Meeting Minutes
N -Springs Presentation to EPA / Ecology
January 24, 1995

- Scott Hajner issued the meeting agenda (attachment A).

N - Springs ERA

- Paul Pak provided an introduction and issued a package (attachment B) for the N-Springs ERA presentation.

- Tony Knepp reviewed the N - Springs data evaluation slides which provided the preliminary results and interpretations of new field and laboratory data. Key points included:

    * Strontium concentrations in sediments taken from the groundwater monitoring wells & geotechnical borings.
    * Modeled soil contaminant distribution coefficient confirmed by laboratory results.
    * Reduced hydraulic conductivity significantly reduces the quantity of Sr-90 predicted to enter the Columbia River.
    * Predicted cumulative release of Sr-90 to the Columbia River based on modified flow system and modified hydraulic conductivities.

- Merl Lauterbach reviewed the project basis, evaluation and conclusions.

- A question was raised by Chuck Cline as to the basis for the $32 million cost estimate for a 250 gpm pump and treat system (reference slide on Evaluations/Conclusions). Cline indicated that the original EE/CA indicated a cost of $22 million. Merl Lauterbach responded that the original EE/CA was based on unsophisticated - preliminary estimates.

- Paul Pak summarized the N-Springs ERA recommendations as follows:

    * Terminate the installation of the barrier wall
    * Terminate the design and construction of a pump and treat system
    * Address groundwater issues in the 100-NR-2 CMS/FFS

- Doug Sherwood voiced a concern over the number of wells used to gather data in the "erosional area" (identified as a white rectangle on the slide titled "Model Predicated Equipotentials (ft) and Streamlines - 2000 Ft Vertical Barrier). Sherwood's main concern was that there is only one (1) well in this area, and the data obtained was used as the basis for dropping the entire program.

- Sherwood questioned the assumption of using a steady state condition as a main driver, and that DOE/ERC did not look at the transient effects.

- Doug Sherwood indicated that by using a steady state analysis, the values are no longer conservative.

- Doug Sherwood / Roger Stanley requested another discussion to evaluate the data in more detail. **Action Item: Paul Pak to organize a meeting with the EPA / Ecology Unit Managers.**

- Sherwood indicated that removal of 1.5 Ci Sr-90 (0.011g) over 10 years using a 250gpm system, as indicated in the package, was a "bogus number". A discussion ensued as to the validity of the assumptions, between Sherwood, Knepp and others.

- Stanley asked for clarification as to whether DOE/ERC included an assessment of ecological impacts in the analysis. Sherwood asked if DOE/ERC assessed the exposure pathway from bushes and plants to deer, as part of the analysis. After a discussion, it was decided that DOE/ERC would need to investigate this further, with PNL, who supported this assessment.

Skyshine Abatement

- Paul Pak issued a package (attachment C) and reviewed the skyshine abatement project status, basis for project, evaluations/conclusions and DOE recommendations. Key points presented by Pak included:

    * Realistic and conservative scenarios for public exposure.
    * The DOE recommendation: No-action alternative for skyshine abatement.

- There was no further discussion on skyshine abatement.

1301-N / 1325-N Crib Characterization

- Paul Pak issued a package (attachment D) and reviewed the crib characterization project status, basis for project, evaluations/conclusions and DOE recommendations.

- Key points presented by Pak included:

    * Due to the productivity challenge the following activities were initiated:
        ◊ Reevaluate the characterization program to meet the DQOs
        ◊ Conduct an ALARA review
        ◊ Compilation of all existing characterization data
        ◊ Evaluation of future characterization data needs and timing for input to closure plan/CMS

    * A recent review of all available data indicates that there is sufficient data to support the evaluation of remedial alternatives

- Paul Pak summarized the crib characterization recommendations as follows:

    * Defer the characterization program because sufficient data exists
    * Proceed with the CP/CMS using existing data, delete the LFI and associated milestone

* The CMS will define what characterization data is needed for the recommended remediation alternative and when the data is needed to support remedial design and corrective measures.

- Doug Sherwood expressed a concern that EPA / Ecology were not involved in the reevaluation of the characterization program scope to meet DQOs (3 boreholes to 2 boreholes with reduced sampling). It was discussed that DOE considered this an effort to support the productivity challenge.

- Doug Sherwood expressed a concern about the accuracy of data obtained from boreholes adjacent to the cribs. Sherwood asked how DOE was going to determine the nature and extent of contamination.

