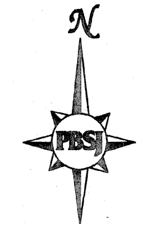


GRAPHIC SCALE

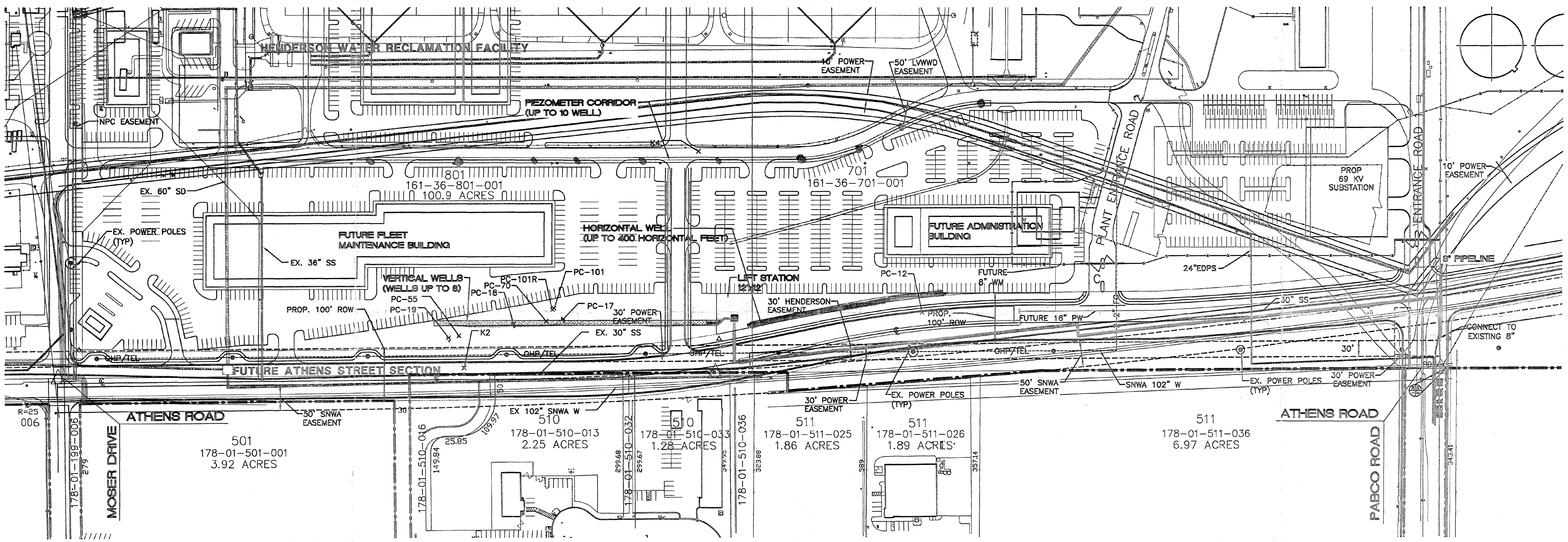
200 100 50 0 100 300

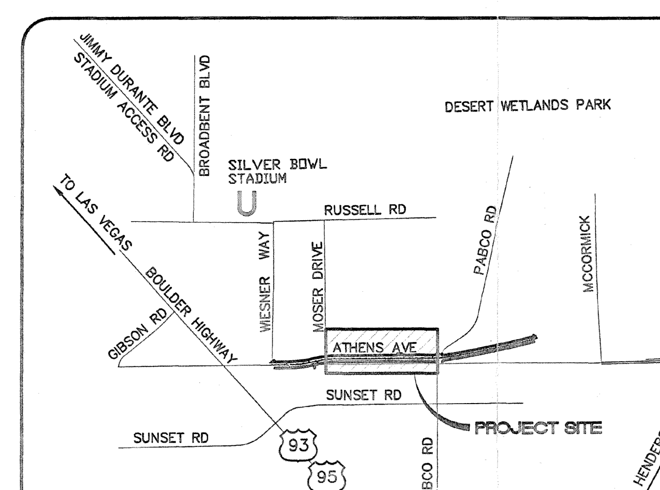
(IN FEET)
1 inch = 100' ft.

LEGEND

- PROP PIEZOMETER CORRIDOR – 40 SQ. FT.
- PROP VERTICAL WELLS – 5500 SQ. FT.
- PROP HORIZONTAL WELLS – 3800 SQ. FT.
- PROP PIPE
- CITY ℞
- PROP LIFT STATION SITE = 5200 SQ. FT.

RECEIVED
MAY 1 6 2001





VICINITY MAP
N.T.S.

PRELIMINARY ONLY
NOT FOR CONSTRUCTION
5/02/01

RICHARD J. CAPP
CIVIL
No. 12877

KERR-McGEE CHEMICAL LLC

P.O. BOX 55 HENDERSON, NEV. 89009-7000

APPRAISAL MAP
ATHENS RD LATERAL PIPELINE AND WELL FIELD

SCALE: 1" = 100'

DATE: 04/18/01

TOLERANCE UNLESS OTHERWISE SPECIFIED
FRACTIONS ±
AFE No. 0.00 ±
0.000 ±

JOB No.

REVISIONS

REV	DESCRIPTION	BY	DATE

DESIGN	DATE	APPROVED FOR CONSTRUCTION	BY	DATE		BY	DATE
DRAWN BY CLL		SAFETY			PROCESS ENGR.		
PROJ. ENGR.		ENVIRONMENTAL			PROJECT ENGR.		
ENGR. MNGR. RJC		OPERATIONS MNGR.			ENGR. MNGR.		
		PRODUCTION SUPT.			PLANT MNGR.		
		QLTY. CONTROL					

PAPER SIZE	DRAWING NO.	SHEET	REVISION
D	1	1 OF 1	

ALLEN BIAGGI, *Administrator*

(775) 687-4670

TDD 687-4678

Administration
Facsimile 687-5856

Water Pollution Control
Facsimile 687-4684

Mining Regulation and
Reclamation
Facsimile 684-5259

RECEIVED
ENVIRONMENTAL
PROTECTION

01 DEC 21 AM 9:42

STATE OF NEVADA
KENNY C. GUINN
Governor

R. MICHAEL TURNIPSEED, *Director*

Waste Management
Corrective Actions
Federal Facilities

Air Quality
Water Quality Planning

Facsimile 687-6396

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

DIVISION OF ENVIRONMENTAL PROTECTION

333 W. Nye Lane, Room 138
Carson City, Nevada 89706

December 20, 2001

Ms. Susan Crowley
Kerr-McGee Chemical LLC
P.O. Box 55
Henderson, NV 89009-7000

RE: Kerr-McGee Written Notification of Force Majeure Dated 12/4/01

Dear Ms. Crowley:

Your letter of 12/4/01 describing the events which Kerr-McGee believes constitutes force majeure and the delay the force majeure event will have on the schedule contained in Section II, Work To Be Performed, of the Consent Agreement dated 10/8/01 has been reviewed.

On the basis of the information contained in your letter of 12/4/01 the Nevada Division of Environmental Protection (NDEP) is not able to make a final determination with respect to force majeure. However, the NDEP is agreeable to modifying the schedule contained in Section II.E of the Consent Agreement as follows:

> Kerr-McGee will complete mechanical construction of the plant by February 28, 2002, and shall begin treating perchlorate- containing water by March 29, 2002.

In the event that Kerr-McGee is unable to meet these modified dates and believes that the previous events that have been described or new events constitute force majeure, the NDEP is open to considering such information.

The efforts of Kerr-McGee at this site and your cooperation on this matter are appreciated. If you have any questions, please contact me at 687-4670 ext 3127.

Sincerely,

For

Doug Zimmerman
Bureau Chief
Bureau of Corrective Action

TKC:tjc

cc: Ms. Brenda Pohlmann, Chief, Las Vegas Operations, NDEP, Las Vegas, NV
Mr. Todd Croft, Supervisor, Bureau of Corrective Actions, NDEP, Las Vegas, NV
Mr. Leo Drozdoff, Chief, Bureau of Water Pollution Control, NDEP, Carson City, NV
Mr. Mitch Kaplan, U.S. EPA Region 9, WST-5, 75 Hawthorne Street, San Francisco, CA 94105
Mr. William Frey, Deputy Attorney General, Attorney General, Attorney General's Office, 100 N. Carson Street, Carson City, NV 89701-4717

J:\users/tcroft/kmcllc/112901.fmn

KERR-McGEE CHEMICAL LLC
POST OFFICE BOX 55 - HENDERSON, NEVADA 89009

December 5, 2001

Todd Croft
Supervisor
Nevada Division of Environmental Protection
555 E. Washington, Suite 4300
Las Vegas, NV 89101

Dear Mr. Croft:

Subject:Perchlorate Remediation – Monthly Progress Report

Kerr-McGee Chemical LLC (Kerr-McGee) entered into an Administrative Order on Consent (AOC) with Nevada Division of Environmental Protection (NDEP) in October 2001. In that AOC, Kerr-McGee agreed to provide progress reports describing the progress towards construction completion for the ion exchange / catalytic destruction plant. Progress on AOC-defined work to be performed is provided below.

Slurry Wall (II.2.A)
Construction of the slurry wall, downgradient of the on-site chromium recovery line wells was completed prior to October 31, 2001. It is functional and we have seen an increase in on-site groundwater collection, from about 22 gpm to about 51 gpm. While the volume of on-site collected groundwater can be due to multiple causes, we believe the increase is at least partially due to improved capture.

