



# Advanced Medical Systems, Inc.

1020 London Rd.  
Cleveland, Ohio 44110  
216-692-3270

December 18, 1995

Mr. Kevin G. Null  
Nuclear Materials Licensing Branch  
United States Nuclear Regulatory Commission  
801 Warrenville Road  
Lisle, Illinois 60523-4351

Re: Surveillance Plan for the London Road Facility (Control Number 99566)

Dear Mr. Null:

Advanced Medical Systems, Inc. (AMS) is in receipt of your letter dated December 7, 1995. In that letter, additional information and/or clarification on issues pertaining to the referenced item was solicited. The purpose of this letter is to transmit the AMS response to your inquiries. If you have any questions or require additional information, please call me at (216) 692-3270. We are looking forward to the USNRC's timely approval of our Surveillance Plan.

Sincerely,

Robert Meschter, RSO

cc: D. Cesar  
D. A. Miller, Esq., Stavole & Miller  
C. D. Berger, C.H.P. - IEM

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REGION III

## RESPONSE TO USNRC COMMENTS ON THE SURVEILLANCE PLAN FOR THE LONDON ROAD FACILITY

**USNRC Comment:** Throughout the Plan, reference is made to various ISPs. By letter dated October 30, 1995, you submitted an application for renewal, in which you indicate that the ISPs have been superseded by new Radiation Safety Procedures (RSPs). Please update your Plan by replacing the references to the ISPs with references to the applicable RSPs.

**AMS Response:** The October 30, 1995 license renewal application was submitted with the assumption that the existing provisions of License No. 34-19089-01 would remain in effect until final action is taken on the application by the USNRC. Therefore, no changes to the manner in which in-house procedures are referenced in the Surveillance Plan are required. Since AMS wishes to institute a number of changes in the operation and implementation of its radiation protection program in order to improve its applicability and level of control, we are hopeful for prompt consideration of the October 30, 1995 application.

**Action Taken:** None at this time. However, once AMS receives its renewed license, any ISP numbering changes that may impact the Surveillance Plan will be forwarded to the USNRC.

**USNRC Comment:** On page 6 of the Plan, the annual sampling frequency is discussed. We request that the water sample be taken in the Spring (April or May) when the water levels are high, in order to maximize the effectiveness of your assessment of potential contamination migration. Therefore, please commit to taking water samples in the Spring (April or May), or provide justification why this should not be done.

**AMS Response:** Concur.

**Action Taken:** The following sentence will be added to the end of line 18 on page 6 of the Surveillance Plan: "To maximize the effectiveness of water sampling, the annual surveillance event will be scheduled in April or May of each year."

**USNRC Comment:** On page 8 of the Plan, you indicate that soil and water samples with detectable cobalt-60 will be forwarded to a commercial analytical laboratory for confirmatory analysis. The key word in that statement is "detectable." Please provide the minimal detectable activity to be used to determine if a soil or water sample contains detectable cobalt-60.

**AMS Response:** Concur. However, "minimum detectable activity" is an *a posteriori* limit for a particular measurement, and thus cannot be provided until the analysis is actually performed. Therefore, AMS assumes the "lower limit of detection" (LLD), which is defined as an *a priori* limit representing the capability of the measurement system, will satisfy this request. For the AMS gamma spectroscopy system, the nominal LLD for <sup>60</sup>Co

in soils, assuming a one-hour counting time, is five (5) pCi per gram. For water samples, again assuming a two-hour counting time, the nominal LLD is 60 pCi per liter.

**Action Taken:** Line 2 on page 8 of the Surveillance plan will be modified to read: "Samples that contain  $^{60}\text{Co}$  above a nominal detection limit of five (5) pCi per gram shall be forwarded to a commercial analytical laboratory for confirmatory analysis." In addition, line 7 on page 8 will also be modified to read: "Water samples containing  $^{60}\text{Co}$  above a nominal detection limit of 60 pCi per liter shall be forwarded to a commercial analytical laboratory for confirmatory analysis."



COUNTY OF  
CUYAHOGA

**Cuyahoga Emergency Management  
Assistance Center (CEMAC)**  
December 18, 1995

**Commissioners**

Mary O. Boyle  
Timothy F. Hagan  
Lee C. Weingart

VIA CERTIFIED U.S. MAIL  
Robert Meschter, RSO  
Advanced Medical Systems, Inc.  
1020 London Rd.  
Cleveland, Ohio 44110

Dear Mr. Meschter:

The Cuyahoga County Local Emergency Planning Committee (LEPC) is pleased to submit comments on the September 21, 1995 version of the Emergency Plan for the Advanced Medical Systems, Inc. (AMS) facility located at 1020 London Rd., Cleveland, Ohio 44110. These comments are timely submitted pursuant to 10 CFR 30.32 (i)(4), which allows offsite response organizations expected to respond in case of an accident 60 days to comment. We received your revised plan and your *reference to our comments* on October 19, 1995.

We have carefully reviewed the document submitted and offer the attached page referenced comments. The LEPC believes that the issues raised in the aforementioned attachment must be addressed to provide the local involvement necessary for an effective community response to your emergency plan. If you have any questions please call me at 216-443-7597.

Sincerely,

*Michael S. Kalstrom*

Michael S. Kalstrom  
Secretary, Cuyahoga County LEPC

cc: James L. Caldwell, Deputy Director, NRC Region III  
Commander Robert Cernak, Cleveland Police Dept.  
Lawrence English, NEORS  
Jane Harf, Ohio SERC  
Edmund Mecklenburg, Cuyahoga County Emergency Management  
Edwin Price, Cuyahoga County Community Services  
Dr. Gayle Gaian, University Hospitals  
Chief Thomas Root, Cleveland Fire Marshal  
James Williams, Ohio Emergency Management Agency

E1132



## Referenced Comments

### Emergency Plan (9/21/95 Version) for Advanced Medical Systems, Inc.

### Cuyahoga County LEPC

Page	Section	Comment
1-1	1.1	What does the term <i>potentially dispersible</i> mean? Is it related to the type of material or the storage location? It appears to mean both when it suits this document's authors. The descriptions of the materials at the various locations in the facility are an improvement over the previous document, however, it would be helpful to include the ambient exposure rates on the maps provided. This would provide emergency responders with the immediate information they need in an emergency situation.
1-2	1.2.1	What is the physical state and type of storage of the 4,000 curies of <sup>60</sup> Co reported for the Hot Cell? What does <i>not readily dispersible</i> mean?
1-6	1.2.9	A February 8, 1988 report on the WHUT Room completed by Nuclear Support Services for AMS described approximately one inch of a talcum powder-like material on the floor of the WHUT Room and assessed its activity as 393.1 Curies. Another 136.4 curies was described as stored in a tank. <i>The Total Room Activity was listed at 529.4 Curies.</i> The description in this section does not compare with this description with regard to the contents and location of waste materials and the amount of total activity reported appears to be considerably lower than one would project given the approximately 1.5 half lives since 1988. Why?
1-7	1.3	Figure 5 does not illustrate the information reported in this section. What are the names and addresses of these facilities. Where are they located?
2-2	2.1	We believe that this section of the report would be more useful if it approached emergency scenarios resulting from a range of possible catastrophic events to the facility instead of carefully minimizing the likelihood and consequences of such events. The approach used in the report is not very useful to local emergency responders. It is helpful (from an emergency planning perspective) to know the possible consequences of certain catastrophic events however unlikely they may be.

- 2-2 2.1.1 The amount of *potentially dispersible material* is debatable (see earlier comments regarding this issue).

The dose reported for a fire fighter would be more useful if reported for a range of distances both inside the building and at some distance outside the building rather than for nine meters. This would help fire fighters to be more aware of the relative degree of risk.

- 2-4 2.1.4 The security history of this facility does not comport with this description.

- 2-5 2.1.5 It would be advisable to assess the likelihood of one or more tank ruptures in the temporary storage tanks on-site which hold an estimated 100,000 of water. This large volume of water could cause damage to the facility, personnel and possibly the community.

- 3-3 3.2 In the event of a *site area emergency* involving an off-site release of a reportable quantity of a reportable substance, the Fire Department, the Cuyahoga County LEPC, the Ohio SERC and the National Response Center must be contacted within 0.5 hours according to federal and state law.

- 3-3 3.3 In the event of a release of a reportable substance there are federal and state requirements for both immediate verbal and later written information (Section 304 of EPCRA and Section 3750.06 of the Ohio Revised Code). Information about the content of these notifications has been forwarded to AMS in our earlier Emergency Plan comments forwarded on June 2, 1995. The verbal information should be reported by the RSO at the time of such a release, and a written summary must be forwarded within thirty days of the release.

- 4-3 4.4 List should include the Cuyahoga County Division of Emergency Management and a description of the CMEIMS. It should also include the NEORSD and, of course, the Cuyahoga County LEPC.

- 6-1 6.4 Could not locate the *instrument calibration room* on Figure 3. Emergency responders should be able to locate this equipment in the event AMS personnel are incapacitated or unavailable.

- 7-2 7.3 Perhaps a *Communications drill* should have been performed prior to the release of this version of plan. Many of the telephone numbers and names and organizations are incorrect or missing from Table 2 (see Table 2

comments).

7-2      7.7      The Cuyahoga County Division of Emergency Management forwarded a letter, dated September 26, 1995, in response to the AMS inquiry on this subject, but the letter is not included in this document.

10-1      10      Section 302 (b)(2) of the Emergency Planning and Community Right to Know Act ("EPCRA") and Section 3750.05 (A) of the Ohio Revised Code both authorize the "designation of additional facilities."

As noted earlier the nature, content and phone numbers required for notification under Section 304 of EPCRA and Section 3750.06 of the Ohio Revised Code should be more comprehensive.

11-2      Table 1      Note earlier comments regarding the contents of the WHUT room.

11-3      Table 2      We believe that this table should be carefully reviewed. It has errors regarding names of people and agencies, errors regarding emergency telephone numbers and errors regarding the organizations listed as first responders. The following is a summary of the changes recommended.

Larry Grove is not a first responder. If names must be included we would suggest John Wills.

We don't believe that University Hospitals would be a first-responder, but will defer to the hospital staff. While the hospital would be involved it would not be *on-scene*.

There is a letter in Appendix E from the Ohio Department of Health that says that it is not a first responder.

The Ohio Environmental Protection Agency does not have a Chairperson. Jane Harf is the Chairperson of the Ohio SERC, and a staff member of the Ohio EPA, but not an emergency responder. The number listed here should be the emergency telephone number for the Ohio EPA/SERC - 800-282-9378.

The Cuyahoga County Division of Emergency Management should be listed as a first responder, in the event that CEMAC Mobile One (its mobile communications vehicle) were activated. It is accessed via the CMEIMS as described in our September 26, 1995 letter.

The NEORSO should be listed as a first responder. Its emergency

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telephone numbers are 641-6000 during business hours and 641-3200 from 4:30 P.M. to 8:00 A.M. on week nights and on weekends.

The telephone number listed for the Cuyahoga County LEPC should be 216-771-1365. This number is answered 24 hours per day.

The National Response Center Hotline number should be included. It is 800-824-8802.

Figures The Figures do not include a site map that locates facilities outside of the primary building. For example the Pump House is not included on any of the Figures.

12-8 Figure 7 Is this meant to accommodate *all* emergencies? It seems likely that the emergency responders involved would vary depending upon the incident and might include agencies not listed here.

Emergency Response The procedures and agencies to be notified in the event of a reportable release (Section 304 of EPCRA and Section 3750.06 of the Ohio Revised Code) are not included anywhere in the *Emergency Response and Notifications* section.