- Doug Sherwood indicated the need to drill boreholes in the cribs to obtain the Sr-90 vertical distribution data.

- Doug Sherwood asked how DOE was going to determine the extent of chemical contamination hazards below the site.

- Chuck Cline indicated a concern over defining the level of remediation funding with a lack of characterization information.

- A discussion ensued, initiated by Steve Liedle, on the timing of when the characterization data is required, the need for additional characterization data in support of completing the CP/CMS, and the use of contingencies in the closure planning.

- Doug Sherwood / Roger Stanley requested further discussions to review the technical details in more detail. **Action Item: Paul Pak to organize meeting(s) with the EPA / Ecology Unit Managers.**

Open Discussion

- Julie Erickson (DOE-RL) indicated that DOE needs a decision from the Regulators on the ERA (barrier wall and pump & treat). Steve Liedle discussed the cost implications of the pump & treat monitoring well network.

- Steve Wisness requested a discussion on a "Path Forward".

- Doug Sherwood indicated the possibility of having to go to dispute resolution over the Tri-Parties not signing the ER Refocusing tentative agreement per a discussion with Roger Freeberg on 1/20/94.

- Julie Erickson expressed the need for the Regulators to revise the N-Springs action memorandum since the actions cannot be implemented as written (barrier wall).

- Greg Eidam indicated that technical meetings could start this week with the Regulator Unit Managers.

- Pam Innis indicated that the additional details would need to be evaluated prior to the Regulator Unit Managers providing recommendations to Sherwood / Stanley.

- Phil Staats requested that comments, provided by the Regulators to DOE on skyshine, be included in the technical discussions. It was indicated that the ERC has written the response to comments, although they still need DOE review.

- Doug Sherwood indicated that EPA is not going to resolve all of these issues on a piece meal basis, that we need to resolve the ER Refocusing Agreement first. Sherwood indicated that we would need to take these types of changes out for public comment.

- Roger Stanley indicated that Tonya Barnett and Andy Boyd are reviewing the N-Springs action memorandum.

- Doug Sherwood indicated that the DOE has not yet submitted a letter to the Regulators and Administrative Record documenting the barrier wall problems. **Action: DOE/(ERC) to issue a letter to the Regulators / Administrative Record documenting the barrier wall problems.**

Attachment A

ER Refocus Negotiations

@ EPA Conference Room - Medical Dental Center - Richland, Wa.
(Tuesday, January 24, 1995 - 1:00pm to 3:00pm)

AGENDA

SCHEDULE:	**TOPIC** (***Discussion Leader(s)***)**:**
1:00p -3:00p	**A. N - Springs ERA (Barrier Wall / Pump & Treat)** *(Pak / Knepp / Lauterbach)*
	B. Skyshine Abatement *(Pak)*
	C. Crib Characterization *(Pak)*

Note 1: The TPA Project Managers meeting will follow the above discussion at 3:30p, and include, for ER, a review of change request M-16-94-04 (***1100 area milestones***), and change request M-20-94-06 (***200-BP-11 boundary change***).

Note 2: The review of ER Refocusing "Responses to Public Comments" will be rescheduled to a later date.

Meeting Attendees:

EPA:
Doug Sherwood
Pam Innis
Dennis Faulk

Ecology:
Roger Stanley
Chuck Cline
Phil Staats

DOE-HQ:
Sally Robison

DOE-RL:
Steve Wisness
Dina Murphy
Linda McClain
Julie Erickson
Mike Thompson
Paul Pak

ERC Team:
Steve Liedle
Greg Eidam
Merl Lauterbach
Tony Knepp
Scott Hajner

Attachment B

100-N Remedial Action Projects

- N-Springs ERA
- Skyshine Abatement
- 1301-N/1325-N Crib Characterization

Presentation to Regulators
January 24, 1995

N-Springs ERA

- N-Springs Data Evaluation
- Basis for Project
- Evaluation/Conclusions
- Recommendation