Athens Road Groundwater Extraction (II.2.B)
Well installation, including pump testing, for the remainder of the Athens Road well collection field is complete. Some collection well detail:

- Seven new wells, ART-1 through ART-7, were constructed and now join PC-70, which was completed in 1998. The layout of the well field consists of two parts. A larger western part includes 5 wells at 75-foot spacing - from west to east, ART-1, ART-2, PC-70, ART-3 and ART-4 whereas a smaller eastern part includes 3 wells at 100-foot spacing - from west to east, ART-5, ART-6 and ART-7. These two sections of the well field are about 520 feet apart.
- The ART-series wells were all drilled using an AP-1000 casing-advance percussion-drilling rig. The hole diameter was 13 inches. Six-inch diameter casing (schedule 40 PVC blank and stainless steel vee-wire screen) was used to construct the collection wells. The deepest wells are ART-1 and -2, on the west, at 56 feet whereas the shallowest well is ART-5, on the east, at 25 feet. Pre-pumping saturated alluvial thickness varies from 37.65 feet in ART-1 in the deepest part of the channel to 9.45 feet in ART-5 on the bedrock high separating the main channel from the minor eastern subsidiary channel.
- Step-discharge pump tests were conducted in all 7 ART-series wells. Hydraulic conductivities vary, reflecting the heterogeneous nature of the alluvial channel-fill deposits. ART-2, -4, -6 and -7 are expected to be good producing wells whereas ART-1 and -3 should be moderately good and ART-5 may not provide much collection.
- With the pump-testing information in hand, final modeling can now be done to determine the pumping rates of each of the wells. Pumps can be ordered and flow meters and piping installed.

Manholes, which will be installed around each collection well for protection, have been ordered.

Although the lease has yet to be approved by the Henderson City Council, the City has authorized installation of lift station 3 to begin. The pre-cast concrete boxes, which will collectively constitute the subsurface tank, have been ordered and assembly has begun. The area where the concrete tanks will be installed is being excavated so that the tank top will be just slightly above surface grade.

Pre-fabrication of transfer piping has begun, as well as the electrical conduit runs.

Development of the operations and maintenance manual for the well collection fields (including the Athens Road well field) has begun.

Las Vegas Wash and Seep (II.2.C)
The groundwater wells in the seep area have been installed and pumping (at about 300 gpm) began on October 31, 2001. As of November 30, 11.9 million gallons of water from the seep area had been transferred to the GW-11 pond. Water transferred to GW-11 had an average concentration of about 110 ppm perchlorate.

Pipeline from Las Vegas Wash to Kerr-McGee Facility (II.2.D)
The pipeline to transfer water from the Las Vegas Wash area to the Kerr-McGee facility was completed prior to October 31, including about 14,000 foot of pipeline. This included, as well, installation of lift station 2, which provides a booster pump to finish the 210-foot water lift. Lift station 2 continues to be served by a large electrical generator, until an electrical power feed (supplied by Nevada Power) is completed. The block wall was installed around lift station 2, and landscaping is expected to be complete in early 2002.

New Ion Exchange / Catalytic Destruction Plant (II.2.E)
Construction continues on the 825 gpm perchlorate remediation plant. Engineering is nearly complete with the final stage transitioning from office design engineering to field engineering in support of construction. Overall software programming is continuing, while the portion related to the equalization area operation has been brought to the field for installation and testing. Development of the operations and maintenance manual has begun and sections of this manual are in review for comment.

The majority of the large equipment is at the site with the exception of the ammonia supply system and the new brine heater burners. Delivery of the brine heater burners is not expected until the end of January. The brine make-up tanks are installed. The project construction focus during November was completion of the equalization area and installation of the ISEP portion of the remediation process (the ISEP resin canisters, the ISEP valve assembly and the ISEP turntable). Minor work was also accomplished on utilities systems and the PDM Area.

The ATC application for the brine heater burners was submitted to DAQM in November. Kerr-McGee met with DAQM and teleconferenced with DAQM and EPA to determine the permitting path and any tasks Kerr-McGee could assist the agency with. The ATC certificate is expected from DAQM in later December (after

EPA review of the draft document), and placement of the brine heaters can take place once that ATC certificate is issued.

Please feel free to contact me at (702) 651-2234 if you have any questions related to this information. Thank you.

Sincerely,

Susan M. Crowley
Staff Environmental Specialist

By FAX and certified mail

cc: LKBailey
PSCorbett
WOGreen
KAHasbrouck
E Krish
TWReed
JTSmith
FRStater
R Waters
Rick Simon, ENSR
Brenda Pohlmann, NDEP
Doug Zimmerman, NDEP

Barry Conaty, City of Henderson
Pat Mulroy, Southern Nevada Water Authority
Mitch Kaplan, EPA Region IX

C:\1SMC\1WORD DOCS\1PERCHLORATE\AOC UPDATES AND STATUS REPORTS\AOC MONTHLY 12-01.DOC

KERR-McGEE CHEMICAL LLC
POST OFFICE BOX 55 • HENDERSON, NEVADA 89009-7000

December 4, 2001
By FAX and Federal Express

Mr. Todd J. Croft
Supervisor
Remediation and LUST Branch
Nevada Division of Environmental Protection
555 E. Washington Avenue, Suite 4300
Las Vegas, Nevada 89101-1049

Dear Mr. Croft,

This letter is in follow-up to our verbal *force majeure* notification of November 29, 2001. Kerr-McGee Chemical LLC (Kerr-McGee) is invoking *force majeure* under Section V of the Administrative Order on Consent (AOC) executed October 8, 2001 between Kerr-McGee and the Nevada Division of Environmental Protection (NDEP). Kerr-McGee has determined that due to permitting delays and resulting equipment changes, it will be unable to meet both the specified January 15, 2002 date for mechanical completion and the February 28, 2002 date for start-up of the 825 gallon per minute perchlorate treatment plant, as specified in Section II.2.E of the AOC. At this time, we anticipate that the date for "treating perchlorate containing water" will be March 29, 2002 or 90 days from issuance of an Authority to Construct permit from Clark County, whichever is later. In the interim, Kerr-McGee will continue to operate the temporary ion-exchange system. Accordingly, in the opinion of Kerr-McGee, this event should have negligible effect on achieving the goals of the AOC and therefore, does not present any imminent and substantial hazard to human health, welfare, or the environment.

As you know, Kerr-McGee has worked closely with Clark County Division of Air Quality Management (DAQM) representatives in seeking an Authority to Construct (ATC) for the two fired heaters integral to the 825 gpm treatment plant process. We were both surprised and disappointed to learn in the November 16, 2001 meeting with the DAQM, which you attended, that issuing the ATC would require 4-6 months if the original plant heater/burner design was utilized. Kerr-McGee immediately sought other burner vendors and, after much effort, obtained an agreement on another much more expensive burner system. The new system is able to reduce CO emissions to below de minimis levels and thus accelerate issuance of the ATC. An ATC application reflecting the replacement burners has been submitted to the County and action is pending. Unfortunately, despite all the efforts we could exert, on November 28,2001 the vendor of the new burner systems definitively apprised us that they cannot be delivered until the end of January 2002. We therefore, will miss the AOC January 15 deadline

We therefore, will miss the AOC January 15 deadline for mechanical completion of the plant. Consultation between USEPA and the County resulted in the opinion that early installation of the heater cabins and coils without burners or fuel trains would "constitute construction" and would be precluded by clean air act regulations in the absence of an ATC. Kerr-McGee will proceed with the balance of construction activities other than the fired heater systems until the ATC is approved. Most of the plant will be complete by January 15th.

Assuming the burners arrive by the end of January, we hope to have them installed by the end of February and proceed with check-out of the treatment system. If all goes well, we anticipate meeting the March 29, 2002 date for plant start-up. Any delays in obtaining the ATC beyond the end of December 2001 will adversely impact this revised schedule.

Kerr-McGee is committed to working effectively with NDEP and the USEPA in completion of the perchlorate remediation project. If you have any questions or comments on this letter, please contact me at (702) 651-2234 or Keith Bailey at (405) 270-3651.

Sincerely,

SM Crowley

Susan Crowley

CC: Keith Bailey
Larry Bowerman USEPA
George Christiansen
Pat Corbett
Bill Frey Nevada AG Office
William Green
Mitch Kaplan USEPA
David Moll
Brenda Pohlman NDEP
John Reichenberger
JT Smith
James Worthington
Doug Zimmerman NDEP

Subject: **Tons Perchlorate Removed**
Date: Wed, 14 Nov 2001 18:36:28 -0600
From: "Crowley, Susan" <SCROWLEY@KMG.com>
To: "'Croft, Todd'" <tcroft@govmail.state.nv.us>

Todd,
Sorry this took all day to get to you ... I've been in the field most of the day. The newest numbers on perchlorate removal are as follows:

On-site well collection field (going into the G-11 pond) .... 210.4 tons
Athens Rd well collection (from previous pumping of PC-70) .... ~ 3 tons
Surface Flow - Temp IX treatment .... 102.7 tons
Seep Area Groundwater wells (transfer to GW-11 began 10-31) .... 2.6 tons

Let me know if you need any other info. Thanks for your patience.

Susan M. Crowley
Kerr-McGee Chemical LLC
(702) 651-2234
(702) 592-7727 cell
(702) 651-2310 fax

Kelly, Gertrude

From: Wright, Ann L NWD02 [Ann.L.Wright@nwd02.usace.army.mil]
Sent: Sunday, July 15, 2001 10:15 AM
To: Lynk, Brian
Cc: Kelly, Gertrude; Gruis, Tracy; Curlee Allan E SPK; Roslyn T. Tobe (E-mail); Steffen Phillip J HQ02
Subject: RE: Kerr-McGee report

Sensitivity: Personal

tmp.htm

Brian,

I got a package Friday, but this will probably come in Monday. We are going through the doc's and finding more bits of information suggesting both minimal Navy involvement in the operations at the site and control on the part on K-M, and also indicating releases during the 1970's as a regular part of the operations. (The perchlorate building basement was used as a sort of huge sump to capture liquid process waste, and had cracks allowing large leaks to the subsurface below the concrete. They noted losses of many tons of product as a result of the basement leaks.)

