JUN 1 4 1995

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 your letter dated June 13, 1995, and find that we need additional and clarifying information on each of your requests. Questions regarding your request to evaporate processed water will be provided under separate cover. Our concerns/questions associated with each of your other requests are provided as follows:

I. Installation of a Sampling Device in the New Lateral Connection

We have no objection to the installation of a composite water sampling device in the new lateral connection. However, the purpose of the sampling system is unclear. The water sampling device as currently proposed cannot be used to demonstrate compliance with 10 CFR Part 20.2003, since water samples are collected and analyzed after the release into the sewerage system has occurred.

If your intent is to use the sampling system to show compliance with 10 CFR 20.2003, the system will need to be modified to detect the concentrations of radioactive material in the waste water effluent prior to or during its release and include an isolation capability to terminate the discharge if it exceeds 10 CFR 20 limits. Consequently, please provide the following information:

A. Describe the purpose of the water sampling system.

B. Describe your proposed methods for demonstrating compliance with 10 CFR Part 20.2003 for disposal by release into the sanitary sewerage system, prior to a given discharge.

If the composite sampler will be used to demonstrate compliance with 10 CFR Part 20.2003, or will be used to confirm results of other analyses, please respond to the following additional questions.

C. What modifications will be made to the proposed sampling system that will enable it to be used to evaluate discharges to the sewerage system prior to each discharge?

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D. How is a sample collected during a given discharge? Specifically, is a sample aliquot collected from each discharge of water into the sewerage system? What is the volume of the sample collected?

E. If a sample aliquot is collected of a given discharge, what provisions will be implemented to ensure the aliquot is representative of the total discharge?

F. What is the percent (or relative volume) of the total discharge that will be sampled by the system (i.e., sample to sewerage system discharge ratio)?

G. What will be the methods and equipment used to analyze the samples (e.g. contractor analysis using gamma spectroscopy)? What will be the analysis equipment's minimum detectable activity? How do you plan to determine if the discharge satisfies 10 CFR Part 20 solubility criteria? If you propose to analyze the samples in house, you will need to describe the analysis equipment, its calibration and quality control check procedures.

H. Supplement III of your March 22, 1995 submittal indicates that the Model 3710 sampler's operational temperature range is 32-120 degrees F. Consequently, verify that the sampling system will function properly during sub-freezing winter temperatures.

I. Verify that the maximum rate of the Model 3240 flow rate meter is sufficient when sanitary discharges occur simultaneous with a rain storm or other significant precipitation event.

J. What will be the location of the sampling system relative to the new manhole? If installed upstream or in the manhole itself, explain how the system will sample foundation drains (underdrains), surface, roof and sanitary discharges.

II. Re-connection of the Foundation Underdrain and Sanitary Systems to the New Manhole/Lateral

Before we authorize reconnection of the facility underdrain system to the new manhole/lateral, you must demonstrate that both the underdrain system is contamination free and that surrounding soils do not contain concentrations of radioactive materials in excess of unrestricted use soil release criteria (e.g., 8 pCi/gm for Co-60). As you know, the water problems your facility has experienced over the last several months may have contaminated the soil under the building and along the foundation walls in the vicinity of the underdrains. Therefore, you must evaluate the radiological condition of the underdrain system itself

and of the soils below the building's foundation and in the immediate vicinity of the underdrain system. Should soil contamination exist, we are concerned that movement of cobalt-60 via groundwater transport could contaminate a previously uncontaminated underdrain system. Consequently, please provide the following information:

A. What is the basis for proposing that 3,000 and 10,000 continuous gallons of water pumped from the foundation drainage system and from the newly installed manhole, respectively, and that contain no detectable cobalt-60, is conclusive evidence that the system has been flushed sufficiently?

B. Define the term "no detectable cobalt-60," as discussed in your June 13, 1995 revised Supplement 4. If these criteria will remain unchanged from that previously established (i.e., less than 20 pCi/l non-soluble cobalt-60 and less than 200 pCi/l of soluble cobalt-60, as determined by a contract analytical laboratory), please advise.

