: ± 10 ml typical.

Real Time Clock Accuracy: One minute per month, typical.

Suction Tubing (Intake): Three ft to 99 ft length of 1/4" ID vinyl.

Suction Lift: Twenty six feet, maximum.

Pumping Rate (at 3 ft head): 3,000 ml per minute.

Line Transport Velocity (at 3 ft head): 5.1 ft per second.

Operational Temperature Range: 32° to 120° F

The Model 3240 measures fluctuating flows in small pipes, permitting automatic collection of representative samples even from low flows. The following are its specifications, using a 6" variable gate metering insert:

Height (with Power Source): 18 in.

Width: 12.5 in.

Weight (without Power Source): 19.5 lb.

Enclosure (self certified): NEMA 4x; moisture and corrosion resistant, not damaged by submersion.

Units of Measurement" Flow rate (gallons per second, gallons per minute, gallons per hour, million gallons per day, cubic feet per second, cubic feet per hour, cubic feet per day, cubic meters per second, cubic meters per hour, cubic meters per day, liters per second, acre feet per day) and total flow (gallons, million gallons, cubic feet, cubic meters, liters, acre feet).

Data Storage: 14592 flow rate readings divided in up to three memory partitions, with a resolution of 0.01 gallons per minute.

Maximum Flow Rate: 180 GPM with a 0.5% minimum downstream slope, and 300 GPM with a 2% minimum downstream slope.

Typical Flow Rate Measurement Accuracy: Below 5 GPM ± 0.35 GPM, max; 5 to 10 GPM ± 0.5 GPM, max; 10 to 300 GPM ± 5% of reading, max.

Automatic Drift Correction: After a five minute warmup period, zero level is corrected to $\pm$ 0.002 feet at intervals between 5 and 60 minutes.

Long Term Level Calibration Change: Typically 0.5% of reading per year.

Model 3710 Sampler

Unmatched composite sampling performance

The rugged 3710 Sampler is ideal for general purpose or toxic pollutant composite sampling. It collects composite samples based on time or flow intervals in a single container. The 3710 base holds a 2 1/2 gallon glass or polyethylene bottle, or a 4 gallon polyethylene bottle. Up to 24 sampling stop and resume times can be preset for unattended, automatic sampling.

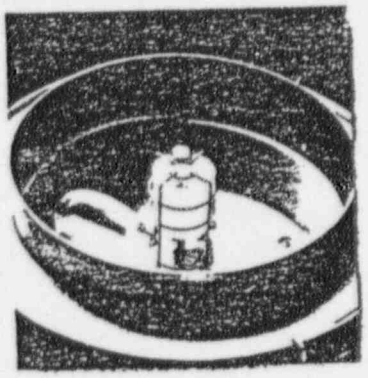
Corrosion Resistant Construction

All 3710 components are constructed from durable, corrosion resistant materials to ensure dependable operation in the harshest environments.

Rugged Peristaltic Pump

The proven Isco peristaltic pump provides dependable and efficient sample delivery. A single piece of medical grade silicone rubber tubing is used to eliminate sample cross contamination and ensure sample integrity. There are no internal tubing connection points. This makes cleaning and tubing replacement fast and easy. The pump is constructed from high strength, corrosion resistant Noryl® for maximum pumping efficiency and long tubing life. The Isco pump meets EPA requirements for representative sample flow velocity.

®General Electric



Built-in Float Mechanism

A built-in float mechanism provides a fail-safe shut-off to eliminate overfilling the sample container.

Accurate Sample Delivery

The exclusive LD90 Liquid Presence Detector and patented Isco pump revolution counting system deliver accurate, repeatable, sample volumes time after time. It automatically compensates for changes in head heighrs. The non-contacting LD90 is not affected by conductivity, viscosity, temperature, or effluent composition. The LD90 provides a preconditioning rinse of the suction line to eliminate sample cross contamination.

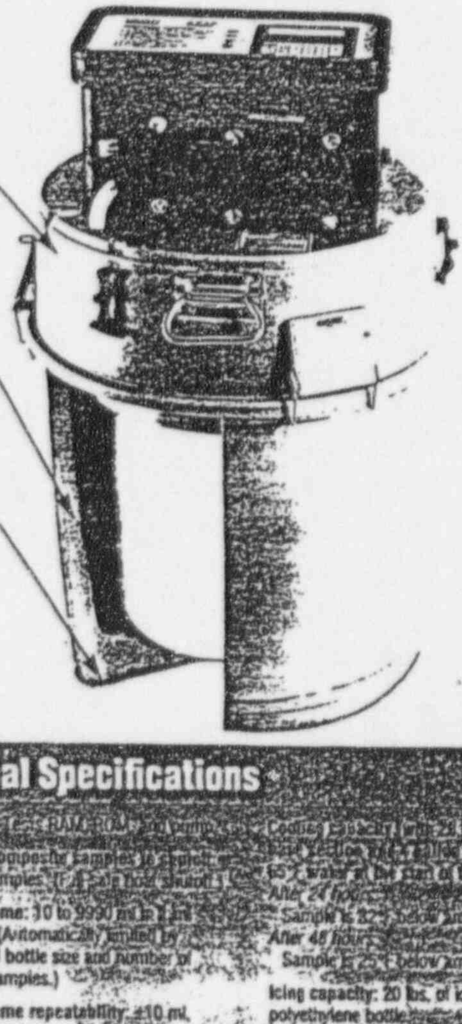
Fully Insulated Base

Isco 3710 Samplers are fully insulated with rigid foam providing a thermal resistance factor of R-14. The 3710 base holds a 2 $^1/_2$ gallon glass or polyethylene bottle, or a 4 gallon glass or polyethylene bottle. Up to 20 pounds of ice can be placed in the base to ensure sample integrity.

Rugged, corrosion resistant exterior and stainless steel hardware for use in harsh environments.

Base is fully insulated with rigid foam providing a thermal resistance factor of R-14. This gives you the most effective sample cooling available.

The rugged reinforced base with skid pad withstands rough use and abuse.



Model 3710 Technical Specifications

Height: 28-3/4 in. (73.3 cm)

Diameter: 19-1/4 in. (48.9 cm)

Dry weight: 32 lbs. (14.5 kg)

Sampler base capacity: One, 2½ [illegible] or 4 gallon polyethylene, or 2½ gallon [illegible] glass bottle.

Liquid presence detection: Non-wetted, non-conductive sensor detects when liquid sample reaches the pump to automatically compensate for changes in head height.

Controller watertightness: Self certified NEMA 4x and 6 ratings (submersible, watertight, dust-tight, and corrosion resistant.)

Programming modes: Basic, extended.

Sampling modes: Uniform time, non-uniform time, flow. (Flow mode is controlled by external flow meter pulses.)

Sample frequency: Selectable in hours and minutes between consecutive samples in 1 minute increments up to 99 hours 59 [illegible]tes, or from 1 to 9,999 flow pulses [illegible]ple pulse intervals. Non-uniform time [illegible]e entered in minute intervals up to [illegible] minutes or clock time.

Flow meter signal requirements: 5 to 15 volt DC pulse or isolated contact closure of at least 25 milliseconds duration. (4 to 20 ma analog or pulse duration signal may be used with optional interface unit.)

Rinse cycles: Suction line automatically rinsed with source liquid before sample collection, 0 to 3 rinses.

Sample retries: Sampling cycle automatically repeated if sample not obtained on initial attempt, 0 to 3 retries.

Program lock: Provides password protection for input displays.

Program storage: Stores up to 3 programs.

Sampling stop/resume: Up to 24 real time/date sample stop/resume commands.

Master/slave: Allows the automatic start of second (slave) sampler.

Tubing life indicator: Provides a warning to change pump tubing.

Intake purge: Adjustable air purge before and after each sample.

Interface port: 8 pin connector; data output at 2400 baud in ASCII RS-232 format with handshake. Allows transfer of Program Setting Report (PSR) and Sample Results Report (SRR) to Field Printer or personal computer.

Diagnostics: [illegible] RAM, ROM [illegible]

Number of composite samples [illegible] Up to 999 samples. [illegible]

Sample volume: 10 to 9990 ml in 1 ml increments. (Automatically limited by programmed bottle size and number of composite samples.)

Sample volume repeatability: ±10 ml, typical.

Real time clock accuracy: 1 minute per month, typical.

Suction tubing (intake): 3 ft. to 99 ft. length of 1/4" ID vinyl, 3/8" ID vinyl, or 3/8" ID Teflon lined tubing.

Suction lift: 26 ft. (7.9 m), maximum.

Pumping rate (at 3 ft. head):
1/4" ID suction tubing: 3000 ml per minute.
3/8" ID suction tubing: 3500 ml per minute.

Line transport velocity (at 3 ft. head):
1/4" ID suction tubing: 5.1 ft. per second.
3/8" ID suction tubing: 2.5 ft. per second.

Operational temperature range: 32° to 120°F (0° to 50°C.)