I checked the agenda for the Wednesday or Thursday meetings on the 25th and 26th. We can make a conference call at 4 p.m. on Wednesday. On Thursday, we have a block of time that is not too critical from about 1230 to about 2:15 p.m. Then we have to be back in the conference room by 2:30. We would have another possible time about 4:15 on Thursday. I will check into the availability of a speaker phone so Allan, Phil and I could be in one place for the call.

Ann

-----Original Message-----
From: Lynk, Brian [mailto:Brian.Lynk@usdoj.gov]
Sent: Friday, July 13, 2001 8:20 PM
To: Ann L Wright (E-mail)
Cc: Kelly, Gertrude; Alan Curlee (E-mail); Roslyn T. Tobe (E-mail)
Subject: Kerr-McGee report
Sensitivity: Personal

I sent you today a copy of a 4/27/01 NPDES discharage monitoring report from Kerr-McGee to NDEP, bates-numbered KM-P-S008792-9440, which I received yesterday from Russell Jessee of Covington & Burling.

ALLEN BIAGGI, *Administrator*

(775) 687-4670

TDD 687-4678

Administration
Facsimile 687-5856

Water Pollution Control
Facsimile 687-4684

Mining Regulation and Reclamation
Facsimile 684-5259

STATE OF NEVADA
KENNY C. GUINN
Governor

R. MICHAEL TURNIPSEED, *Director*

Waste Management
Corrective Actions
Federal Facilities

Air Quality
Water Quality Planning

Facsimile 687-6396

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

DIVISION OF ENVIRONMENTAL PROTECTION

333 W. Nye Lane, Room 138
Carson City, Nevada 89706

June 19, 2001

Kerr-McGee Chemical Corporation
Attn: Ms. Susan Crowley
P.O. Box 55
Henderson, NV 89009-7000

Dear Ms. Crowley:

Please find attached the quarterly billing for the period 01/01/01 through 03/31/01 for our Consent Agreement relating to the Kerr-McGee site in Henderson, Nevada.

The total amount requested at this time is $1,798.72 and is detailed as follows:

Billing #8	(10/01/00-12/31/00)	$1,345.88
	(Previously submitted-outstanding)	
Billing #9	(01/01/01-03/31/01)	$ 452.84

Should you have any question, please contact Doug Zimmerman (Ext. 3127), Jennifer Carr (Ext. 3020), or Lauri Dunn (Ext. 3119).

Sincerely,

Allen Biaggi

Allen Biaggi
Administrator

AB/ld:88-BILL.LTR
Attachments
cc: Doug Zimmerman/Jennifer Carr (w/attachments)
Dan Stewart (w/attachments)
Lauri Dunn (w/attachments)

NV Div. Environmental Protection & Kerr Mc e Chemical

SCHEDULE OF EXPENDITURES AND RECONCILIATION
For the Period Covered: 07/01/00 - 03/31/01
Agreement Budget Period: 07/28/99 - Open

*** SFY01 (07/01/00 - 06/30/01)***

REVENUES	Budget	SFY2001 YTD Revenues	Variances Favorable (Unfavorable)	Variances %
#7 Payment (-09/30/00)		2,599.03		
TOTAL CASH RECEIVED TO DATE:		2,599.03		
TOTAL REVENUE		4,397.75	4,397.75	0.0%

(73.6 Report Dated:) 3/31/01

EXPENDITURES	Budget*	SFY2001 YTD Expenditures	Variances Favorable (Unfavorable)	Variances %
Salary/Fringe Benefits	0.00	3,094.11	(3,094.11)	0.0%
Travel	0.00	527.02	(527.02)	0.0%
Operating	0.00	0.00	0.00	0.0%
Training	0.00	0.00	0.00	0.0%
Contracts	0.00	0.00	0.00	0.0%
Total Direct	0.00	3,621.13	(3,621.13)	0.0%
Indirect Costs	0.00	776.62	(776.62)	0.0%
TOTAL EXPENDITURES	0.00	4,397.75	(4,397.75)	0.0%

*Note: Total is based on State Budgets for each Fiscal Year.

Fee Share Expended	4,397.75
Less Fee cash on hand	(2,599.03)
Total Reimbursement Amount:	1,798.72
Less Outstanding Billing #8:	(1,345.88)
Adjusted Billing #9:	**452.84**

Laurie Dunn 06/04/01
Prepared By: (OFPM) Date

Teresa Rooker 6/7/01
Reviewed By: (OFPM) Date

6/14/01
Approved By: (BCA Bureau Chief) Date

NV Div. Environmental Protection & Kerr Mc .e Chemical
SCHEDULE OF EXPENDITURES AND RECONCILIATION
BCA: Kerr-McGee Perchlorate Agreement
For the Period Covered: 07/01/97 - 03/31/01
Agreement Budget Period: 07/28/99 - Open

*** OVERALL - COMBINED ***

REVENUES

BILLINGS	Budget	SFY98 07/01/97-06/30/98	SFY99 07/01/98-06/30/99	SFY00 07/01/99-06/30/00	SFY01 07/01/00-6/30/01	Cumulative Revenue	Variances Favorable (Unfavorable)	%
#1 Payment (SFY98)		40,286.35				40,286.35		
#2 Payment (SFY99)			12,780.13			12,780.13		
#3 Payment (-09/30/99)				2,717.51		2,717.51		
#4 Payment (-12/31/99)				6,267.52		6,267.52		
#5 Payment (-03/31/00)				3,535.31		3,535.31		
#6 Payment (-06/30/00)				3,601.78		3,601.78		
#7 Payment (-09/30/00)					2,599.03	2,599.03		
ACTUAL CASH RECEIVED TO DATE:		40,286.35	12,780.13	16,122.12	2,599.03	71,787.63		
TOTAL REVENUE	72,694.94	40,286.35	12,780.13	16,122.12	4,397.75	73,586.36	891.42	1.23%

EXPENDITURES	Budget*	SFY1998 07/01/97-06/30/98	SFY1999 07/01/98-06/30/99	SFY00 07/01/99-06/30/00	SFY01 07/01/00-06/30/00	Cumulative Expenditures	Variances Favorable (Unfavorable)	%
Salary/Fringe Benefits	39,202.52	15,182.37	10,017.52	12,136.49	3,094.11	40,430.49	(1,227.97)	-3.13%
Travel	3,049.40	1,180.46	718.94	962.95	527.02	3,389.37	(339.97)	-11.15%
Operating	1,395.02	474.22	375.80	340.52	0.00	1,190.54	204.48	14.66%
Training	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%
Contracts	21,471.13	20,610.20	25.00	0.00	0.00	20,635.20	835.93	3.89%
Total Direct	65,118.07	37,447.25	11,137.26	13,439.96	3,621.13	65,645.60	(527.53)	-0.81%
Indirect Costs	7,576.87	2,839.10	1,642.87	2,682.16	776.62	7,940.75	(363.88)	-4.80%
TOTAL EXPENDITURES	72,694.94	40,286.35	12,780.13	16,122.12	4,397.75	73,586.35	(891.41)	-1.23%

*Note: Budget is based on State Budgets for each Fiscal Year.

Fee Share Expended	73,586.35
Less Fee cash on hand	(71,787.63)
Total Reimbursement Amount	1,798.72
Less Outstanding Billing #8	(1,345.88)
Adjusted Billing #9:	452.84

Laura Dean 06/04/01
Prepared By: (OFPM) Date

Teresa Rooker 6/7/01
Reviewed By: (OFPM) Date

Approved By: (BCA Bureau Chief) Date

File Name: I:\123DATA\ACCOUNT\FEDGRT01\BCA-88.WK3

KERR-McGEE CHEMICAL LLC
POST OFFICE BOX 55 • HENDERSON, NEVADA 89009

May 14, 2001

Mr. John Rinaldi
Property Manager
City of Henderson
240 Water Street
Henderson, NV 89015

Dear Mr. Rinaldi,

Kerr-McGee Chemical LLC (Kerr-McGee) is underway on a project to remediate perchlorate groundwater impact in the Henderson area. One of the areas targeted for groundwater extraction is the east-west alignment of the proposed Athens Road, between Moser and Pabco Roads. We have met with your office to discuss this and are appreciative of your efforts to assist us in understanding the requirements for moving forward with this remediation effort. We understand that you have met with the Property Management Committee to explain our need and received their concurrence of Kerr-McGee's use of this area, with the condition that we can find a suitable vehicle to allow Kerr-McGee to use the property for many years.

The next step is to have the property appraised. Kerr-McGee is agreeable to pay for an appraisal to establish the value of the property. I have attached a map describing the approximate area Kerr-McGee believes is required to install and maintain the Athens Road well collection field.

Please let me know if you need any other information to move forward with the appraisal. Kerr-McGee is available to discuss the map with the appraisal firm and/or to meet the appraisal firm in the field to confirm locations. Feel free to call me at 651-2234 or 592-7727 (cell). Thank you for your assistance on this project.

