

**PROJECT PLAN FOR GEOCHEMICAL  
ANALOG OF CONTAMINANT TRANSPORT  
IN UNSATURATED ROCK**

*Prepared for*

**Nuclear Regulatory Commission  
Contract NRC-02-93-005**

*Prepared by*

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**UNCONTROLLED**

**Revision 2  
Change 6**

**March 1994**

# CENTER FOR NUCLEAR WASTE REGULATORY ANALYSES

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Change: 6  
Date: March 1994

Title: PROJECT PLAN FOR GEOCHEMICAL ANALOG OF CONTAMINANT TRANSPORT IN UNSATURATED ROCK

### EFFECTIVITY

Revision 2 of this document became effective on August 28, 1992.  
This document consists of the pages and changes listed below.

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Supersedes: Revision 2, Change 5 - December 1993

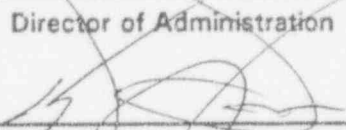
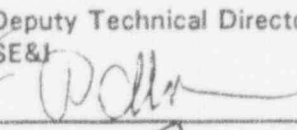
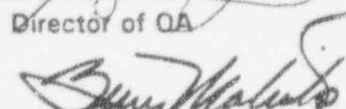

Director of Administration	Date:	Deputy Technical Director for SE&I	Date:
	3/14/94		3/12/94
Director of QA	Date:	Technical Director	Date:
	3/12/94		3/12/94

Table A-1. Geochemical Analogs Estimated Spending Plan, FY94

	1	2	3	4	5	6	7	8	9	10	11	12	13	Total
Center PI-4	459	306	459	459	306	459	306	306	459	306	459	306	459	5,053
Center PI-3	1,281	1,317	1,278	1,666	1,317	1,278	1,317	1,317	1,317	1,317	1,278	1,317	1,317	17,299
Center PI-2	3,213	3,279	3,217	4,052	3,279	3,186	3,279	3,248	3,279	3,279	3,248	3,279	3,217	40,002
Center PI-1	2,355	2,387	2,387	2,983	2,387	2,385	2,387	2,365	2,387	2,387	2,387	2,387	2,365	31,598
Center Tech	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Center Chemical	258	246	257	306	257	246	257	246	257	246	257	246	257	3,329
Center Labor	7,546	7,525	7,568	9,469	7,545	7,535	7,545	7,483	7,698	7,535	7,629	7,535	7,615	100,301
Center Burden	3,297	3,293	3,300	4,138	3,297	3,293	3,311	3,270	3,364	3,293	3,334	3,293	3,308	43,831
Center Overhead	7,266	7,255	7,315	9,116	7,265	7,255	7,264	7,205	7,412	7,255	7,345	7,255	7,332	96,570
SwRI PI-4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SwRI PI-3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SwRI PI-2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SwRI PI-1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SwRI Tech	2,033	1,778	1,788	2,233	1,788	1,778	1,788	1,788	1,778	1,788	1,788	1,778	1,788	23,896
