

4764

**ABANDONMENT AND PLUGGING OF THE KC-2
WAREHOUSE/WELL NO. 67 REMOVAL ACTION
FACT SHEET AUGUST 30, 1993**

09/27/93

**DOE-FN/EPA
22
REPORT**

**Abandonment and Plugging of the KC-2 Warehouse/Well No. 67
Removal Action Fact Sheet August 30, 1993**

In March 1993, a Removal Site Evaluation (RSE) for the KC-2 Warehouse/Well No. 67 was performed. The RSE focused on determining the potential impact of sediment-like material, discovered in Well No. 67 on the groundwater quality in the lower portion of the Great Miami Aquifer, pursuant to Section 104 (a)(1) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

Based on the data available in the RSE, DOE determined the need for a removal action pursuant to 40 CFR 300.415 Sections (b)(2)(ii) and (b)(2)(viii).

Field activities to remove the estimated 40 feet of material from the 178 foot to 218 foot depth interval in Well No. 67 began on July 1, 1993. An electric hoist utilizing standard cable tools was selected as the most effective method to remove the sediment with minimal impact to the warehouse. Soon after commencing removal activities a hard layer of material was encountered in the sediment column. It took approximately one hour to advance one foot. An examination of the sediment samples removed from the well revealed the presence of wood chips suggesting that a chunk of wood was impeding progress. After two days of attempting to advance past the wood it was decided that a longer derrick would be placed on the electric hoist to allow the use of other tools to break through the blockage. During the next three days of work the drillers were able to advance twelve feet to a depth of 190 feet from the top of the well casing. No further evidence of wood was noted in the sediment samples collected from this interval.

Samples collected at the 190 foot depth revealed the presence of small pieces of scrap steel and several nuts and bolts. Several days were spent attempting to advance past the 190 foot depth. A magnet and breaker bit were used in an attempt to remove more of the metal pieces suspected in the hole. On July 13, 1993 a sediment sample was collected for an onsite analysis for total uranium. The analytical results of the July 13, 1993 sample indicated a concentration of 4 ppm compared to the pre-removal activity sample of January 13, 1993 which was <11 ppm.

Further attempts to advance past 190 feet were unsuccessful. A decision was made to perform a downhole camera survey of the bore hole to observe the condition of the casing and to see if the obstruction was visible. Results of the camera survey showed the casing to be in good condition down to a depth of 184 feet. No screen was observed to this depth. The turbidity of the water prevented deeper examination of the well casing. A decision was made to attempt to loosen the sediment with a jetting tool and remove it with a sand pump or sand bailer. Before the jetting process began, water samples were collected from the well on July 15, 1993 for onsite analysis of total uranium. This information is presented in Table 3.

All analytical results on sediment samples collected from the well have been received. The results of the pesticide/herbicide, volatile organic compounds and semi-volatile organic compounds analyses were "Non-Detect" for all analytes. Results of the total metals and TCLP metals analyses were received for the two sediment samples collected in the 178-188 foot depth interval. Results for the TCLP analysis were below the detection limit for all parameters tested except for lead. The levels of lead present were below the regulatory level of 5.0 mg/L for toxicity characteristic (See Table 1). Table 2 has been prepared to compare sediment sample results with the mean background values for metals found in soils onsite.

On July 23, 1993 the jetting tool was used in an attempt to penetrate and loosen the sediment in the well casing. The drillers were able to advance the jetting tool into the sediment approximately three feet. The drillers noted that hard material was present in the sediment and that the jetting tool was being deflected by this material. Several attempts were made to remove the sediment with a sand pump and a sand bailer after the jetting process. Minimal amounts of material were recovered. It was decided that the current methods being used to clean out the well were no longer effective.

A groundwater sample was collected on July 15, 1993 after twelve feet of sediment had been removed from the well. The results for this sample were 1.4 ug/l (filtered) and 4.6 ug/L (unfiltered) for total uranium. This is considerably less than the January 13, 1993 groundwater sample result of 2400 ug/L. Additional water samples were collected from the well on August 12, 1993 for total uranium, Full Hazardous Substance List (HSL), total and dissolved metals and radiological parameters. Only uranium analysis from the onsite laboratory are available at this time. The results of the total uranium analysis were 20 ug/L for the unfiltered sample and 0.8 ug/L for the filtered sample. Results of the total metals analyses suggest the presence of elevated metals. It should be noted that when the magnet was used in the casing fine metal shavings were retrieved. This suggests that the elevated total metals values are due to suspended particulates. A summary of all water analytical data available as of August 30, 1993 are presented in Table 3. This data has not been validated.