Sincerely,

Susan Crowley
Staff Environmental Specialist

Attachment
By certified mail

cc: LKBailey
PSCorbett
EMSpore
FRStater
Dave Gerry, ENSR
Richard Capp, PBSJ
Brenda Pohlmann, NDEP
Doug Zimmerman, NDEP
John Vaught

PETER G. MORROS
Director

STATE OF NEVADA
KENNY C. GUINN
Governor

ALLEN BIAGGI
Administrator

(702) 486-2850

FAX (702) 486-2863

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL PROTECTION
(Las Vegas Office)
555 E. Washington, Suite 4300
Las Vegas, Nevada 89101-1049

May 11, 2001

Ms. Susan Crowley
Staff Environmental Specialist
Kerr-McGee Chemical LLC
post Office Box 55
Henderson, NV 89009

Subject: Work Plan and Schedule for Seep Capture (dated April 12, 2001)

Dear Ms. Crowley:

The Nevada Division of Environmental Protection (NDEP) has received and reviewed the above referenced work plan focused at potential opportunities to capture additional, perchlorate-containing, groundwater in the general vicinity of the current seep capture area. This work plan follows a March 26, 2001 meeting at the Kerr-McGee Chemical LLC (Kerr-McGee) Henderson, Nevada facility between representatives of Kerr-McGee, the NDEP, and the U.S. EPA wherein various ideas were exchanged regarding "additional seep area capture".

We recognize significant efforts have been put forth to date to consider how and where additional capture might occur and how these project components might be integrated into the larger, long-term, remediation project. We also appreciate the level of effort expended to design, permit, and construct the necessary infrastructure related to the long-term remediation project. While we are in general agreement with the April 12, 2001 Work Plan, the following comments focus on the capacity of this enhanced system.

Short-Term:

A network of extraction wells and associated conveyances and infrastructure are needed in the general vicinity of the "seep". We believe that capture is both possible and prudent to aggressively remove perchlorate-containing groundwater that is destined for the Las Vegas Wash (Wash). Further, we believe the capture system installed should be capable of producing approximate 400 gallons per minute (gpm).

The April 12, 2001 Work Plan identified two wells would be constructed in the vicinity of the "seep". However, the NDEP requests you focus your efforts on capturing approximately 400 gpm rather than a specified number of wells. We understand that 400 gpm is the maximum capacity of the existing temporary ion exchange (IX) system.

Construction of the extraction wells and associated infrastructure should occur as soon as practical. We anticipate the initial use of only two (2) extraction wells (as you have proposed) between August 2001 and approximately January 2002 (when the long-term remediation system becomes operational). However, please recognize that

J:\USERS\TCROFT\KMCLLC\041201.WP

construction of additional extraction wells and associated infrastructure may be necessary to achieve the desired production rate of approximately 400 gpm.

Long-Term:

The benefit of these extraction wells will be most evident at the point where the long-term remediation system becomes operational. At that point, we understand the Athens Road Area Well Field will be fully operational. We further understand that Kerr-McGee believes groundwater that has passed beyond the Athens Road Area may take approximately six (6) to twelve (12) months to migrate to the "seep" area.

Use of all extraction wells in the vicinity of the "seep" commencing at the time the Athens Road Area Well Field becomes operational should allow for an approximate 90 % combined effective capture of perchlorate-containing groundwater near the Wash. This effort would greatly enhance the designed and proposed remediation project and significantly limit the amount of perchlorate that reaches the Wash. Depending upon the realized hydrogeologic conditions, these wells (and the related effort) may only be operational for the "drain down" time of approximately six (6) to twelve (12) months.

The currently in use IX treatment system would be needed to process the approximate 400 gpm of extracted groundwater during the "drain down" period. Once "drain down" has been achieved, as observed by diminished perchlorate concentrations at these extraction wells, these wells could be turned off and the IX system shut down. However, the extraction wells, pumps, infrastructure, and IX will have to be kept and maintained in a "ready mode" for some additional period of time in the event of capture problems at the Athens Road Area Well Field. This time period will be determined at a future date based upon overall system performance.

Closing:

We are available to meet and discuss these issues and review the status of the long-term remediation system & schedule should this be needed. In the meantime, please proceed with implementation of the April 12, 2001 Work Plan as modified by the above comments.

Please contact Todd Croft in our NDEP - Las Vegas Office [(702) 486-2871] if you have any questions regarding this letter.

Sincerely,

Todd J. Croft, Supervisor
Remediation & LUST Branch
Bureau of Corrective Actions
NDEP - Las Vegas Office

TJC:tjc

cc: Ms. Brenda Pohlmann
Mr. Doug Zimmerman
Mr. Leo Drozdoff

J:\USERS\TCROFT\KMCLLC\041201.WP

KERR-McGEE CHEMICAL LLC
POST OFFICE BOX 55 - HENDERSON, NEVADA 89009

April 27, 2001

Ms. Jennifer McMartin
State of Nevada
Division of Environmental Protection
Bureau of Water Permits & Compliance
333 W. Nye Lane
Carson City, Nevada 89710

Dear Ms. McMartin:

SUBJECT: Discharge Monitoring Report (DMR)
First Quarter 2001 – NPDES Permit NV 0023060

Kerr-McGee maintains an NPDES Permit #0023060 for discharge of water treated, as part of their on-going effort to remediate perchlorate in the Henderson area. The attached DMRs (Attachment 1) reflect information associated with the perchlorate remediation efforts, i.e. discharge of treated surface water near the Las Vegas Wash. Supporting analytical sheets, including a summary analytical table (Table 1), are included as well (Attachment 2). Please note that analyses of Attachment A analytes, for the treated discharge, indicates that there is no significant increase in "other constituents" due to the IX treatment. This was expected due to the focused nature of IX based perchlorate removal.

Listed separately are analytical results for four Las Vegas Wash locations, which require analyses to evaluate the mixing zone (Attachment 3) as well as the upgradient on-site groundwater well (Attachment 3).

Should you have any questions concerning this report, please contact me at (702) 651-2234. Thank you.

Sincerely,

SMCrowley

S. M. Crowley
Staff Environmental Specialist

By overnight mail
cc: LKBailey
PSCorbett, w/o analytical attachment
WOGreen, w/o analytical attachment
SJMathew, w/o analytical attachment
MJPorterfield, w/o analytical attachment
EMSpore, w/o analytical attachment
FRStater, w/o analytical attachment
Rick Simon, ENSR
Brenda Pohlmann, NDEP (Las Vegas), w/o analytical attachment
Doug Zimmerman, NDEP, w/o analytical attachment

smc/2001 1st Q NPDES NV 0023060 - Cvr Ltr.doc

ALLEN BIAGGI, *Administrator*

(775) 687-4670

TDD 687-4678

Administration
Facsimile 687-5856

Water Pollution Control
Facsimile 687-4684

Mining Regulation and Reclamation
Facsimile 684-5259

STATE OF NEVADA
KENNY C. GUINN
Governor

R. MICHAEL TURNIPSEED, *Director*

Waste Management
Corrective Actions
Federal Facilities

Air Quality
Water Quality Planning

Facsimile 687-6396

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

DIVISION OF ENVIRONMENTAL PROTECTION

333 W. Nye Lane, Room 138
Carson City, Nevada 89706

April 25, 2001

01 MAY -1 AM 9:47

RECEIVED ENVIRONMENTAL PROTECTION

Susan Crowley
Staff Environmental Specialist
Kerr McGee Chemical LLC
8000 West Lake Mead Dr.
Henderson, NV 89015

Subject: Dye Injections Study,
WET Test Alternate Species,
Perchlorate Removal Technology and Waters to be Treated for Perchlorate Removal

Dear Ms. Crowley:

We have reviewed the documents referenced above and offer the following comments:

Dye Injection Study:

Kerr McGee is authorized to proceed with the study. You should make every effort to coordinate this work with the Southern Nevada dischargers and the Southern Nevada Water Authority. Please report your findings to this office following the completion of the study.

WET Test Alternate Species:

In accordance with your request, Kerr McGee may use hyallella azteca and sheepshead minnows in place of daphnids and fathead minnows respectively. Please provide us with the name of the certified lab that will perform these analyses in advance of completing the work.

Perchlorate Removal Technology and Waters to be Treated for Perchlorate Removal:

NDEP hereby confirms that we will maintain existing permit language which allows the permanent 825gpm IX/Catalytic system to operate under the 97 percent (97%) perchlorate removal requirement. This language will remain in place until such time as improved removal efficiency is demonstrated to be available and reliable.

Kerr McGee has decided to add granular activated carbon (GAC) to the treatment train. This technology will allow Kerr McGee to treat organic pesticides to non-detect levels. Kerr McGee is authorized to include water from the Pittman Lateral area for perchlorate removal and discharge from outfall 001. Please be aware that other sources of groundwater must be evaluated for TDS impacts to receiving waters prior to receiving authorization for treatment and discharge.

Please feel free to contact me at (775) 687-4670 ext. 3142 with any questions or comments on these matters.

Sincerely,

Leo M. Drozdoff

Leo M. Drozdoff, P.E., Chief
Bureau of Water Pollution Control

cc: Jon Palm
Jennifer McMartin
Doug Zimmerman
Brenda Pohlmann
Terry Oda, US EPA Region IX

KERR-McGEE CHEMICAL LLC
POST OFFICE BOX 55 - HENDERSON, NEVADA 89009

APR 26 01

April 23, 2001

Mr. Doug Zimmerman
Chief, Bureau Corrective Actions
Nevada Division of Environmental Protection
123 West Nye Lane
Carson City, NV

Dear. Mr. Zimmerman:

Subject: EPA Guidance on Soil Excavations

Kerr-McGee Chemical LLC (Kerr-McGee) is proceeding with installation of a pipeline to move water from the "seep" area to the Kerr-McGee plant site. The installation process will include areas where a trench must be dug, and a pipeline installed and subsequently buried. As a follow-up to our phone conversation on Wednesday, April 18, attached is the EPA Guidance for handling soil excavation at times when soils "are temporarily moved within the area of contamination, and subsequently redeposited into the same excavated area." Considering this Guidance document, and following our phone conversation, Kerr-McGee intends to return excavated soil from the pipeline installation trenches to the area from which it was pulled without sampling.