N-Springs ERA

N-Springs Data Evaluation

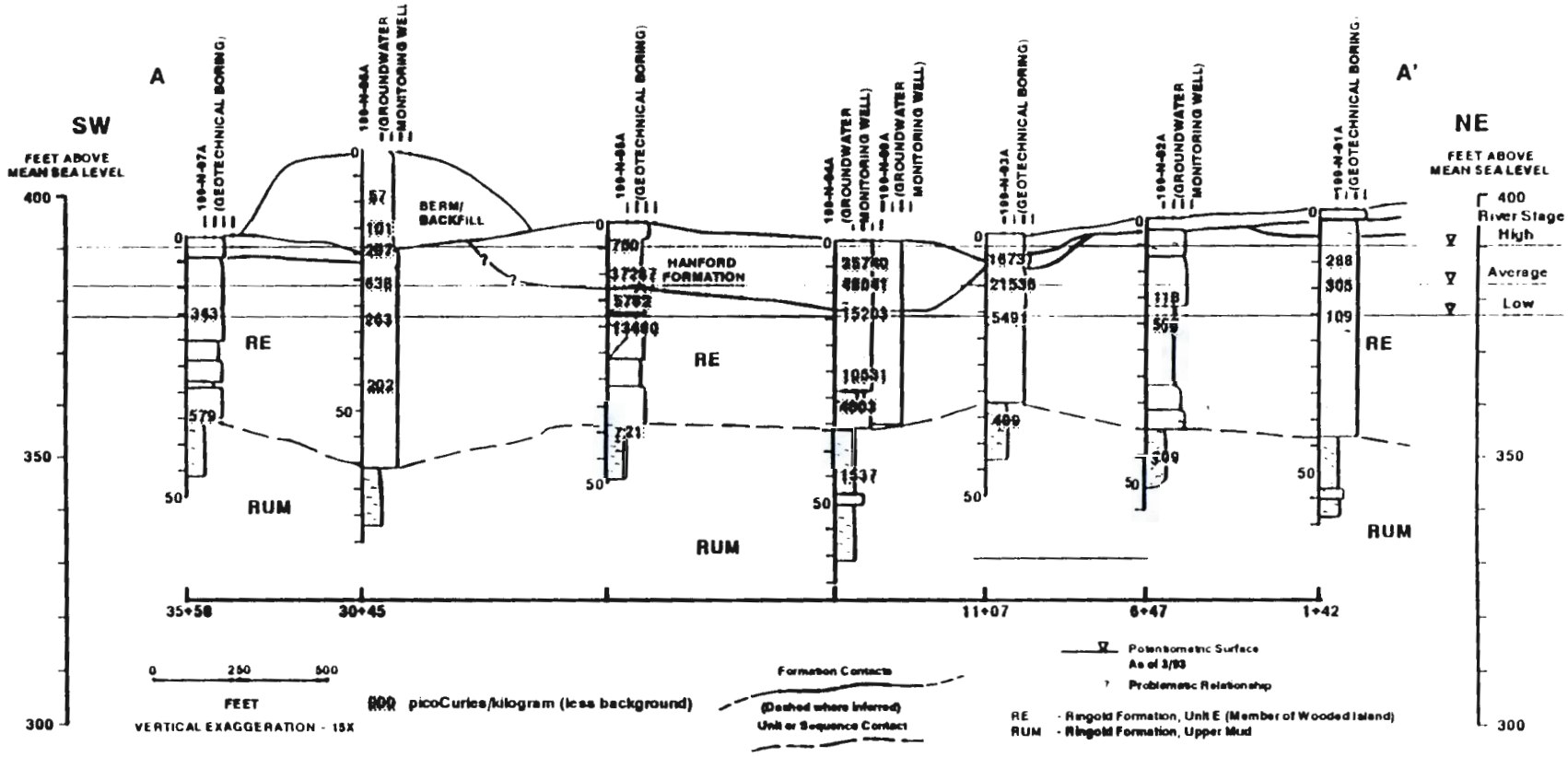
Purpose

- Present preliminary results and interpretations of new field and laboratory data

Data Collected

- Geologic and Lithologic information
- Strontium-90 soils information
- Strontium-90 desorption and adsorption equilibria
- Aquifer properties
- Groundwater sampling data
- Hourly water level data (ongoing)

^{90}Strontium Concentrations in Sediments Taken from the New Groundwater Monitoring Wells & Geotechnical Borings



Notes:
Elevations are Approximate for Borings 199-N-91A, N-93A AND N-97A
Horizontal Locations for all Borings and Wells are Approximate.