In order to assess the potential impacts of Well No. 67 on the aquifer, a down gradient monitoring well (No. 41066) was installed approximately 375 feet east southeast of Well No. 67 (see figure 1). This well was installed under the "Project Specific Plan for Additional Monitoring Well Installation and Abandonment" (DOE, May 1993). During the installation of the well, hydropunch water samples were collected at 10 foot intervals starting at 150 feet below grade and continuing to a depth of 210 feet. Results of the filtered total uranium screening are presented in Table 4. Groundwater samples from this well were all below the proposed Maximum Contaminant Level of 20 ug/L as were the water samples collected from Well No. 67 on July 15, 1993 and August 12, 1993.

An estimate has been prepared to determine the cost to remove and plug and abandon Well No. 67 (see attached cost estimate). This estimate includes the costs to modify bay no. 2 of the warehouse to allow access to the well by a full size drill rig so the well casing could be overdrilled, the cost to remove and grout the well, and the cost to restore bay no. 2 to its original condition. The estimated cost to perform these activities is \$329,100. However, this estimate does not address any relocation expenses for wastes stored in other bays of the warehouse which may have to be moved during the plugging and abandonment operation.

Based on an evaluation of the available data, it does not appear that the materials in Well No. 67 have had a significant impact on the regional aquifer. In addition, the costs to plug and abandon Well No. 67 at this time are excessive in comparison to the apparent risk posed by the well to the aquifer.

Due to the limited funding available for remediation activities, these funds would be better allocated on other more urgent projects. It is recommended that the removal action be terminated and that Well No. 67 be left open and sampled on a semiannual basis for uranium and HSL metals. This sampling would continue until the KC-2 Warehouse is decommissioned. At this time the warehouse does not have a scheduled date for closure. Once the warehouse is decommissioned the well casing will be removed and the hole will be grouted to the surface.

Table 1
Summary of Sediment Samples
TCLP Metals
KC-2 Warehouse/Well No. 67

Analyte	July 1, 1993 (mg/L)	July 2, 1993 (mg/L)	MCCTC (mg/L)
Arsenic	<0.09	<0.09	5.0
Barium	0.58	0.60	100.0
Cadmium	<0.005	<0.005	1.0
Chromium	<0.006	<0.006	5.0
Lead	0.517	0.822	5.0
Mercury	<0.0001	<0.0001	0.2
Selenium	<0.1	<0.1	1.0
Silver	<0.02	<0.02	5.0

MCCTC - Maximum Concentration of Contaminants for the Toxicity Characteristic (TCLP)

Table 2
Summary of Sediment Samples (CLP Metals)
KC-2 Warehouse/Well No. 67

Analyte	1/04/93 (mg/Kg)	7/1/93 (mg/Kg)	7/2/93 (mg/Kg)	Background Values 0"-6"	Background Values 48"-54"
Aluminum		3500	1700	7863	7304
Antimony		24.0	24.0		
Arsenic	6.5	6.3	4.6	5.18	4.32
Barium	56	57.2	16.4	61.95	45.3
Beryllium		1.4	1.3	0.26	0.29
Cadmium	1.2	1.4	1.3	0.32	0.23
Calcium		97700	106000	1900	10800
Chromium	46	11.4	8.4	10.43	9.62
Cobalt		7.0	4.3	9.66	8.13
Copper		28.9	29.9	7.33	11.18
Iron		39900	31100	14465	16267
Lead	330	348	273	17.22	7.34
Magnesium		27700	25500	1646	23951
Manganese		568	475	650	468
Mercury	<0.2	0.07	0.06	0.07	0.06
Nickel		20.8	12.2	9.66	16.58
Potassium		696	343		
Selenium	0.04	0.51	0.25	0.39	0.3
Silver	2.4	0.57	0.51		
Sodium		152	123	34.3	129
Thallium		0.29	0.25	0.26	0.21
Vanadium		11.2	6.6	19.76	15.82
Zinc		41.8	34.3	39.99	44.95
Cyanide		0.36	0.32		
Molybdenum		4.9	4.3	1.3	1.1
Silicon		276	115		