13-13 Edmund M. *Mecklenburg*'s name is spelled incorrectly.

Note earlier comment regarding Mr. Mecklenburg's September 26, 1995 letter.

14-1 Jane *Harf*'s name is spelled incorrectly.

Edmund M *Mecklenburg*'s name is spelled incorrectly.

The Cuyahoga County Local Emergency Planning Committee ("LEPC") should be added to the distribution list.

The NEORSD should be added to the distribution list.





UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

December 18, 1995

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

Dear Mr. Cesar:

This refers to your August 2, 1995, letter concerning the FY 1995 annual fees assessed for your License No. 34-19087-01 (Invoice No. AM03482-95), Registration Nos. NRO115D102S (Invoice No. AM03483-95), NRO115D103S (Invoice No. AM03484-95), and NRO115S101S (Invoice No. AM03485-95), and Quality Assurance Program Approval No. 0354 (Invoice No. AM03436-95).

You stated that in your renewal application you requested a change to your license classification to 2B and 3P. In your November 29, 1994, renewal application and supplements thereto you requested authorization for: use of byproduct material for training of personnel in the manufacturing of sealed sources, calibration of radiation survey instruments, and storage, which pertain to fee Category 3P of 10 CFR 170.31 and 10 CFR 171.16; the use of depleted uranium for shielding which pertains to fee Category 2B; and servicing, installation and maintenance, which pertain to fee Category 3N. The fee classification of your license has not changed with the submittal of your November 29, 1994, renewal application.

You further state that fee Category 10B(1) does not appear to be correct for your Quality Assurance Program Approval No. 0354 (QA Approval No. 0354), and that you have not fabricated sources since 1991. The activities covered by QA Approval No. 0354 relate to transportation packagings, not to the manufacture of sources. Advanced Medical Systems, Inc. is the primary holder of the Certificates of Compliance for the following transportation packagings: Model Nos. 181361 and 181375 (Certificate of Compliance No. 5796); Model No. E-MEH-00-00004 (Certificate of Compliance No. 9011); and Model GE-500 (Certificate of Compliance No. 9049). As the primary certificate holder, Advanced Medical Systems, Inc. is responsible for maintaining records related to fabrication and design of these packagings and modifications thereto. On July 10, 1992, QA Approval No. 0354 was revised to include design, fabrication, and use of packagings as requested in your December 7, 1984, application. Accordingly, annual fees were appropriately assessed for fee Category 10B(2) for FY's 1991 and 1992, and for fee Category 10B(1) for FY's 1993, 1994, and 1995. As stated in the February 9, 1995, letter from the Office of Nuclear Material and Safeguards transmitting the renewal of QA Approval No. 0354, if you wish to amend the Approval, you should submit a written request.

During our review of your licenses and authorizations, we find annual fees were not appropriately assessed for License No. 34-19087-01 for FY's 1991, 1992, and 1993. The enclosed table reconstructs the fee history for your

E/133

David Cesar

- 2 -

annual fee payments, what was charged, and what should have been charged. Specifically, annual fees should not have been assessed for manufacturing (fee Category 3B) in FY's 1991, 1992, and 1993 since it was deleted from your license prior to the effective date of the FY 1991 fee rule. However, annual fees should have been assessed for depleted uranium for shielding (fee Category 2B) in FY's 1991, 1992, and 1993.

Based on the foregoing, the remaining annual fee balance of \$95,360 as shown on the enclosed table is due and payable. Because of the amount of time we have taken to respond to your letter, in accordance with 10 CFR 15.37(j), I will waive all interest and late charges which have accrued if payment is received within 30 days from the date of this letter. If payment is not received, all interest and late charges will be assessed.

Sincerely,

/s/ Jesse L. Funches for

Ronald M. Scroggins  
Deputy Chief Financial  
Officer/Controller

Enclosure: Table

DISTRIBUTION:

B22 Materials Annual Fee Correspondence File, w/cy inc and encl  
Invoice File AM03482-95 and AM03436-95, w/cy inc  
License File 34-19089-01 and QA 0354, w/cy inc  
NUDOCS (ML61), w/cy inc  
PDR, w/cy inc  
OC R/F, w/cy inc  
OC/DAF R/F, w/cy inc  
OC/DAF/LFARB R/F, w/cy inc  
OC/DAF/LFARB (LF-95-280),  
GJackson, OC/DAF/LFARB/LFS  
LTremper, OC/DAF/LFARB/ARS

DOCUMENT NAME G \AMS (For Table G \ADV)

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OFFICE	OC/DAF/LFARB/LFS	OC/DAF/LFARB	MMSS/IMMS/SCDB	OC/DAF	OC
NAME	SKimberley R.	DBDandois	JJankovich	PJRadeau	RMScroggins
DATE	12/1/95	12/1/95	12/1/95	12/1/95	12/1/95

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Annual Fee History

<u>Fee Categories Billed</u>					<u>Amt Paid</u>	<u>Amt Credited</u>	<u>Add'l Owed</u>	<u>Balance Due</u>
License No. 34-19089-01								
	<u>3B</u>	<u>3N</u>	<u>3P</u>	<u>2B</u>				
AM4626-91	\$4,500	\$4,400	\$1,500					
AM3943-92	1,800	1,800	1,800		\$10,400	\$4,500 <sup>1</sup>	\$ 390 <sup>2</sup>	-\$4,110
AM4246-93	1,800	1,800	1,800		5,400	1,800 <sup>1</sup>	580 <sup>2</sup>	- 1,220
AM3591-94		1,800	1,800		5,400	1,800 <sup>1</sup>	810 <sup>2</sup>	- 990
AM3482-95		7,670	2,470	970	11,110			
		6,000	1,700	480	-0-			
License No. QA 0354								
	<u>10B2</u>	<u>10B1</u>						
AM4564-91	\$1,800							8,180
AM3890-92	1,500							
AM4191-93					\$ 1,800			
AM3541-94		1,800			1,500			
AM3436-95		64,870			1,800			
		77,800			65,271 <sup>3</sup>			
					-0-			
License No. NR0115D102S								
	<u>2A</u>							77,800
AM4627-91	\$6,200							
AM3944-92	1,800				\$ 6,200			
AM4247-93	1,800				1,800			
AM3592-94	9,770				1,800			
AM3483-95	7,100				9,815 <sup>3</sup>			
					-0-			
License No. NR0115D103S								
	<u>2A</u>							7,100
AM4628-91	\$6,200							
AM3945-92	1,800				\$ 6,200			
AM4248-93	1,800				1,800			
AM3593-94	9,770				1,800			
AM3484-95	7,100				9,815 <sup>3</sup>			
					-0-			
7,100								

<sup>1</sup>For fee Category 3B<sup>2</sup>For fee Category 2B<sup>3</sup>Includes late charges

Annual Fee History

<u>Fees Categories Billed</u>		<u>Amt Paid</u>	<u>Amt Credited</u>	<u>Add'l Owed</u>	<u>Balance Due</u>
License No. NR0115S101S					
	<u>9C</u>				
AM4629-91	\$1,400	\$1,400			
AM3946-92	1,800	1,800			
AM4249-93	1,800	1,800			
AM3594-94	2,270	2,295 <sup>3</sup>			
AM3485-95	1,500	-0-			\$ 1,500
Remaining Balance					<u>\$95,360</u>

December 20, 1995

Erwin J. Odeal, Executive Director  
 Northeast Ohio Regional Sewer District  
 3826 Euclid Avenue  
 Cleveland, Ohio 44115-2504

Dear Mr. Odeal:

This acknowledges your letter of November 13, 1995, addressed to Mr. John Madera of my staff, regarding the footer drains at Advanced Medical Systems, Inc. (AMS).

By letter dated November 29, 1995 (enclosed), we asked AMS to provide additional information to support its proposal. On December 14, 1995, we received AMS' response (enclosed). We are currently evaluating the additional information.

When our evaluation is complete, you will be informed of our decision.

Should you have any further questions regarding AMS, please do not hesitate to contact me.

Sincerely,

Original signed by James L. Caldwell

James L. Caldwell, Deputy Director  
 Division of Nuclear Materials Safety

Enclosures: As stated (2)

See Attached Distribution

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OFFICE	RIII	RIII	RIII	RIII
NAME	MWeber:dp	JMadera	JCaldwell	
DATE	12/20/95	12/20/95	12/20/95	12/ /95

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w/encls and 11/13/95 ltr from NEQRSD:

Robert Meschter  
Radiation Safety Officer  
Advanced Medical Systems, Inc.  
121 N. Eagle Street  
Geneva, OH 44041

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Department of Health  
246 North High Street, 3rd Floor  
P.O. Box 118  
Columbus, OH 43266

Michael R. White, Mayor  
City of Cleveland  
601 Lakeside Avenue  
Cleveland, OH 44114

Lisa Mehringer  
City of Cleveland Law Department  
601 Lakeside Avenue, Room 106  
Cleveland, OH 44114

Michael Kalstrom, Secretary  
County of Cuyahoga  
Cuyahoga Emergency Management  
Assistance Center  
1255 Euclid Avenue, Room 102  
Cleveland, OH 44115-1807

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Cuyahoga County Board of Health  
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Marian Zobler  
U.S. Nuclear Regulatory Commission

bcc:

C. Jones, NMSS  
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AMS File

E-mail:

Bruce Berson (BAB1)	Bill Brach (EWB)	Joe DeCicco (JXD1)
Cynthia Jones (CGJ)	Mike Stein (MHS)	Jim Caldwell (JLC1)
Tim Johnson (TCJ)	Mike Weber (MFW1)	Fred Combs (FCC)
John Madera (JRM4)	Marian Zobler (MLZ)	Donald Cool (DAC)
Kevin Null (KGN)	Bernie Bordenick (BMB)	Steve Crockett (SFC)
Cindy Pederson (CDP1)	Josie Piccone (JMP1)	Geoffrey Wright (GCW)

November 29, 1995

Advanced Medical Systems, Inc.  
ATTN: Robert Meschter  
Radiation Safety Officer  
1020 London Road  
Cleveland, OH 44110

Dear Mr. Meschter:

This is in response to your October 17, 1995 letter, in which you discuss the addition of grout to the abandoned footer drain and four inch discharge line at AMS.

Regarding the abandoned footer drain, you refer to an "independent analysis of more than 30,000 gallons of water that has been collected from the newly installed footer drain system, which shows no detectable cobalt-60." Please provide us the results of this analysis, and explain when, where, and how the water samples were collected.

Regarding the four inch discharge line, you refer to photographs of the AMS facility which show "that a trench is in the vicinity of where the 4" line should currently lie." In addition, you state that "AMS has recently confirmed that the 4" discharge line is indeed located in a trench ... and is surrounded by concrete." During an NRC inspection on November 2-3, 1995, you provided one of the photographs to which you refer in your letter to a member of my staff. You also discussed the results of drilling tests being performed in the basement of the AMS facility which, you indicated, show that the discharge line is surrounded by concrete. Please furnish us with an update on this work, and provide, in writing, a detailed explanation of how AMS confirmed that the four inch discharge line is located in a trench and is surrounded by concrete.

Should you have any questions regarding this letter, please do not hesitate to contact me.

