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

JUL 31 1992

Docket No. 40-8778
License No. SMB-1393

Molycorp, Inc.
ATTN: Ms. Barbara K. Dankmyer
Resident Manager
300 Caldwell Avenue
Washington, Pennsylvania 15301

Dear Ms. Dankmyer:

This letter transmits the meeting summary of the July 8, 1992 meeting between Molycorp representatives and the U.S. Nuclear Regulatory Commission staff at NRC offices in Rockville, Maryland. As you know, this meeting concerned the decommissioning of your facility in Washington, Pennsylvania.

In a letter to NRC, dated June 15, 1992, Molycorp tentatively committed to meeting a schedule for site decommissioning pending the outcome of the July 8, 1992 meeting. Molycorp also agreed to confirm this schedule, or request reasonable alternatives dates, within one month of the meeting. Based on our telephone conversation on July 28, 1992, it is my understanding that Molycorp proposes to commit to the following schedule for site decommissioning: (1) submit a plan on the characterization and closure of 8 surface ponds by September 1, 1992; (2) submit a site characterization plan by October 1, 1992; (3) submit a report evaluating decommissioning alternatives, and options for disposing of contaminated material by March 1, 1993; (4) submit a complete site characterization report by May 30, 1993; (5) submit a decommissioning plan by November 30, 1993, including a decommissioning funding plan to cover the estimated costs for the preferred decommissioning approach; and (6) complete site decommissioning and submit a final radiation survey in accordance with the NRC-approved decommissioning plan by May 30, 1995.

It is also our expectation that Molycorp will submit a modified application for license renewal to NRC requesting that these commitments be incorporated, as conditions, in Source Material License No. SMB-1393. We look forward to receiving your renewal request within the next several weeks.

NRC FILE CENTER COPY

delete: ACNW

If you have any questions or are not in full agreement with our characterization of the meeting, please contact me at (301) 504-2560 or Chad Glenn of my staff at (301) 504-2546.

Sincerely,

/S/

Chad Glenn, Project Manager
Decommissioning and Regulatory Issues Branch
Division of Low-Level Waste Management
and Decommissioning
Office of Nuclear Material Safety
and Safeguards

Enclosure: As stated
cc: R. Shoemaker, Molycorp
G. Dawes, Molycorp
B. Belanger, EPA reg. III
J. Yusko, PA-DER-RP
W. Dornsife, PA Bureau
of Radiation Protection
J. Kinneman, Reg. I

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JKinneman	DFutoma	MBauwens		

PDR YES ✓
PDR NO ___ Category: Proprietary ___ or CF Only ___ ___
ACNW YES ___ NO ✓ ___

SUBJECT ABSTRACT: Docket No. 40-8778, License No. SMB-1393

OCF	LLDR CG	LLDR MW	LLDR MWF		
NAME	CGlenn	MWeber	JAustin		
DATE	7/28/92	7/31/92	7/31/92		

S:\MOLYCOVE.CG OFFICIAL RECORD COPY S:Concur-2.LLW

SUMMARY OF JULY 8, 1992 MEETING
BETWEEN MOLYCORP, INC. AND THE U. S. NUCLEAR REGULATORY COMMISSION
ON DECOMMISSIONING OF WASHINGTON, PENNSYLVANIA SITE

The discussion during this meeting included: (1) a brief review of the history of operations at this site; (2) an overview of Molycorp's plans for site decommissioning; (3) a discussion of alternative remediation approaches; and (4) comments on Molycorp's June 15, 1992 letter to NRC, along with comments on the submittal of a decommissioning funding plan. The agenda and meeting notice along with the list of attendees are attached (Enclosure 1).

The meeting began with a review of the history of Molycorp's operations at the Washington, Pennsylvania facility. Molycorp produced ferrocolumbium alloys between 1964 and 1970. The columbium ore processed over this timeframe had a natural thorium content which resulted in slags containing 0.1 to 0.7 % thorium. Molycorp explained that the ore was blended with aluminum metal and iron oxide and other ingredients, and then subjected to a high temperature exothermic reaction. This thermic reaction occurred in a sand pit situated in the floor of Building No. 34. Two end products from this process included (1) a ferrocolumbium alloy which was crushed, packaged, and sold; and (2) a thorium-bearing slag which was used as fill over portions of the site. Due to the high temperature associated with the exothermic reaction (estimated at 5000 degrees F), Molycorp maintains that the slag is insoluble and strongly resistent to chemical attack.

Molycorp started characterizing the contamination onsite in 1971 after being cited for burying quantities of thorium-bearing slag onsite in excess of the limits specified in 10 CFR 20.304. Molycorp established a cleanup level of 250 uR/h and excavated material above this level with the intention of disposing of it in a commercial burial ground. Molycorp contracted with Nuclear Fuel Services (NFS) in West Valley, New York and shipped 21 truckloads of thorium-bearing slag to this disposal facility. In September 1972, the State of New York stopped future shipments to NFS. Molycorp proceeded with the excavation and stockpiling of contaminated material onsite until other arrangements could be made for ultimate disposal. Molycorp has been unable to find suitable disposal for the waste in this storage pile since the mid-1970s. In response to a question regarding offsite use of thorium-bearing slag, Molycorp stated that no contaminated slag has been released for offsite use.