C. Provide the details of your planned sampling program to evaluate the radiological condition of the soils both under the building and in the vicinity of the underdrain system. Your description of the soil sampling program should include the sample locations, minimum number of samples, sample volume and soil analysis methods. NUREG/CR-5849 and Section 4 of Draft Branch Technical Position On Site Characterization For Decommissioning (enclosed), provide guidance on soil sampling.

(1) Soil sample locations should address the depth of the samples and the horizontal distance from the outside of the building's walls with respect to the underdrain system.

(2) Soil sampling should not be limited solely to excavated areas since other portions of the underdrain system may have been subjected to water inflow from the contaminated manhole/lateral. Therefore, the soil sampling program should be supplemented at a minimum, to include the extraction of soil samples at depths from the surface around the east and south perimeter regions of your building. Soil borings or equivalent techniques should be used for sampling at depths from the surface soils.

D. We are concerned that over the last several months, backflow from the existing manhole may have contaminated the four-inch diameter cast iron sanitary discharge pipe in the immediate area where it connects into the manhole. Therefore, describe your plans to evaluate the radiological condition of the existing sanitary discharge line at its outfall into the contaminated manhole, prior to its reconnection to the proposed new manhole/lateral system.

E. Supplement 4 of your March 22, 1995 submittal indicates that processed water meeting the release criteria will be pumped to the collapsible storage tanks for subsequent evaporation. Footnote No. 3 to Supplement 4 further indicates that water that does not meet the release criteria will be pumped into the above ground tanks and directly to the evaporator system. It is our understanding that all water that accumulates in the drainage system during remediation activities will be pumped out of the sump pit or injection point in/near the existing sump pit, into above ground tanks and processed. Please confirm our understanding. Based on your statements in Supplement 4 of the March 22, 1995 letter, it is unclear if all water accumulated during the excavation and grouting work will be processed to meet the release criteria prior to evaporation.

F. Supplement 4 of your March 22, 1995 submittal together with the Neff & Associates drawing appear to limit the length of foundation perimeter drains that will be excavated and removed or decontaminated. The extent of the pipe to be removed appears to be from the sump pit on the southeast corner of the building to the "Y" connection of the existing four-inch diameter pipe leading to the facility manhole. Provide the basis for the limits of your proposed excavation and pipe removal/decontamination. Also, provide details on the reconstructed foundation perimeter drainage system by including a cross-section of the installation showing the perforated pipe, filter provisions, and backfilling plans to include material gradation and compaction requirements.

G. Supplement 4 of your March 22, 1995 submittal together with the Neff & Associates drawing do not address the final disposition of surface water that originally flowed to three catch basins in front of the facility.

Specifically, only the perforated underdrains, sanitary drain and roof drains are noted as being connected to the proposed new lateral connection to the interceptor sewer. It is assumed that the "sealed" surface water drains depicted in the drawing would be removed, allowing flow through the new 15-foot section of 15-inch PVC pipe and into the new manhole. Please clarify this issue.

H. Additional information is necessary regarding your plans for "grouting in" the existing service connection.

(1) The cementitious material that is used to fill the existing service connection is referred to as a concrete. Is the material to be a concrete with coarse aggregate or a grout consisting of cement and sand materials? Please define the limits of filling for the existing lateral, manhole and the section of severed four-inch diameter cast iron pipe.

Identify the extent of the fill procedure and indicate how complete filling of the volume will be accomplished and verified.

(2) What plans exist for the compression plug previously inserted by the Northeast Ohio Regional Sewer District at the outfall of your facility's sewer lateral. Specifically, will the cementitious material be used to seal in the compression plug, or will the plug be removed and another barrier placed at the lateral's outfall and sealed in place with the grout material?

III. Discharge of Ground, Surface and Waste Water into The Sanitary Sewerage System

10 CFR Part 20.2003, "Disposal by Release into Sanitary Sewerage," authorizes the discharge of licensed material into the sanitary sewerage provided:

A. The material is readily soluble (or is readily dispersible biological material) in water; and

B. The concentration of licensed material released into the sewer does not exceed that listed in Table 3 of Appendix B to 20.1001 - 20.2401 (e.g., Co-60 concentration of 3 E-5 microcuries/ml (30,000 pCi/l)).