Sincerely,

Original Signed By

John R. Madera, Chief  
Nuclear Materials Licensing Branch

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

See Attached Distribution



# Advanced Medical Systems, Inc.

1020 Loridon Rd.  
Cleveland, Ohio 44110  
216-692-3270

December 11, 1995

Mr. J. R. Madera, Chief  
Nuclear Materials Licensing Section  
United States Nuclear Regulatory Commission  
801 Warrenville Road  
Lisle, Illinois 60523-4351

Re: Advanced Medical Systems Inc. (License No. 34-19089-01)

Dear Mr. Madera:

We are in receipt of your November 29, 1995 letter regarding the foundation drainage system at the Advanced Medical Systems, Inc., (AMS) facility and the results of water sampling that has occurred since the system was remediated. The following are our responses to your questions.

Included herein as Attachment 1 is a summary of the sampling and analysis results from the new foundation drainage system. Grab samples from the discharge line were collected by pumping water out of the new manhole. Rain water was collected from an open 55-gallon drum that was placed in the north west portion of the property during a rain storm. Drinking water was collected from the tap of the Atlas facility, a neighbor to AMS. Composite samples from the poly tanks and from the frac tanks were collected after re-circulating each tank for at least two full tank volumes. Any samples that were "positive" for  $^{60}\text{Co}$  above a nominal detection limit of 20 pCi/l were subject to solubility testing.

As of the date of this letter, approximately 50,000 gallons of water have been collected from the new foundation drainage system. On December 5-6, 1995, approximately 19,000 gallons from that volume were discharged into the back parking lot of the London Road facility.

In regard to the four-inch discharge line, a copy of a photograph taken during building construction was given to Mike Weber (USNRC Region III). As I explained to Mr. Weber, that photograph shows the location of a trench where the four-inch line currently exists. Therefore, it is reasonable to assume that when the building footers were poured, this trench was filled with cement. However, AMS did not rely solely on this assumption in concluding that the four-inch line is, in fact, encased.

On August 31, 1995, the position of the four-inch line in the front basement was located. A hole was drilled into the basement less than one (1) foot to the side of the four-inch line and at a

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distance of approximately 10 feet inside (to the west) of the east wall. Drilling continued to a depth of approximately 14 inches, and at no time was subsurface soil encountered. At other basement floor locations, subsurface soils are reached at a depth of six (6) inches. Therefore, AMS concluded that the four-inch line was, indeed, fully-encased in the cement-filled trench.

For additional confirmation, AMS consulted its contract engineer, Mr. John Denega, who reviewed the drawings, discussed the August 31, 1995 drilling effort with me, and made his own observations. His report of findings is included herein as Attachment 2.

I hope that I have resolved your remaining concerns on these issues. Please call me at (216) 692-3270 if further discussion is necessary. Additional information on the "old" and the "new" drainage system is forthcoming in the remediation report.

Sincerely,

A handwritten signature in cursive script, appearing to read "Robert Meschter".

Robert Meschter, RSO

cc: D. Cesar  
D. A. Miller, Esq. - Stavole & Miller  
C. D. Berger, C.H.P. - IEM

# ATTACHMENT 1 - RESULTS OF WATER SAMPLING

Collection Date	Collection Location	Results
August 8, 1995	Approx. 10,000 gallons in frac tank (for use in 10,000 gallon flush test)	N.D. - Co-60
August 8, 1995	Approx. 3,000 gallons in "old" Poly tank (from 10,000 gallon flush test)	33 $\pm$ 21 pCi/l Bi-214 54 $\pm$ 22 pCi/l Pb-214 N.D. - Co-60
August 9, 1995	Approx. 3,000 gallons in "old" Poly tank (from 10,000 gallon flush test)	N.D. - Co-60
August 9, 1995	Approx. 3,000 gallons in "old" Poly tank (from 10,000 gallon flush test)	23.1 $\pm$ 9.2 pCi/l Co-60 12 $\pm$ 1.3 pCi/l gross beta(filtered)
August 10, 1995	Approx. 3,000 gallons in "old" Poly tank (from 10,000 gallon flush test)	N.D. - Co-60
October 5, 1995	Discharge line from new footer drains (grab sample)	N.D. - Co-60
October 18, 1995	3,000 gallons in "old" Poly tank (composite)	N.D. - Co-60
October 18, 1995	Discharge line from new footer drains (grab sample)	N.D. - Co-60
October 20, 1995	Discharge line from new footer drains (grab sample)	N.D. - Co-60
October 24, 1995	Cleveland drinking water (grab sample from Atlas facility)	N.D. - Co-60
November 6, 1995	3,000 gallons in "new" Poly tank (composite)	N.D. - Co-60
November 14, 1995	Discharge line from new footer drains (grab sample)	N.D. - Co-60
November 15, 1995	Discharge line from new footer drains (grab sample)	N.D. - Co-60
November 16, 1995	Discharge line from new footer drains (grab sample)	N.D. - Co-60
November 17, 1995	Discharge line from new footer drains (grab sample)	N.D. - Co-60
November 20, 1995	Discharge line from new footer drains (grab sample)	N.D. - Co-60
November 20, 1995	Approx. 22,000 gallons in frac tank No. 1 (composite)	N.D. - Co-60
November 20, 1995	Rain water (composite) collected in barrel on property	N.D. - Co-60
November 29, 1995	Approx. 16,000 gallons in frac tank No. 2 (composite)	N.D. - Co-60

ATTACHMENT 2 - LETTER FROM J. W. DENEGA, P.E., P.S.



## NEFF &amp; ASSOCIATES

PLANNERS • ENGINEERS • SURVEYORS

December 6, 1995

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

Attn: David Cesar

RE: Response to comments from U.S.N.R.C. dated 29 November  
1995 regarding 4" discharge line at 1020 London Road,  
Cleveland, Ohio  
File No. 10459.007

Dear Mr. Cesar:

On 4 December 1995 Mr. Meschter, Radiation Safety Officer, contacted me concerning the response to the regulatory agency regarding the condition of the 4" discharge line at the 1020 London Road facility. On 6 December 1995 I visited the site to review the matter with him. Review of construction drawings, discussion with him, and my observations of the events relative to this matter were used to arrive at my opinion.

It was disclosed to me that on 31 August 1995 a test hole was made in the basement floor of this facility approximately one foot from the 4" discharge line as shown on the attached exhibit. This test hole was made by Alan Duff of Integrated Environmental Management Inc. in consort with Chris Reed assistant to Mr. Meschter. It was reported to me that this hole was terminated at a depth of 12 to 14 inches without exiting the floor slab, indicating that at the time of construction the trench surrounding the 4" discharge line was filled with concrete at the same time the floor slab was installed.

It is my opinion to a reasonable degree of engineering certainty that the 4" discharge line is included in the concrete floor slab. This opinion is based on the following facts which I perceive to be correct:

1. It is not probable that the increased thickness of concrete found is an isolated event.

Post-It™ Fax Note	7671	Date	12-11	# of pages	2
To	BOB	From	DAVID CESAR		
Co/Dept.		Co.			
Phone #		Phone #			
Fax #		Fax #			

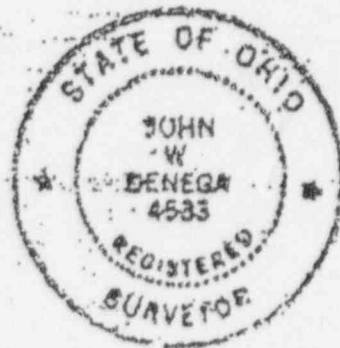
2. The original design of the floor slab was to be six inches thick, as shown on the construction plans. This was confirmed by prior coring performed by another contractor.
3. Photographs taken during construction clearly indicate the existence of a trench at the approximate location of the 4" discharge line.
4. It is reasonable to conclude that the increased thickness of concrete is consistent along the 4" discharge line and that the utility trench was backfilled with concrete at the time the floor slab was installed.

The insitu condition of this 4" discharge line deviates from normal construction for whatever reasons pertinent at the time of construction. Further invasive investigation to substantiate this opinion would be counter productive in that it might breach the integrity of the discharge line, as well as weaken the structure.

Very Truly Yours,

*John W. Denega P.E., P.S.*

John W. Denega P.E., P.S.  
Neff & Associates





# Northeast Ohio Regional Sewer District

3826 Euclid Avenue • Cleveland, Ohio 44115-2504 216 • 881 • 6600 FAX: 216 • 881 • 9703

November 13, 1995

Mr. John Madera  
U. S. Nuclear Regulatory Commission  
Region III  
901 Warrenville Road  
Lisle, Illinois 60532-4351

Re: Failure of AMS to Immobilize Footer Contamination

Dear Mr. Madera:

Attached please find a copy of an October 17, 1995 letter we recently received regarding the intention of Advanced Medical Systems, Inc. ("AMS") to forego grouting of the 4" footer drains that contain water that is known to be potentially contaminated to a level of 11,200 picoCuries/liter.

To leave them in this improperly abandoned condition obviously leaves open the probability of migration of contaminated water and particulates trapped therein into the ground surrounding the facility. This improper abandonment could also lead to contamination of the newly installed footers and/or further contamination of the public sewer system serving the London Road area.

AMS' stated reasons for abdicating their responsibility to prevent the spread of contamination are spurious. The materials handling and delivery of liquid grouting are handled by professionals, rather than AMS personnel, hence do not pose a hazard thereto.

Further, while it is not as inexpensive as plain cement, the liquid grouting originally promised is not a significant cost when compared against the certainty of gravity-driven contaminated water and particulates presently stored in porous footer drains leaching into the environment. If the cost of such grouting is prohibitive to AMS, this fact should certainly be conveyed to those individuals at the Nuclear Regulatory Commission responsible for assessing the adequacy of financial assurances for decommissioning.

Further, in the event that it is indeed cost-prohibitive for AMS to take those measures necessary to properly protect the environment through proper abandonment of these underground contaminated lines, the NRC should take those necessary measures on behalf of your licensee.

NOV 17 1995

The mission of the Northeast Ohio Regional Sewer District is to enhance public health and welfare through the efficient, cost-effective conveyance and treatment of wastewater. This is accomplished by an organization dedicated to professionalism, fairness and consistency that anticipates and responds to the changing environmental needs of the community.

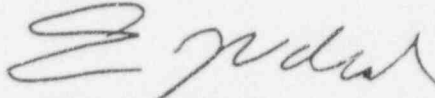


Mr. John Madera  
November 14, 1995  
Page Two

Finally, bear in mind that as long as the footers remain un-grouted, the District will not allow AMS to re-connect to the public sewer system.

Please call me or Thomas Lenhart or Lawrence English of my legal staff at (216) 881-6600 if you have any questions or comments.

Very truly yours,

A handwritten signature in dark ink, appearing to read 'E. Odeal', written in a cursive style.

Erwin J. Odeal  
Executive Director

encl.

cc: Richard Connelly  
Rod Dell'Andrea  
Thomas E. Lenhart  
Lawrence K. English



# Advanced Medical Systems, Inc.

1020 London Rd.  
Cleveland, Ohio 44110  
216-692-3270

RECEIVED

OCT 31 1995

Legal Department  
N. E. O.

October 17, 1995

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

Re: Addition of Grout to Abandoned Footer Drain and 4" Discharge Line at AMS  
(USNRC License No. 34-19089-01)

Dear Mr. Caldwell:

In the letter dated July 19, 1995 from Advanced Medical Systems (AMS) to you, AMS stated its intention of using AV-118 Duriflex liquid grout to fill the abandoned section of the foundation drains at the AMS facility in order to immobilize contaminants that were present in the drain line. This type of grout was originally selected based on its properties (enters the system in a free-flowing liquid form, seals well, etc.).