In this cleanup operation, Molycorp excavated substantial quantities of contaminated material from the southern portion of the property along with material from the western portion of the site north of Caldwell Avenue. By the mid-1970s, Molycorp had completed the excavation of contaminated material above the 250 uR/h cleanup level and consolidated this material in a 250,000 cubic foot storage pile. In the course of this discussion, a question was raised concerning the volume of the existing storage pile. This question was apparently prompted by a 1985 Oak Ridge Associated Universities radiological survey of the site which referred to a significantly lower volume of contaminated material. Molycorp indicated that they believe the higher volume estimate is correct, but committed to double check their volume figure.

The next item discussed was Molycorp's plans for characterizing, remediating, and ultimately decommissioning the site. A consultant, Dr. McDonald Wrenn, provided an overview of Molycorp's past and planned work to characterize the

extent of contamination at this site. This discussion focused on characterization and remediation of: (1) 8 surface ponds; (2) existing surface and subsurface contamination over the remainder of the site; and, (3) the slag storage pile situated on the southern part of the site. Briefing charts used in this discussion are attached (Enclosure 2).

Molycorp stated that their initial goal is to decommission the 8 surface ponds in 1992. A representative from the State of Pennsylvania, attending the meeting, indicated that the State would also like to see Molycorp move forward with decommissioning of these ponds. The 8 surface ponds are situated on the west side of this facility and have been in place since 1968. Molycorp stated that the ponds were used for cooling water from the plant's roaster, but the ponds are no longer used. Molycorp emphasized that the roaster was not used for processing ferrocolumbium ore. Therefore, Molycorp does not believe the ponds contain radioactive material. However, Molycorp does plan to characterize the contents of each pond to determine their radiological and chemical characteristics. Molycorp provided an overview of their plans for closing the ponds and stated their intent to submit a Pond Closure Plan to NRC in the near future.

Dr. Wrenn presented the results of 1990 study entitled, "A Sub-Surface Survey for Thorium Content at The Molycorp Plant Site in Washington, Pa". A copy of this study was provided to NRC staff on June 26, 1992. The objective of this radiation survey was to measure the surface and subsurface concentration of thorium in the vicinity of the 8 surface ponds. Subsurface radiation measurements were made by drilling 32 bore holes over the western portion of the site and lowering a sodium iodide (NaI) scintillation probe down each hole. An important aspect of this discussion concerned the calibration of the NaI probe used to measure subsurface radiation levels. Core samples were taken at a number of locations to verify the calibration of the probe. These cores are being analyzed for their thorium and uranium content and will be used as a check on the calibration of the NaI probe. Dr. Wrenn stated that the results of this analysis are expected to be completed shortly and will be provided to NRC. Molycorp also stated that additional work is planned to characterize the extent of radiological contamination over the remainder of the site.

The results of the 1990 sub-surface survey indicate that the distribution of radiation contamination is patchy and laterally discontinuous. Bore holes, which were drilled to 19 feet, also indicate that the contamination generally does not extend below 10 feet. Based on the results of this survey, most holes show less than a 2-foot interval of contamination. However, of the 32 bore holes surveyed, 29 had thorium concentrations exceeding 5 pCi/g above background confirming the presence of substantial sub-surface contamination.

Molycorp discussed a proposal to cleanup the site to a level of 5 pCi/g at one meter above background averaged over an area of 10 square meters. Molycorp outlined their proposal that would include: (1) excavating contaminated material above 25 uR/h at one meter (11 uR/h background + 14 uR/h = 25uR/h; 1 pCi/g ^{232}Th in secular equilibrium with daughters yields an exposure rate of about 2.8 uR/h at one meter); (2) leaving contaminated material below 4 feet in place; (3) extending surface and subsurface characterization across the

site; and (4) developing dose estimates for various scenarios. This site cleanup effort would begin with the decommissioning of the 8 surface ponds. NRC staff indicated that they would defer judgement on this proposal until after Molycorp completed their evaluation of alternative approaches for remediating the contamination onsite.

In addition to the radiological characterization, Molycorp has also retained a hydrologist to characterize the groundwater underlying the site. As indicated earlier, Molycorp believes that the contaminated slag is relatively insoluble and poses little threat of groundwater contamination. The point was made that core samples and past leaching studies will be useful in substantiating this point. Molycorp's Site Characterization Plan will include additional leaching measurements of ferrocolumbium slag to document the solubility of the thorium-bearing slag. The results of hydrological characterization of the site will be provided to NRC when this study is completed.

As indicated above, Molycorp estimates that there is 250,000 cubic feet of waste in the slag storage pile and this material contains approximately 89,000 pounds of thorium. The average concentration of thorium in this pile is 1250 pCi/g. Molycorp emphasized the point that the concentration of slag in this pile is not characteristic of the concentration of slag in other areas of the site. Molycorp added that this material exceeds the specific activity limit in Envirocare's license (680 pCi/g) for thorium-232 in equilibrium with its daughters. Therefore, disposal of this material at the Envirocare facility is not a viable alternative. The extent of contamination under the storage pile is unknown. Molycorp plans to drill through the storage pile during site characterization to determine the extent of subsurface contamination at this location.

The next item discussed in the meeting concerned alternative approaches for remediation the contamination onsite. In this discussion, Molycorp stated that they intend to evaluate a number of options for ultimate disposition of contaminated material. Molycorp will submit their evaluation of alternatives to NRC for consideration. Some of the alternatives Molycorp anticipates evaluating include:

- permanent storage onsite with enhanced engineered protection;
- disposal in a Utah mine, or a deep mine in Pennsylvania;
- export of contaminated slag to Brazil;
- disposal in a commercial facility, such as Envirocare;
- onsite reprocessing of slag to remove additional thorium for volume reduction.