Consequently, your request to discharge ground, surface and waste water that contains less than 200 pCi/l of soluble cobalt-60, solubility as defined in NRC Information Notice #94-07, does not require an amendment since it is authorized by 10 CFR Part 20.

IV. Miscellaneous Questions: Neff & Associates (February 24, 1994) Engineering Drawing "Relocated Service Connection"

A. General note #9 on the drawing is unclear. Specifically, clarify what is meant by filling the existing service connection to within one foot of the casting. What and where is the casting?

B. The drawing does not appear to detail the severance and reconnection of the existing four-inch diameter cast iron sanitary pipe at 1% grade, exiting from the front of the building to the proposed new four-inch diameter PVC pipe. The plan and profile of the new service connection appear to only indicate a double "Y" connection to the four-inch PVC from the two sides of the foundation perimeter drain piping. The drawing also does not

provide details regarding the limits on where the sections of perforated pipe begin and end, and where the non-perforated pipe begins. Please provide additional information to address these items.

C. The drawing has not been "sealed" by a professional engineer; therefore, we question if it is the final drawing approved for construction. The engineering seal attests to the correctness of the drawing and certification of the engineering firm.

We will continue our review of your application upon receipt of this information. Please reply in duplicate, within 30 days, and refer to Control Number 98334.

If you have any questions or require clarification on any of the information stated above, you may contact us at (708) 829-9887.

Sincerely,

Original Signed By
John R. Madera, Chief
Nuclear Materials Licensing Section

License No. 34-19089-01
Docket No. 030-16055

Enclosures:
1. NUREG/CR-5849
2. Draft Branch Technical Position
   On Site Characterization for Decommissioning

Advanced Medical Systems, Inc.
21 North Eagle Street • Geneva, Ohio 44041
1[illegible] 466-4671 FAX (216) 466-0186

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.

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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
Engineered Products

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 coajuction 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.