Background Values - Mean values (mg/Kg) documented in the "CERCLA/RCRA Background Soil Study Report," March 19, 1993

4764

Table 3
Summary of Groundwater Sample Detections
KC-2 Warehouse/Well No. 67

Analyte	January 13, 1993 Results (ug/L)	July 15, 1993 Results (ug/L)	August 12, 1993 Results (ug/L)	MCL (ug/L)
Sulfides	6000	PNS	PNS	
VOC's				
Acetone	9.4	NA	ND	
Xylene	4.3	NA	ND	10,000
Metals	Total/Dissolved			
Aluminum	NA	NA	29700/22	
Antimony	NA	NA	112/45	5.0
Arsenic	97/ND	NA	71.1/1.1	50.0
Barium	670/240	NA	757/333	2000
Beryllium	NA	NA	2.3/1	1.0
Cadmium	6.1/ND	NA	44.6/3	5.0
Calcium	NA	NA	912000/ 1119000	
Chromium	240/ND	NA	1560/4.4	100
Cobalt	90/ND	NA	69.4/6.2	NA
Copper	340/ND	NA	273/4.1	1300
Iron	NA	NA	375000/ 3240	
Lead	3800/11	NA	1880/1.1	15.0
Magnesium	NA	NA	228000/ 39100	
Manganese	NA	NA	5250/113	
Mercury	0.9/ND	NA	0.24/0.2	2.0
Nickel	310/ND	NA	898/19	100
Potassium	NA	NA	6500/ 1280	
Selenium	NA	NA	11.1/1.1	50.0

Table 3 Continued

Silver	NA	NA	12.8/3	
Sodium	NA	NA	20900/ 19300	
Thallium	1800/ND	NA	1.4/1.1	2.0
Vanadium	190/ND	NA	78.1/4	
Zinc	700/ND	NA	1260/9	
Total Uranium Filtered	NA	1.4 ug/L	0.8 ug/L	20*
Total Uranium Non Filtered	2400 ug/L	4.6 ug/L	20 ug/L	NA

NA - Not Applicable

ND - Not Detected

PNS - Parameter Not Sampled

MCL - Maximum Contaminant Level

ug/L - Micrograms per Liter

* - Proposed MCL

Table 4
Summary of Hydropunch Total Uranium
Groundwater Analysis for Well No. 41066

Depth (Feet)	Total Uranium (ug/L)
150	12.0
160	2.9
170	6.9
180	5.6
190	3.6
200	2.7
210	3.1
TD @ 220	Well Screen 200 - 210 Feet

FERMCO
PROJECT & CONFIGURATION CONTROL
ESTIMATING SERVICES

18-AUGUST-93

SCOPE NARRATIVE

PROJECT DESCRIPTION:	<u>KC-2 WAREHOUSE - WELL #67 REMOVAL</u>
PROJECT NUMBER:	<u>JKN-01</u>
PROJECT LOCATION:	<u>NORTH OF BOILER PLANT</u>
PROJECT ENGINEER:	<u>L. WEHLITZ</u>
ESTIMATOR:	<u>R. ROPPEL</u>
ESTIMATE NUMBER:	<u>3224</u>

SUPPORTING DOCUMENTATION:

DRAWINGS	[]	EQUIPMENT LIST	[]	SITE WALK	[]
SKETCH	[]	QUOTATIONS	[]		

BASIS OF ESTIMATE:

Remove a 220 vlf, 6" dia well and casing from the center of Bay 2 in the KC-2 Warehouse Bldg. Temporarily remove the chain link fence north of Bldg 63 to allow access to the bldg for a well drilling rig. Site grade the drainage ditch to allow the rig and other equipment to enter from the north side of the bldg. Construct a temporary access road with gravel across the ditch and to the bldg. Remove a 40'x75' section of the roof, roof support steel, light fixtures and conduit, and sprinkler piping for rig access and boom clearance. Remove a 40' wide section of the concrete block wall for equipment access. As the well piping and casing sections are removed, wrap in polyethylene and place in ISO containers. Plug the well opening with pressure grout for the full 220' depth. Re-install or replace all building structures that were removed. Rebuild the curb around the interior of the bay, repair the floor as required, and recoat with the RCRA coating as applied before. Regrade the area, removing the materials from the drainage ditch, and replace the fence.