SwRI Labor	2,033	1,778	1,788	2,233	1,788	1,778	1,788	1,788	1,778	1,788	1,788	1,778	1,788	23,896
SwRI Burden	868	777	781	978	781	777	781	781	777	781	781	777	781	10,442
SwRI Overhead	3,329	2,965	2,980	3,722	2,980	2,965	2,980	2,960	2,965	2,980	2,980	2,965	2,980	38,831
ADP Services	396	400	383	449	400	396	415	400	313	396	383	400	396	5,527
Machine Shop	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Material/Supply	2,037	2,039	2,037	2,548	2,037	2,037	2,039	2,037	2,038	2,038	2,037	2,039	2,037	27,000
Quality Assur.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Report Services	1,057	1,055	1,058	1,321	1,056	1,057	1,057	1,056	1,056	1,057	1,056	1,055	1,057	14,000
Telephone & Tgram	76	74	76	94	76	76	76	74	76	76	76	74	76	1,000
Travel	0	6,150	0	8,450	3,343	2,807	0	2,807	3,343	8,450	0	6,150	0	41,500
Consultants	1,766	1,819	1,766	2,241	1,819	1,766	1,766	1,872	1,766	1,793	1,766	1,819	1,766	23,725
Car Prem Pay	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Temporary Svcs	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Est. and. CFC, Fee	29,753	35,140	29,100	44,755	32,368	31,743	29,484	31,753	32,587	37,442	29,177	35,140	29,157	427,624
Center CFC	476	475	479	597	476	475	478	472	485	475	481	475	480	6,322
SwRI CFC	232	203	204	255	204	203	204	204	203	204	204	203	204	2,725
Total Estimate Cost	30,461	35,818	29,786	45,606	33,066	32,421	30,166	32,429	33,275	38,121	29,862	35,818	29,841	436,671
Fee	2,380	2,811	2,328	3,580	2,591	2,539	2,506	2,699	2,770	3,183	2,480	2,387	2,479	35,333
Total Cost with Fee	32,841	38,629	32,114	49,187	35,659	34,960	32,672	35,128	36,045	41,304	32,342	38,205	32,319	472,004
% Completion	6.96%	8.18%	6.80%	10.42%	7.55%	7.41%	6.92%	7.44%	7.64%	8.75%	6.85%	8.22%	6.85%	100.00%
Cumulative Cost	32,841	71,470	103,594	152,771	198,430	223,389	248,061	291,189	327,234	368,538	400,880	436,665	472,004	
Current Completion	6.96%	15.14%	21.95%	32.37%	39.92%	47.33%	54.25%	61.69%	69.33%	78.06%	84.93%	93.15%	100.00%	