Cooling capacity [illegible] water at the start of the test.
After 24 hours: [illegible] Sample is 32° [illegible] below ambient.
After 48 hours: [illegible] Sample is 25° [illegible] below ambient.

Icing capacity: 20 lbs. of ice with a 4 gallon polyethylene bottle.

Base insulation: Standard thermal resistance factor of R-14.

Sampler power requirements: 12 volts DC. (Supplied by battery or AC power converter.)

Sampler standby current: 10 milliamps, maximum.

External Isco nickel cadmium battery capacity: 3 standard sampling programs. (50 samples at a rate of one 200 ml sample per half hour, using 10 ft. of 3/8" vinyl suction line at a 5 ft. head.)

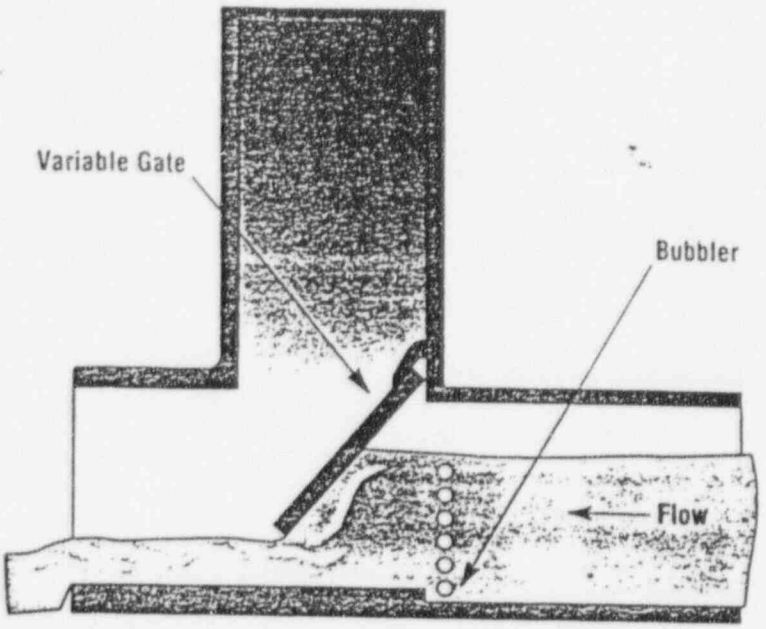
Controller internal lithium battery life (maintains internal logic and user selected settings): 5 years minimum.

New Technology for Maximum Accuracy

The Variable Gate Metering Insert is the heart of the Isco 3240. The insert has a pivoting gate under which the liquid flows. The gate creates an upstream level that is measured with a bubbler system. Together, the gate position and upstream level determine the flow rate through the metering insert.

To give you maximum accuracy, the flow meter automatically adjusts the gate in response to changing flow rates. This allows the 3240 to accurately measure a much wider range of flows than a weir or flume.

To maintain accuracy, the 3240 periodically purges its bubble line, and flushes silt and solids that may build up behind the gate.

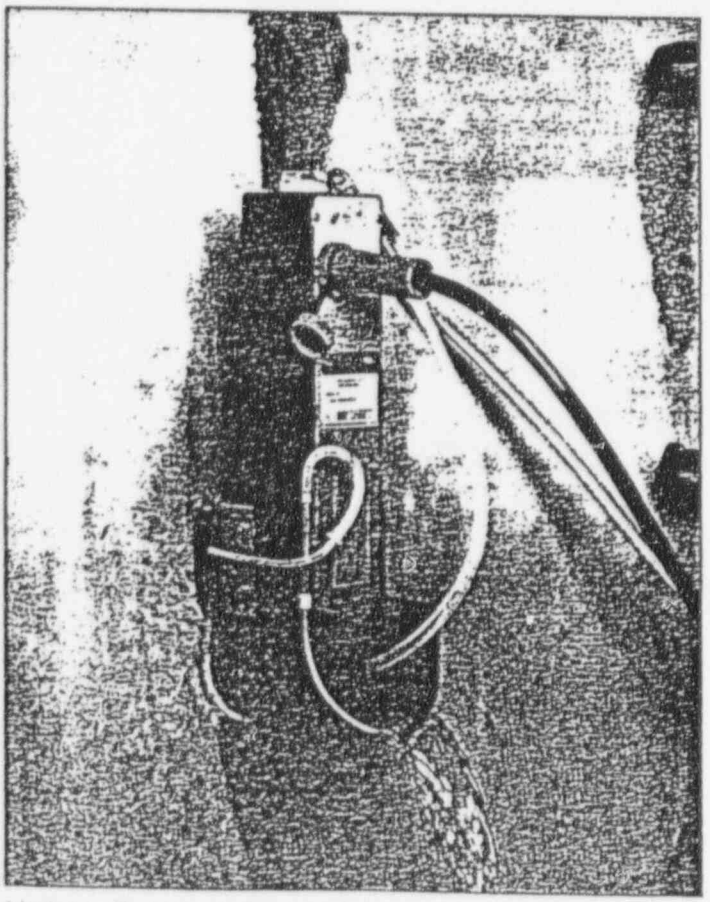


Principle of operation — Gate position and upstream level determine the flow rate through the metering insert.

Easy Installation

Metering inserts are available for 4, 6 and 8 inch pipes. Installation is quick and easy. No weir or flume is needed, and no calibration is required.

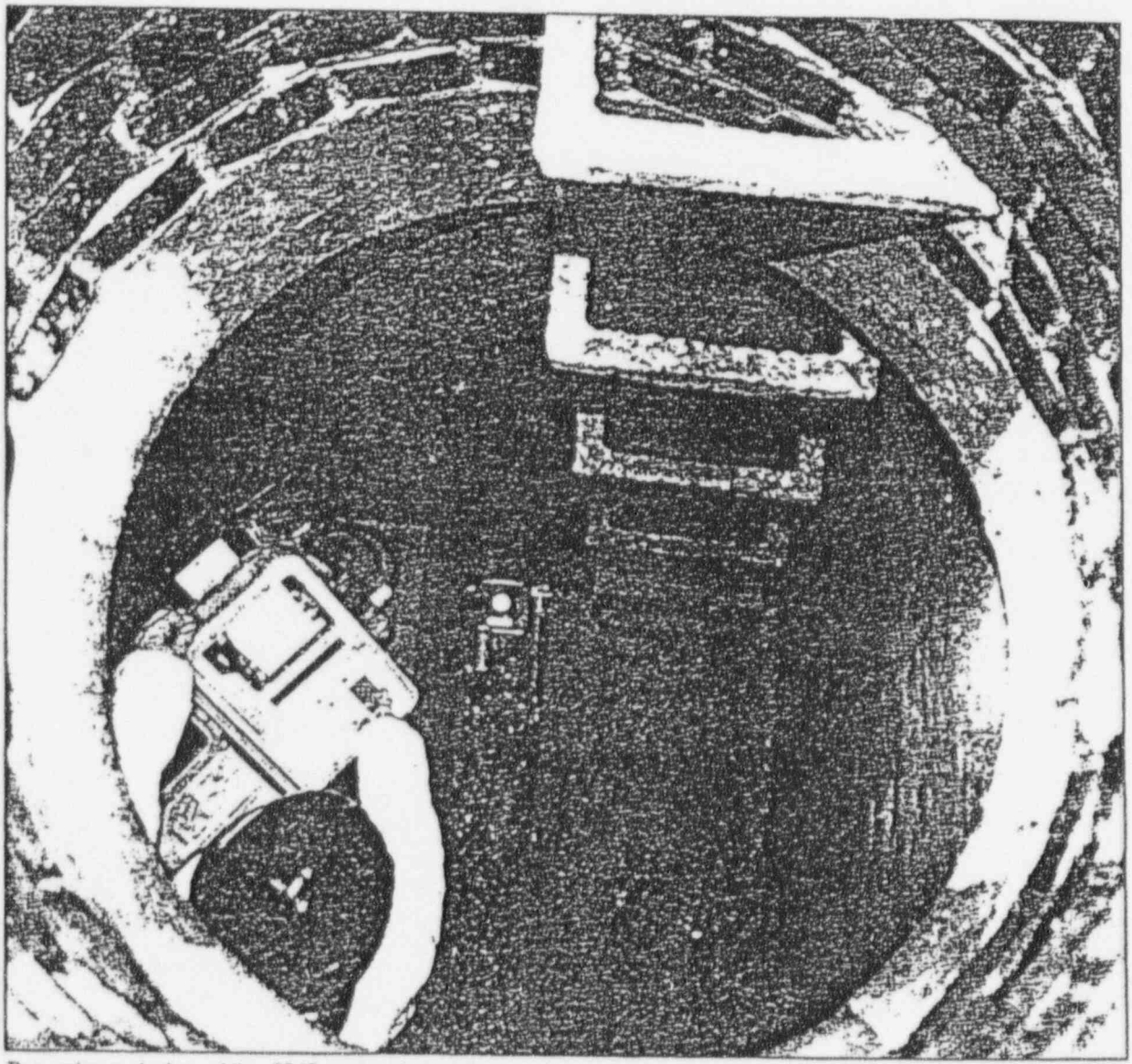
The metering insert is typically installed in the upstream pipe of a manhole. A stainless steel expansion ring grips the inside of the pipe and holds the metering insert in place. A rubber bladder seals the pipe and routes the flow through the insert.