Kerr-McGee requests NDEP's concurrence on the stated activities, which can be provided in the form of a signature below. Please feel free to call me at (702) 651-2234 if you have any questions. Thank you.

Doug Zimmerman — 4/27/01
NDEP Approval — Date

Sincerely,

SM Crowley

Susan M. Crowley
Staff Environmental Specialist

Attachment
By certified mail

cc: John Sanderson, Timet
Jennifer Carr, NDEP
Brenda Pohlmann, NDEP
LKBailey
PSCorbett
D Moll
MJPorterfield
JTSmith
EMSpore
FRStater
R Waters

ATTACHMENT 1

OSWER 9441.1992(16)

EPA United States Environmental Protection Agency **Office of Solid Waste**

Welcome What's New Topics Search Full Text Search Advanced Search How To

Record Detail

Full Document:	
Title:	CLARIFICATION OF THE APPLICABILITY OF CERTAIN RCRA REQUIREMENTS TO COMMON EXCAVATION-TYPE ACTIVITIES
Date:	06/11/92
To:	Green
From:	Lowrance
Organization of Recipient:	Piper and Marbury
Description:	excavating and redepositing hazardous soils (active management) within an area of contamination (AOC) during trenching or other non-RCRA related construction is not generation, treatment, storage, or disposal of hazardous waste and triggers no RCRA requirements, including land disposal restrictions (LDR) and generator rules; such excavation does not "generate" waste and not subject to generator requirements (SEE ALSO: 63 FR 28556, 28617; 5/26/98)
Part(s) & Subpart(s):	260 Subpart B
Section(s):	260.1
Statutory Citation(s):	NA
Topic(s):	Construction and Demolition Wastes, Disposal, Generators, Hazardous Waste, Land Disposal Restrictions, Large Quantity Generators (LQG), Storage, Treatment
Approximate Number of Hardcopy Pages:	2
Fax-On-Demand Code:	11671
EPA Document Number:	NA
RPC Number:	06/11/92 - 1
RPPC Number (if applicable):	9441.1992(16)
NTIS Number (if applicable):	NA
OSWER Directive Number (if applicable):	NA
Ordering & Availability:	Contact the RCRA, Superfund & EPCRA Hotline at (800) 424-9346

Faxback 11671

9441.1992(16)

United States Environmental Protection Agency
Washington, D.C. 20460
Office of Solid Waste and Emergency Response

June 11, 1992

Mr. Douglas H. Green
Piper & Marbury
1200 Nineteenth Street, N.W.
Washington, D.C. 20036-2430

Dear Mr. Green:

Thank you for your letter of April 30, 1992, requesting clarification of the Environmental Protection Agency's (EPA's) interpretation of the applicability of certain Resource conservation and Recovery Act (RCRA) requirements to common excavation-type activities.

The particular situation which you presented in your letter involves excavation of soils, such as trenching operations for pipeline installation, where the soils may be hazardous by characteristic, or may contain listed hazardous wastes. We understand that your questions specifically relate to excavations being conducted on public roadways or at other similar locations that are not necessarily associated with or are part of a RCRA regulated treatment, storage, or disposal facility.

In the example which you cited in your letter, the soils from the excavation or construction activities are temporarily moved within the area of contamination, and subsequently redeposited into the same excavated area. In these situations, we agree that such activity does not constitute treatment, storage, or disposal of a hazardous waste under RCRA. The activity of placing waste in the ground would not normally meet the regulatory definitions of "treatment" or "storage" (40 CFR 260.10). In addition, as you noted in your letter, movement of wastes within an area of contamination does not constitute "land disposal" and thus does not trigger RCRA hazardous waste disposal requirements (55 FR 8666, March 8, 1990). Thus, RCRA requirements such as land disposal restrictions would not apply.

With respect to generator requirements, as you indicated, a hazardous waste "generator" is one, by site, who produces a hazardous waste or first causes the waste to be regulated as hazardous (40 CFR 260.10). In the circumstances you described, the excavation does not "produce" the hazardous waste, nor does it subject the waste to hazardous waste regulation since, as discussed above, the activity you described is not "treatment," storage, or "land disposal" of hazardous waste. Therefore, we agree that the activity is not subject to any generator requirements.

Please let me know if you have any further questions regarding this issue.

Sincerely yours,
Sylvia K. Lowrance, Director
Office of Solid Waste

KERR-McGEE CHEMICAL LLC
POST OFFICE BOX 55 - HENDERSON, NEVADA 89009

April 12, 2001

Ms. Jennifer Carr
Nevada Division of Environmental Protection
123 West Nye Lane
Carson City, NV 89710

Dear. Ms. Carr:

Subject: Report on Debris Removal – Warm Springs and Boulder Highway

In October 2000, NDEP provided approval for Kerr-McGee Chemical LLC (Kerr-McGee) to move forward with soil sampling in an area close to the intersection of Warm Springs Road and Boulder Highway. This area had been used to hold material as it was removed from the historic BMI complex storm drain piping.

As per the October 11, 2000 Work Plan, the debris, along with material scrapped from the debris pile footprint, was removed from the intersection area and placed into the interim storage area within the confines of the BMI Common Area Upper Ponds. This interim storage is currently being utilized to hold remediated material from the Interim Remedial Measures work conducted by BRC. A dust suppressant, Chemloc 411, was applied to the debris piles as they were placed in the interim storage area. As the material was collected, a composite sample from the top, middle and lower portions of each pile was taken. These were analyzed per the Work Plan. Once each footprint area was scrapped, a discrete surface soil sample was taken to confirm the debris had been completely removed. In addition, two samples were collected from the surface to 3-inch depth in the runoff area where water carrying sediments out of the storm water piping drained surficially.

All samples were analyzed (per Work Plan commitments) for organochlorine pesticides (DDT and DDE analytical method) as well as the TCLP metals chromium and barium. Analytical information (as well as the approved Work Plan) is provided in Attachment 1.

After reviewing the analytical information and the supporting Risk Assessment (Attachment 2) provided by NewFields, Kerr-McGee requests a determination from NDEP that the No Further Action status of the parcel, received earlier, remain intact.

Please feel free to call me at (702) 651-2234 if you have any questions or need additional information. Thank you.

Sincerely,

Susan Crowley

Susan Crowley, CEM EM-1428
Staff Environmental Specialist

Attachments
By certified mail
cc: Shane Martin, CCHD
Robin Bain, BRC

ATTACHMENT 1

-

Analytical Data

KERR-McGEE CHEMICAL LLC
POST OFFICE BOX 55 · HENDERSON, NEVADA 89009

October 11, 2000

Ms. Jennifer Carr
Nevada Division of Environmental Protection
123 West Nye Lane
Carson City, NV

Dear. Ms. Carr:

Subject: Work Plan for Debris Removal – Warm Springs and Boulder Hwy

Please find attached a Work Plan covering activities related to removal of debris from the northwest corner of Warm Springs Rd and Boulder Hwy. It is Kerr-McGee's intent to proceed as quickly as possible and request NDEP concurrence on the stated activities. This can be provided in the form of a signature below. Please feel free to call me at (702) 651-2234 if you have any questions. Thank you.

Jennifer A. Carr 10/11/00
NDEP Approval

Sincerely,

SM Crowley

Susan M. Crowley
Staff Environmental Specialist

cc: Robin Bain, BMI
PSCorbett
MJPorterfield
EMSpore
FRStater

WORK PLAN
REMOVAL OF DEBRIS
FROM THE CORNER OF WARM SPRINGS RD
& BOULDER HWY

History

Kerr-McGee Chemical LLC is moving forward (with NDEP's approval) on construction plans for a perchlorate remediation process to be located on-site at the Henderson NV manufacturing facility. Remediation is intended to include water from the general location of the wash and so pipeline transport of this water, to and from the wash area, is being arranged. The pipelines will run from the wash area south along Pabco Rd and cross under Boulder Hwy, near the intersection of Boulder Hwy with Warm Springs Rd.

To accomplish the transfer under Boulder Hwy, Kerr-McGee intends to use the "BMI Siphon", which has for several decades, until recently, conveyed stormwater from the BMI facilities area under Boulder Hwy for ultimate transport to the Las Vegas Wash. With the recent construction of Warm Springs Rd this "BMI siphon" line under Boulder Hwy is no longer needed. Storm water has been redirected to prevent flooding of Warm Springs Rd. Thus the "BMI siphon" is available, if appropriately prepared, to function as a transfer line under Boulder Hwy of the perchlorate remediated water, being returned to the wash area.

To evaluate the suitability of the line for Kerr-McGee's use, Kerr-McGee contracted with Abe Sewer and Plumbing to camera view the line. Seeing the line was intact, with just minor repairs needed, Kerr-McGee then requested the contractor remove the sediment from the line, so that any necessary repairs could be made and the line prepared for its new use. The sediment (approximately 15 cubic yards) was placed in small piles beside the mid-point manhole (on the northwest corner of Warm Springs and Boulder Hwy), as well as at the line's termination point (east of Boulder Hwy). Several of the small piles in the vicinity of the mid-point manhole were spread to allow continued access to the area as the job progressed. The line is now clean and ready for consideration of use in the perchlorate remediation pipeline construction process.