FERMCO
PROJECT & CONFIGURATION CONTROL
ESTIMATING SERVICES

12-August-93

ESTIMATE ASSUMPTIONS

PROJECT DESCRIPTION:	KC-2 WAREHOUSE - WELL #67 REMOVAL
PROJECT NUMBER:	JKN-01
PROJECT LOCATION:	NORTH OF BOILER PLANT
PROJECT ENGINEER:	L. WEHLITZ
ESTIMATOR:	R. ROPPEL
ESTIMATE NUMBER:	3224

DECONTAMINATION & DISPOSAL

The pipe and well casing is assumed to be contaminated and is to be placed in ISO containers as the sections are removed.

WAGE RATES

Wage rates within the estimate are based on the current rates furnished by the local craft labor board.

EXECUTION

The estimate is based on a 40 hour work week, and no allowance for premium time.

ENGINEERING

Title I, II, and III by Fermco.

CONTINGENCY

Seven percent(7%) of the total project cost has been included for contingency due to unforeseen conditions. Costs due to changes in scope are excluded from contingency.

GENERAL

Indirect costs, site specific costs, and office costs are addressed on the estimate summary sheet, and in the estimate detail sheets as applicable.



EST FILE #: 3224
 CLIENT: US DOE
 PROJECT TITLE: KC-2 WAREHOUSE - WELL #67 REMOVAL

DATE: 11-Aug-93
 ESTIMATOR: R. ROPPEL
 LOCATION: NORTH OF BOILER PLANT

CODE	ITEM DESCRIPTION	M/H	RATE	LABOR \$	S/C \$	MAT'L \$	TOTAL \$
	EXCAVATION AND CIVIL	138		\$4,300	\$34,200	\$200	\$38,700
	CONCRETE						
	STRUCTURAL STEEL						
	BUILDINGS	514		\$12,900	\$16,400	\$16,800	\$46,100
	MACHINERY AND EQUIPMENT						
	PIPING						
	ELECTRICAL	66		\$1,200		\$500	\$1,700
	INSTRUMENTS						
	PAINTING AND SCAFFOLD						
	INSULATION						

	AVG/HR					
DIRECT FIELD COSTS	1.118	\$16.46	\$18,400	\$50,600	\$17,500	\$86,500
SUPERVISION - CONTRACTOR			\$3,000			\$3,000
SM TOOLS/CONSM'BLS					\$1,100	\$1,100
EQUIPMENT RENTAL					\$41,600	\$41,600
TEMP. FACILITIES			\$400	\$700		\$1,100
TEMP UTL'S HOOK-UP			\$200	\$400		\$600
JOB CLEAN-UP			\$400	\$700		\$1,100
SAFETY			\$200	\$400		\$600
HEALTH PHYSICS			\$4,500			\$4,500
CERCLA \$1,500 PER PERSON					\$800	\$800
BOND					\$900	\$900
OVERHEAD & PROFIT					\$12,800	\$12,800
PAYRL BRD.&BENFT.			\$14,100			\$14,100
CONSTR MGMT			\$6,700			\$6,700
INDIRECT FIELD COSTS			\$29,500		\$59,400	\$88,900
DIRECT & INDIRECT FIELD COSTS			\$47,900	\$50,600	\$76,900	\$175,400

TRANSPORTATION & BURIAL						\$60,000
WASTE CONTAINERS	QTY	(2) ISO				\$900
SOIL WATER/AIR					\$900	\$900
G&A (HO EXP)						\$1,800
PROJ.MGMT-FERMCO						\$14,000
ENGINEERING	TITLE I	TITLE II		TITLE III		\$35,100
HOME OFFICE COSTS						\$111,800
TOTAL FIELD & HOME OFFICE COSTS						\$287,200
SALES TAX	6.0%		\$76,900			\$4,600
SUB-TOTAL						\$291,800
ESCALATION	2.5%	(1 years)				\$7,300
SUB-TOTAL						\$299,100
RISK BUDGET	5.0%					\$15,000
CONTINGENCY	5.0%					\$15,000
TOTAL ESTIMATED INSTALLED COST						\$329,100