Variable Gate Metering Inserts are available for measuring flows in 4, 6 and 8 inch pipes. (4" insert shown above.)

Regulations requiring measurement of wastewater discharges from industrial and commercial facilities are becoming increasingly strict. These discharges often fluctuate between very low and very high flow rates. However, weirs and flumes are not designed to measure both extremely low and extremely high flows.

The patent pending Isco 3240 Variable Gate Flow Meter is the only instrument designed to accurately measure fluctuating flows in small pipes. The 3240 also allows you to automatically collect representative samples, even from very low flows.



The unique design of the 3240 makes installation quick and easy.

SUPPLEMENT 4
FINAL REPAIR OF FACILITY DRAINAGE

Pursuant to Amendment No. 32 (March 17, 1995) of License No. 34-19089-01, when the areas in the vicinity of the discharge line from the AMS facility are dewatered, the soils in the vicinity of the four-inch line and the footer drains will be excavated. The footer drains will be disconnected from the sump and the four-inch line will be remediated.

Soil and water samples will be collected and analyzed throughout the process. Any water generated will be treated pursuant to the procedures authorized under Amendment No. 32, and pumped into collapsible storage tanks located in the AMS warehouse. At the same time, a new lateral connection to the NEORSD's London Road Interceptor will be installed.

The contamination status of the footer drainage system will then be evaluated by the on-site Project Manager and the AMS Radiation Safety Officer. As necessary, the system will be decontaminated. Water that accumulates in the drainage system during remediation will be pumped out of the corner sump, treated to ensure that the 60-Co concentration meets the release criteria contained in the February 1, 1995 letter from J. Grobe to D. Cesar (e.g., less than 200 pCi/l of soluble 60-Co, consistent with Information Notice 94-07, "Solubility Criteria for Liquid Effluent Release to Sanitary Sewerage Under the Revised 10 CFR Part 20"0, and then pumped to the collapsible storage tanks. Treatment will continue until the 60-Co concentrations are consistently less than the release criteria.

Water from the drainage system will continue to be pumped out of the sump, stored in above-ground storage tanks and sampled.[2] (Sufficient sample to permit "splits" with the USNRC, if requested, will be collected.) Water that meets the release criteria will be pumped to the collapsible storage tanks.[3]

---

[2] For process control purposes, samples will be analyzed with AMS gamma spectrometry system, using NIST-traceable source (water equivalent density) of 60-Co for system calibration. For confirmatory analysis, the samples shall be sent for analysis to Quanterra, Inc., a commercial analytical laboratory, in St. Louis, Missouri. There the 60-Co concentration will be determined by the methodology of gamma spectroscopy. A minimum detection limit of 20 to 30 pCi per liter has been specified. The solubility of 60-Co in samples containing "detectable" activity, up to a maximum of 200 pCi per liter, will be demonstrated by the methodology of the American Public Health Association's Method 7110, "Gross Alpha and Gross Beta Radioactivity (Total, Suspended, and Dissolved)" from Standard Methods for the Examination of Water and Wastewater.

[3] Water that does not meet the release criteria will be pumped into the above-ground storage tanks and directly to the evaporator system for treatment.

After 3,000 gallons of water with 60-Co concentrations less than the release criteria have been pumped continuously from the drainage system, the footer drains, the sanitary drains, and the roof drains will be connected to the newly-installed lateral connection to the London Road Interceptor.

At this point, all waste water that contains less than 200 pCi/l of soluble 60-Co as defined in Information Notice 94-77 will be discharged. Weekly composite samples of discharges into the Interceptor will be analyzed by gamma spectroscopy in order to document compliance with 10 CFR 20.2003.

FAX TRANSMITTAL

To Carol Berger | From Wayne Slawinski
Dept./Agency | Phone #
Fax # (301) 762-0638 | Fax # (708) 575-1259
NSN 7540-01-317-7368 5099-101 GENERAL SERVICES ADMINISTRATION

Carol

Our questions regarding the evaporator operations are provided below.

Attachment B

I Evaporation of Processed Water Stored in the Warehouse

A. What is the status of the City of Cleveland/EPA evaporation permit request?

B. Where will the evaporator be installed within your facility? Who will install the system and provide training in its operation?

C. Has operation of the evaporator system inside your facility been evaluated as a potential fire hazard? For example, will evaporator system operation generate sufficient heat to actuate the facility's automatic fire suppression systems?

D. Is system use planned during unoccupied hours? What are the systems' automatic operation and shutdown capabilities? Specifically, if the system is not continually monitored during its operation, what features detect excessive heat buildup and actuate system shutdown?

E. Describe the water feed system from the 25,000-gallon collapsible storage bladders to the evaporator. If the feed system is automatic and will be operated unattended, also describe its automatic shutdown and safety features to prevent spills and overflows.

F. Where will evaporator effluents for "water vapor" and "burner exhaust" be discharged? Is water vapor exhaust discharged to the atmosphere or a condenser? Does the system generate airborne radioactive effluents; if yes, how will these effluents be evaluated for compliance with 10 CFR Part 20?

G. Describe the methods and equipment that will be used to conduct a radiological analysis of the solids removed from the evaporator. How will these solids be removed from the evaporator system?

H. Develop and submit a Standard Operating Procedure for monitoring and surveillance of the evaporator system.

Solids accumulate on a collection plate ... checked by ... ?

... would be O.K. for H.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
801 WARRENVILLE ROAD
LISLE, ILLINOIS 60532-4351

Attachment C

DRAFT

Advanced Medical Systems, Inc.
ATTN: David Cesar, Treasurer
121 North Eagle Street
Geneva, OH 44041

Dear Mr. Cesar:

We have reviewed your March 22, 1995 amendment request as supplemented by letter dated June 8, 1995 and find that we need additional and clarifying information concerning your request to evaporate processed water. Our requests and our concerns/questions associated with evaporator operations each are provided below.

Evaporation of Processed Water Stored in the Warehouse

A. Our review of your permit application to the EPA, submitted to us as an enclosure to letter dated June 8, 1995, provides information that may not reflect recent changes in the water processing project as it relates to the concentration and volume of processed water. These recent changes may alter your cobalt-60 evaporation source term. Specifically, for 1995, your EPA permit application and COMPLY code report assume evaporation of 60,000 gallons of water containing a cobalt-60 concentration of 200 pCi/l. This volume of water appears to be an underestimate. Also, as authorized in Amendment No. 34, dated June 9, 1995, a cobalt-60 concentration of 1000 pCi/l may be more appropriate. Based on these recent changes, and a June 13, 1995 telephone conversation between Wayne Slawinski and Mike Weber of the NRC and Mike Murpby of the US EPA, it is our understanding that you may need to re-apply to the EPA for installation and operation of the evaporator. Please advise us as to the applicability of resubmitting your application to the EPA.

B. Describe where the evaporator will be installed within your facility as well as who will install the system and provide training to the operators.

C. Submit an evaluation of the potential fire hazard due to operation of the evaporator system inside your facility. Also, we are concerned that operation of the evaporator system may generate sufficient heat to actuate the facility's automatic fire suppression systems. Please address this issue as well.

D. Please indicate if the system will be used during unoccupied hours. Also, describe the systems' automatic operation and shutdown capabilities. Specifically, if the system is not continually monitored during its operation, please describe system controls designed to detect excessive heat buildup and actuate system shutdown.

DRAFT

E. Describe the water feed system from the 25,000-gallon collapsible storage bladders to the evaporator. If the feed system is automatic and will be operated unattended, also describe its automatic shutdown and safety features to prevent spills and overflows.

F. Please indicate where evaporator effluents for "water vapor" and "burner exhaust" will be discharged. Is water vapor exhaust discharged to the atmosphere or a condenser? Does the system generate airborne radioactive effluents? If yes, you must demonstrate how you will evaluate the effluents for compliance with 10 CFR Part 20.

G. Describe the methods and equipment that will be used to conduct a radiological analysis of the solids removed from the evaporator. Also, describe how these solids be removed from the evaporator system.

H. Develop and submit a Standard Operating Procedure for monitoring and surveillance of the evaporator system during operation.

Advanced Medical Systems, Inc.
1020 London Road
Cleveland, OH 44110
(216) 692-3270

Attachment D

June 8, 1995

Mr. James Caldwell
Nuclear Materials Inspection, Section 2
United States Nuclear Regulatory Commission
801 Warrenville Road
Lisle, Illinois 60523-4351

Re: Application to Amend License No. 34-19089-01

Dear Mr. Caldwell:

On March 22, 1995, Advanced Medical Systems, Inc. (AMS) requested an amendment of License No. 34-19089-01 to permit evaporation of water stored in the warehouse of the London Road facility. On June 8, 1995, Mr. Wayne Slawinski forwarded to us a series of questions that pertain to this request. The following are our responses.