In the course of this discussion, NRC suggested that Molycorp contact the Department of Energy's Director of Technology Development for other ideas on remediation involving large volumes of materials with thorium contamination. In terms of the feasibility of disposal of slag in a deep mine in Pennsylvania, the State representative indicated that this may be a viable

alternative if leachability studies demonstrate that the slag is highly insoluble. There was also an indication that the State might oppose onsite disposal, and possibly offsite disposal within the State if this would conflict with disposal in an Appalachian Compact disposal facility. NRC stated its willingness to consider all of these options, noting NRC's general decommissioning standard of cleanup for unrestricted use, and the need for additional protection if significant quantities of radioactive material are left onsite.

Molycorp responded to NRC's May 29, 1992 letter prior to this meeting. Therefore, there was little discussion on this agenda item. It is NRC's expectation that Molycorp will submit a modified license renewal application requesting the incorporation, as license conditions, of agreed upon dates for decommissioning milestones.

NRC ACTION ITEMS:

- Locate Molycorp's May 1970 leaching study and send a copy to Molycorp by August 15, 1992.

- Refund Molycorp $67,590.62 in the near future. NRC provided Molycorp with a copy of a letter, dated July 2, 1992, from NRC's Division of Accounting and Finance stating that Molycorp was incorrectly billed and will be refunded in the near future.

- Provide Molycorp with a copy of the Federal Register Notice on disposal of non 11(e)2 byproduct material (completed July 16, 1992).

- Review Molycorp's Sub-Surface Survey for Thorium Content at the Molycorp Plant Site in Washington, Pa using the revised tables provided in this meeting. (complete by September 15, 1992).

- Provide Molycorp with a copy of draft NUREG/CR-5849, entitled "Guidance Manual for Conducting Radiological Surveys in Support of License Termination" (complete by August 15, 1992).

- Provide Molycorp with a copy of proposed rule on import and export of radioactive waste (complete by August 15, 1992).

- Provide Molycorp with a copy of NRC Staff Technical Position on Design of Erosion Protection Covers for Stabilization of Uranium Mill Tailings Sites (complete by August 15, 1992).

- Complete NRC's review of Molycorp's license renewal application within one month from the date the renewal application is docketed.

- Complete NRC's review of Molycorp's Pond Closure Plan within one month from the date the plan is docketed.

- Review and comment on Molycorp's proposed alternatives for ultimate disposal of thorium-bearing slag.

MOLYCORP ACTION ITEMS:

- Inform NRC of any errors or inconsistencies in the write-up on Molycorp's Washington, PA site in the May 1992 version of the SDMP. (NRC provided Molycorp with a copy of this document at the meeting).

- Submit a report to NRC on alternatives for decommissioning of the site and ultimate disposal of contaminated slag and soil. The report will provide estimated costs for each decommissioning and waste disposal alternative, including removal of all slag and contaminated soil in excess of 5 pCi ^{232}Th/g above background levels from the Washington site. Molycorp will look at reprocessing the slag to remove the thorium content, as well as other reasonable alternatives such as export of the contaminated material for processing and/or disposal, mine cavity disposal within the State of Pennsylvania or other State, and onsite stabilization and disposal of the contaminated material.

- Submit a modified application for license renewal to NRC requesting incorporation of agreed upon dates, as license conditions, for the following decommissioning milestones: (1) submittal of a site characterization plan; (2) submittal of a report evaluating decommissioning alternatives, including estimated costs for decommissioning and options for disposing of the contaminated material; (3) submittal of a complete site characterization report; (4) submittal of a decommissioning plan, including a decommissioning funding plan to cover the estimated costs for the preferred decommissioning approach; and (5) completion of site decommissioning and submittal of a final radiation survey in accordance with an NRC-approved decommissioning plan.

- Submit a license amendment request including a plan on the characterization and closure of 8 surface ponds in the near future.

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

JUN 15 1992

Docket No. :40-8778
License No.:SMB-1393

Molycorp, Inc.
ATTN: Barbara Dankmyer, Resident Manager
300 Caldwell Avenue
Washington, Pennsylvania, 15301

Dear Ms. Dankmyer:

This is to confirm our meeting concerning decommissioning of your Washington site under Nuclear Regulatory Commission license No. 1393. If you have any questions, please call me at (301) 504-2546, or Mike Weber at (301) 504-1298.

DATE OF MEETING: JULY 8, 1992

TIME: 9:00 a.m.

LOCATION: U.S. Nuclear Regulatory Commission
Conference Room 1F19
11555 Rockville, Maryland

DRAFT AGENDA ITEMS:
1. Brief history of Molycorp site.
2. Overview of Molycorp's plans for decommissioning site.
   - site characterization
   - site location discussion
3. Alternative remediation approaches.
4. Molycorp's response to NRC's May 29, 1992 letter.
5. Status of Decommissioning Funding Plan.

PARTICIPANTS:

Molycorp Participants
Barbara Dankmyer, Resident Manager
David Shoemaker, Manager of Molybdenum Operations
Dr. McDonald Wrenn, Consultant

NRC Participants:
Richard Bangart, Director, Division of Low-Level Waste Management and Decommissioning
William Brach, Deputy Director, Division of Low-Level Waste Management and Decommissioning
John Austin, Chief, Decommissioning and Regulatory Issues Branch

14 pp.