After further review, AMS now intends to take no further action with regards to the grouting of the abandoned line. This decision was based on the fact that installation of this type of grout carries significant cost, involves the use of hazardous materials in the mixture (sodium persulfate catalyst), and requires a specialized delivery system. AMS maintains that the contaminated pipe is adequately isolated without the grout since there is a concrete isolation wall surrounding the drain and an impermeable liner covering the ground surface above the drains. Independent analysis of more than 30,000 gallons of water that has been collected from the newly installed footer drain system, which shows no detectable cobalt-60, further justifies this decision.

During a July 18, 1995 teleconference call between AMS and the USNRC, Mr. Jack Grobe also recommended that AMS grout in the entire length of the 4" discharge line that rests beneath the AMS basement. (Please recall that it was AMS's intent from the onset of the sewer remediation project to only grout in each end of the 4" line. This has been done). However, review of photographs of the AMS facility taken during building construction shows that a trench is in the vicinity of where the 4" line should currently lie. This implies that the line is imbedded in the cement foundation. AMS recently confirmed that the 4" discharge line is indeed located in the trench depicted in the photograph and is surrounded by concrete (i.e., the 4" line was laid in the trench and concrete was poured to fill the trench and completely surround the line). Therefore, it serves no purpose to grout in that section of the 4" line that traverses the building.

Should you have any questions or if I can provide any additional information, please call me at (216)

OCT 25 1995

Sincerely,

*Robert Meschter*

Robert Meschter, R.S.O.

cc: D. Cesar  
D. A. Miller, Esq. - Stavole & Miller  
C. D. Berger, C.H.P. - IEM

RECEIVED  
EXECUTIVE DIRECTOR'S OFFICE

OCT 31 1995

NORTHEAST OHIO REGIONAL  
SEWER DISTRICT



COUNTY OF  
CUYAHOGA

**Cuyahoga Emergency Management  
Assistance Center (CEMAC)**  
December 18, 1995

**Commissioners**  
Mary O. Boyle  
Timothy F. Hagan  
Lee C. Weingart

VIA CERTIFIED U.S. MAIL  
Robert Meschter, RSO  
Advanced Medical Systems, Inc.  
1020 London Rd.  
Cleveland, Ohio 44110

Dear Mr. Meschter:

The Cuyahoga County Local Emergency Planning Committee (LEPC) is pleased to submit comments on the September 21, 1995 version of the Emergency Plan for the Advanced Medical Systems, Inc. (AMS) facility located at 1020 London Rd., Cleveland, Ohio 44110. These comments are timely submitted pursuant to 10 CFR 30.32 (i)(4), which allows offsite response organizations expected to respond in case of an accident 60 days to comment. We received your revised plan and your *reference to our comments* on October 19, 1995.

We have carefully reviewed the document submitted and offer the attached page referenced comments. The LEPC believes that the issues raised in the aforementioned attachment must be addressed to provide the local involvement necessary for an effective community response to your emergency plan. If you have any questions please call me at 216-443-7597.

Sincerely,

Michael S. Kalstrom  
Secretary, Cuyahoga County LEPC

cc: James L. Caldwell, Deputy Director, NRC Region III  
Commander Robert Cermak, Cleveland Police Dept.  
Lawrence English, NEORSD  
Jane Harf, Ohio SERC  
Edmund Mecklenburg, Cuyahoga County Emergency Management  
Edwin Price, Cuyahoga County Community Services  
Dr. Gayle Galan, University Hospitals  
Chief Thomas Root, Cleveland Fire Marshal  
James Williams, Ohio Emergency Management Agency

CECOMS CENTER 443-3196    CRIS CENTER 443-7940    EMERGENCY MANAGEMENT 443-5700

## Referenced Comments

### Emergency Plan (9/21/95 Version) for Advanced Medical Systems, Inc.

#### Cuyahoga County LEPC

Page	Section	Comment
1-1	1.1	What does the term <i>potentially dispersible</i> mean? Is it related to the type of material or the storage location? It appears to mean both when it suits this document's authors. The descriptions of the materials at the various locations in the facility are an improvement over the previous document, however, it would be helpful to include the ambient exposure rates on the maps provided. This would provide emergency responders with the immediate information they need in an emergency situation.
1-2	1.2.1	What is the physical state and type of storage of the 4,000 curies of <sup>60</sup> Co reported for the Hot Cell? What does <i>not readily dispersible</i> mean?
1-6	1.2.9	A February 8, 1988 report on the WHUT Room completed by Nuclear Support Services for AMS described approximately one inch of a talcum powder-like material on the floor of the WHUT Room and assessed its activity as 393.1 Curies. Another 136.4 curies was described as stored in a tank. <i>The Total Room Activity was listed at 529.4 Curies.</i> The description in this section does not compare with this description with regard to the contents and location of waste materials and the amount of total activity reported appears to be considerably lower than one would project given the approximately 1.5 half lives since 1988. Why?
1-7	1.3	Figure 5 does not illustrate the information reported in this section. What are the names and addresses of these facilities. Where are they located?
2-2	2.1	We believe that this section of the report would be more useful if it approached emergency scenarios resulting from a range of possible catastrophic events to the facility instead of carefully minimizing the likelihood and consequences of such events. The approach used in the report is not very useful to local emergency responders. It is helpful (from an emergency planning perspective) to know the possible consequences of certain catastrophic events however unlikely they may be.

2-2 2.1.1 The amount of *potentially dispersible material* is debatable (see earlier comments regarding this issue).

The dose reported for a fire fighter would be more useful if reported for a range of distances both inside the building and at some distance outside the building rather than for nine meters. This would help fire fighters to be more aware of the relative degree of risk.

2-4 2.1.4 The security history of this facility does not comport with this description.

2-5 2.1.5 It would be advisable to assess the likelihood of one or more tank ruptures in the temporary storage tanks on-site which hold an estimated 100,000 of water. This large volume of water could cause damage to the facility, personnel and possibly the community.

3-3 3.2 In the event of a *site area emergency* involving an off-site release of a reportable quantity of a reportable substance, the Fire Department, the Cuyahoga County LEPC, the Ohio SERC and the National Response Center must be contacted within 0.5 hours according to federal and state law.

3-3 3.3 In the event of a release of a reportable substance there are federal and state requirements for both immediate verbal and later written information (Section 304 of EPCRA and Section 3750.06 of the Ohio Revised Code). Information about the content of these notifications has been forwarded to AMS in our earlier Emergency Plan comments forwarded on June 2, 1995. The verbal information should be reported by the KSO at the time of such a release, and a written summary must be forwarded within thirty days of the release.

4-3 4.4 List should include the Cuyahoga County Division of Emergency Management and a description of the CMEIMS. It should also include the NEORSD and, of course, the Cuyahoga County LEPC.

6-1 6.4 Could not locate the *instrument calibration room* on Figure 3. Emergency responders should be able to locate this equipment in the event AMS personnel are incapacitated or unavailable.

7-2 7.3 Perhaps a *Communications drill* should have been performed prior to the release of this version of plan. Many of the telephone numbers and names and organizations are incorrect or missing from Table 2 (see Table 2



comments).

7-2 7.7 The Cuyahoga County Division of Emergency Management forwarded a letter, dated September 26, 1995, in response to the AMS inquiry on this subject, but the letter is not included in this document.

10-1 10 Section 302 (b)(2) of the Emergency Planning and Community Right to Know Act ("EPCRA") and Section 3750.05 (A) of the Ohio Revised Code both authorize the "designation of additional facilities."

As noted earlier the nature, content and phone numbers required for notification under Section 304 of EPCRA and Section 3750.06 of the Ohio Revised Code should be more comprehensive.

11-2 Table 1 Note earlier comments regarding the contents of the WHUT room.

11-3 Table 2 We believe that this table should be carefully reviewed. It has errors regarding names of people and agencies, errors regarding emergency telephone numbers and errors regarding the organizations listed as first responders. The following is a summary of the changes recommended.

Larry Grove is not a first responder. If names must be included we would suggest John Wills.

We don't believe that University Hospitals would be a first-responder, but will defer to the hospital staff. While the hospital would be involved it would not be *on-scene*.

There is a letter in Appendix E from the Ohio Department of Health that says that it is not a first responder.

The Ohio Environmental Protection Agency does not have a Chairperson. Jane Harf is the Chairperson of the Ohio SERC, and a staff member of the Ohio EPA, but not an emergency responder. The number listed here should be the emergency telephone number for the Ohio EPA/SERC - 800-282-9378.

The Cuyahoga County Division of Emergency Management should be listed as a first responder, in the event that CEMAC Mobile One (its mobile communications vehicle) were activated. It is accessed via the CMEIMS as described in our September 26, 1995 letter.

The NEORSD should be listed as a first responder. Its emergency

telephone numbers are 641-6000 during business hours and 641-3200 from 4:30 P.M. to 8:00 A.M. on week nights and on weekends.

The telephone number listed for the Cuyahoga County LEPC should be 216-771-1365. This number is answered 24 hours per day.

The National Response Center Hotline number should be included. It is 800-824-8802.

Figures The Figures do not include a site map that locates facilities outside of the primary building. For example the Pump House is not included on any of the Figures.

12-8 Figure 7 Is this meant to accommodate *all* emergencies? It seems likely that the emergency responders involved would vary depending upon the incident and might include agencies not listed here.

Emergency Response The procedures and agencies to be notified in the event of a reportable release (Section 304 of EPCRA and Section 3750.06 of the Ohio Revised Code) are not included anywhere in the *Emergency Response and Notifications* section.

13-13 Edmund M. *Mecklenburg's* name is spelled incorrectly.

Note earlier comment regarding Mr. Mecklenburg's September 26, 1995 letter.

14-1 Jane *Harf's* name is spelled incorrectly.

Edmund M *Mecklenburg's* name is spelled incorrectly.

The Cuyahoga County Local Emergency Planning Committee ("LEPC") should be added to the distribution list.

The NEORSD should be added to the distribution list.



# Advanced Medical Systems, Inc.

1020 London Road  
Cleveland, OH 44110  
(216) 692-3270

FAX # (216) 692-3269

## FAX MESSAGE

TO: Mike Weber

FROM: BUS M

FAX NO:

DATE: 12-20-95

PAGE OF 1.6

---

Received ATTACHED today.