A. What is the status of the City of Cleveland/EPA evaporation permit request?
The City of Cleveland relinquished jurisdiction on this issue to the U. S. Environmental Protection Agency on May 5, 1995 (see Attachment 1). Mr. Michael H. Murphy (USEPA Region 5) reviewed our permit application (see Attachment 2) and gave verbal authorization to proceed to David Cesar (AMS) on or about May 23, 1995. His written authorization is expected shortly. We will forward a copy to you immediately upon receipt.

B. Where will be evaporator be installed within your facility? Who will install the system and provide training in its operation?
AMS intends to install the evaporator in the warehouse at the location shown on the map enclosed in the permit application (see Attachment 2). However, the recommendations of the installation contractor will be taken into account before the final siting decision is made. We anticipate using the services of McPhillips Plumbing, Heating and Airconditioning (Cleveland, Ohio) to provide the installation services (e.g., gas, water and electrical plumbing). However, if McPhillips cannot accommodate our installation schedule, another local company will be contracted. Training in the proper operation of the system will be provided to AMS by the vendor.

C. Has operation of the evaporator system inside your facility been evaluated as a potential fire hazard? For example, will evaporator system operation generate sufficient heat to actuate the facility's automatic fire suppression systems?

The evaporator design is fully automated for unattended operation in facilities like the AMS warehouse. Monitors and sensors report on the temperature of fluid in the evaporator tank, and the unit is automatically shut down if elevated temperature conditions exist. There is no viable mechanism whereby sufficient heat can be generated to actuate the facility's fire suppression system.

D. Is system use planned during unoccupied hours? What are the system's automatic operation and shutdown capabilities? Specifically, if the system is not continually monitored during its operation, what features detect excessive heat buildup and actuate system shutdown.

See response to Question C. The permit applications (Attachment 2) were based upon an assumption of continuous (24-hour) operation. However, final decisions on operating hours will not be made until system installation, check-out, and final procedure development. The system will not be operated unattended if AMS, the evaporator vendor or the isntallation contractor deems it unsafe to do so.

E. Describe the water feed system from the 25,000 gallon collapsible storage bladders to the evaporator. If the feed system is automatic and will be operated unattended, also describe its automatic shutdown and safety features to prevent spills and overflows.

See response to Questions C and D. The type and operating procedures for the feed system will be determined by the evaporator vendor and the installation contractor. Whether the sytem will be operated unattended or not, applicable safety and spill-control procedures will be developed and implemented prior to routine system operation.

F. Where will evaporator effluents for "water vapor" and "burner exhaust" be discharged? Is water vapor exhaust discharged to the atmosphere or a condenser? Does the system generate airborne radioactive effluents; if yes, how will these effluents be evaluated for compliance with 10 CFR Part 20?

The stack description and discharge mechanism is described in the permit applications (Attachment 2). The system to be installed is a small-scale system, capable of evaporating only 30 to 37 gallons per hour. In addition, there is no mist carryover from the unit. Therefore, radionuclide emissions will not occur. However, for the purposes of permitting and demonstrating compliance with USNRC (10 CFR 20) and USEPA (40 CFR 61, Appendix D) requirements, and to permit the use of a computer model for determining off-site population doses, a mist carryover rate and an emission factor of 100% was assumed. Using the COMPLY code, the postulated annual emissions using this unrealistically-conservative scenario, are 45.4 microcuries in 1995 (during the current remediation effort) and 37.9 microcuries for future years (if it continues to be used). Consequently, the effective dose equivalent calculated for the maximally-exposed individual (Level 4 Compliance) is 1.2 millirem during 1995.

G. Describe the methods and equipment that will be used to conduct a radiological analysis of the solids removed from the evaporator. How will these solids be removed from the evaporator system?

The specific procedure for removal and analysis of solids will be determined after system installation and checkout. Analytical methodologies being considered include gross screening, gamma spectroscopy, and others that would typically be used to determine the radiological constituents in solids.

H. Develop and submit a Standard Operating Procedure for monitoring and surveillance of the evaporator system.

A standard operating procedure (ISP) for operation and surveillance of this unit will be developed after system installation and checkout. The procedure will be reviewed and approved by the AMS RSO and the Isotope committee prior to implementation.

We hope that this information will permit you to complete your evaluation of our request to evaporate the treated water that currently exists in the warehouse at the AMS building. However, please call me at (216) 692-3270 if additional information is required. We are looking forward to your timely authorization to proceed.

Sincerely,

Robert Meschter

Robert Meschter, RSO

cc: D. Cesar
D. A. Miller, Esq., Stavole & Miller

ATTACHMENT 1
LETTER FROM THE CITY OF CLEVELAND

City of Cleveland

MICHAEL R. WHITE, MAYOR

DEPARTMENT OF LAW
SHARON BOBIK JORDAN
DIRECTOR

ROOM 106 • CITY HALL
601 LAKESIDE AVENUE
CLEVELAND, OHIO 44114
(216) 664-2800

May 5, 1995

Post-it™ Fax Note 7671	Date 5-9	# of pages ▶ 2
To Carol Berger	From David Cesar	
Co./Dept.	Co. AMS	
Phone #	Phone # 216/466-4671	
Fax # 301/762-0638	Fax #	

Advanced Medical Systems, Inc.
David Cesar, Treasurer
121 North Eagle Street
Geneva, Ohio 44041

Re: Permit Applications for 1020 London Road
By FAX an Regular U. S. Mail

Dear Mr. Cesar:

As I informed you during our meeting on Wednesday, April 26, 1995, the City forwarded the two permit applications received from AMS, one for excavation of the lateral and manhole, and one for the installation and operation of the evaporation system, to the Region V offices of the United States Environmental Protection Agency (US EPA). As US EPA Inspector Mike Murphy explained at our meeting, the US EPA's Air and Radiation Division has jurisdiction over, and technical ability to permit and monitor these activities.

Since the US EPA is the proper permitting agency, and is responsible for approving the methodology, issuing the terms and conditions for the permits needed for both the excavating and the evaporating, and overseeing the work, you do not need a permit from the City to begin work on these projects. The forty dollar ($40.00) permit application fee submitted by Longo Construction was inadvertently sent to the US EPA Region V offices along with the applications. I am in the process of trying to track down that check and return it to your contractor.

If you have any questions before or during this proposed work at 1020 London Road, please do not hesitate to call me at (216) 664-4332.

Very truly yours,

Martha R. McCorkle

cc: Mike Murphy, US EPA
Jack Barnet, US EPA
John Madera, US NRC
Tom Lenhart, NEORSD
Larry English, NEORSD
Michael Kalstrom, LEPC
Dwight Miller, Stavole & Miller
Judith Zimomra, Mayor's Office
Tom Root, Division of Fire
Robert Staib, Department of Public Health
William M. Ondrey Gruber, Law
[illegible] Thomas, Division of Building and Housing

ATTACHMENT 2
APPLICATION FOR PERMIT TO INSTALL (Enclosure 1)
AND
APPLICATION FOR PERMIT TO OPERATE (Enclosure 2)

Enclosure 1

Application for Permit to Install

AMS Evaporator System

FOR OFFICE USE ONLY	
Description	
Control No.	
Fee	
TI	
I	
PTO	
S-PTO	
Date S Received	

City of Cleveland
Division of Air Pollution Control

PERMIT APPLICATION

Thoroughly complete and sign this application in ink for each source. The Appendix and other information contained in the Ohio EPA application for this source will be incorporated into this City of Cleveland application. Additional information may be requested.

Advanced Medical Systems
Facility Name (where the source is or will be located)

1020 London Road
Facility Address

Cleveland Ohio 44110
City State Zip Code

(216) 692-3270
Area Code Telephone No.

Mr. Bob Meschter
Person to Contact (for Facility)

1020 London Road
Mailing Address (for Facility)

Cleveland Ohio 44110
City State Zip Code

(216) 692-3270
Area Code Telephone No.

1. Description of Source: Water Evaporation System for Rainwater Inleakage

2. Identification for Source: Evaporator

3. Is this permit application for the control equipment only? ☐Yes ☒No
   Describe:

4. Ohio EPA permit you requested for the Source: (check one)
   ☒Permit to Install or Modify ☐Permit to Operate ☐Variance to Operate

5. Name the Appendix you attached to the Ohio EPA application for this Source: (refer to the attached list of Appendix letters and descriptions) Appendix A - Process

6. Date you submitted this Ohio EPA application: March 21, 1995

7. Your Ohio EPA application number, if assigned:

8. I am the individual specified in Chapters 257 and 259 of the Air Pollution Code of the City of Cleveland. I hereby apply for a (check one)

   X Permit to Install or Modify (complete No.9 on back)
   _____ Permit to Operate
   _____ Variance to Operate

for the air contaminant source described herein. An Ohio EPA application for the same source has been or is currently being filed with the City of Cleveland Division of Air Pollution Control. The Appendix and all other information submitted therewith for an Ohio EPA permit is hereby incorporated into this application for a City of Cleveland permit. I have reviewed all information submitted and find it to be true and complete to the best of my knowledge.