Enclosure 1

Jerry Swift, Chief, Operations Branch
Michael Weber, Section Leader, Regulatory Issues Section
Yawar Faraz, Operations Branch
Chad Glenn, Project Manager, Regulatory Issues Section
Robert Fonner, Office of the General Counsel
John Kinneman, Region I

Sincerely,

Chad Glenn

Chad Glenn, Project Manager
Regulatory Issues Section
Decommissioning and Regulatory
Issues Branch
Division of Low-Level Waste Management
and Decommissioning

cc:
G. Dawes, Molycorp, Inc.
E. Erickson, EPA RIII
Administrator
W. Dornsife, PA Bureau
of Rad. Protection
E. Farrell, PA Bureau
of Waste Management

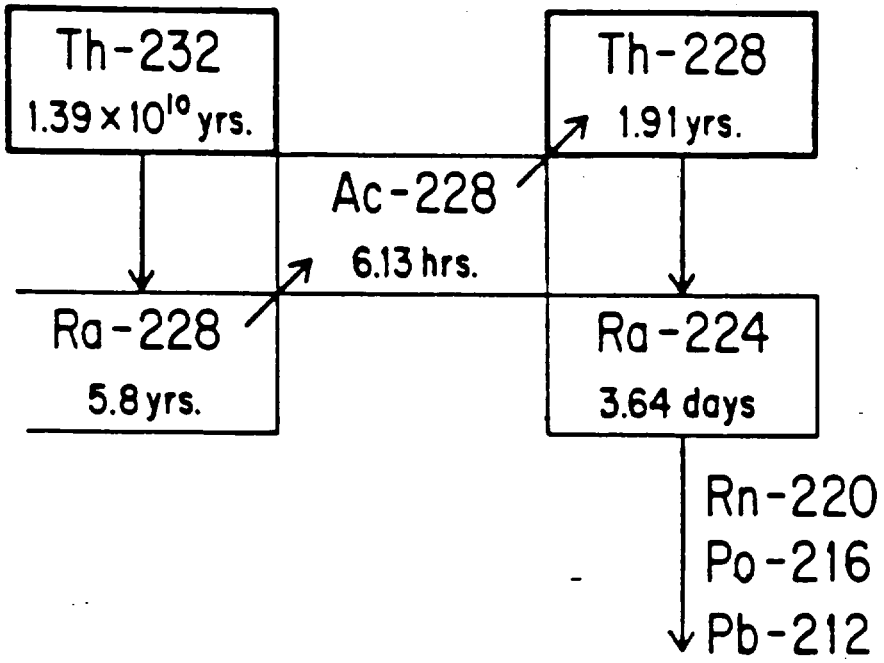
Meeting Between The NRC and Molycorp, Inc on Decommissioning of Washington, Pa Site

July 8, 1992

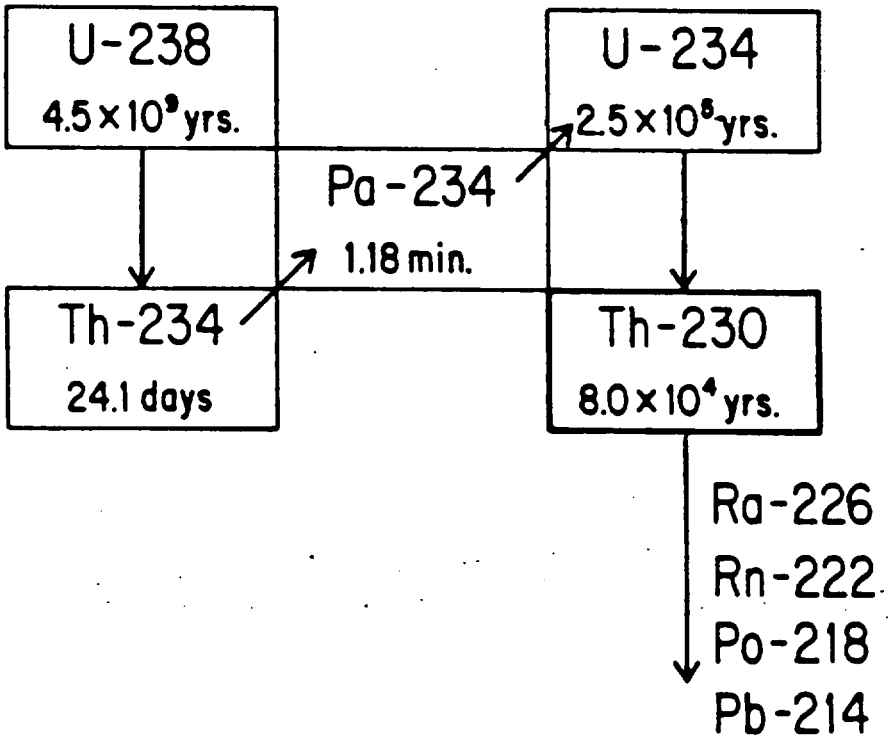
List of Attendees

Name	Organization	Phone No
Chad Glenn	NRC/NMSS/LLOR	(301) 504-2546
Michael Weber	NRC/NMSS/LLDR	(301) 504-1298
James Yusko	PA - DER - RP	412-442-4000
John Kinneman	USNRC Region I	(215) 337-5252
Mark R. Bowmers	USNRC Region I	(215) 337-6910
John H. Austin	USNRC, NMSS, LLWD	(301) 504-2560
David Futoma	USNRC - OGC	(301) 504-1621
Yawar Faraz	NRC/NMSS/IMNS	(301) 504-2669
McDonald E. Wrenn	Rad. Surveillance Assoc.	301-974-0132
David Shoemaker	Molycorp	(505) 586-7601
George Dawes	Molycorp	412 222 5605
Barbara K Dankmyer	Molycorp	412 222 5605
Jerry J. Swift	NRC/NMSS/IMSB	301 504 2609