.ısc. 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

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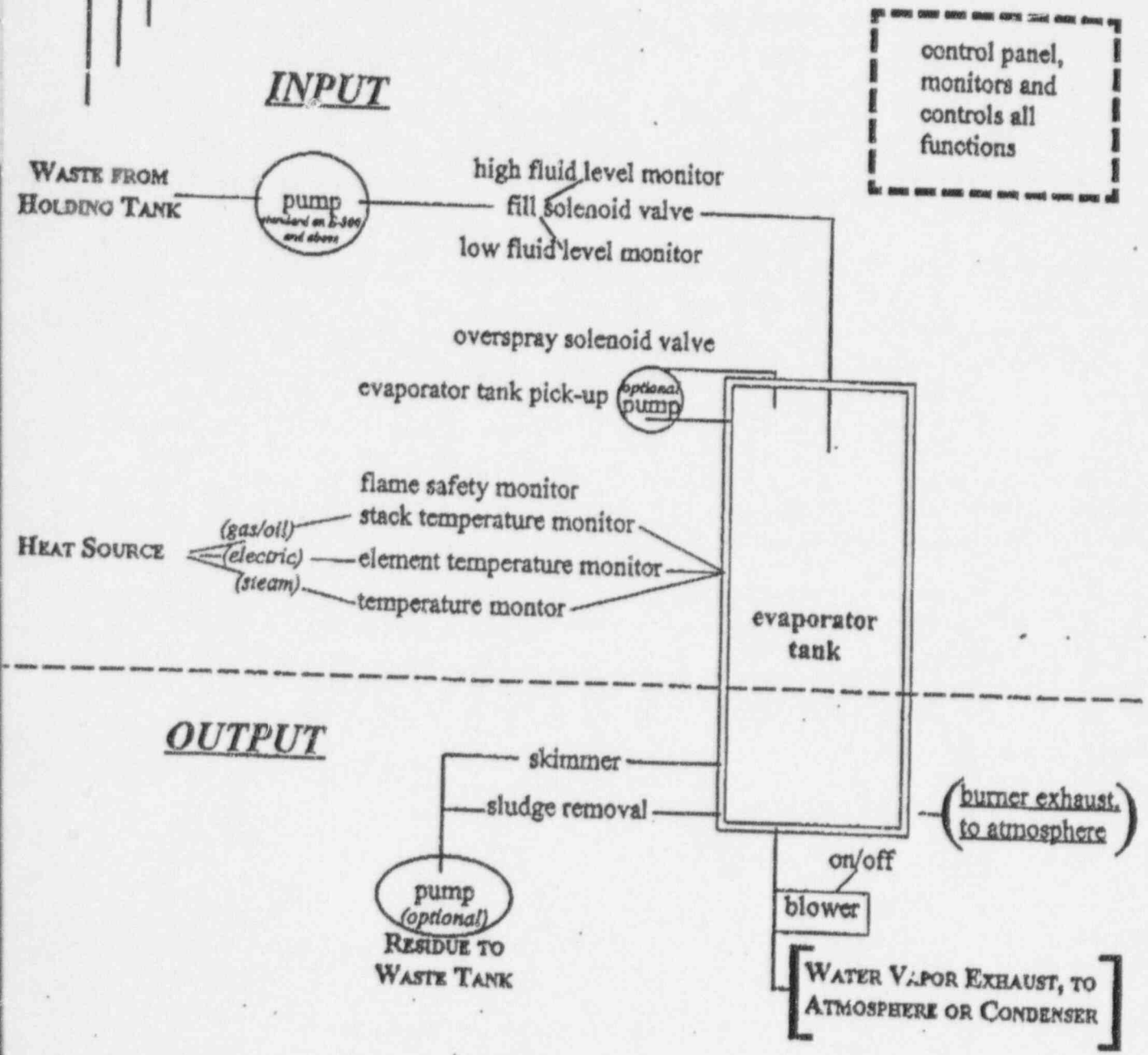
POWER PLANT SERVICE, INC.
2500 West Jefferson Boulevard
Fort Wayne Indiana
46802-4824

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 ± 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 heights. 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.

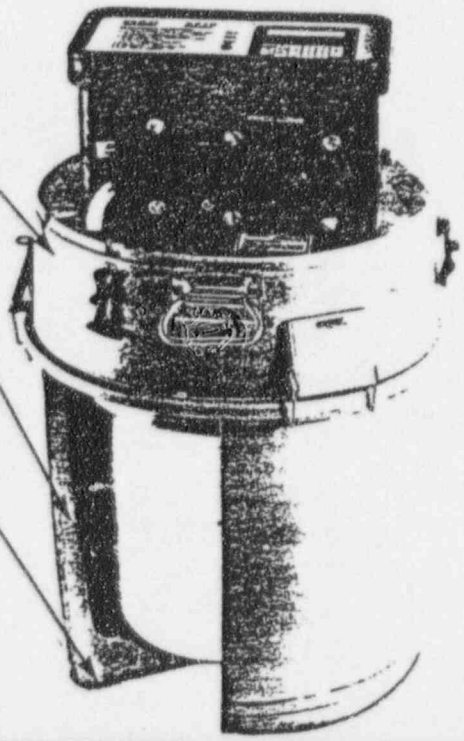
Fully Insulated Base

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: 29 3/4 in. (75.5 cm)

Diameter: 19 3/4 in. (48.9 cm)

Dry weight: 32 lbs. (14.5 kg)

Sampler base capacity: One, 2 1/2 gallon or 4 gallon polyethylene, or 2 1/2 gallon 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 minutes, or from 1 to 9,999 flow pulses pulse intervals. Non-uniform time entered in minute intervals up to 99 hours 59 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.

Number of composite samples: Up to 999 samples.

Sample volume: 30 to 2990 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.)

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.)