- ① They received the "plan" on 10-4-95  
Don't know when they received  
"Reference to our comments."
- ② These people are NOT FIRST  
Responders.
- ③ Forwarding FYI & for courtesy

ENJOY

E/135

# ACTION ITEM CONTROL FORM

YEAR

96

NUMBER

0006

DATE INITIATED

01 03 96

REQUESTED BY

H MILLER

REQUESTING DIVISION

ORA

PUBLIC RESPONSIVENESS CORRESPONDENCE (Y OR N)

N

DESCRIPTION

NORTHEAST OHIO REGIONAL  
SEWER DISTRICT

ASSIGNED TO

C PEDERSON

DIVISION

D NMS

DUPLICATE DATE

01 24 96

CLOSEOUT ACTION

CLOSED DATE

REMARKS  
REEN TICKET ACTION

Assigned to  
Weber 1/4/96

Maddia

E/136

# ACTION

## EDO Principal Correspondence Control

FROM:

DUE: / /

EDO CONTROL: 0000914

DOC DT: 12/21/95

FINAL REPLY:

PRIORITY ROUTING

Erwin J. Odeal  
Northeast Ohio Regional Sewer District

TO:

James M. Taylor

OR SIGNATURE OF :

\*\* GRN \*\*

First	Second
BA	RC
ORA	EIC
DRP	SGA
DRS	QI
DNMS	PAC
DRWA	

CRC NO:

FILE HAS

ESC:

ROUTING:

ERRORS IN NRC INSPECTION REPORT NO. 030-16055/  
95005 (DRSS)

Ltr only:  
Taylor  
Milhoan  
Thompson  
Blaha  
Russell, NRR  
Paperiello, NMSS  
Lieberman, OE

DATE: 12/27/95

ASSIGNED TO:

CONTACT:

RIII

Miller

SPECIAL INSTRUCTIONS OR REMARKS:

For Appropriate Action

action DNMS

cc letter  
to ASB,  
BABS

due: 3 weeks

# ACTION

## EDC Principal Correspondence Control

FROM:   
 DUE: / /   
   
 win J. Odeal   
 Northeast Ohio Regional Sewer District

James M. Taylor

R SIGNATURE OF :

\*\* GRN \*\*

SC:

ERRORS IN NRC INSPECTION REPORT NO. 030-16055/  
95005 (DRSS)

TE: 12/27/95

SIGNED TO:

CONTACT:

RIII

Miller

SPECIAL INSTRUCTIONS OR REMARKS:

For Appropriate Action

EDO CONTROL: 0000914

DOC DT: 12/21/95

FINAL REPLY:

PRIORITY ROUTING

First	Second
BA	RC
DRA	EIC
DRP	SGA
DRS	QI
DNMS	PAC
DRMA	

CRC NO:

FILE HAS

ROUTING:

Ltr only:

Taylor

Milhoan

Thompson

Blaha

Russell, NRR

Paperiello, NMSS

Lieberman, OE

*Action DNMS*  
*- cc letter to ASIS, BABS*  
*due: 3 weeks*





# Northeast Ohio Regional Sewer District

3826 Euclid Avenue • Cleveland, Ohio 44115-2504

216 • 881 • 6600

FAX: 216 • 881 • 9709

December 21, 1995

Mr. James M. Taylor  
Executive Director for Operations  
U. S. Nuclear Regulatory Commission  
Washington, DC 20555

Re: Errors in NRC Inspection Report No. 030-16055/95005(DRSS)

Dear Mr. Taylor:

We were deeply troubled to receive Nuclear Regulatory Commission ("NRC") Inspection Report No. 030-16055/95005(DRSS), dated November 27, 1995, reviewed December 5, 1995, and approved December 4, 1995. This inspection report purports to reflect the results of NRC inspections that took place from April 3 to November 3, 1995. However, the contents of this inspection report are at odds with the facts as documented below.

We have attached a copy of the inspection report for your reference. We have also enclosed a copy of a videotape highlighting just a small portion of the pervasive violations of NRC regulations, good health physics practices, and ordinary safe working procedures at the Advanced Medical Systems, Inc. ("AMS") London Road facility during the period purportedly covered by the inspection report. We recite below some of the violations documented on the videotape in the context of the inspection report, to ensure that you see that our concern is fully justified.

As an initial point, both the transmittal letter and first page of the inspection report state that the purpose of the inspection was to determine whether the activities conducted by your licensee "were conducted safely and in accordance with NRC requirements." It is not clear under what authority the NRC may assess the safety of licensee conduct beyond compliance with specific NRC regulations, but it is clear that obvious safety violations were abundant at this facility during the period of inspection.

Referring to the excerpt of videotape taken July 5, 1995, you may readily observe unprotected workers in an un-shored excavation with heavy equipment in operation above them. You will also note that actual subsidence of the excavation is taking place. Similar operation of heavy equipment over an un-shored excavation may be seen in the excerpt of videotape taken July 7, 1995. In the July 28, 1995 excerpt you can see that the equipment being used to excavate is no longer level. It should be obvious that having unprotected workers in open, un-shored excavations with heavy equipment above them is unsafe.

EDO --- 000914

It should be obvious that having unprotected workers in open, un-shored excavations with heavy equipment above them is unsafe.

Reference to Occupational Safety and Health Administration ("OSHA") rules regulating open-trench excavation may assist you in confirming that these are indeed unsafe practices.

In the July 28, 1995 excerpts, you may observe a confined space entry into one of the AMS manholes. You will observe that the confined space entry takes place with no apparent ongoing atmospheric monitoring whatsoever, hence with no indication of toxic or explosive gases. You will also see that a worker is left dangling in a harness unattended at the entry to the AMS manhole, and see the harness later come up without the worker in it. You will also see the same worker smoking at the mouth of the radiologically-controlled AMS manhole where explosive gases could well accumulate. It also appears that Robert Meschter, the AMS Radiation Safety Officer, may have lit the cigarette for him. It also appears that no radiological control is being exercised over materials being removed from the manhole.

Each of these illustrates an obviously unsafe practice. As in the case with open-trench excavation, reference to Occupational Safety and Health Administration ("OSHA") rules regarding confined space entry may assist you in confirming that these are indeed unsafe practices.

These several points illustrate that the activities conducted at the AMS London Road facility were not conducted in a safe manner. As NRC inspectors may be unfamiliar with safe excavation practices, safe confined space entry requirements, and OSHA regulations, these oversights may be explainable through mere ignorance of the applicable standards. They may have ignored these problems because of their lack of authority. If the latter is the case, the inspection report should not state that it is examining AMS' activities for "safety". However, the inspection report goes on to make a number of erroneous statements with respect to observation of safe radiological practices that appear to be within NRC inspector training.

As a predicate to the following comments, it must be first observed that the NRC inspection report confirms at pages 3 and 5 that the sewer discharge system owned by AMS, and particularly the four-inch discharge line and the underdrain system, were indeed radioactively contaminated. Accordingly, the conduct of AMS employees and AMS contractors should be evaluated in terms of activities in a known contaminated area. Viewed as such, the actions of the AMS employees and contractors were woefully deficient, and matched only by the NRC inspectors' failure to note such deficiencies.

For example, it is stated at page 6 of the inspection report:

*All workers involved with the project received general radiation safety training from AMS, followed by training on the job-specific radiation work permit (RWP) 95-10.*

*According to the RWP, workers were required to wear TLDs and pocket dosimeters at all times while working in restricted areas. Workers were also required to wear latex gloves when handling soil and water samples.*

The same RWP is discussed at page 4:

*... Moreover, workers were required to wear full protective clothing (coveralls, hoods, booties, and gloves), in addition to using breathing zone air samplers, while working in contaminated areas.*

Page 6 of the inspection report falls short of stating full compliance with RWP 95-10. In fact, the report goes no further than to state, "The inspectors observed that workers wore proper dosimetry at all times, and wore latex gloves when handling soil and water samples." A cursory review of the videotape readily demonstrates that even this rudimentary requirement of good health physics practice and the RWP prepared was not observed.

For example, examine the videotape excerpts of July 5, 1995, in which workers are handling sections of the contaminated footers without gloves. Or see the excerpts from the July 11, 1995 videotape, in which the worker is using his bare hands to handle sections of the footer he has just broken up with a pick. This segment is particularly interesting, as he puts gloves on after handling the contaminated footers, apparently without washing his hands in the interim. Similarly, no protective gloves appear in the July 17, 1995 segment.

These are obvious failures to meet even the modest claim by the inspectors that "workers wore proper dosimetry at all times, and wore latex gloves when handling soil and water samples." That is, even the limited version of compliance stated by the NRC inspectors appears to be incorrect.

Beyond these multiple failures for AMS workers and contractors to wear gloves when handling radioactive materials, you will note many examples of failure to abide by the RWP mandate to "wear full protective clothing (coveralls, hoods, booties, and gloves), in addition to using breathing zone air samplers, while working in contaminated areas."

Note, for example, the workers in the contaminated excavation with no protective clothing whatsoever in the July 5, 1995 videotape excerpt. No breathing zone samplers are in evidence, either. In the July 7, 1995 excerpt, you can see that work is being performed in contaminated areas in short pants. In this same excerpt, you can also see a worker splashing contaminated water as he smashes at contaminated piping in the excavation with a breaker bar. The worker splashing the contaminated water is the one smoking the cigarette.<sup>1</sup> On the same day, you can see a worker in short pants in the truck bed into which contaminated dirt is poured. The truck, not surprisingly, has no liner.

In the July 11, 1995 excerpts, you can see a worker in a tee-shirt without gloves or face protection again smashing at the contaminated lines around the building. On this occasion you see him splashing himself in the face with contaminated water. There is no eyewash station for him to rinse his face, so he has a cigarette. In the July 13, 1995 excerpt, you can see workers again in short sleeves. On July 17, 1995, you can see a worker wearing no protective gear in a truck bed into which contaminated dirt is shoveled. The truck bed is still unlined.

You may also notice that there is a posting that some area is a "high radiation area." Which area is the high radiation area is not clear, as there is no apparent delimiting of areas at this facility throughout the project.

The extent of radioactive contamination at this site is indicated in the July 20, 1995 videotape excerpts, in which an AMS consultant states that soil samples may be too "hot" to handle. To be precise, he states that the soil samples being excavated are giving off 2 - 3 millirem/hour.

Notwithstanding the consultant's awareness of such high levels of contamination, the NRC inspectors do not make clear the efforts, if any, to characterize the contamination, nor do they unambiguously state the status of the AMS facility. The lack of clarity is exacerbated by the lack of precision in the inspectors' discussion of the activities themselves. For example, on page 5, the following may be found:

*Soils in the area were surveyed by the licensee using a scintillation counter employing a 2 inch x 2 inch sodium iodide crystal. Any soil which exhibited radiation levels at or above 8 picocuries per gram (pCi/g)<sup>3</sup> was removed and placed in a posted, roped off area in the rear parking lot, near the building.<sup>4</sup>*

---

<sup>1</sup>Quite a bit of smoking is evident on these videotape excerpts, with most of it being done by the AMS Radiation Safety Officer. As it is he who provides radiation training to the non-radiation workers, his example of poor health physics practices is particularly troubling.

Footnote 4 to this text elaborates on this AMS procedure:

*To be more precise, the soil was excavated using a backhoe. If any soil in the "scoop" exhibited readings at or above 8 pCi/g, the entire scoop of soil was considered potentially contaminated, and subsequently placed in the posted, roped off area in the rear parking lot.*

As you may recognize, sodium iodide crystal scintillation detectors do not provide readings in pCi/g. Hence, an important step has been left out of the discussion of how any material at this facility was characterized. Further, as to the tables attached to the inspection report, the MDA level for liquids of 20 - 60 pCi/l and for solids of 7 - 26 pCi are quite high, and do not seem to reflect best practices.

Certainly, no systematic evaluation of the facility or grounds approaching the NRC Draft Branch Technical Position on Site Characterization for Decommissioning Sites (NRC, 1992) has been conducted. Hence, this facility cannot be considered "characterized". Similarly, as nothing approaching the information contemplated by the Manual for Conducting Radiological Surveys in Support of License Termination, Draft NUREG/CR-5849 (J.D. Berger, ORISE, June 1992) has been developed, no part of this facility can be called "released".

Also, the implicit acceptance by the inspectors of leaving known contaminated piping in the ground (July 11, 1995) or simply covering a known contaminated area with a plastic tarp (July 24, 1995) or piling known contaminated material above ground (July 17, 1995) is very troubling. The idea that proper characterization and/or remediation would not take place because of poor shoring practices or the proximity of utility connections (see footnote 5 on page 6 of the inspection report) is also very troubling.

It puzzles us that such apparent violations are so easily recorded by the District, yet overlooked by NRC inspectors. Other aspects of the inspection report also puzzled us. For example, on page 7, the NRC chooses to forego finding AMS in violation of its license condition to remediate the London Road interceptor. The report states, "In fact, AMS has not yet been allowed to enter the interceptor."