David Cesar
AUTHORIZED PERSON'S NAME (PLEASE PRINT)

AUTHORIZED PERSON'S SIGNATURE

Treasurer
TITLE

FOR OFFICE USE ONLY: CHECK APPROPRIATE BOX

_____ Air Discharge

_____ Water Discharge to New Source Treatment Works

_____ Solid Waste Disposal Facility

_____ Hazardous Waste Disposal Facility

FOR OFFICE USE ONLY

PTI Application No. _____

Date Received _____

Premise No. _____

OHIO ENVIRONMENTAL PROTECTION AGENCY
APPLICATION FOR PERMIT TO INSTALL

Advanced Medical Systems
Applicant's Name

1020 London Road
Mailing Address

Cleveland	Cuyahoga	Ohio	44110	(216) 692-3270
City	County	State	Zip	Telephone Number

Mr. Bob Meschter (216) 692-3270
Person to contact (Name and Title and Telephone Number)

1020 London Road
Location of Proposed Facility (specific street and number, ie. 555 E. Montroe St.)

Cleveland	Cuyahoga	44110	
City or Township	County	Zip Code	Standard Industrial Classification Code

Directions: A Permit to Install is required for new or modified source of pollution under the provisions of OAC Rule 3745-31. An application cannot be considered complete unless all applicable questions are answered and the required information has been submitted. This application must be signed in accordance with OAC Rule 3745-31-04(B) or it cannot be accepted.

Applications for permits involving air emissions or wastewater treatment facilities will be required to pay a permit to install fee as shown in Section 3745.11(B) and (C) of the Ohio Revised Code. This fee is payable thiry days after the date of final issuance of the permit.

Name of new or modified source or facility: Water Evaporation System

Product of new or modified source/facility: Water Containing Radioactivity

Will the proposed source/facility involve any of the following: Check all that apply.

A. X Air Discharge
B. _____ Wastewater Treatment Works
C. _____ Solid Waste Disposal Facility
D. _____ Hazardous Waste Disposal Facility

you wish to request permit to install registration status via OAC 3745-31-05(E)?

_____ yes X no

OHIO ENVIRONMENTAL PROTECTION AGENCY

INSTALLATION SCHEDULE

THIS FORM CONSTITUTES PART OF THE APPLICATION OF:

FACILITY NAME: Advanced Medical Systems

ADDRESS: 1020 London Road, Cleveland, Ohio, 44110

FOR A PERMIT TO INSTALL THE FOLLOWING AIR CONTAMINANT SOURCE:

IDENTIFICATION: Water Evaporation System

DESCRIPTION: Evaporator to concentrate radioactivity in water

THE INSTALLATION OF THE ABOVE AIR CONTAMINANT SOURCE IS PLANNED TO FOLLOW THE TIME SCHEDULE DESCRIBED BELOW:

	DATE
1. EQUIPMENT ORDERED	3/21/95
2. COMMENCE CONSTRUCTION	5/26/95
3. STARTUP	6/09/95
4. PERFORMANCE TESTING	6/09/95

Note: If this source has already been installed then you must still fill out this form using the actual dates the above events occured.

Appendix A - Process: for sources not included in the other appendices.

Appendix B - Fuel-Burning Equipment: for any furnace, boiler, apparatus, and all appurtenances thereto, used in the process of burning fuel with the primary purposes of producing heat or power by indirect heat transfer.

Appendix C - Incinerator: for any equipment, machine, device, article, contrivance, structure or part of a structure used to burn refuse or to process refuse material by burning other than by open burning.

Appendix D - Surface Coating or Printing Operation: for a surface coating operation not included under Appendix K or for a printing operation.

Appendix E - Storage Tank: a storage tank for petroleum liquids.

Appendix H - Gasoline Dispensing Facility: any site where goasoline is dispensed to motor vehicle gasoline tanks from stationary storage tanks.

Appendix J - Loading Rack at a Bulk Gasoline Plant or Terminal: an operation for transferring gasoline to a delivery vessel.

Appendix K - Surface coating line: a coating line consists of one or more coating applicators, flash-off areas or ovens to be used for the following: an automobile or light-duty truck assembly plant; can manufacturing; coil-coating; fabric coating; large appliance coating; magnet wire coating; metal furniture coating; paper coating; vinyl coating.

Appendix L - Solvent Metal Cleaning: an operation employing solvent for cleaning metal surfaces; wipe-cleaning is excluded.

Appendix M - Fugitive Dust Emission Sources (See List Below)

Appendix O - Dry Cleaning Facility

Appendix P - Landfill

General:

M1-1 - Plant Roadways and Parking Areas
M1-2 - Aggregate Storage Piles
M1-3 - Material Handling
M1-4 - Mineral Extraction

Iron and Steel Mills:
- M2-1 - Coke Manufacturing
- M2-2 - Iron Production
- M2-3 - Steel Manufacture

M3 - Lime Plants
M4 - Power Plants
M5 - Grain Terminals
M6 - Country Grain Elevators
M7 - Gray Iron Foundries
M8 - Steel Foundries
M9 - Glass Manufacturing
M10 - Fiberglass Manufacturing
11 - Secondary Aluminum Processing Plt
M12 - Fertilizer Mixing/Blending Plants
M13 - Cement Manufacturing & Blending Plans
M14 - Ferroalloy Production
M15 - Metal Salvage Operations
M16 - Pulp and Paper Mills
M17 - Woodworking Operations
M18 - Aggregates Processing Plants
M19 - Coal Processing Plants
M20 - Brick & Related Clay Product Mfg. Plts.
M21 - Asphaltic Concrete Plants
M22 - Concrete Batching Plants
M23 - Sandblasting Operations
M24 - Petroleum Refineries
M25 - Agricultural Chemical Mfg Plts.
M26 - Bulk Gasoline Terminals
M27 - Carbon Black Plants
M28 - Municipal Incineration
M29 - Salt Processing Operations
M30 - Galvanizing Plants

Response to Questions

Ohio Environmental Protection Agency
Application for Permit to Install

1. **Describe the product or service to be produced by the applicant along with a description of the proposed source/facility.**

Advanced Medical Systems, Inc. (AMS) owns a facility that was once used to fabricate sealed radioactive sources utilizing the radioactive element Cobalt-60. This fabrication operation ceased prior to 1989.

The Northeast Ohio Regional Sewer District has stopped accepting sanitary and storm water from the AMS facility. Rainwater has accumulated in the facility's drains and its basement. The water, whose volume currently totals approximately 60,000 gallons, contains Cobalt-60 in concentrations that range from 500 to 500,000 picocuries/liter (pCi/L).

AMS has contracted a firm to treat the accumulated water on site. The treated water, with a Cobalt-60 concentration less than 200 pCi/L, will be initially stored in tanks onsite. In order to dispose of the treated water, AMS is proposing the installation of an evaporator system to vent the excess water in vapor form. Concentrates from the evaporator will be collected, converted to a solid form, and stored onsite.

After the initial treatment of water is completed, AMS would like to have the capability to treat additional water through the evaporator, in the event spills or flooding occurs. This permit application was prepared assuming that up to 10,000 gallons/year will be treated in the evaporator, with Cobalt-60 concentrations up to 1,000 pCi/L.

2. **List the name and quantity of all chemicals (solid, liquid, or gaseous) that will be used or produced by the source/facility.**

The estimated quantities by year of water and Cobalt-60 are as follows:

Year	Water (gals)	Cobalt-60 (μCi)
1995	60,000	45.4
Future Years	10,000	37.9

3. **State the reason for the application. Is this a new installation, modification to an existing source/facility, reconstruction of an existing source/facility, or startup of a source/facility that has been permanently shutdown for ____ years?**

This application is for a new installation. The reason for the application is to obtain state

approval for the installation of an evaporator to remove water from a wastestream containing Cobalt-60.

4. **Has a previous Ohio EPA application or plan submission been filed for this source/facility? If so, state the date and type of the application previously submitted.**

This is the initial application for the proposed evaporator.

5. **Will the proposed source/facility comply with all rules, laws, and regulations of Ohio EPA and U. S. EPA?**

The proposed evaporator will comply with all Ohio EPA and U. S. EPA rules, laws, and regulations.