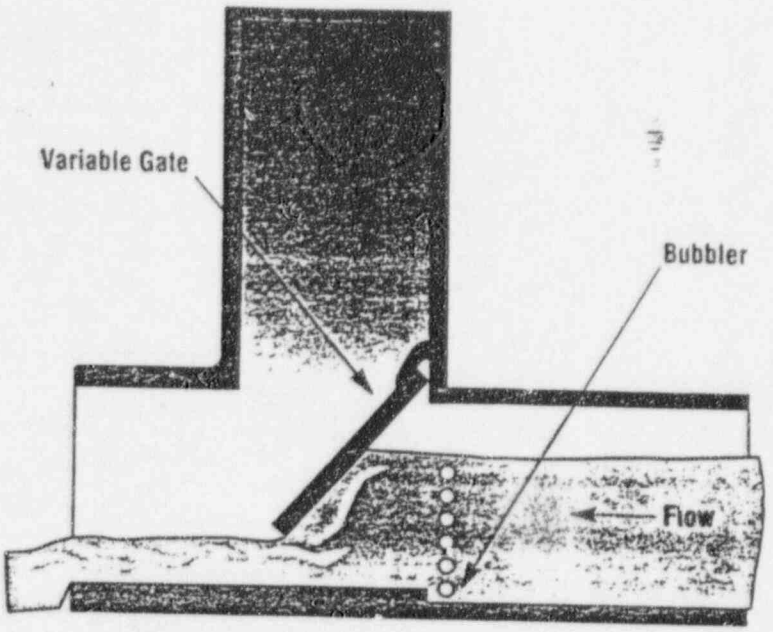
Controller internal lithium battery life (maintains internal logic and user selected settings): 5 years minimum.

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 liq 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.

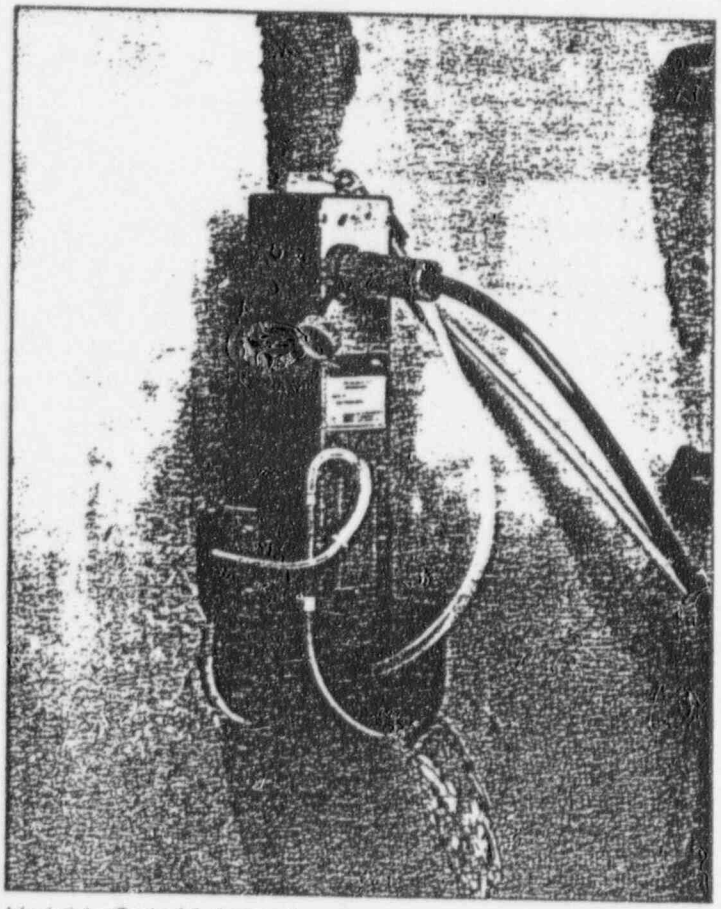


Principle of operation — Gate position and upstream level determine the flow rate through the metering insert.

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.