N-Springs ERA Data Evaluation

- Modeled soil contaminant distribution coefficient confirmed by laboratory results

ADSORPTION AND DESORPTION RESULTS (ML/G)								
		ADSORPTION		DESORPTION				
		(31 DAY)		(3 DAY)		CORRECTION		
WELL						SOIL PASSING		EFFECTIVE
N-94A		AVERAGE		AVERAGE		< 2MM %		KD
10-12 FT		25.55		42.20		33.4		14.09
15-17 FT		25.17		40.40		34.6		13.98
45 FT		195.16						
N-95A								
10 FT		41.95		50.27		23.1		11.61
20 FT		21.42		33.03		34		11.23
39 FT		112.74						
N-96A							AVERAGE	12.73
10 FT		29.29						
20.5 FT		18.34			UPDATED	MODEL	POROSITY	0.15
45 FT		31.68					B. DENSITY	1.6
							KD	9.3

N-Springs ERA Data Evaluation

- Reduced hydraulic conductivity significantly reduces the quantity of Sr-90 predicted to enter the Columbia River

		HYDRAULIC CONDUCTIVITY TEST RESULTS (FT/DAY)				
	WELL	TEST TYPE	RESULT			
1	699-77-54	LONG TERM	48			
2	699-87-55	LONG TERM	55			
3	199--N-71	SLUG	25			
4	199-N-72	SLUG	30		AVERAGE	94.44
5	199-N-73	SLUG	10			
6	199-N-74	SLUG	115		GEOM. MEAN	63.56
7	199-N-32	LONG TERM	106			
8	199-N-34	LONG TERM	282		MEDIAN	63.50
9	199-N-39	LONG TERM	124			
10	199-N-62	LONG TERM	330		MODE	70.00
11	199-N-67	LONG TERM	216			
12	199-N-92A	SLUG	76			
13	199-N-96A	SLUG	24		UPDATED MODEL	
14	199-N-99A	SLUG	26		EROS.	300.00
15	199-N-8S	FLOW EQN	70		RINGOLD	100.00
16	199-N-20	FLOW EQN	36			
17	199-N-25	FLOW EQN	57			
18	199-N-23	FLOW EQN	70			