6. **State the amount of each air contaminant (actual emissions) from each source in pounds per hour and tons per year at maximum and average conditions.**

The only potential contaminant that might be emitted is Cobalt-60. The manufacturer of the evaporator states that there will be no mist carryover from the unit, so Cobalt-60 emissions will not occur. For the purposes of this permit application, a mist carryover rate of 0.001 is assumed. This value was obtained from the report, "Recommended Values and Technical Bases for Airborne Release Fractions (ARFs), Airborne Release Rates (ARRs), and Respirable Fractions (RFs) for materials from Accidents in the DOE Fuel Cycle, Ex-Reactor Facilities (Revision 2)," by Jofu Mishima (dated 4/21/93). Using this value, the following average and maximum emissions of Cobalt-60 are as follows:

Emissions	Rate (pCi/hour)
Average	252
Maximum	568

To determine compliance with the U. S. EPA's National Emission Standards for Hazardous Air Pollutants, an emissions factor of 1.0 was used in accordance with 40 CFR 61, Appendix D. The postulated annual emissions to be used in the COMPLY code are therefore:

Year	Co-60 Annual Emissions (μCi)
1995	45.4
Future Years	37.9

7. **Are the proposed sources required to comply with the following federal requirements?**

   i. **New Source Performance Standards (NSPS)**
   ii. **National Emissions Standards for Hazardous Air Pollutants (NESHAPS)**
   iii. **Prevention of Significant Deterioration (PSD)**
   iv. **Appendix "S" - Emission Offset Policy**

Since the AMS facility is a U.S. Nuclear Regulatory Commission (NRC) licensee, it is required to meet the requirements of 40 CFR 61, Subpart I ("National Emissions Standards for Radionuclide Emissions from Facilities Licensed by the Nuclear Regulatory Commission and Federal Facilities Not Covered by Subpart H"). In accordance with this regulation, emissions from the proposed evaporator were modeled using the U. S. EPA COMPLY Code. The results of this modeling are attached.

8. **Will the proposed sources employ best available technology?**

AMS considers the evaporator system to be the best available technology for the wastewater provided.

9. **Will the proposed sources cause the significant degradation in air quality?**

No.

10. **Will the proposed sources interfere with the attainment and maintenance of ambient air quality standards?**

No.

11. **Describe any source monitoring, emission monitoring, or control equipment monitoring devices to be installed by the applicant.**

Cobalt-60 concentrations in any accumulated water will be measured before it is introduced into the evaporator, to ensure that the concentrations are below the 1,000 pCi/L limit. Based on the output of the COMPLY Code, there is no need for emissions monitoring. The evaporator is highly instrumented with temperature and water level controls to ensure that the unit is operating properly. If any operating parameter exceeds it acceptable range, the evaporator will shut down automatically.

12. **Will the proposed sources involve the use of asbestos, benzene, beryllium, mercury, or vinyl chloride?**

No.

13. **Complete and attach an anticipated construction schedule for each proposed source.**

The proposed installation schedule is as follows:

Equipment Purchase	3/21/95
Installation Begun	5/26/95
Start-up of Unit	6/9/95
Performance Testing	6/9/95

14. **Please include the estimated cost of any air pollution control equipment to be installed on the proposed source.**

The evaporator system, including hardware and installation, is estimated to cost $45,000.

15. **An appendix for each air contaminant source must accompany this application. From the following description of the appendices, determine which should accompany your application.**

Appendix A (Process: for sources not included in the other appendices) is included in this application.

40 CFR Part 61
National Emission Standards
for Hazardous Air Pollutants

REPORT ON COMPLIANCE WITH

THE CLEAN AIR ACT LIMITS FOR RADIONUCLIDE EMISSIONS

FROM THE COMPLY CODE, VERSION 1.5d

Prepared by:

Advanced Medical Systems
1020 London Road
Cleveland, Ohio, 44110

Mr. Bob Meschter, RSO
(216) 692-3270

Prepared for:

U.S. Environmental Protection Agency
Office of Radiation Programs
Washington, D.C. 20460

COMPLY: V1.5d. 3/13/95 1:55

porator Vent System Assessment

SCREENING LEVEL 2

DATA ENTERED:

Nuclide		Release Rate (curies/YEAR)
CO-60	Y	4.540E-05

Release height 8 meters.

Building height 6 meters.

The source and receptor are not on the same building.

Distance from the source to the receptor is 43 meters.

Building width 55 meters.

Default mean wind speed used (2.0 m/sec).

NOTES:

Input parameters outside the "normal" range:

None.

RESULTS:

Effective dose equivalent: 5.7 mrem/yr.

*** Comply at level 2.

COMPLY: V1.5d. 3/13/95 1:55

vaporator Vent System Assessment

SCREENING LEVEL 3

DATA ENTERED:

He produces his own VEGETABLES at home.

He produces his own MILK and MEAT at home.

NOTES:

Input parameters outside the "normal" range:

None.

RESULTS:

Effective dose equivalent: 5.7 mrem/yr.

*** Comply at level 3.

COMPLY: V1.5d. 3/13/95 1:55

orator Vent System Assessment

SCREENING LEVEL 4

DATA ENTERED:

He produces his own MILK at home.

He produces his own MEAT at home.

NOTES:

Input parameters outside the "normal" range:

None.

RESULTS:

Effective dose equivalent: 1.2 mrem/yr.

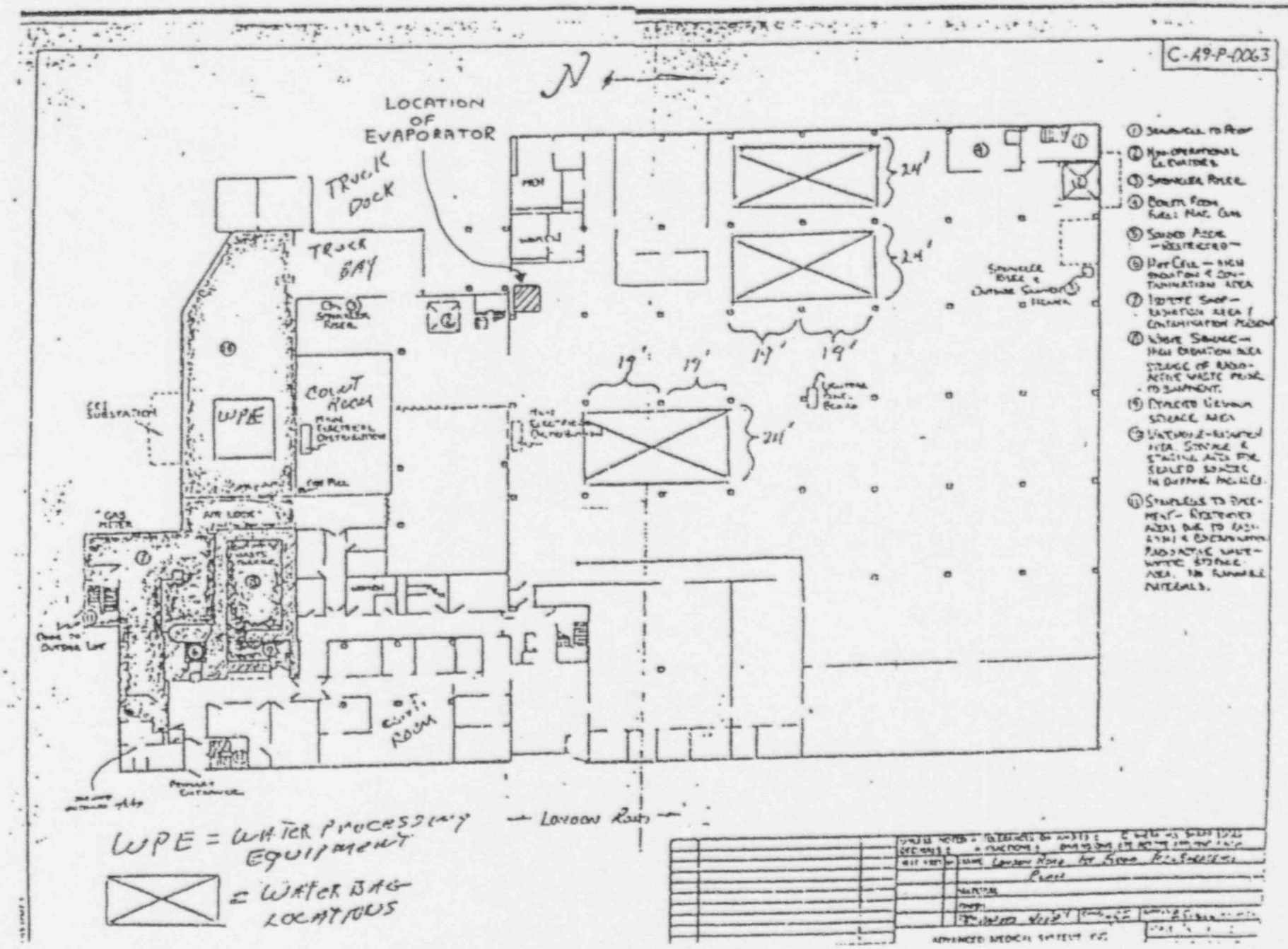
*** Comply at level 4.

This facility is in COMPLIANCE.

It may or may not be EXEMPT from reporting to the EPA.

You may contact your regional EPA office for more information.