This is grossly inaccurate and misleading, and all the more troubling because at least one of the NRC officials signing off on the inspection report actually knows that this statement is false. As was explained by telephone and confirmed in a November 1, 1995 letter to John Madera, the reason that AMS has failed to gain entry to the London Road interceptor is because they have unilaterally failed to properly arrange such entry. How it is that no violation is found when a licensee merely sits on its hands and ignores your license requirements is a mystery to us.



December 21, 1995

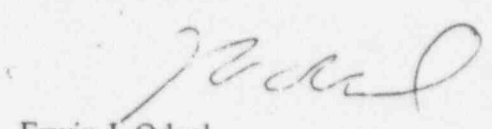
Page 6

These videotape excerpts illustrate the District's concern with AMS confined space entry practices (e.g., smoking in manhole, improper use of harness, etc.) and highlight the necessity of express conditions upon AMS and its contractors as a critical precondition to entry into the public sewer system.

Overall, NRC Inspection Report No. 030-16055/95005(DRSS) does not reflect the real conditions at the AMS facility nor accurately relate the activities that have taken place there. The extent to which the report diverges from the facts raises serious questions about NRC oversight of this licensee. We would appreciate your thorough review of the enclosed materials and appropriate follow-up investigation. As there are abundant violations apparent in these materials, we would recommend that the videotape not be shared with your licensee during the pendency of your investigation. We will be monitoring your enforcement follow-up closely.

Please call Richard Connelly, Manager of our Water Quality and Industrial Surveillance division, at (216) 641-6000, or Thomas Lenhart or Lawrence English of our Legal Department at (216) 881-6000, if you have any questions. Thank you for your assistance in this matter.

Very truly yours,



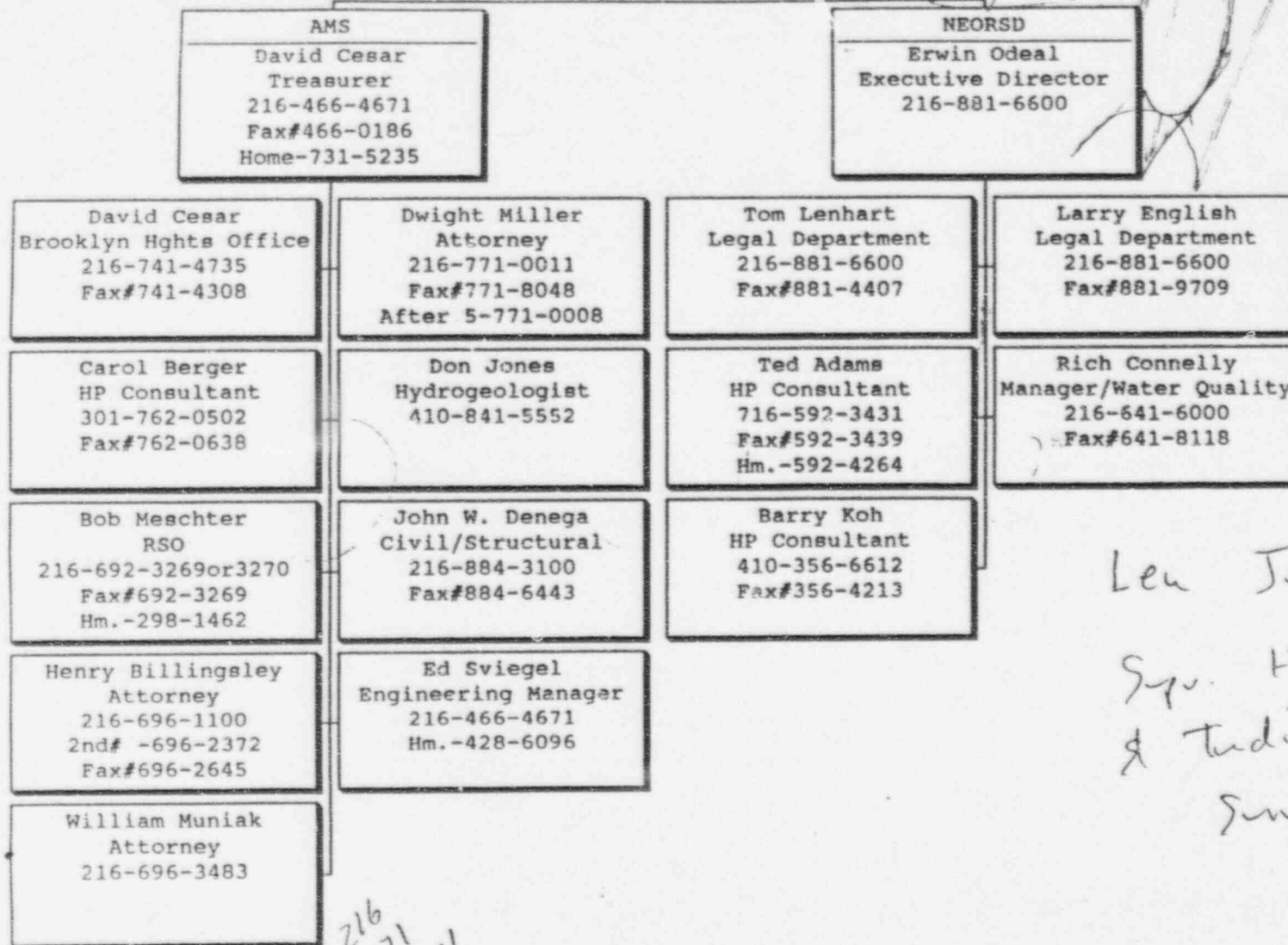
Erwin J. Odeal  
Executive Director

encl.

cc: Richard N. Connelly  
Thomas E. Lenhart  
Lawrence K. English



# ORGANIZATIONS INTERESTED IN AMS ISSUES



Len Jofko -  
Syr. H<sub>2</sub>O quality  
& Technical  
Service



UNITED STATES  
NUCLEAR REGULATORY COMMISSION

REGION III  
801 WARRENVILLE ROAD  
LISLE, ILLINOIS 60532-4351

December 4, 1995

Advanced Medical Systems  
ATTN: David Cesar  
Vice President  
121 North Eagle Street  
Geneva, OH 44041

Dear Mr. Cesar:

SUBJECT: NRC INSPECTION REPORT NO. 030-16055/95005(DRSS)

This refers to the inspection conducted by members of this office and NRC Headquarters on April 3 through November 3, 1995 at the London Road, Cleveland, Ohio facility. The purpose of the inspection was to determine whether activities authorized by the license were conducted safely and in accordance with NRC requirements. At the conclusion of the inspection, the findings were discussed with those individuals identified in the enclosed report.

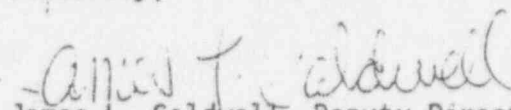
The areas examined during the inspection are identified in the report. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observation of activities in progress.

No violations of NRC requirements were identified during the inspection.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be placed in the NRC Public Document Room.

We will gladly discuss any questions you have concerning this inspection.

Sincerely,

  
James L. Caldwell, Deputy Director  
Division of Nuclear Materials Safety

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

Enclosure: Inspection Report  
No. 030-16055/95005(DRSS)

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 030-16055/95005(DRSS)

License No. 34-19089-01

Category B

Priority 1

Licensee: Advanced Medical Systems, Inc. (AMS)  
1020 London Rd.  
Cleveland, OH 44110

Inspection Dates: April 3 through November 3, 1995

Inspector: Michael F. Weber  
Michael F. Weber  
Materials Inspector

11/27/95  
Date

Reviewed By: John R. Madera  
John R. Madera, Chief  
Nuclear Materials Licensing  
Branch

12/5/95  
Date

Approved By: James L. Caldwell  
James L. Caldwell, Deputy  
Director, Division of  
Nuclear Materials Safety

12/4/95  
Date

Inspection Summary

Inspection on April 3 through November 3, 1995  
(Report No. 030-16055/95005(DRSS))

Areas Inspected: This was a special inspection to determine whether activities authorized by the license, primarily the removal of contaminated water and soil in and around the AMS facility, were conducted safely and in accordance with NRC requirements.

Results: Of the areas inspected, no violations of NRC requirements were identified.

## DETAILS

### 1. Place of Use

Advanced Medical Systems, Inc. (AMS)  
1020 London Rd.  
Cleveland, OH 44110

### 2. Persons Contacted

\*David Cesar - Vice President  
\*+Robert Meschter - Radiation Safety Officer  
Steve Haddock - Isotope Handler  
Chris Reed - Isotope Technician  
\*Carol Berger - Health Physicist (Contractor)  
\*Alan Duff - Project Manager (Contractor)  
\*Dwight Miller - Attorney for AMS  
Various contract workers

\*Present at exit meeting held on Aug. 29, 1995.

+Present at exit meeting held on Nov. 3, 1995.

### 3. Licensed Program

AMS is currently authorized to possess and use up to: (1) 150,000 curies of cobalt-60 as solid metal for storage only incident to waste disposal or transfer; (2) 135,000 curies of cobalt-60 in sealed sources for installation in, maintenance on, servicing and dismantling of, and training on teletherapy units; (3) 40,000 curies of cesium-137 for installation in, maintenance on, and servicing and dismantling of radiography and teletherapy units; (4) 4,040 kilograms of depleted uranium for shielding in radiography and teletherapy units; (5) 15,000 curies of cobalt-60 in non-NRC approved sealed sources for storage only; and (6) 15 millicuries of cobalt-60 in sealed sources for calibration of survey instruments. Prior to May 31, 1991, AMS was authorized to manufacture NRC approved sealed sources.

The license issued to AMS was originally issued on November 2, 1979, and was renewed on December 13, 1989, with an expiration date of December 31, 1994. The license was most recently amended on August 8, 1995. In November 1994, AMS submitted a timely renewal application, and the existing license continues to be effective pending completion of the NRC review of the renewal application.

### 4. Background

On October 21, 1994, the Executive Director of the Northeast Ohio Regional Sewer District (NEORS) served an Order upon AMS indicating that the NEORS would no longer provide wastewater treatment services for the AMS facility. On November 15, 1994, NEORS installed plugs in

the AMS connections to the sewage treatment system. The sewer line plugs rendered non-functional the facility underdrain system which was designed to control ground water pressure on the foundation structure. This resulted in increasing water levels in the soil around the facility and, by mid-January 1995, ground water intrusion into the basement of the facility. The water in the basement became radioactively contaminated from facility surface contamination.

On March 17, 1995, AMS' license was amended to authorize the following activities: (1) process<sup>1</sup> water that was stored outside its facility in above-ground tanks, (2) simultaneously pump and process water in the sanitary sewer manhole and lateral, building sump pit and basement, (3) excavate areas around the facility to allow: (i) access to the radioactively contaminated four-inch sewer discharge line; and (ii) the radiological evaluation of the facility's underdrain system and surrounding soils, (4) immobilize the radioactive contamination present in the sewer discharge system owned by AMS, and (5) remediate the London Road interceptor in the vicinity of the abandoned facility lateral. These activities were required to be completed by June 17, 1995.

On June 16, 1995, the license was amended to provide new completion dates for the five items listed above. The excavation of areas around the facility was to be completed by July 7, 1995.

By letter dated June 29, 1995,<sup>2</sup> AMS indicated that because of continuing delays in receiving the necessary permits and authorizations, its scheduled completion date for the excavation project would be extended to July 21, 1995. By letter dated July 12, 1995, AMS indicated that, due to the delay associated with the additional excavation caused by inaccurate building drawings depicting the foundation drainage system, etc., the scheduled completion date would be further extended to July 28, 1995. On July 13, 1995, NRC informed AMS via telephone that, since AMS did not request a license amendment in either of these two letters, it was in violation of License Condition 19, and would continue to be in violation until its license was amended by NRC.