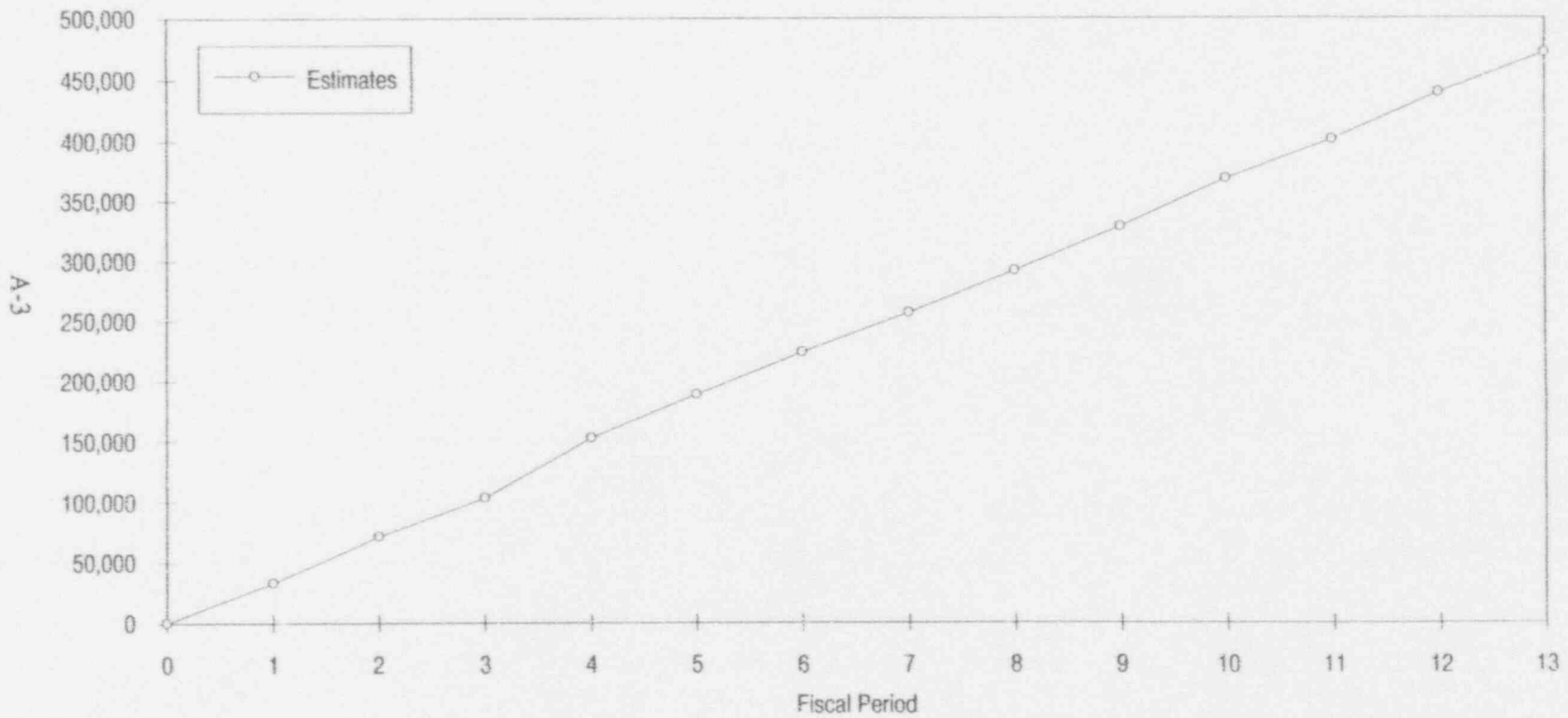


Figure A-1. Geochemical Analogs Estimated Spending Plan, FY94

Table A-2. Geochemical Analogs Estimated Labor Plan, FY94

	1	2	3	4	5	6	7	8	9	10	11	12	13	Total
Center Labor	9	34	34	43	34	33	34	34	34	34	33	34	34	99
Center PI-4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Center PI-3	104	106	104	131	106	103	107	105	106	106	105	106	104	1,363
Center PI-2	111	112	112	140	112	111	112	111	112	112	112	112	111	1,480
Center PI-1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Center Tech	25	24	25	30	25	24	25	24	25	24	25	24	25	325
Center Chemical	283	282	283	353	283	290	294	290	296	292	294	292	283	3,745
Total Center Labor	283	282	283	353	283	290	294	290	296	292	294	292	283	3,745
SwRI Labor	189	188	189	236	189	188	189	189	188	188	189	188	189	2,500
SwRI PI-4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SwRI PI-3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SwRI PI-2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SwRI PI-1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SwRI Tech	189	188	189	236	189	188	189	189	188	188	189	188	189	2,500
Total SwRI Labor	189	188	189	236	189	188	189	189	188	188	189	188	189	2,500