********** END OF COMPLIANCE REPORT **********


C-A9-P-0063
N
LOCATION OF EVAPORATOR
TRUCK DOCK
TRUCK BAY
WPE
COUNT ROOM
AIR LOCK
24'
24'
19'
19'
19'
19'
21'
LONDON ROAD
WPE = WATER PROCESSING EQUIPMENT
= WATER BAG LOCATIONS

FOR OFFICIAL USE ONLY

mise No. _____
rce No. _____

APPENDIX A, PROCESS

PROCESS DATA

1. Name of process Water Evaporation System

2. End product of this process Concentrated Water containing Radioactivity

3. Primary process equipment Evaporator

   Your identification E-01 Year Installed 1995

4. Manufacturer Power Plant Service, Inc. Make or Model E-300

5. Capacity of equipment (lbs./hr): Rated 250 Max. 250

6. Method of exhaust ventilation: ☒ Stack ☐ Window fan ☐ Roof vent
   ☐ Other, describe _____

   Are there multiple exhausts? ☐ Yes ☒ No

OPERATING DATA

7. Normal operating schedule: 24 hrs./day, 7 days/wk., 6 wks./year.

8. Percent annual production (finished units) by season:
   Winter 50 Spring 50 Summer ____ Fall ____

9. Hourly production rates (lbs.): Average 250 Maximum 250

10. Annual production (indicate units) 222,000 lbs.
    Projected percent annual increase in production 0

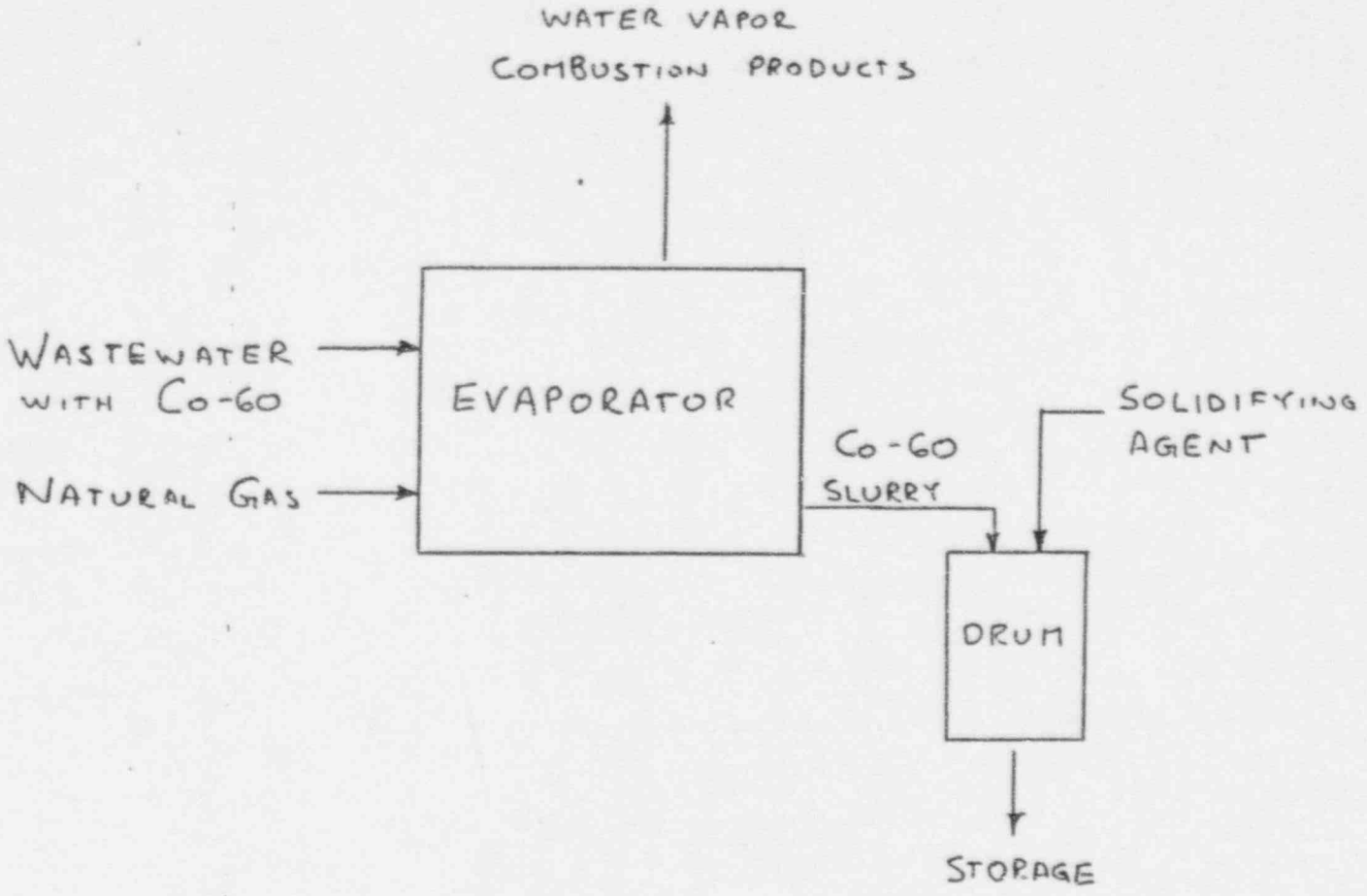
11. Type of operation: ☐ Continuous ☒ Batch

12. If batch, indicate Minutes per cycle 6000 Minutes between cycles 23200

13. Materials used in process:

List of Raw Materials	Principal Use	Amounts (lbs./hr.)
Water	Vaporization	250
Natural Gas	Heat Source	4.2 Therms/hour
Cobalt-60	Solidification	0.11 microCi/hr.

PROCESS FLOW DIAGRAM MUST BE INCLUDED WITH THIS APPENDIX. Show entry and exit points of all raw materials, intermediate products, by-products and finished products. Label all materials including airborne contaminants and other waste materials. Label the process equipment and control equipment.



PROCESS FLOW DIAGRAM

Enclosure 2

Application for Permit to Operate

AMS Evaporator System

FOR OFFICE USE ONLY
Description
Control No.
Fee
C
S
E-PTC
Date S Received

City of Cleveland
Division of Air Pollution Control

PERMIT APPLICATION

Thoroughly complete and sign this application in ink for each source. The Appendix and other information contained in the Ohio EPA application for this source will be incorporated into this City of Cleveland application. Additional information may be requested.

Advanced Medical Systems Facility Name (where the source is or will be located)	Mr. Bob Meschter Person to Contact (for Facility)
1020 London Road Facility Address	1020 London Road Mailing Address (for Facility)
Cleveland Ohio 44110 City State Zip Code	Cleveland Ohio 44110 City State Zip Code
(216) 692-3270 Area Code Telephone No.	(216) 692-3270 Area Code Telephone No.

1. Description of Source: Water Evaporation System for Rainwater Inleakage
2. Identification for Source: Evaporator
3. Is this permit application for the control equipment only? ☐Yes ☒No
   Describe: _____
4. Ohio EPA permit you requested for the Source: (check one)
   ☐Permit to Install or Modify ☒Permit to Operate ☐Variance to Operate
5. Name the Appendix you attached to the Ohio EPA application for this Source: (refer to the attached list of Appendix letters and descriptions) Appendix A - Process
6. Date you submitted this Ohio EPA application: March 21, 1995
7. Your Ohio EPA application number, if assigned: _____
8. I am the individual specified in Chapters 257 and 259 of the Air Pollution Code of the City of Cleveland. I hereby apply for a (check one)
   _____ Permit to Install or Modify (complete No.9 on back)
   __X__ Permit to Operate
   _____ Variance to Operate
   for the air contaminant source described herein. An Ohio EPA application for the same source has been or is currently being filed with the City of Cleveland Division of Air Pollution Control. The Appendix and all other information submitted therewith for an Ohio EPA permit is hereby incorporated into this application for a City of Cleveland permit. I have reviewed all information submitted and find it to be true and complete to the best of my knowledge.

David Cesar
AUTHORIZED PERSON'S NAME (PLEASE PRINT)

AUTHORIZED PERSON'S SIGNATURE

Treasurer
TITLE

OHIO ENVIRONMENTAL PROTECTION AGENCY
APPLICATION FOR A PERMIT TO OPERATE
AN AIR CONTAMINANT SOURCE

Advanced Medical Systems Facility Name	Mr. Bob Meschter Person to Contact
1020 London Road Facility Address	1020 London Road Mailing Address
Cleveland Cuyahoga 44110 City County Zip	Cleveland Ohio 44110 City State Zip
(216) 692-3270 Telephone Area Number	(216) 692-3270 Telephone

(Application No., if this is a renewal application) Std. Ind: Class: Code

1. Complete and attach any of the following appendices most appropriate to the air contaminant source. In addition, a compliance time schedule form is to be attached when applicable. Check as appropriate the following:

X Appendix A, Process	___Appendix L, Solvent Metal Cleaning
___Appendix B, Fuel-Burning Equipment	___Appendix M, Fugitive Dust Emission Sources
___Appendix C, Incinerator	___ Specify Appendix No.
___Appendix D, Surface Coating or Printing Operation	___Appendix N, Rubber Tire Manufacturing
___Appendix E, Storage Tank	___Appendix O, Dry Cleaning Facility
___Appendix H, Gasoline Dispensing Facility	___Appendix P, Landfills
___Appendix J, Loading Rack at Bulk Gasoline Plant or Terminal	___Other Appendix ___
___Appendix K, Surface Coating Line or Printing Line	___Compliance Time Schedule

2. Description of Source (same as used on appendix): Evaporator

3. Your identification for Source (same as used on appendix): Water Evaporation System

I, being the individual specified in Rule 3745-35-02(B) of the Ohio Administrative Code, hereby apply for a Permit to Operate the air contaminant source(s) described herein. As required, the following additional documents are submitted as part of this application (describe all attachments):

David Cesar
Authorized Signature*

Treasurer
Title

March 21, 1995
Date

*Pursuant to OAC Rule 3745-35-02(B) (Permit to Operate).