Model Predicted Equipotentials (ft) and Streamlines
2000 Ft Vertical Barrier

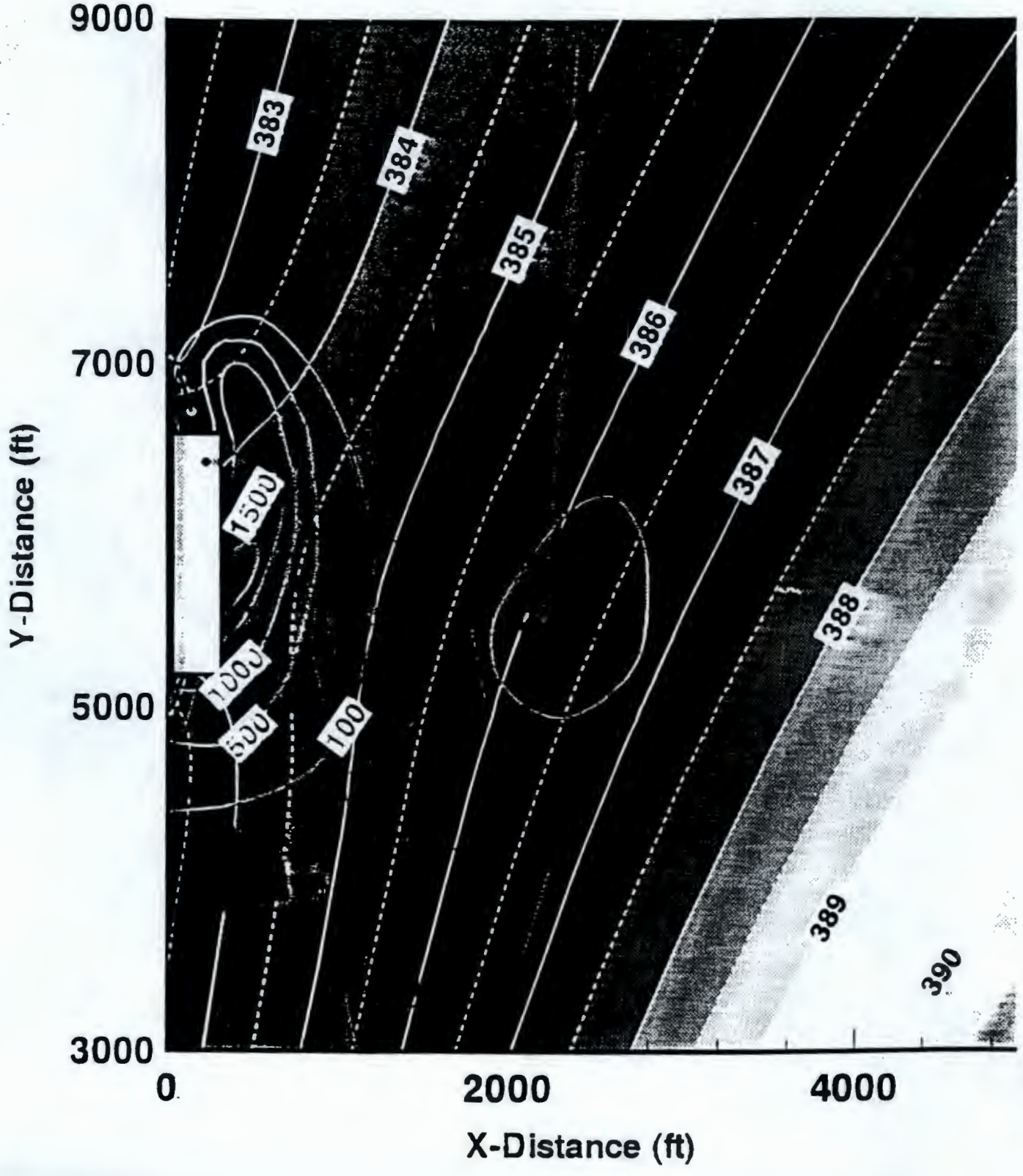


Table A
Predicted Cumulative Release of ^{90}Sr to the Columbia River

EE/CA (1993)		
RUN	Ci for 10 Years	Avg. Ci/yr
No wall	8.2	0.82

Differences between Table A results and Table B results are attributed to:

- Boundary conditions
- Calibration to operating period of crib

Table B
Predicted Cumulative Release of ^{90}Sr to the Columbia River

Groundwater Modeling Report (1994)		
RUN	Ci for 10 Years	Avg. Ci/yr
No wall	3.0	0.3

Differences between Table B results and Table C results are attributed to:

- Modified flow system
- Modified hydraulic conductivities

Table C
Predicted Cumulative Release of ^{90}Sr to the Columbia River

Updated Groundwater Modeling Results (1995)		
RUN	Ci for 10 Years	Avg. Ci/yr
No wall	1.6	0.16

N-Springs ERA

Basis for Project

- M-14-00 Dispute Resolution

  Perform a non-time-critical ERA to:
  - Reduce ^{90}Sr flux that feeds N-Springs
  - Evaluate commercially available treatment options for ^{90}Sr
  - Provide data necessary to set demonstratable ^{90}Sr groundwater clean-up standards

- Action Memorandum

  Barrier Wall
  - A "removable vertical barrier would consist of a grouted hinge sheet pile wall with a minimum length of not less than 3000 feet, installed in close proximity to the river's edge."
  - "Pump and treat technology will be enhanced with the installation of a sheet pile wall"

N-Springs ERA

Basis for Project, Continued

- Action Memorandum, Continued

  Pump and Treat System

  - Reduce ^{90}Sr flux from groundwater to river
  - Provide data to set ^{90}Sr groundwater cleanup standards
  - Initial system to operate at 50 GPM with provisions to expand to 180 GPM
  - Treatment goal is 42 pCi/l of ^{90}Sr; minimum requirement is 90% reduction of ^{90}Sr from influent stream
  - Effluent shall be discharged upgradient within the 100N Area for the purpose of recovery

- Concentration Limit ARAR

  - Current MCL for ^{90}Sr is 8 pCi/l
  - Regulatory agencies have authority to establish a point of compliance other than the groundwater beneath the site and to establish an alternative concentration limit (ACL) based on existing technology, cost, or implementability

N-Springs ERA

Evaluation/Conclusions

- Based on the available data at the time that the M-14-00 Agreement was prepared, it was assumed that discharge of ^{90}Sr flux constituted a threat of release to the environment.

- New data shows that significantly less flux is discharging to the river. (1.6 Ci vs. 8.2 Ci over 10 years).

- An ERA is not warranted due to the significantly reduced threat of flux release.

- A pump and treat system designed to reduce flux would have to operate at 250 gpm, cost $32 million, remove 1.5 Ci ^{90}Sr (0.011g) over 10 years, at a cost of $20 million/Ci.