Table A-3. Geochemical Analogs Task 3 Estimated Spending Plan, FY94

	1	2	3	4	5	6	7	8	9	10	11	12	13	Total
Center PI-4	153	102	153	153	102	153	102	102	153	102	153	102	153	1,684
Center PI-3	557	581	581	736	581	581	581	581	581	581	581	581	581	7,585
Center PI-2	1,792	1,794	1,794	2,227	1,825	1,763	1,856	1,794	1,825	1,825	1,825	1,794	1,794	23,907
Center PI-1	1,888	1,918	1,918	2,387	1,918	1,897	1,918	1,897	1,897	1,918	1,918	1,918	1,897	25,286
Center Tech	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Center Clerical	258	246	257	308	257	246	257	246	257	246	257	246	257	3,339
Center Labor	4,648	4,642	4,703	5,811	4,683	4,640	4,714	4,620	4,712	4,672	4,734	4,642	4,682	61,902
Center Burden	2,031	2,028	2,055	2,539	2,046	2,028	2,060	2,019	2,059	2,042	2,069	2,028	2,046	27,051
Center Overhead	4,475	4,469	4,528	5,595	4,508	4,468	4,538	4,448	4,537	4,499	4,558	4,469	4,507	59,598
SwRI PI-4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SwRI PI-3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SwRI PI-2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SwRI PI-1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SwRI Tech	2,033	1,778	1,788	2,233	1,788	1,778	1,788	1,788	1,778	1,788	1,788	1,778	1,788	23,895
SwRI Labor	2,033	1,778	1,788	2,233	1,788	1,778	1,788	1,788	1,778	1,788	1,788	1,778	1,788	23,895
SwRI Burden	886	777	781	976	781	777	781	777	781	781	781	777	781	10,442
SwRI Overhead	3,399	2,965	2,980	3,722	2,980	2,965	2,980	2,980	2,965	2,980	2,980	2,965	2,980	39,831
ADP Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Machine Shop	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Material/Supply	1,660	1,661	1,660	2,076	1,660	1,660	1,661	1,660	1,660	1,661	1,660	1,661	1,660	22,000
Quality Assur.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Report Services	755	754	755	944	754	755	755	754	755	755	755	754	755	10,000
Tphone & Tgram	38	37	38	47	38	38	38	37	38	38	38	37	38	500
Travel	0	4,675	0	4,880	3,343	1,332	0	1,332	3,343	4,880	0	4,675	0	28,460
Consultants	1,766	1,819	1,766	2,241	1,819	1,766	1,766	1,872	1,766	1,793	1,766	1,819	1,766	23,725
Cler Prem Pay	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Temporary Svcs	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Est. excl. CFC, Fee	21,684	25,605	21,064	31,063	24,401	22,207	21,081	22,292	24,391	25,889	21,129	25,605	21,003	307,405
Center CFC	293	293	296	366	295	292	297	291	297	294	298	293	295	3,902
SwRI CFC	232	203	204	255	204	203	204	204	203	204	204	203	204	2,725
Tot Estimate Cost	22,209	26,100	21,555	31,683	24,900	22,702	21,582	22,787	24,891	26,388	21,631	26,100	21,502	314,031
Fee	1,735	2,048	1,684	2,485	1,952	1,777	1,782	1,895	2,073	2,201	1,796	2,176	1,785	25,400
Tot Cost with Fee	23,943	28,149	23,239	34,168	26,852	24,479	23,374	24,682	26,964	28,588	23,427	28,277	23,287	339,430
% Completion	7.08%	8.29%	6.85%	10.07%	7.91%	7.21%	6.89%	7.27%	7.94%	8.42%	6.90%	8.33%	6.86%	100.00%
Cumulative Cost	23,943	52,092	75,331	109,499	136,351	160,830	184,204	208,886	235,851	264,439	287,866	318,142	339,430	
Cumul. Completion	7.08%	15.35%	22.19%	32.26%	40.17%	47.38%	54.27%	61.54%	69.48%	77.91%	84.81%	93.14%	100.00%	

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Table A-4. Geochemical Analogs Task 4 Estimated Spending Plan, FY94