Mode of Decay - Thorium Series

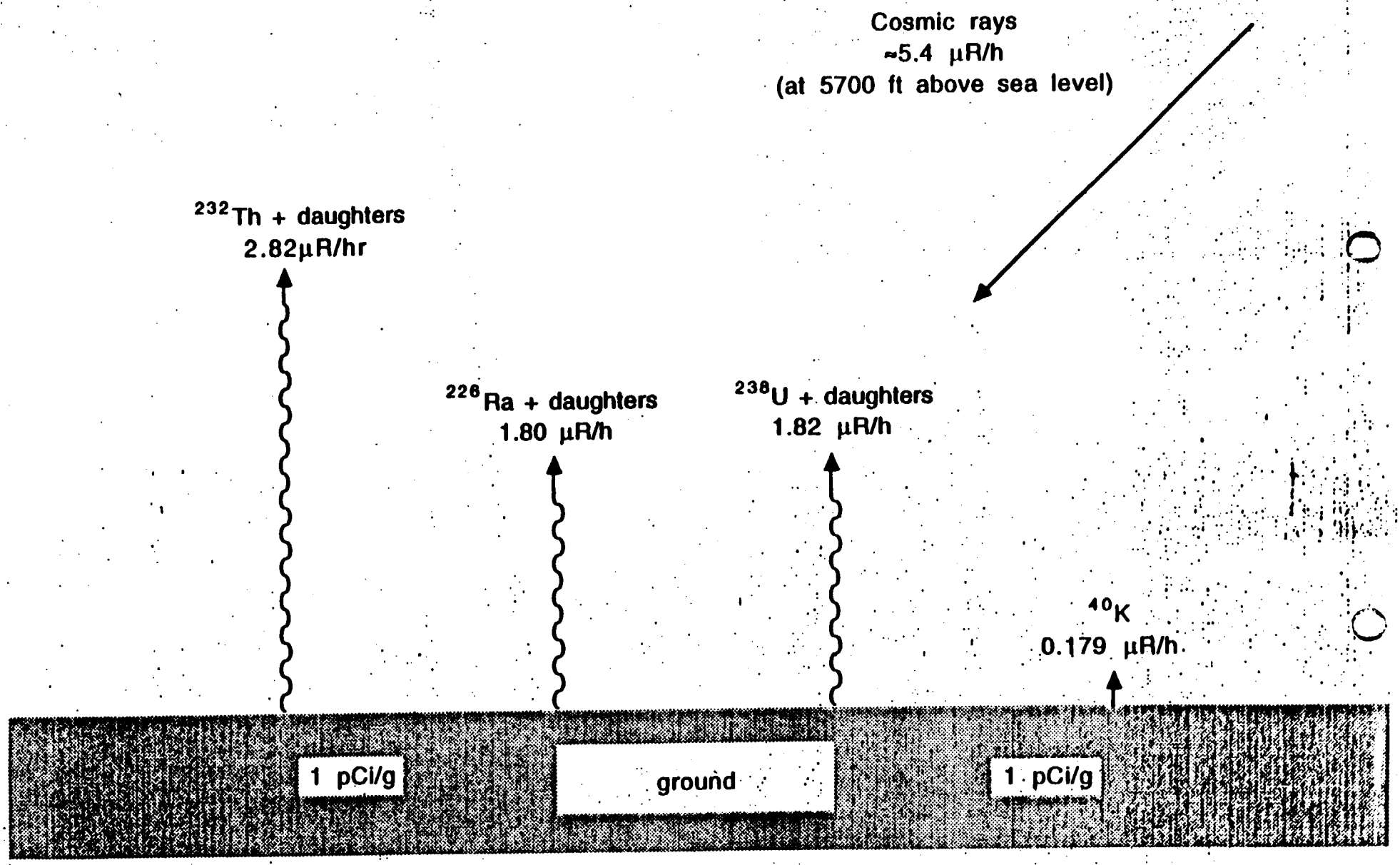


Mode of Decay - Uranium Series

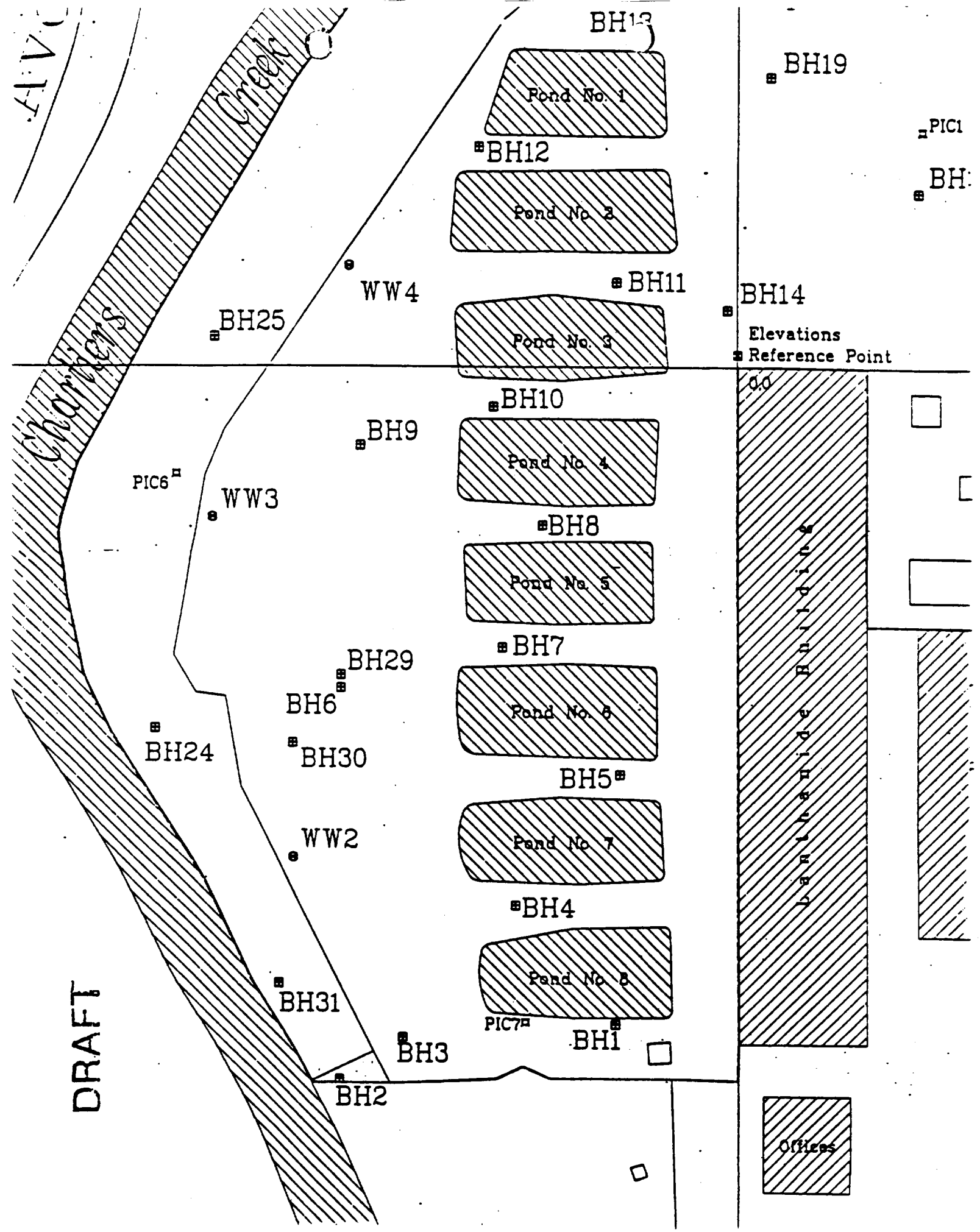


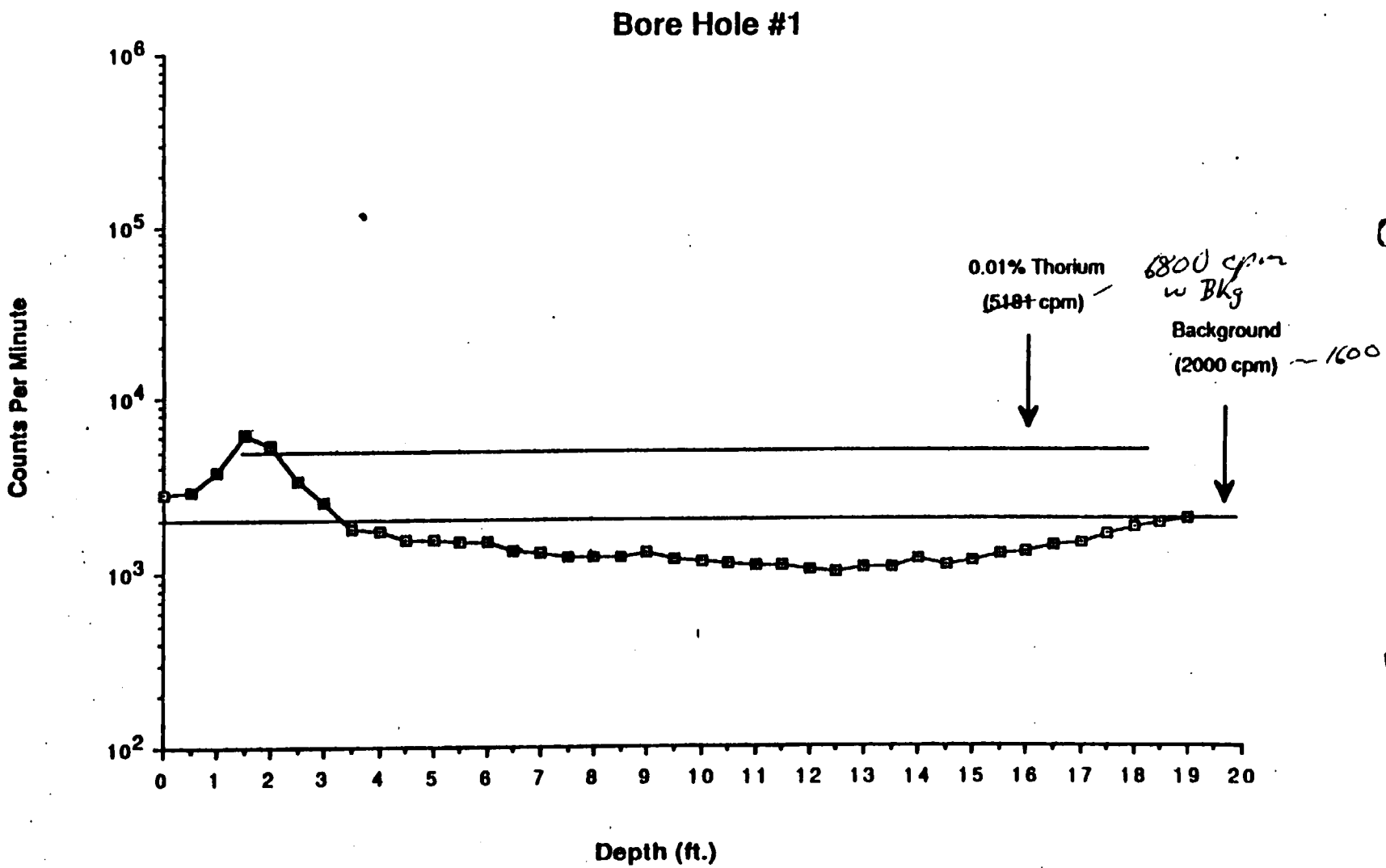
Enclosure 2

Figure 2



Exposure rate at one meter above the ground for uniformly