Characterization

The material pulled from the mid-point manhole was sampled and analyzed for:
- Volatile Organics – EPA 8260B
- Semi-Volatiles – EPA 8270
- Perchlorate – EPA 314
- Organochlorine Pesticides – EPA 8081A, Dec 1996
- TCLP 8 Metals – EPA 6010 & EPA 7470A (Mercury)
- TPH – EPA 8015M

Analytical results show very low levels of only two organic compounds (DDT @ 200 ppb and DDE @ 100 ppb) and very low levels of metals (chromium @ 0.024 ppm and barium @ 1.7 ppm). All other analytes were returned as non-detected.

Work Proposed

Kerr-McGee proposes to remove the debris collected from the line at the mid-point manhole and transport this to the interim storage area within the confines of the BMI Common Area Upper Ponds. This interim storage area is currently being utilized to hold remediated material (from the Interim Remedial Measures (IRM) recently conducted under approved NDEP work plans at the BMI Common Areas Mohawk Area and Lower Ponds) until their final disposition is determined. Chemloc 411, a spray rubberized polymer, will be applied to the debris in the storage area to prevent wind, rain, and dust transport (as was also applied for the IRM material). In order to understand the matrix, as the debris is collected and removed, Kerr-McGee proposes to collect three samples representative of the material being transported. These representative samples will be composites made up of equal portions from the top, middle and bottom thirds of a pile. In addition to the piles, approximately 3 inches of substrate soil under each pile will be removed to ensure each entire pile has been collected.

Once the piles are collected and the immediate substrate soil has been removed from an area, a discrete sample of the soil in each pile's footprint will be collected.

In addition, two samples will be collected from the surface to 3 inch depth in the runoff area where the water carrying the sediments out of the siphon drained surficially. The first sample will be collected 20 foot from the pile area in the direction of runoff and the second will be 50 foot from the pile area in the direction of runoff.

All samples will be analyzed for Organochlorine Pesticides (DDT and DDE analytical method) as well as TCLP metals - chromium and barium, utilizing the same methods mentioned above.

Results will be evaluated to determine whether material transfer was complete and will be reported to NDEP. At that time the property owner, Basic Environmental Company, will request written confirmation from NDEP that this property requires no further remedial action as a result of this debris removal and that the current NFA status remains unchanged.

MONTGOMERY WATSON LABORATORIES
a Division of Montgomery Watson Americas, Inc.
555 East Walnut Street
Pasadena, California 91101
Tel: 626 568 6400 Fax: 626 568 6324
1 800 566 LABS (1 800 566 5227)

Laboratory Report

for

Kerr McGee Henderson Plant
P.O. Box 55

Henderson , NV 89009

Attention: Susan Crowley
Fax: (702) 651-2310

DATE OF ISSUE
DEC 11 2000
MONTGOMERY WATSON LABS

ADE Andy Eaton
Project Manager

Report#: 71620
CL04

Laboratory certifies that the test results meet all QA/QC requirements unless noted in the Comments section or the Case Narrative. Following the cover page are Comments, Data Report, Hits Report, totaling 4 page[s].

MONTGOMERY WATSON LABORATORIES
a Division of Montgomery Watson Americas, Inc.
555 East Walnut Street
Pasadena, California 91101
Tel: 626 568 6400 Fax: 626 568 6324
1 800 566 LABS (1 800 566 5227)

Report
Comments
#71620

Group Comments

Analysis conducted by APPL LABS - Fresno. See attached rpt.

MONTGOMERY WATSON LABORATORIES
a Division of Montgomery Watson Americas, Inc.
555 East Walnut Street
Pasadena, California 91101
Tel: 626 568 6400 Fax: 626 568 6324
1 800 566 LABS (1 800 566 5227)

Laboratory
Hits Report
#71620

Kerr McGee Henderson Plant
Susan Crowley
P.O. Box 55
Henderson , NV 89009

Samples Received
04-nov-2000 10:42:14

Analyzed	Sample#	Sample ID	Result	UNITS	MDL
	2011040014	**PILE 1**			
12/07/00		Subcontracted Analyses-soils	APPL	None	
	2011040015	**PILE 2**			
12/07/00		Subcontracted Analyses-soils	APPL	None	
	2011040016	**PILE 3**			
12/07/00		Subcontracted Analyses-soils	APPL	None	
	2011040017	**RUNOFF 20'**			
12/07/00		Subcontracted Analyses-soils	APPL	None	
	2011040018	**RUNOFF 50'**			
12/07/00		Subcontracted Analyses-soils	APPL	None	
	2011040019	**FOOT PRINT PILE**			
12/07/00		Subcontracted Analyses-soils	APPL	None	
	2011040020	**BACKGROUND SOIL**			
12/07/00		Subcontracted Analyses-soils	APPL	None	
	2011040021	**FOOT PRINT PILE 2**			
12/07/00		Subcontracted Analyses-soils	APPL	None	
	2011040022	**FOOT PRINT PILE 3**			

SUMMARY OF POSITIVE DATA ONLY.

MONTGOMERY WATSON LABORATORIES
a Division of Montgomery Watson Americas, Inc.
555 East Walnut Street
Pasadena, California 91101
Tel: 626 568 6400 Fax: 626 568 6324
1 800 566 LABS (1 800 566 5227)

Laboratory
Hits Report
#71620

Kerr McGee Henderson Plant
Susan Crowley
P.O. Box 55
Henderson , NV 89009

Samples Received
04-nov-2000 10:42:14

Analyzed	Sample#	Sample ID	Result	UNITS	MDL
	2011040022	**FOOT PRINT PILE 3**			
12/07/00	Subcontracted Analyses-soils		APPL	None	

SUMMARY OF POSITIVE DATA ONLY.

MONTGOMERY WATSON LABORATORIES
a Division of Montgomery Watson Americas, Inc.
555 East Walnut Street
Pasadena, California 91101
Tel: 626 568 6400 Fax: 626 568 6324
1 800 566 LABS (1 800 566 5227)

Laboratory Data Report #71620

Kerr McGee Henderson Plant
Susan Crowley
P.O. Box 55
Henderson , NV 89009

Samples Received
11/04/00

Prepared	Analyzed	QC Ref#	Method	Analyte	Result	Units	MRL	Dilution
PILE 1 (2011040014) Sampled on 10/13/00 09:30								
	12/07/00 12:00		(	) Subcontracted Analyses-soils	APPL	None	0.0000	1
PILE 2 (2011040015) Sampled on 10/13/00 09:40								
	12/07/00 12:00		(	) Subcontracted Analyses-soils	APPL	None	0.0000	1
PILE 3 (2011040016) Sampled on 10/13/00 09:50								
	12/07/00 12:00		(	) Subcontracted Analyses-soils	APPL	None	0.0000	1
RUNOFF 20' (2011040017) Sampled on 10/13/00 09:50								
	12/07/00 12:00		(	) Subcontracted Analyses-soils	APPL	None	0.0000	1
RUNOFF 50' (2011040018) Sampled on 10/13/00 09:55								
	12/07/00 12:00		(	) Subcontracted Analyses-soils	APPL	None	0.0000	1
FOOT PRINT PILE (2011040019) Sampled on 10/13/00 09:55								
	12/07/00 12:00		(	) Subcontracted Analyses-soils	APPL	None	0.0000	1
BACKGROUND SOIL (2011040020) Sampled on 11/01/00 01:30								
	12/07/00 12:00		(	) Subcontracted Analyses-soils	APPL	None	0.0000	1
FOOT PRINT PILE 2 (2011040021) Sampled on 11/01/00 01:30								
	12/07/00 12:00		(	) Subcontracted Analyses-soils	APPL	None	0.0000	1
FOOT PRINT PILE 3 (2011040022) Sampled on 11/01/00 01:30								
	12/07/00 12:00		(	) Subcontracted Analyses-soils	APPL	None	0.0000	1

Montgomery Watson Laboratories
555 East Walnut Street
Pasadena, CA 91101
Ph (626) 568-6400 Fax (626) 568-6324

Date 11/08/00 **Submittal Form** NEWMCGEE-NV

Ship To **Glen Brown**
APPL Labs, Inc

4203 West Swift
Fresno, CA 93722

(559) 275-2175 Fax (559) 275-4422

***REPORTING REQUIREMENTS: One report for this MWL Project Number:**
Do Not Combine Report with any other samples submitted under different MWL project numbers!
Report & Invoice must have the MWL Project Number and Sub PO#: 71620 99-3534
Report all quality control data according to Method. Include dates analyzed, date extracted (if extracted) and Method reference on the report. Fax results to 626-568-6324
Faxed results must have complete data & QC. Hardcopy report is due in hand on due date.
Please advise us immediately if Due Date will be missed.