	1	2	3	4	5	6	7	8	9	10	11	12	13	Total
Center PI-4	153	102	153	153	102	153	102	102	102	102	153	102	153	1,664
Center PI-3	704	736	697	930	736	697	736	736	736	736	697	736	736	9,614
Center PI-2	896	928	897	1,144	928	897	897	897	897	928	897	928	897	12,062
Center PI-1	467	469	469	597	469	469	469	469	469	469	469	469	469	5,242
Center Tech	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Center Chemical	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Center Labor	2,220	2,235	2,216	2,824	2,235	2,216	2,204	2,235	2,276	2,235	2,216	2,235	2,255	29,602
Center Burden	970	977	968	1,204	977	968	963	977	965	977	968	977	965	12,936
Center Overhead	2,138	2,152	2,134	2,719	2,152	2,134	2,122	2,152	2,192	2,152	2,134	2,152	2,171	28,501
SwRI PI-4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SwRI PI-3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SwRI PI-2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SwRI PI-1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SwRI Tech	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SwRI Labor	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SwRI Burden	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SwRI Overhead	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ADP Services	396	400	383	449	400	396	815	400	313	396	383	400	396	5,527
Machine Shop	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Material/Supply	377	378	377	472	377	377	378	377	376	377	377	378	377	5,000
Quality Assur	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Report Services	189	188	189	236	189	188	185	189	188	189	189	188	189	2,500
Telephone & Tgram	38	37	38	47	38	38	38	37	38	38	38	37	38	500
Travel	0	1,475	0	3,570	0	1,475	0	1,475	0	3,570	0	1,475	0	13,040
Consultants	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Clear Prem Pay	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Temporary Sacs	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Est end. CFC, Fee	6,328	7,841	6,395	11,551	6,367	7,792	6,709	7,841	6,380	9,933	6,305	7,841	6,411	97,606
Center CFC	140	141	140	178	141	140	139	141	143	141	140	141	142	1,866
SwRI CFC	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tot Estimate Cost	6,468	7,982	6,445	11,729	6,506	7,932	6,848	7,982	6,523	10,074	6,445	7,982	6,554	96,472
Fee	506	627	504	924	506	623	570	667	542	844	536	667	545	8,085
Tot Cost with Fee	6,974	8,609	6,950	12,653	7,012	8,555	7,418	8,649	7,065	10,918	6,981	8,649	7,099	107,538
% Completion	6.97%	8.01%	6.46%	11.77%	6.53%	7.96%	6.99%	8.04%	6.57%	10.15%	6.49%	8.04%	6.60%	100.00%
Cumulative Cost	6,974	15,583	22,533	35,186	42,203	50,759	58,177	66,826	73,891	84,809	91,790	100,439	107,538	
Cost Completion	6.50%	14.49%	20.95%	32.72%	39.25%	47.20%	54.10%	62.14%	68.71%	78.86%	85.36%	93.40%	100.00%	

Table A-5. Geochemical Analogs Task 5 Estimated Spending Plan, FY94

	1	2	3	4	5	6	7	8	9	10	11	12	13	Total
Center PI-4	153	102	153	153	102	153	102	102	153	102	153	102	153	1,684
Center PI-3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Center PI-2	525	557	526	680	526	526	557	526	557	526	526	557	526	7,113
Center PI-1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Center Tech	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Center Chemical	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Center Labor	678	659	679	834	628	628	659	628	710	628	679	659	679	8,797
Center Burden	296	288	297	364	274	297	288	274	310	274	297	288	297	3,844
Center Overhead	653	634	654	803	605	654	634	605	683	605	654	634	654	8,470
SwRI PI-4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SwRI PI-3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SwRI PI-2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SwRI PI-1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SwRI Tech	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SwRI Labor	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SwRI Burden	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SwRI Overhead	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ADP Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Machine Shop	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Material Supply	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Quality Assur.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Report Services	113	113	114	141	113	114	113	113	112	113	114	113	113	1,500
Telephone & Tgram	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Travel	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Consultants	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Clear Prem Pay	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Temporary Svcs	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Est excl. CFC, Fee	1,741	1,694	1,743	2,141	1,620	1,743	1,694	1,620	1,817	1,620	1,743	1,694	1,742	22,613
Center CFC	43	42	43	53	40	43	42	40	45	40	43	42	43	565
SwRI CFC	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tot Estimate Cost	1,784	1,736	1,786	2,194	1,659	1,786	1,736	1,659	1,861	1,659	1,786	1,736	1,785	23,167
Fee	138	136	139	171	130	138	144	138	154	138	148	144	148	1,868
Tot Cost with Fee	1,923	1,871	1,926	2,365	1,789	1,926	1,880	1,797	2,016	1,797	1,934	1,880	1,933	25,036
% Completion	7.70%	7.47%	7.63%	9.45%	7.15%	7.69%	7.51%	7.16%	8.05%	7.16%	7.72%	7.51%	7.72%	100.00%
Cumulative Cost	1,923	3,794	5,720	8,085	9,874	11,799	13,679	15,476	17,492	19,289	21,223	23,102	25,036	
Cumulative Completion	7.70%	15.15%	22.85%	32.29%	39.44%	47.13%	54.64%	61.82%	69.87%	77.04%	84.77%	92.28%	100.00%	