distributed natural emitters (at a concentration of 1 pCi/g)

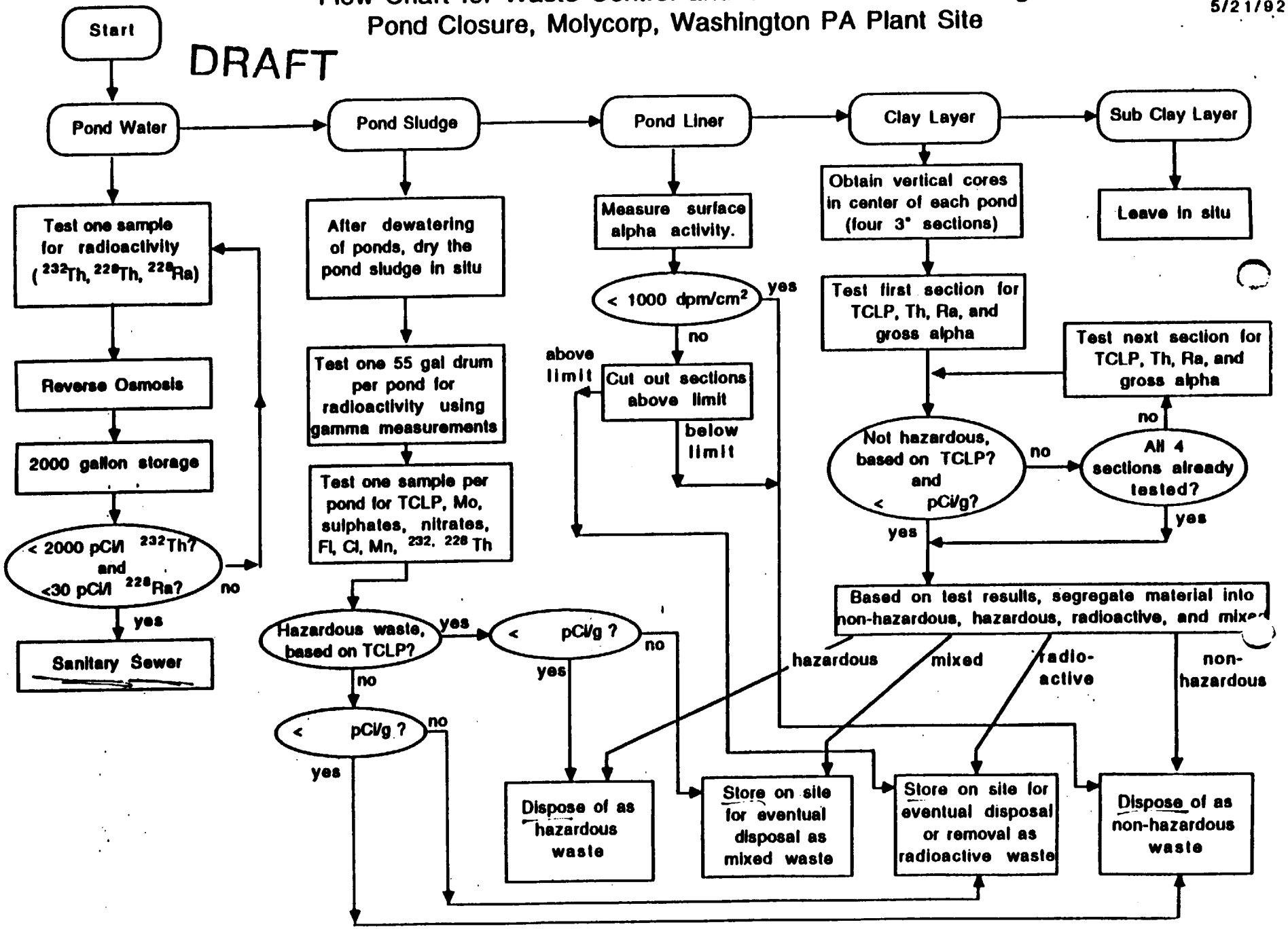

Charles Creek
BH13
Pond No. 1
BH19
PIC1
BH12
Pond No. 2
WW4
BH11
BH14
BH25
Pond No. 3
Elevations
Reference Point
0.0
BH10
BH9
Pond No. 4
PIC6
WW3
BH8
Pond No. 5
BH7
BH29
BH6
Pond No. 6
BH24
BH30
BH5
WW2
Pond No. 7
BH4
Pond No. 8
BH31
PIC7
BH1
BH3
BH2
Offices
DRAFT


Bore Hole #1
Counts Per Minute
10^6
10^5
10^4
10^3
10^2
0.01% Thorium
(5181 cpm)
6800 cpm w Bkg
Background
(2000 cpm)
~1600
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
Depth (ft.)