HARDCOPY REPORT, FORMS, & INVOICE MUST BE SENT TO ATTENTION
Martha Frost, Sub-contracting Administrator
Montgomery Watson Laboratories 555 East Walnut Street Pasadena, CA 91101
Phone (626) 568-6437 Fax (626) 568-6324

For Specific Questions about samples: Andrew Eaton (626) 568-6425

DDT AND DDE LIST TO BE DETERMINED BY PM AFTER REVIEWING FAX ON 11/8 FROM GLEN

MWL Project #	Report Due:	Sub PO#
71620	11/23/00	99-3534

Qty	Test Code	Use MWL Lab # for ID	Client Sample ID for reference only	Analysis Requested		Sample Date & Time		Matrix		Container
1		2011040014	PILE 1	CR, BA BY TCLP,	DDT/DDE	11/01/00	0930	soil	2	4 OZ GLASS JARS
2		2011040015	PILE 2	CR, BA BY TCLP,	DDT/DDE	11/01/00	0940	soil	2	4 OZ GLASS JARS
3		2011040016	PILE 3	CR, BA BY TCLP,	DDT/DDE	11/01/00	0950	soil	2	4 OZ GLASS JARS
4		2011040017	RUNOFF 20'	CR, BA BY TCLP,	DDT/DDE	11/01/00	0950	soil	2	4 OZ GLASS JARS
5		2011040018	RUNOFF 50'	CR, BA BY TCLP,	DDT/DDE	11/01/00	0955	soil	2	4 OZ GLASS JARS
6		2011040019	FOOT PRINT PILE	CR, BA BY TCLP,	DDT/DDE	11/01/00	0955	soil	2	4 OZ GLASS JARS
7		2011040020	BACKGROUND SOIL	CR, BA BY TCLP,	DDT/DDE	11/01/00	1330	soil	2	4 OZ GLASS JARS
8		2011040021	FOOT PRINT PILE 2	CR, BA BY TCLP,	DDT/DDE	11/01/00	1330	soil	2	4 OZ GLASS JARS
9		2011040022	FOOT PRINT PILE 3	CR, BA BY TCLP,	DDT/DDE	11/01/00	1330	soil	2	4 OZ GLASS JARS

Relinquished by: Sample Control Date 11/08/00 Time 15:30 Page 1

Received by: Date 11/09/00 Time 945

An Acknowledgement of Receipt is requested to attn: Martha Frost

appl
AGRICULTURE & PRIORITY POLLUTANTS LABORATORIES, INC.

4203 West Swift ▼ Fresno, California 93722 ▼ Phone 559.275-2175 ▼ Fax 559.275-4422

December 7, 2000

Montgomery Laboratories
555 East Walnut Street
Pasadena, California 91101

Attn: Martha Frost

Subject: Report of Data: Case 33961

Results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Dear Ms. Frost:

Nine soil samples for Project "71620" were received November 9, 2000, in good condition. Written results are being provided on this December 7, 2000, for the requested analyses.

For the EPA 8081A analysis, the samples were extracted by EPA method 3550B. The extracts for the following samples were dark and oily: 2011040014, 2011040016, 2011040017, 201104019, 2011040020, 2011040021, and 2011040022. The reporting limit was raised from 50ug/kg to 170ug/kg for these samples, due to the dilutions required by the dirty sample matrix. The samples were screened for J-values between the levels 50ug/kg to 170ug/kg. The analyst observed target-analyte responses in the samples below 50ug/kg; however these responses were not reported since they were below the calibration for J-value range.

For the EPA 6010B analysis, the samples were extracted by EPA method 1311 and digested by EPA method 3010A.

No other unusual problems or complications were encountered with this sample set.

If you have any questions or require further information, please contact us at your convenience. Thank you for choosing APPL, Inc.

Sincerely,

Mike Ray

Mike Ray, Laboratory Director
APPL, Inc.

MR/rp
Enclosure
cc: File

Number of pages in this report 24

33961 Frost Pasadena.doc

EPA 8081A OCL Soil

Montgomery Laboratories
555 East Walnut Street
Pasadena, CA 91101

APPL Inc.
4203 West Swift Avenue
Fresno, CA 93722

Attn: Martha Frost
Project: 71620
Sample ID: 2011040014
Sample Collection Date: 11/1/00

ARF: 33961
APPL ID: AP99016
QCG: $8081S-001115A-30975

Method	Analyte	Result	PQL	Units	Extraction Date	Analysis Date
EPA 8081A	2,4-DDD	Not detected	170	ug/kg	11/15/00	12/1/00
EPA 8081A	2,4-DDE	67 J	170	ug/kg	11/15/00	12/1/00
EPA 8081A	2,4-DDT	Not detected	170	ug/kg	11/15/00	12/1/00
EPA 8081A	4,4'-DDE	57 J	170	ug/kg	11/15/00	12/1/00
EPA 8081A	4,4'-DDT	57 J	170	ug/kg	11/15/00	12/1/00
EPA 8081A	4,4'-TDE/DDD	Not detected	170	ug/kg	11/15/00	12/1/00
EPA 8081A	Surrogate: DECA	77.4	32-117	%	11/15/00	12/1/00
EPA 8081A	Surrogate: TCMX	84.2	39-151	%	11/15/00	12/1/00

J = Estimated value, below quantitation limit.

Run #: 153
Instrument: ECD02
Sequence: 001128
Dilution Factor: 100
Initials: MA

EPA 8081A OCL Soil

Montgomery Laboratories
555 East Walnut Street
Pasadena, CA 91101

APPL Inc.
4203 West Swift Avenue
Fresno, CA 93722

Attn: Martha Frost
Project: 71620
Sample ID: 2011040015
Sample Collection Date: 11/1/00

ARF: 33961
APPL ID: AP99017
QCG: $8081S-001115A-30975

Method	Analyte	Result	PQL	Units	Extraction Date	Analysis Date
EPA 8081A	2,4-DDD	Not detected	50	ug/kg	11/15/00	12/1/00
EPA 8081A	2,4-DDE	130	50	ug/kg	11/15/00	12/1/00
EPA 8081A	2,4-DDT	Not detected	50	ug/kg	11/15/00	12/1/00
EPA 8081A	4,4'-DDE	100	50	ug/kg	11/15/00	12/1/00
EPA 8081A	4,4'-DDT	90	50	ug/kg	11/15/00	12/1/00
EPA 8081A	4,4'-TDE/DDD	Not detected	50	ug/kg	11/15/00	12/1/00
EPA 8081A	Surrogate: DECA	74.6	32-117	%	11/15/00	12/1/00
EPA 8081A	Surrogate: TCMX	91.1	39-151	%	11/15/00	12/1/00

Run #: 154
Instrument: ECD02
Sequence: 001128
Dilution Factor: 20
Initials: MA

EPA 8081A OCL Soil

Montgomery Laboratories
555 East Walnut Street
Pasadena, CA 91101

APPL Inc.
4203 West Swift Avenue
Fresno, CA 93722

Attn: Martha Frost
Project: 71620
Sample ID: 2011040016
Sample Collection Date: 11/1/00

ARF: 33961
APPL ID: AP99018
QCG: $8081S-001115A-30975

Method	Analyte	Result	PQL	Units	Extraction Date	Analysis Date
EPA 8081A	2,4-DDD	Not detected	170	ug/kg	11/15/00	12/1/00
EPA 8081A	2,4-DDE	160 J	170	ug/kg	11/15/00	12/1/00
EPA 8081A	2,4-DDT	Not detected	170	ug/kg	11/15/00	12/1/00
EPA 8081A	4,4'-DDE	140 J	170	ug/kg	11/15/00	12/1/00
EPA 8081A	4,4'-DDT	100 J	170	ug/kg	11/15/00	12/1/00
EPA 8081A	4,4'-TDE/DDD	Not detected	170	ug/kg	11/15/00	12/1/00
EPA 8081A	Surrogate: DECA	79.1	32-117	%	11/15/00	12/1/00
EPA 8081A	Surrogate: TCMX	91.1	39-151	%	11/15/00	12/1/00

J = Estimated value, below quantitation limit.

Run #: 155
Instrument: ECD02
Sequence: 001128
Dilution Factor: 100
Initials: MA

EPA 8081A OCL Soil

Montgomery Laboratories
555 East Walnut Street
Pasadena, CA 91101

Attn: Martha Frost
Project: 71620
Sample ID: 2011040017
Sample Collection Date: 11/1/00

APPL Inc.
4203 West Swift Avenue
Fresno, CA 93722

ARF: 33961
APPL ID: AP99019
QCG: $8081S-001115A-30975

Method	Analyte	Result	PQL	Units	Extraction Date	Analysis Date
EPA 8081A	2,4-DDD	Not detected	50	ug/kg	11/15/00	12/7/00
EPA 8081A	2,4-DDE	110	50	ug/kg	11/15/00	12/7/00
EPA 8081A	2,4-DDT	Not detected	50	ug/kg	11/15/00	12/7/00
EPA 8081A	4,4'-DDE	96	50	ug/kg	11/15/00	12/7/00
EPA 8081A	4,4'-DDT	90	50	ug/kg	11/15/00	12/7/00
EPA 8081A	4,4'-TDE/DDD	Not detected	50	ug/kg	11/15/00	12/7/00
EPA 8081A	Surrogate: DECA	71.6	32-117	%	11/15/00	12/7/00
EPA 8081A	Surrogate: TCMX	103	39-151	%	11/15/00	12/7/00

Run #: 32
Instrument: ECD02
Sequence: 001206
Dilution Factor: 20
Initials: MA

EPA 8081A OCL Soil

Montgomery Laboratories
555 East Walnut Street
Pasadena, CA 91101

Attn: Martha Frost
Project: 71620
Sample ID: 2011040018
Sample Collection Date: 11/1/00

APPL Inc.
4203 West Swift Avenue
Fresno, CA 93722

ARF: 33961
APPL ID: AP99020
QCG: $8081S-001115A-30975

Method	Analyte	Result	PQL	Units	Extraction Date	Analysis Date
EPA 8081A	2,4-DDD	Not detected	50	ug/kg	11/15/00	12/1/00
EPA 8081A	2,4-DDE	Not detected	50	ug/kg	11/15/00	12/1/00
EPA 8081A	2,4-DDT	Not detected	50	ug/kg	11/15/00	12/1/00
EPA 8081A	4,4'-DDE	Not detected	50	ug/kg	11/15/00	12/1/00
EPA 8081A	4,4'-DDT	Not detected	50	ug/kg	11/15/00	12/1/00
EPA 8081A	4,4'-TDE/DDD	Not detected	50	ug/kg	11/15/00	12/1/00
EPA 8081A	Surrogate: DECA	72.1	32-117	%	11/15/00	12/1/00
EPA 8081A	Surrogate: TCMX	90.6	39-151	%	11/15/00	12/1/00