By letter dated July 21, 1995, AMS requested an amendment to its license to change the excavation completion dates, etc. By letter dated August 8, 1995, AMS indicated that the excavation project had been completed.

The failure to complete the excavation of areas around the AMS facility by July 7, 1995, constitutes a violation of License Condition 19. This failure constitutes a violation of minor significance and is being treated as a Non-Cited Violation, consistent with Section IV of the NRC Enforcement Policy.

One Non-Cited Violation of NRC requirements was identified.

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<sup>1</sup> To "process" contaminated water means to remove Co-60 from the water.

<sup>2</sup> "29" is a typographical error, the correct number is "19."



5. Water Processing Project

As discussed above, on March 17, 1995, AMS' license was amended to authorize the following activities: (1) process water that was stored outside its facility in above-ground tanks, and (2) simultaneously pump and process water in its sanitary sewer manhole and lateral, building sump pit and basement. From early April to June 23, 1995, AMS contractors processed a total of nearly 100,000 gallons of water from these areas.

Most of the water processing equipment, including barrels containing processing wastes, was set up in the Isotope Warehouse, a restricted area. An AC powered Gamma Alarm, which gives audible and visual alarms if radiation levels exceed 2 mrem/hr, was located approximately 10 feet from the equipment, in an area often frequented by workers.

The inspectors continuously surveyed the processing equipment and surrounding areas. The highest reading on the water processing equipment was approximately 200 mrem/hr at the surface of the first carbon vessel. The highest reading on the surface of a waste drum was 7 mrem/hr. The exposure rates in the areas of the Isotope Warehouse most often frequented by workers were less than 1 mrem/hr; thus the inspectors never witnessed the Gamma Alarm in an alarm mode.

Sampling and storage tanks were located in the warehouse section of the building, an unrestricted area. Sample tanks were enclosed by wooden dikes/frames and plastic sheets in order to contain water if the tanks leaked. Additionally, a pump, equipped with a level trigger and connected to a hose to the basement, was located next to each sample tank. The only leaks observed by the inspectors occurred near the tanks' valves. These leaks were minor, produced puddles a few inches wide at the most, were always contained within the wooden dikes/frames, and did not cause contamination on the floor.

All workers involved with the water processing project were required to receive general radiation safety training from AMS, followed by training on the job-specific radiation work permit (RWP) 95-10. The inspectors audited several training sessions and noted that the training was very thorough in that it fully covered basic radiation safety topics as well as AMS specific information.

The inspectors interviewed nearly all of the contract workers and determined that they had received and understood the required training.

According to the RWP, workers were required to wear film badges and pocket dosimeters at all times while working in restricted areas. (All persons entering the facility are required to wear pocket dosimeters). Moreover, workers were required to wear full protective clothing (coveralls, hoods, booties, and gloves), in addition to using breathing zone air samplers, while working in contaminated areas. Workers were also required to wear latex gloves when handling water samples. •



The inspectors observed that workers wore proper dosimetry at all times, wore proper protective clothing and used breathing zone air samplers while in contaminated areas, and wore latex gloves when handling water samples.

Regarding surveys, the PWP required performance of ambient radiation surveys prior to entering a work area, along with routine surveys to assess changing radiological conditions. Prior to leaving a work area, workers were required to frisk themselves, and any equipment and materials with them.

The inspectors observed that the workers performed ambient radiation surveys and frisks as required.

No violations of NRC requirements were identified.

#### 6. Excavation Project

As discussed above, on March 17, 1995, AMS' license was amended to authorize the following activities: (1) excavate areas around the facility to allow: (i) access to the radioactively contaminated four-inch sewer discharge line; and (ii) the radiological evaluation of the facility's underdrain system and surrounding soils, (2) immobilize the radioactive contamination present in the sewer discharge system owned by AMS (this, of course, necessitated the installation of a new manhole), and (3) remediate the London Road interceptor in the vicinity of the abandoned facility lateral. The work on these activities began in late June, and, with the exception of the remediation of the London Road interceptor, ended in mid-August, 1995.

Following the installation of the new manhole, a trench (between 13 and 15 feet deep) was dug nearby, on the east side of the building, in order to locate the four-inch discharge line between the building's foundation and the old manhole. The line was unearthed, and the inner surface was found to be contaminated. The line was subsequently severed, and then capped with cement. In contrast to the building drawings from the 1950s, this line was not connected to the underdrain system at this location. Soils in that area were surveyed by the licensee using a scintillation counter employing a 2 inch x 2 inch sodium iodide crystal. Any soil which exhibited radiation levels at or above 8 picocuries per gram (pCi/g)<sup>3</sup> was removed and placed in a posted, roped off area in the rear parking lot, near the building.<sup>4</sup>

The excavation continued along the east and south sides of the building.

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<sup>3</sup> The maximum soil concentration for cobalt-60 in an unrestricted area is 8 pCi/g (Order Establishing Criteria and Schedule for Decommissioning the Bloomsburg, PA Site (Safety Light Corporation), 57 FR 6136, February 20, 1992).

<sup>4</sup> To be more precise, the soil was excavated using a backhoe. If any soil in the "scoop" exhibited readings at or above 8 pCi/g, the entire scoop of soil was considered potentially contaminated, and subsequently placed in the posted, roped off area in the rear parking lot.

Here, the underdrain system, at a depth of approximately 13 feet, was unearthed and found to be contaminated. The contaminated piping and any soil which exhibited radiation levels at or above 8 pCi/g were removed.

The excavation was halted in the area of the Source Garden, due to calculated exposure rates of more than 30,000 mrem/hr near the underdrain system (approximately 13 feet below the ground surface). These high exposure rates result from the storage of approximately 20,000 curies of Co-60 in the Source Garden.

The underdrain system north of the Source Garden was then unearthed, and again found to be contaminated. Moreover, a tee connecting the four-inch discharge line to the underdrain system was discovered. The line was subsequently severed, and then capped with cement. The underdrain system continued another 13 feet north past the tee connection, where it terminated. Approximately four feet of this length ran beneath the Isotope Shop air lock slab. As before, the contaminated piping and any soil (with the exception of some fill under the Isotope Shop airlock<sup>a</sup>) which exhibited radiation levels at or above 8 pCi/g were removed.

The entire underdrain system, with the exception of the drains near the Source Garden, was then replaced and the trenches filled with clean gravel and soil. In the area near the Source Garden, new drains were laid outside of the abandoned drains, and were connected to the new system. In order to prevent rain water, etc., from reaching the abandoned drains, a cement "wall" was installed underground between the abandoned system and the new system. In addition, the ground surface between the building and the new drains was sloped from the building toward the new system and covered with an impermeable plastic liner. The new underdrain system was then connected to the new manhole.

All workers involved with the project received general radiation safety training from AMS, followed by training on the job-specific radiation work permit (RWP) 95-10.

According to the RWP, workers were required to wear TLDs and pocket dosimeters at all times while working in restricted areas. Workers were also required to wear latex gloves when handling soil and water samples. Prior to leaving a work area, workers were required to frisk themselves, and any equipment and materials with them.

The inspectors observed that workers wore proper dosimetry at all times, and wore latex gloves when handling soil and water samples.

Regarding surveys, the RWP required performance of ambient radiation surveys prior to entering a work area, along with routine surveys to

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<sup>a</sup> Most, but not all, of the soil and gravel in this area under the Isotope Shop air lock slab was removed by the backhoe. The removal was not completed due to: (1) the dangers of a cave-in, due to the large amount of gravel in the area, (2) the proximity of a gas line, and (3) the proximity of an electric substation. The new underdrain system terminated approximately nine feet north past the former location of the tee connection; thus it did not extend into the area under the slab.

assess changing radiological conditions. Prior to leaving a work area, workers were required to frisk themselves, and any equipment and materials with them.

The inspectors observed that the workers performed ambient radiation surveys and frisks as required.

Regarding the requirement to remediate the London Road interceptor, License Condition 19.F. of Amendment 32 required that: (1) AMS coordinate the remediation of the interceptor with NEORS<sup>6</sup>, and (2) the project be completed by June 17, 1995. On June 6, 1995, the license was amended to require that: (1) the project begin by no later than July 8, 1995, and (2) AMS notify NRC no later than July 14, 1995, to confirm initiation of the project, and to provide an estimated completion date. AMS and NEORS have been negotiating/discussing the project since at least December, 1994. To date, very little progress has been made; in fact, AMS has not yet been allowed to enter the interceptor. This is necessary in order for AMS to evaluate the contamination of the interceptor, and develop a remediation plan. NRC continues to monitor the status of this project.

No violations of NRC requirements were identified.

#### 7. Confirmatory Measurements

From March 27 to July 6, 1995, the Region III Mobile Environmental Radiation Laboratory (Lab) was stationed in the Cleveland area to aid in the inspection effort. The Lab, and later the Region III Laboratory in Illinois, were used by NRC to: (1) measure the Co-60 concentration in the water after it was processed, and (2) determine the solubility characteristics of the Co-60 in the processed water.

At AMS, the processed water was first pumped into one of four 2500 gallon sample tanks located inside the building. For each sample tank, the water was recirculated for one hour, and then two one-liter samples were taken - one for NRC, one for AMS.

NRC's water samples were counted on a gamma spectroscopy system in the Region III mobile laboratory, or in the Region III laboratory in Illinois. The minimum detectable activity (MDA) at each laboratory varied between approximately 20 and 60 picocuries per liter (pCi/l). If Co-60 was detected above the MDA, then a solubility test was performed. The method used to determine solubility was ASTM D-1888-78, "Standard Test Methods for Particulate and Dissolved Matter, Solids, or Residue in Water," which is listed in NRC Information Notice (IN) 94-07 as the first of two acceptable methods which may be used for the radioanalysis of suspended solids in water. Briefly, this method involves passing the processed water through a 0.45 micron filter, and then analyzing the filter for gamma radioactivity. For the filter analyses, the MDA at

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<sup>6</sup> The London Road interceptor is owned by NEORS, not AMS.

each laboratory varied between approximately 7 and 26 pCi. If any activity of Co-60 above the MDA was detected on the filter, then the Co-60 was considered insoluble; otherwise, the Co-60 was considered soluble.

In all cases, NRC's solubility tests on the processed water pumped to the storage bladders revealed no detectable Co-60 on the filters. (See Table 1.)

8. Facility Security and Postings

The AMS building is equipped with an automatic security system for both physical protection of the facility and fire detection and suppression. In addition, during the excavation project, AMS provided a security guard when AMS staff were not present at the facility.

Regarding postings, all restricted, radiation, and contaminated areas inside and outside the AMS building were properly posted throughout the water processing and excavation projects.

No violations of NRC requirements were identified.

9. Personnel Radiation Protection - External

As indicated earlier, workers were required to wear TLDs and pocket dosimeters at all times while working in restricted areas. AMS monthly external exposure reports reveal that from January through the end of August, 1995, the highest total exposure for a worker was 295 mrem. The total exposure for all workers was 1125 mrem. (See Table 2.) This is well below the standards for occupational workers as found in 10 CFR 20.1201.

10. Exit Meeting

Exit meetings were held with those individuals and at those times indicated in Section 2 of this Inspection Report.