N-Springs ERA

Recommendation

- Terminate the Installation of a Barrier Wall
  - Reduced threat of flux release
  - Installation costs (unit price) will be significantly higher due to site conditions

- Terminate the design and construction of a pump and treat system
  - A pump and treat system would not be effective/efficient at reducing flux to the river

- Address Groundwater Issues in the 100-NR-2 CMS/FFS
  - Aquifer and ^{90}Sr concentration responses would be evaluated through pump tests

Attachment C

Skyshine Abatement

- Project Status
- Basis for Project
- Evaluation/Conclusions
- Recommendation

Skyshine Abatement

Project Status

- Issued skyshine letter report documenting exposure scenarios and abatement alternatives (M-16-12) on 10/31/94

- For exposures to the general public along the N-Springs shoreline;
  - Identified regulatory requirements
  - Developed exposure scenarios
  - Evaluated "no action" and cover alternatives

- Worker exposures are managed through procedures and ALARA program and are not addressed in the report

- ERC recommended no-action alternative to the DOE

- Presently addressing regulator comments

Skyshine Abatement

Basis for Project

- Limits on public exposure:

DOE Order 5400.5	100 mrem/yr/person
DOE ALARA Guidance	30 mrem/yr/person
Pending 10CFR834	25 mrem/yr/person for residual radioactive waste

- Our evaluation is that the 25 mrem/yr requirement is the applicable limit
- The limit is to be applied to a realistic exposure scenario

Skyshine Abatement

Evaluation/Conclusions

- Scenarios considered for an intruder to occupy the shoreline adjacent to cribs:

Scenario	Hours	Description
1	8,760	Baseline number of hours in a year
2	3,096	24 hrs/day for 129 day fishing season
3	2,920	8 hrs/day for one year
4	1,032	8 hrs/day for 129 day fishing season
5	888	24 hrs/day for each weekend of the fishing season
6	296	8 hrs/day for each weekend of the fishing season

- Scenarios 5 and 6 (fisherman-intruders) were selected as realistic and conservative scenarios

Skyshine Abatement

Evaluation/Conclusions, Continued

- The resultant doses for the selected exposure scenarios are:

Scenario	Hours	Dose (mrem/yr)
5	888	18
6	296	7
Resultant doses have been corrected for 88 mrem/yr background		

- Realistic and conservative exposure scenarios do not exceed action levels of 25 mrem/yr

Recommendation

- No-action alternative for skyshine abatement is recommended because exposures to the pubic are below the applicable action limit

Attachment D

1301-N/1325-N Crib Characterization

- **Project Status**
- **Basis for Project**
- **Evaluation/Conclusions**
- **Recommendation**

1301-N/1325-N Crib Characterization

Project Status

- Held DQO/SAFER Workshop in June 1994

  - Data Quality Objectives:
    1. Confirm the 1301-N/1325-N Cribs are high priority sites
    2. Support the evaluation of remedial technologies in terms of effectiveness, implementability, and cost

  - Key assumptions in DQO document:
    1. Soil column could be safely accessed, e.g. dose would be ALARA
    2. Skyshine abatement to reduce exposure levels from skyshine would be addressed in a separate work scope
    3. Funding would be available to complete the work

- Submitted proposed characterization program in DOW report, August 1994
  - 3 boreholes with analysis of up to 39 samples

1301-N/1325-N Crib Characterization

Project Status, Continued

The following activities were initiated as a result of a productivity challenge:

- Reevaluated the characterization program to meet the DQOs
  - 2 Boreholes with reduced sampling
  - RLS logging of existing nearby wells

- Conducted ALARA review
  - Using administrative and engineering controls to reduce exposures, results in an estimate of 3 person-rem

- Compilation of all existing Characterization data

- Have evaluated future characterization data needs and timing for input to Closure Plan/CMS

1301-N/1325-N Crib Characterization

Basis for Project

- The basis for the crib characterization program is to satisfy the DQOs:
  - Confirm cribs are high priority sites
  - Provide data to support evaluation of remedial technologies for the Closure Plan/CMS

1301-N/1325-N Crib Characterization

Evaluation/Conclusions

- The DQOs are still valid and there is no need to revise
- Existing data shows cribs to be high priority sites
- A recent review of all available data indicates that there is sufficient data to support the evaluation of remedial alternatives
- Estimated worker exposures are significant even with implementation of administrative and engineering control measures

1301-N/1325-N Crib Characterization

Recommendation

- Defer the crib characterization program because sufficient data exists
- Proceed with the CP/CMS using existing data, delete the LFI and associated milestone
- The CMS will define what characterization data is needed for the recommended remediation alternative and when the data is needed to support remedial design and corrective measures