LANDLORD COSTS
 SOILS WASHING COSTS

CONTR. NO. - 4424321
 CLIENT - U.S. DEPT. OF ENERGY
 PROJECT - KC-2 WAREHOUSE - WELL #67 REMOVAL
 LOCATION - NORTH OF BOILER PLANT
 PROJ. CTL. - JKN-01

EST. NO. 3224
 BY: R. HOPPEL
 DATE: 08/12/93

BUDGET ESTIMATE DETAILS

COST CATEG.	DESCRIPTION	QUAN	UNIT	MANHOURS		COST/UNIT		LABOR	SUB CONTRACT	MATERIAL	TOTAL
				TOTAL	RATE	LABOR	SUB				
	SUMMARY										
	EXCAVATION & CIVIL WORKS										
	GENERAL SITE WORK			211				\$3,500			\$3,500
	MACHINE EXCAVATION W/HAND TRIM										
	MACHINE TRENCHING & HOLE BORING										
	HAND EXCAVATION										
	HAUL & DUMP										
	SPECIAL OR PURCHASED BACKFILL										
	CIVIL & MARINE WORK										
	ROADS			8	16.51			\$100		\$100	\$200
	AREA WORK OR PAVING			19	16.51			\$300		\$100	\$400
									\$34,200		\$34,200
	SUB TOTAL (EXCAV. & CIVIL)			238				\$3,900	\$34,200	\$200	\$38,300
	PRODUCTIVITY FACTOR							400			
	TAKE-OFF ALLOWANCE										
	TOTAL (EXCAV. & CIVIL)			238				\$4,300	\$34,200	\$200	\$38,700

4764

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 LOCATION - NORTH OF BOILER PLANT
 PROJ.CTL. - JKN-01

EST. NO. 3224
 BY: R. ROPPEL
 DATE: 08/12/93

BUDGET ESTIMATE DETAILS

COST CATEG.	DESCRIPTION	QUAN	UNIT	MANHOOURS		LABOR	SUB CONTRACT	MATERIAL	TOTAL
				UNIT	TOTAL RATE				
	<u>EXCAVATION & CIVIL</u>								
	<u>GENERAL SITE WORK</u>								
	SITE DEMOLITION								
	REMOVE CHAIN LINK FENCE.	60	LF	0.20	12	\$198			\$198
	REMOVE 4'x4' CONCRETE PAD	1	EA	2.00	2	\$33			\$33
	REMOVE PERSONNEL DOOR AND FRAME	1	EA	6.00	6	\$99			\$99
	REMOVE INSULATION BENEATH ROOF	3000	SF	0.00	6	\$99			\$99
	REMOVE SPRINKLER PIPING IN BAY 2	1	LOT	10.00	10	\$165			\$165
	REMOVE LIGHT FIXTURES, CONDUIT, & WIRE.	1	LOT	16.00	16	\$264			\$264
	REMOVE ROOF SUPPORT STEEL.	1	LOT	60.00	60	\$991			\$991
	REMOVE 6"x6" CURB - NORTH WALL, BAY 2	50	LF	0.20	10	\$165			\$165
	REMOVE CONCR BLK WALL - 40'x11' HIGH	440	SF	0.08	35	\$578			\$578
	REMOVE GUTTERS & DOWNSPOUT	1	LOT	6.00	6	\$99			\$99
	REMOVE ROOF SECTION - 40'x75'	3000	SF	0.01	30	\$495			\$495
	REMOVE CONCRETE AROUND WELL - (2)6" FLR SLAB	7	SF	1.70	12	\$198			\$198
	ROUGH GRADING - CUT, FILL, STRIP, ETC.								
	FILL DRAINAGE DITCH W/EXSTG SOIL. BLDG ACCES	15	CY	0	6	\$99			\$99
	DIKES, FIREWALLS, LEVEES, ETC. (NONE REQUIRED)								
	BLASTING ROCK, CONCRETE, ETC. (NONE REQUIRED)								
	DEWATERING (NONE REQUIRED)								
	SHORING (NONE REQUIRED)								
	SURVEYS & SOIL TEST INDIRECT COST IN THE ESTIMATE								

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U.S. NO. 3224
 BY: R. HOPPLE
 DATE: 08/12/93