TABLE 1 - Results of NRC's Analysis of Processed Water Pumped to Storage Bladders

Water Sample Collection Date	NRC Sample Number	Concentration (pCi/l) (Water Sample)	Activity (pCi) (Filter Sample)
3/27/95	2	$28 \pm 8$	< 7
3/27/95	4	< 19	< 7
3/28/95	5	$35 \pm 8$	< 9
3/28/95	6	< 41	< 10
3/28/95	7	$81 \pm 18$	< 8
4/10/95	10	< 39	< 9
4/24/95	17	< 42	N/A
5/1/95	20	$39 \pm 7$	< 6
4/29/95	21	< 46	N/A
4/26/95	22	$131 \pm 23$	< 7
4/29/95	23	$194 \pm 27$	< 25
5/16/95	24	$162 \pm 25$	< 25
5/19/95	26	$126 \pm 23$	< 11
5/22/95	27	$187 \pm 26$	< 11
5/23/95	28	< 52	N/A
6/5/95	29	< 21	N/A
6/6/95	30	< 20	N/A
6/5/95	31	< 22	N/A
5/31/95	32	< 47	N/A
5/31/95	33	$54 \pm 10$	< 26
5/31/95	34	< 45	N/A
5/31/95	35	< 53	N/A
6/2/95	36	< 57	N/A
6/6/95	119	< 44	< 8
6/6/95	120	$110 \pm 16$	< 7
6/13/95	121	$178 \pm 19$	< 9
6/13/95	122	$66 \pm 13$	< 9



TABLE 2 - External Exposures to AMS and Contract Workers

Worker	Monthly External Exposure (millirem)								Total
	1/95	2/95	3/95	4/95	5/95	6/95	7/95	8/95	
1	nd	nd	nd	nd	20	nd	nd	nd	20
2	10	20	nd	nd	nd	160	10	nd	200
3	10	10	10	nd	40	160	20	45	295
4	--	--	nd	nd	nd	10	nd	30	40
5	--	--	nd	20	50	20	--	--	90
6	--	--	nd	10	60	170	nd	30	270
7	--	--	--	--	--	170	--	--	170
8	--	--	--	--	--	--	--	40	40
9	--	--	--	--	--	nd	nd	--	0
10	--	--	--	--	--	nd	nd	--	0
11	--	--	--	--	--	nd	nd	--	0
Total									1125

NOTES:

- (1) "nd" means the dose is below the dosimetry vendor's minimal measurable quantity. A value of zero was substituted for nd in the calculation of each worker's total dose.



6/13/95	123	$232 \pm 21$	< 9
6/13/95	124	$23 \pm 7$	< 11
6/11/95	125	< 23	N/A
6/13/95	126	$193 \pm 16$	< 12
6/9/95	127	$63 \pm 10$	< 11
6/8/95	128	< 16	N/A
6/11/95	129	$38 \pm 10$	< 9
6/6/95	130	$93 \pm 20$	< 8
6/6/95	131	< 20	< 8
6/19/95	132	$82 \pm 12$	< 12
6/7/95	133	$87 \pm 22$	< 8
6/6/95	134	$107 \pm 32$	Unavailable
6/21/95	135	$332 \pm 53$	< 11
6/13/95	136	< 22	< 9
6/13/95	137	$294 \pm 32$	< 9
6/14/95	138	$287 \pm 33$	< 8
6/15/95	139	$199 \pm 13$	< 9
6/14/95	140	$435 \pm 43$	< 11
6/21/95	141	$21 \pm 8$	< 6
6/13/95	142	< 21	N/A
6/7/95	143	$93 \pm 18$	< 8
6/8/95	144	< 20	N/A

NOTES:

- (1) For the water analysis, the MDA varied between approximately 20 and 60 pCi/l. For the filter analyses, the MDA varied between approximately 7 and 26 pCi.
- (2) All results less than the MDA are listed as "< x" where "x" represents the numerical value of the MDA.
- (3) All results greater than the MDA are listed with errors. The errors are twice the standard deviation.
- (4) "N/A" or Not Applicable signifies that the concentration of Co-60 in the water sample was below the MDA, thus, the solubility test was not performed. (As a check, the solubility test was performed on some samples with concentrations less than the MDA.)
- (5) "Unavailable" signifies that one water sample was lost, thus the solubility test was not performed.

As requested, I have reviewed the AMS inspection report dated 12/4/95, NEORSD's letter dated 12/21/95, and the video tape. The following are my impressions and opinions:

General Impression: NEORSD appears to have made assumptions that did not appear to be substantiated based on available material. It seemed that they were of the impression that all of the soil and all of the pipe on AMS' property was contaminated with radioactive material. However, the video does not appear to prove that impression was correct. They also seemed to have an unrealistic understanding of NRC's knowledge and inspection effort regarding OSHA regulatory requirements. It is interesting that none of their claims regarding "violations" taken on video appeared to be in the presence of an NRC inspector.

1. The inspection report states that no violations of NRC requirements were identified during the inspection. However, Item 4. of the report states that one non-cited violation of NRC requirements was identified. This appears to be inconsistent.
2. Video from 7/5/95 does show workers removing soil from a trench with heavy equipment, and the trench does appear un-shored from a limited point of view. The workers are not donning protective clothing or breathing zone samplers. It is not clear if the excavation is a contaminated area or not. It is not clear if the excavation area is a restricted or unrestricted area. Therefore, it is not clear if the video shows violations of (RWP) 95-10. It is not clear if the operation was observed by NRC staff.
3. Video from either 7/6/95 or 7/7/95 shows a worker in a trench that is unshored and heavy equipment is next to it. The workers are not donning protective clothing. It is not clear if the excavation is a contaminated area or not. It is not clear if the excavation area is a restricted or unrestricted area. Therefore, it is not clear if the video shows violations of (RWP) 95-10. It is not clear if the operation was observed by NRC staff.
4. Video from 7/28/95 does not appear to show unlevel excavation equipment.
5. NEORSD claims that unprotected workers in open, un-shored excavations with heavy equipment above is unsafe and in violation of OSHA requirements. It is not clear if NRC observed the activities when they were video taped. Also, radiation safety and NRC regulatory compliance are the main objectives of NRC inspections. OSHA concerns are typically incidental findings during NRC inspections. Most NRC inspectors do not receive detailed training regarding OSHA regulations, especially for activities that are rarely observed during routine NRC inspections (e.g., sewer excavation).
6. Video taken on 7/28/95 shows a worker entering a manhole without apparent atmospheric monitoring. A worker is left unattended while suspended by a harness at the manhole opening. The worker is seen smoking at the manhole entrance. The empty harness is seen removed from the manhole followed by the worker. It is not clear if the work area is a contaminated area or not. It is not clear if the work area is a

restricted or unrestricted area. Therefore, it is not clear if the video shows violations of (RWP) 95-10. It is not clear if the operation was observed by NRC staff. Also, radiation safety and NRC regulatory compliance are the main objectives of NRC inspections. OSHA concerns are typically incidental findings during NRC inspections. Most NRC inspectors do not receive detailed training regarding OSHA regulations, especially for activities that are rarely observed during routine NRC inspections (e.g., sewer excavation).

7. Video from 7/5/95 shows a worker handling pipe fragments while donning gloves. It is not clear if the work area is a contaminated area or not. It is not clear if the pipe fragments are contaminated. It is not clear if the work area is a restricted or unrestricted area. Therefore, it is not clear if the video shows violations of (RWP) 95-10. It is not clear if the operation was observed by NRC staff.
8. Video from 7/11/95 shows a worker handling pipe fragments with bare hands. After handling the pipe fragments, the worker dons gloves. However it is not clear if he washed his hands prior to donning the gloves because the video tape was stopped and restarted between takes. Furthermore, it is not clear if hand washing was necessary because it is not clear whether the pipe fragments were contaminated or not. It is not clear if the work area is a contaminated area or not. It is not clear if the work area is a restricted or unrestricted area. Therefore, it is not clear if the video shows violations of (RWP) 95-10. It is not clear if the operation was observed by NRC staff.
9. Video from 7/17/95 shows a worker with no protective gear standing in a truck bed picking off debris from an excavator scoop. It is not clear if the work area is a contaminated area or not. It is not clear if the work area is a restricted or unrestricted area. Therefore, it is not clear if the video shows violations of (RWP) 95-10. It is not clear if the operation was observed by NRC staff.
10. Video from 7/8/95 shows a worker come out of a trench wearing shorts, and he is carrying a bagged sample. It is not clear if the work area is a contaminated area or not. It is not clear if the work area is a restricted or unrestricted area. Therefore, it is not clear if the video shows violations of (RWP) 95-10. It is not clear if the operation was observed by NRC staff.
11. Video from 7/7/95 shows a worker splashing water while hitting a pipe with a bar. It is not clear if the work area is a contaminated area or not. It is not clear if the work area is a restricted or unrestricted area. Therefore, it is not clear if the video shows violations of (RWP) 95-10. It is not clear if the operation was observed by NRC staff.
12. Video from 7/7/95 did not appear to show a worker in short pants in an unlined truck bed into which dirt is poured.
13. Video from 7/11/95 shows a worker in a short sleeve shirt with booties and a hard hat, but without overalls and a hood. The worker splashes

water while hitting a pipe and smoking a cigarette. It is not clear if the work area is a contaminated area or not. It is not clear if the work area is a restricted or unrestricted area. Therefore, it is not clear if the video shows violations of (RWP) 95-10. It is not clear if the operation was observed by NRC staff.

14. Video from 7/13/95 shows workers in short sleeves remove samples from a ditch. It is not clear if the work area is a contaminated area or not. It is not clear if the work area is a restricted or unrestricted area. Therefore, it is not clear if the video shows violations of (RWP) 95-10. It is not clear if the operation was observed by NRC staff.
15. Video from 7/18/95 showed a High Radiation Area posting, and it appeared that the area was marked using tape.
16. Video from 7/18/95 showed an individual say that soil samples to be taken will range to about 2 mR/hr. However, this appears to be a prediction, and the video does not substantiate the accuracy of the prediction. Furthermore, it is not clear if the individual was basing his predictions on ambient dose rates from the source garden rather than actual samples of soil contamination.
17. Video from 7/95 shows smoking by workers. It is not clear if the work areas are a contaminated area or not. It is not clear if the work areas were restricted or unrestricted. Therefore, it is not clear if the video shows violations of (RWP) 95-10 or poor health physics practices. It is not clear if the operation was observed by NRC staff.
18. NEORSD indicates that the AMS grounds did not get characterized to the degree outlined in certain NRC literature, thus they cannot be "released". The AMS facility was not released for unrestricted use. Rather, the primary activities conducted were to safely remove contaminated soil and water in and around the AMS facility.
19. Video from 7/11/95 did not appear to show acceptance by inspectors of leaving known contaminated piping in the ground.
20. Video from 7/24/95 did not appear to show covering of a known contaminated area with a plastic tarp.
21. Video from 7/17/95 did not appear to show piling of known contaminated material above ground.
22. Footnote 5 of the inspection report indicates that some soil under the Isotope Shop air lock slab was not removed due to hazards involving cave-in, and nearby gas and electric utilities. The risk of death due to trench cave-in, explosion or electrocution appeared to be a reasonable excuse for not removing all of the soil. Furthermore, explosion/fire from hitting a gas/electric line would likely result in radiological hazards far more significant than what exists without removing the soil.

23. NEORSD questions why NRC did not cite AMS for failure to remedy the London Rd. interceptor which was required to be started by 7/8/95. NRC states that AMS has not been allowed to enter the NEORSD-owned interceptor to evaluate contamination. NEORSD states that NRC knew AMS hasn't entered the interceptor because AMS failed to properly arrange entry. There appears to be a conflict requiring more information for resolution.

Robert D. Hattis Jr. 1/10/96