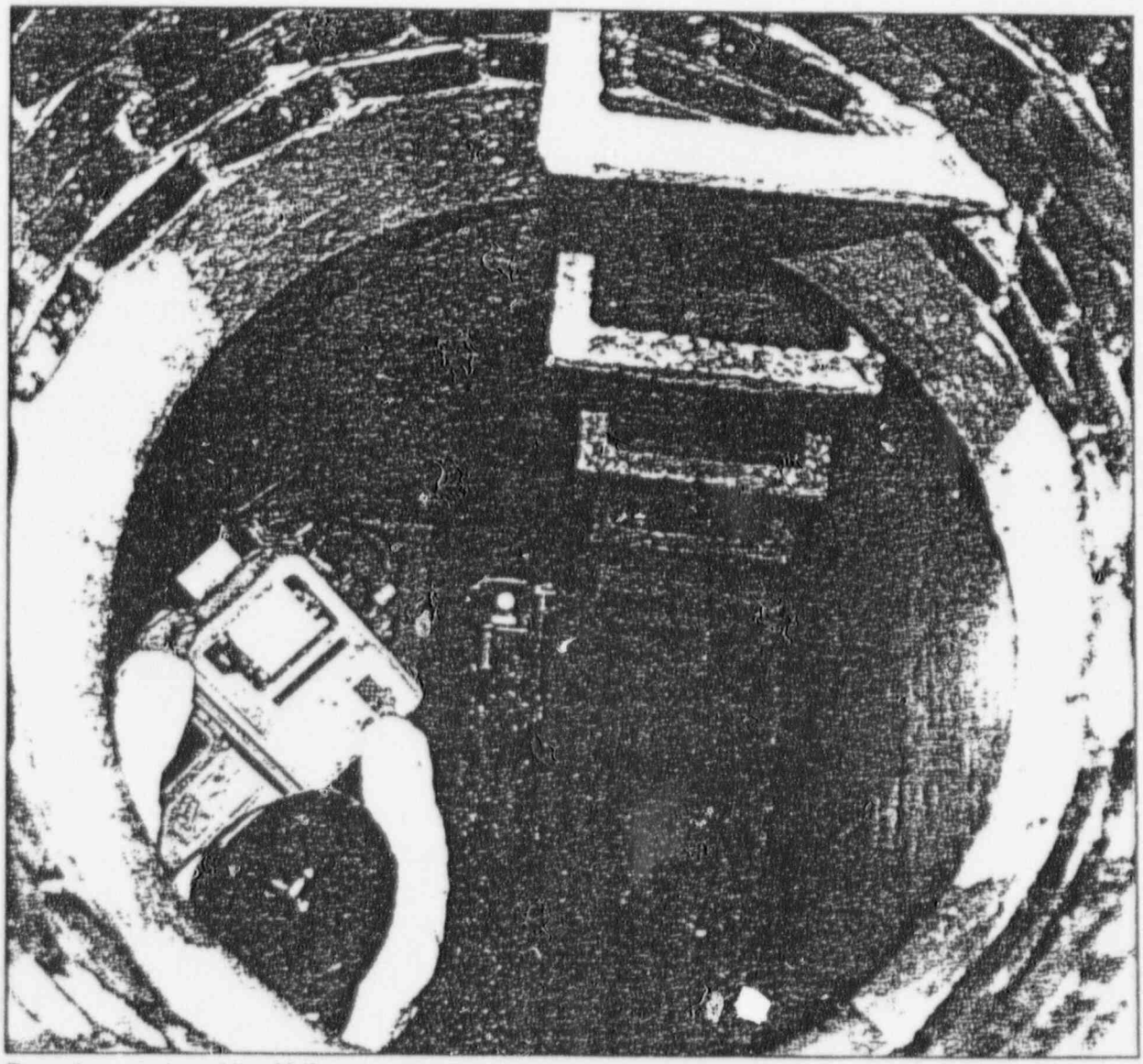
The metering insert is typically installed in the upstream pipe of a manhole. A stainless steel expansion ring grips the inside of the pipe and holds the metering insert in place. A rubber bladder seals the pipe and routes the flow through the insert.



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[2] 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.[3] (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.

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[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/1 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.