BUDGET ESTIMATE DETAILS

COST CATEG.	DESCRIPTION	QUAN	UNIT	MANHOURS		COST/UNIT		LABOR	SUB CONTRACT	MATERIAL	TOTAL
				TOTAL	RATE	LABOR	SUB				
	SPECIAL OR PURCHASED BACKFILL. PURCHASED BACKFILL MAT'L. (INCLUDES 20% COMPACTION FACTOR)										
	TOTAL (BACKFILL)										
	CIVIL & MARINE WORKS										
	WELL REMOVAL - Pricing based on ltr. dtd 3/5/91, to B. Davis - DOE from D. Hamel - ASI/IT. Subject: RESPONSE TO SENATE ARMED SVCS COMMITTEE QUESTIONS REGARDING WELL INSTALLATIONS.*	1 LOT									
	MOBILIZE, REMOVE 220 LF. 6" PIPE & CASING	180 CF							\$25,000		\$25,000
	FILL WELL OPENING W/GROUT.	1 LOT							\$7,200		\$7,200
	DEMOP, DECONTAM EQUIPMT	1 LOT							\$2,000		\$2,000
	TOTAL (CIVIL & MARINE)			16.51					\$34,200		\$34,200
	ROADS										
	TEMP. ACCESS ROAD, 4" GRAVEL, COMPACT	12.0 SY		8	16.51			\$132		\$60	\$192
	TOTAL (ROADS)			8				\$132		\$60	\$192
	AREA WORK OR PAVING										
	REMOVE FILL/GRAVEL FROM DITCH & TEMP. ROAD.	17 CY		6	16.51			\$99			\$99
	REPLACE CONCRETE PAD @ PERSONNEL DOOR.	1 EA		1	16.51			\$17			\$17
	REPLACE CHAIN LINK FENCE.	60 LF		12	16.51			\$198		\$60	\$258
	TOTAL (AREA WORK OR PAVING)			19				\$314		\$60	\$374

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 PROJ. CTL. - JKN-01

EST. NO. 3224
 BY: R. ROPPEL
 DATE: 08/12/93

BUDGET ESTIMATE DETAILS

COST CATEG.	DESCRIPTION	QUAN	UNIT	MANHOURS		COST/UNIT		LABOR	SUB CONTRACT	MATERIAL	TOTAL
				TOTAL	RATE	LABOR	MAT'L				
	<u>BUILDINGS</u>										
	PREFABRICATED BUILDINGS										
	MASONRY	121						\$2,200	\$14,900	\$1,500	\$18,600
	FRAMING - WOOD OR METAL										
	SIDING AND ROOFING	340						\$6,100		\$13,400	\$19,500
	SASH, DOORS, LOUVERS, GLAZING	8						\$100		\$50	\$150
	INTERIOR COVERING AND FINISH										
	FURNITURE, LABORATORY AND SHOP EQUIPMENT										
	VENTILATING AND AIR CONDITIONING										
	PLUMBING	180						\$3,300		\$300	\$3,600
	<u>SUB TOTAL (BUILDINGS)</u>	649						\$11,700	\$14,900	\$15,250	\$83,700
	PRODUCTIVITY FACTOR			100							
	TAKE - OFF ALLOWANCE			65				\$1,170	\$1,490	\$1,530	\$4,190
	<u>TOTAL (BUILDINGS)</u>	814						\$12,900	\$16,400	\$16,800	\$46,100

CONTR. NO. - 4424321
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 LOCATION - NORTH OF BOILER PLANT
 PROJ. CTL. - JKN-01

CONTR. NO. - 4424321
 EST. NO. 3224
 BY: R. ROPPEL
 DATE: 08/12/93

BUDGET ESTIMATE DETAILS

COST CATEG.	DESCRIPTION	QUAN	UNIT	UNIT	MANHOURS		COST/UNIT		LABOR	SUB CONTRACT	MATERIAL	TOTAL
					TOTAL	RATE	LABOR	SUB				
	<u>ELECTRICAL</u>											
	MAJOR ELECTRICAL EQUIPMENT											
	CONDUIT & FITTINGS											
	WIRE & CABLE (Power & Control Only)											
	ELECTRICAL SYSTEMS ACCESSORIES											
	OPERABILITY TEST & FINAL CHECKOUT											
	MISC. & SUPPORT					60			\$1,100		\$500	\$1,600
						60			\$1,100		\$500	\$1,600
	SUB TOTAL (ELECTRICAL)								100			
	PRODUCTIVITY FACTOR											
	TAKE - OFF ALLOWANCE					6						
	TOTAL (ELECTRICAL)					66			\$1,200		\$500	\$1,700

100

RISK BUDGET / OVERRUN ANALYSIS OUTPUT.