M5 - Grain Terminals
M6 - Country Grain Elevators
M7 - Gray Iron Foundries
M8 - Steel Foundries
M9 - Glass Manufacturing Plants
M10 - Fiberglass Manufacturing
M11 - Secondary Aluminum Processing Plants
M12 - Fertilizer Mixing/Blending Plants
M23 - Sandblasting Operations
M24 - Petroleum Refineries
M25 - Agricultural Chemical Manufacturing Plants
M26 - Bulk Gasoline Terminals and Plants
M27 - Carbon Black Plants
M28 - Municipal Incineration
M29 - Salt Processing Operations
M30 - Galvanizing Plants

Appendix N - Rubber Tire Manufacturing
Appendix O - Dry Cleaning Facility
Appendix P - Landfill

There are separate instructions with each appendix. If more than one application form is submitted at one time, it is acceptable to use photocopies of these forms containing identical data entry; however, each application must contain an original signature.

The following Sections of Chapter 3745-35 of the Ohio Administrative Code provide the applicant with information regarding air contaminant sources, permits to operate and variances. A complete copy of OAC Rule 3745-35 is available upon request.

OAC Rule 3745-35-01(B)(1) "Air Contaminant Source" shall mean any machine, device,appartaus, equipment, building, or other physical facility that emits or may emit any air pollutant.

OAC Rule 3745-35-02(A) Except as otherwise provided in Parargraph (H) of this rule and in rules 3745-35-03 and 3745-35-05 of the Administrative Code, no person may cause, permit, or allow the operation or other use of any air contaminant source without applying for and obtaining the permit to operate from the Ohio Environmental Protection Agency in accordance with the requirements of this rule.

OAC Rule 3745-35-03 (A) No person shall cause, permit or allow the operation or other use of any air contaminant source that emits any air pollutant in violation of any applicable air pollution control law, unless a variance has been applied for and obtained from the director for such source, pursuant to the provisions of this rule. No variance from any rule of the director adopted under Chapter 3704 of the Revised Code may be issued except pursuant to this rule.

Signature on Application Form:

OAC Rule 3745-35-02(B)(1) Applications for permits to operate shall be signed, in the case of a corporation, by a principal executive officer of at least the level of vice president, or his duly authorized representative, if such representative is responsible for the overall operation of the facility from which the emission described in the application originates.

(2) Applications for permits to operate shall be signed, in the case of partnership, by a general partner.
(3) Applications for permits to operate shall be signed, in the case of sole proprietorship, by the proprietor.
(4) Applications for permits to operate shall be signed, in the case of municipal, state, federal or other governmental facility, by the principal executive officer, the ranking elected official, or other duly authorized

NON OFFICIAL USE ONLY

License No. _____
Source No. _____

APPENDIX A, PROCESS

PROCESS DATA

1. Name of process Water Evaporation System

2. End product of this process Concentrated Water containing Radioactivity

3. Primary process equipment Evaporator

   Your identification E-01 Year Installed 1995

4. Manufacturer Power Plant Service, Inc. Make or Model E-300

5. Capacity of equipment (lbs./hr): Rated 250 Max. 250

6. Method of exhaust ventilation: ☒ Stack ☐ Window fan ☐ Roof vent ☐ Other, describe _____

   Are there multiple exhausts? ☐ Yes ☒ No

OPERATING DATA

7. Normal operating schedule: 24 hrs./day, 7 days/wk., 6 wks./year.

8. Percent annual production (finished units) by season:
   Winter 50 Spring 50 Summer ____ Fall ____

9. Hourly production rates (lbs.): Average 250 Maximum 250

10. Annual production (indicate units) 222,000 lbs.
    Projected percent annual increase in production 0

11. Type of operation: ☐ Continuous ☒ Batch

12. If batch, indicate Minutes per cycle 6000 Minutes between cycles 23200

13. Materials used in process:

List of Raw Materials	Principal Use	Amounts (lbs./hr.)
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Natural Gas	Heat Source	4.2 Therms/hour
Cobalt-60	Solidification	0.11 microCi/hr.

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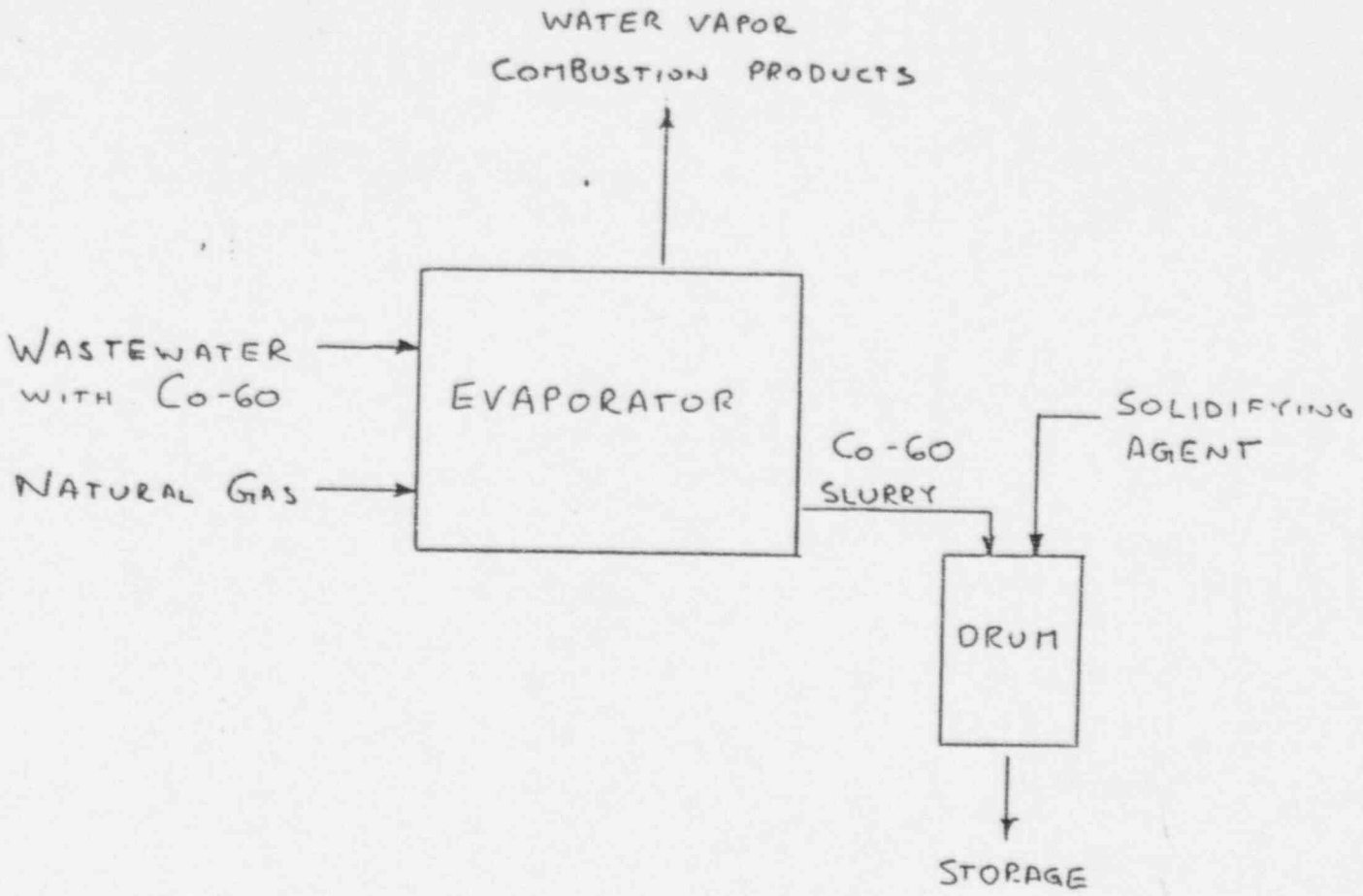

PROCESS FLOW DIAGRAM