RSA
5/21/92

Flow Chart for Waste Control and Characterization During Pond Closure, Molycorp, Washington PA Plant Site

DRAFT



PYROCHLORE ORE CONTENT OF U AND Th+

Th	2,000 - 2,500	PPM
U	50 - 150	PPM

+A. S. PASCHOA AND A. W. NOBREGA, NON-NUCLEAR MINING WITH RADIOLOGICAL IMPLICATION IN ARAXA IN RADIATION HAZARDS IN MINING, M. GOMEZ, ED., AIMMPE, 1981, p82 - 88.

INFORMATION ABOUT THE SLAG PILE+

Volume:		2.494×10^5 ft^3
Mass:		2.245×10^7 lbs
Density:		90 lbs/ft^3
Concentration of Th:		11.4 $\pm$ 0.2 mg Th/g
	or	1.14%
	or	1250* pCi/g Th-232
Total Activity:		12.7 Ci Th-232

+ Applied Health Physics Report dated May 22, 1975

* NOTE: This material exceeds the specific activity limit in Envirocare's license (680 pCi/g) for Th-232 in equilibrium with its daughters.

MAXIMUM CONCENTRATIONS OF Th-232 FOUND IN BOREHOLES AT THE MOLYCORP, WASHINGTON, PA SITE (JULY 1990)

BH #	pCi/g	depth (ft)*	
1	10.8	1.5	
2	8.1	3.5	
3	159	2.5	
4	9.0	3.5	
5	15.6	2.0	
6	118	6.0	
7	181	4.0	
8	49	3.5	
9	12.7	5.0	
10	10.4	1.5	
11	26	1.5	
12	42	2.5	
13	1.7	1.5	
14	16.3	7.0	
15	30.5	4.5	
16	285	3.5	
17	9.9	2.0	
18	12.3	8.0	
19	10.2	4.0	
20	20.8	2.5	
21	159	4.5	
22	13.8	6.0	
23	13.0	3.0	
24	26.8	1.5	(1.0)
25	25.7	2.5	
26	65	4.5	
27	0.7	6.5	
28	2.0	5.0	
29	244	6.5	
30	93	4.5	
31	26	1.5	(1.0)
32	64	1.5	

* NOTE: The lower end of the NaI probe was at the depth indicated.

NUMBER OF BOREHOLES WITH ONE OR MORE MEASUREMENTS EXCEEDING THE INDICATED CONCENTRATION FOR Th - 232

	#HOLES	
< 5 pCi/g	3	(2 WERE BACKGROUND)
> 5 pCi/g	29	
> 15 pCi/g	19	
> 25 pCi/g	15	
>250 pCi/g	1	

1990 RSA SURVEY

SITE CHARACTERIZATION PLAN

Extend surface and subsurface radiation measurements to cover those portions of the site not covered in the 1990 survey by RSA.

Increase the density of boreholes on the site, to a depth of 8 - 10 feet.

Measure Th-232, 230, 228 content of selected cores by radiochemical techniques and alpha spectrometry.

Measure Ra-228 in upstream and downstream composite water samples from Chartiers Creek.

Measure leaching rates of Th-232, 228 and Ra-228 from representative samples of Fe-Cb slag, using weak acids representative of pH's characteristic of root zones of selected vegetation, and in simulated lung fluid.

Measure Th-232, 230, 228 and U-234, 238 in a few samples of Fe-Cb slag to verify equilibrium and minimal contribution of the uranium series to the activity of the slag.

Subsurface Th-232 content as a function of depth to be measured below the ponds at closure.

PROPOSED ACTIONS

SURFACE - MEET OPTION 1+

1 TO 4 FEET - MEET MODIFIED OPTION 2; LIMIT TO BE PROPOSED FOR AVERAGE Th-232 (pCi/g) AND AREA OVER WHICH AVERAGE IS TO BE DETERMINED AFTER SITE CHARACTERIZATION IS SUFFICIENTLY COMPLETE SO THAT ACCURATE COST ESTIMATES CAN BE MADE.*

LEAVE MATERIAL IN PLACE BELOW 4 FEET

\+ DEMONSTRATE COMPLIANCE WITH GROUND Th-232 LIMIT BY GAMMA MONITORING

COMPLIANCE WILL BE DEMONSTRATED IF AVERAGE GAMMA EXPOSURE RATE MEASURED IS LESS THAN OR EQUAL TO 25 uR/HOUR ON 10 METER GRID SPACINGS, AVERAGED OVER 10 METERS. (11 uR/HOUR BACKGROUND + 14uR/HOUR = 25uR/HOUR)

5 pCi/g Th-232 UNIFORMLY DISTRIBUTED IN SURFACE SOIL WILL PRODUCE A 14.1 uR/HOUR EXPOSURE RATE 3 FEET ABOVE THE GROUND.

* DEVELOP DOSE ESTIMATES FOR VARIOUS SCENARIOS TO INCLUDE AGRICULTURAL UPTAKE AND RESUSPENSION.