PROJECT: KC-2 WRHSE - WELL #67 REMOVAL DATE: 16-Aug-93
 CLIENT: DOE
 CONTRACT: 3224 BASE ESTIMATE: \$300,800

CHANCES OF OVERRUN	PROJECT COST W/RISK BUDGET	RISK BUDGET ADDED TO BASE ESTIMATE	%RISK BUDGET OF BASE ESTIMATE
0.00%	\$387,520	\$86,720	28.8%
0.05%	\$345,462	\$44,662	14.8%
5.00%	\$331,583	\$30,783	10.2%
10.00%	\$328,169	\$27,369	9.1%
15.00%	\$325,957	\$25,157	8.4%
20.00%	\$324,214	\$23,414	7.8%
25.00%	\$322,668	\$21,868	7.3%
30.00%	\$321,210	\$20,410	6.8%
35.00%	\$319,869	\$19,069	6.3%
40.00%	\$318,585	\$17,785	5.9%
45.00%	\$317,103	\$16,303	5.4%
50.00%	\$315,649	\$14,849	4.9%
55.00%	\$314,369	\$13,569	4.5%
60.00%	\$313,243	\$12,443	4.1%
65.00%	\$312,053	\$11,253	3.7%
70.00%	\$310,805	\$10,005	3.3%
75.00%	\$309,490	\$8,690	2.9%
80.00%	\$307,796	\$6,996	2.3%
85.00%	\$305,891	\$5,091	1.7%
90.00%	\$303,847	\$3,047	1.0%
95.00%	\$301,220	\$420	0.1%
99.95%	\$289,165	(\$11,635)	-3.9%
100.00%	\$260,886	(\$39,914)	-13.3%

4764

FERMCO RISK BUDGET ESTIMATING
INPUT DATA TABLE

PROJECT: KC-2 WRHSE - WELL #87 REMOVAL
CLIENT: DOE
CONTRACT: 3224

ACCOUNT NO.	ITEM DESCRIPTION	ESTIMATE				DIST. TYPE	RELA. TIONS	RANGE FACTOR
		\$BASE	%LOW	\$LOW	%HIGH			
1	EXCAV LBR	\$4,300	-10.0%	\$3,870	45.0%	T		18%
2	EXCAV MATL	200	-10.0%	180	50.0%	T		17%
3	EXCAV S/C	34,200	-20.0%	27,360	60.0%	T		25%
4	BLDG LBR	12,900	-20.0%	10,320	60.0%	T		25%
5	BLDG MATL	16,800	-5.0%	15,960	15.0%	T		25%
6	BLDG S/C	16,400	-20.0%	13,120	50.0%	T		29%
7	ELECTRICAL	1,700	-0.0%	1,700	20.0%	T		0%
8	EQUIPMENT RENTAL	41,600	-15.0%	35,360	35.0%	T		30%
9	O H & P	12,800	0.0%	12,801	30.0%	T		-0%
10	LABOR BURDENS	14,300	-5.0%	13,585	5.0%	T		50%
11	TRANSPORT & BURIAL	60,000	-15.0%	51,000	10.0%	T		60%
12	ENGR	35,300	-10.0%	31,770	30.0%	T		25%
13	PROJ MGMT	14,100	-20.0%	11,280	30.0%	T		40%
14	MISC INDIRECTS	36,200	-10.0%	32,580	15.0%	T		40%
15		0		0				0%
16		0		0				0%
17		0		0				0%
18		0		0				0%
19		0		0				0%
20		0		0				0%
21		0		0				0%
22		0		0				0%
23		0		0				0%
24		0		0				0%
25		0		0				0%
26		0		0				0%
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38		0		0				0%
39		0		0				0%
40		0		0				0%
41		0		0				0%
42		0		0				0%
43		0		0				0%
44		0		0				0%
45		0		0				0%
TOTAL:		\$300,800		\$260,886				\$387,520