Run #: 157
Instrument: ECD02
Sequence: 001128
Dilution Factor: 20
Initials: MA

EPA 8081A OCL Soil

Montgomery Laboratories
555 East Walnut Street
Pasadena, CA 91101

Attn: Martha Frost
Project: 71620
Sample ID: 2011040019
Sample Collection Date: 11/1/00

APPL Inc.
4203 West Swift Avenue
Fresno, CA 93722

ARF: 33961
APPL ID: AP99021
QCG: $8081S-001115A-30975

Method	Analyte	Result	PQL	Units	Extraction Date	Analysis Date
EPA 8081A	2,4-DDD	Not detected	80	ug/kg	11/15/00	12/8/00
EPA 8081A	2,4-DDE	47 J	80	ug/kg	11/15/00	12/8/00
EPA 8081A	2,4-DDT	Not detected	80	ug/kg	11/15/00	12/8/00
EPA 8081A	4,4'-DDE	40 J	80	ug/kg	11/15/00	12/8/00
EPA 8081A	4,4'-DDT	36	80	ug/kg	11/15/00	12/8/00
EPA 8081A	4,4'-TDE/DDD	Not detected	80	ug/kg	11/15/00	12/8/00
EPA 8081A	Surrogate: DECA	69.9	32-117	%	11/15/00	12/8/00
EPA 8081A	Surrogate: TCMX	110	39-151	%	11/15/00	12/8/00

J = Estimated value, below quantitation limit.

Run #: 33
Instrument: ECD02
Sequence: 001206
Dilution Factor: 20
Initials: MA

EPA 8081A OCL Soil

Montgomery Laboratories
555 East Walnut Street
Pasadena, CA 91101

Attn: Martha Frost
Project: 71620
Sample ID: 2011040020
Sample Collection Date: 11/1/00

APPL Inc.
4203 West Swift Avenue
Fresno, CA 93722

ARF: 33961
APPL ID: AP99022
QCG: $8081S-001115A-30975

Method	Analyte	Result	PQL	Units	Extraction Date	Analysis Date
EPA 8081A	2,4-DDD	Not detected	50	ug/kg	11/15/00	12/8/00
EPA 8081A	2,4-DDE	30 J	50	ug/kg	11/15/00	12/8/00
EPA 8081A	2,4-DDT	Not detected	50	ug/kg	11/15/00	12/8/00
EPA 8081A	4,4'-DDE	38 J	50	ug/kg	11/15/00	12/8/00
EPA 8081A	4,4'-DDT	Not detected	50	ug/kg	11/15/00	12/8/00
EPA 8081A	4,4'-TDE/DDD	Not detected	50	ug/kg	11/15/00	12/8/00
EPA 8081A	Surrogate: DECA	78.6	32-117	%	11/15/00	12/8/00
EPA 8081A	Surrogate: TCMX	107	39-151	%	11/15/00	12/8/00

J = Estimated value, below quantitation limit.

Run #: 34
Instrument: ECD02
Sequence: 001206
Dilution Factor: 20
Initials: MA

EPA 8081A OCL Soil

Montgomery Laboratories
555 East Walnut Street
Pasadena, CA 91101

APPL Inc.
4203 West Swift Avenue
Fresno, CA 93722

Attn: Martha Frost

Project: 71620

Sample ID: 2011040021

Sample Collection Date: 11/1/00

ARF: 33961

APPL ID: AP99023

QCG: $8081S-001115A-30975

Method	Analyte	Result	PQL	Units	Extraction Date	Analysis Date
EPA 8081A	2,4-DDD	Not detected	50	ug/kg	11/15/00	12/8/00
EPA 8081A	2,4-DDE	36 J	50	ug/kg	11/15/00	12/8/00
EPA 8081A	2,4-DDT	Not detected	50	ug/kg	11/15/00	12/8/00
EPA 8081A	4,4'-DDE	48 J	50	ug/kg	11/15/00	12/8/00
EPA 8081A	4,4'-DDT	Not detected	50	ug/kg	11/15/00	12/8/00
EPA 8081A	4,4'-TDE/DDD	Not detected	50	ug/kg	11/15/00	12/8/00
EPA 8081A	Surrogate: DECA	79.7	32-117	%	11/15/00	12/8/00
EPA 8081A	Surrogate: TCMX	120	39-151	%	11/15/00	12/8/00

J = Estimated value, below quantitation limit.

Run #: 35
Instrument: ECD02
Sequence: 001206
Dilution Factor: 20
Initials: MA

EPA 8081A OCL Soil

Montgomery Laboratories
555 East Walnut Street
Pasadena, CA 91101

APPL Inc.
4203 West Swift Avenue
Fresno, CA 93722

Attn: Martha Frost
Project: 71620
Sample ID: 2011040022
Sample Collection Date: 11/1/00

ARF: 33961
APPL ID: AP99024
QCG: $8081S-001115A-30975

Method	Analyte	Result	PQL	Units	Extraction Date	Analysis Date
EPA 8081A	2,4-DDD	Not detected	50	ug/kg	11/15/00	12/8/00
EPA 8081A	2,4-DDE	34 J	50	ug/kg	11/15/00	12/8/00
EPA 8081A	2,4-DDT	Not detected	50	ug/kg	11/15/00	12/8/00
EPA 8081A	4,4'-DDE	47 J	50	ug/kg	11/15/00	12/8/00
EPA 8081A	4,4'-DDT	Not detected	50	ug/kg	11/15/00	12/8/00
EPA 8081A	4,4'-TDE/DDD	Not detected	50	ug/kg	11/15/00	12/8/00
EPA 8081A	Surrogate: DECA	84.1	32-117	%	11/15/00	12/8/00
EPA 8081A	Surrogate: TCMX	85.6	39-151	%	11/15/00	12/8/00

J = Estimated value, below quantitation limit.

Run #: 36
Instrument: ECD02
Sequence: 001206
Dilution Factor: 20
Initials: MA

Metals Analysis

Montgomery Laboratories
555 East Walnut Street
Pasadena, CA 91101

APPL Inc.
4203 West Swift Avenue
Fresno, CA 93722

Attn: Martha Frost
Project: 71620
Sample ID: 2011040014
Sample Collection Date: 11/1/00

ARF: 33961
APPL ID: AP99016

Method	Analyte	Result	PQL	Units	Prep Date	Analysis Date
6010B/TCLP	Barium (Ba)	369	0.007	mg/L	11/15/00	11/21/00
6010B/TCLP	Chromium (Cr)	7.5	0.005	mg/L	11/15/00	11/21/00

Printed: 11/21/00 11:03:07 AM

Metals Analysis

Montgomery Laboratories
555 East Walnut Street
Pasadena, CA 91101

Attn: Martha Frost
Project: 71620
Sample ID: 2011040015
Sample Collection Date: 11/1/00

APPL Inc.
4203 West Swift Avenue
Fresno, CA 93722

ARF: 33961
APPL ID: AP99017

Method	Analyte	Result	PQL	Units	Prep Date	Analysis Date
6010B/TCLP	Barium (Ba)	677	0.007	mg/L	11/15/00	11/21/00
6010B/TCLP	Chromium (Cr)	7.2	0.005	mg/L	11/15/00	11/21/00

Printed: 11/21/00 11:03:08 AM

Metals Analysis

Montgomery Laboratories
555 East Walnut Street
Pasadena, CA 91101

Attn: Martha Frost
Project: 71620
Sample ID: 2011040016
Sample Collection Date: 11/1/00

APPL Inc.
4203 West Swift Avenue
Fresno, CA 93722

ARF: 33961
APPL ID: AP99018

Method	Analyte	Result	PQL	Units	Prep Date	Analysis Date
6010B/TCLP	Barium (Ba)	433	0.007	mg/L	11/15/00	11/21/00
6010B/TCLP	Chromium (Cr)	9.9	0.005	mg/L	11/15/00	11/21/00

Printed: 11/21/00 11:03:08 AM

Metals Analysis

Montgomery Laboratories
555 East Walnut Street
Pasadena, CA 91101

APPL Inc.
4203 West Swift Avenue
Fresno, CA 93722

Attn: Martha Frost
Project: 71620
Sample ID: 2011040017
Sample Collection Date: 11/1/00

ARF: 33961
APPL ID: AP99019

Method	Analyte	Result	PQL	Units	Prep Date	Analysis Date
6010B/TCLP	Barium (Ba)	801	0.007	mg/L	11/15/00	11/21/00
6010B/TCLP	Chromium (Cr)	6.7	0.005	mg/L	11/15/00	11/21/00

Printed: 11/21/00 11:03:08 AM

Metals Analysis

Montgomery Laboratories
555 East Walnut Street
Pasadena, CA 91101

Attn: Martha Frost

Project: 71620

Sample ID: 2011040018

Sample Collection Date: 11/1/00

APPL Inc.
4203 West Swift Avenue
Fresno, CA 93722

ARF: 33961

APPL ID: AP99020

Method	Analyte	Result	PQL	Units	Prep Date	Analysis Date
6010B/TCLP	Barium (Ba)	647	0.007	mg/L	11/15/00	11/21/00
6010B/TCLP	Chromium (Cr)	Not detected	0.005	mg/L	11/15/00	11/21/00

Printed: 11/21/00 11:03:09 AM

Metals Analysis

Montgomery Laboratories
555 East Walnut Street
Pasadena, CA 91101

Attn: Martha Frost
Project: 71620
Sample ID: 2011040019
Sample Collection Date: 11/1/00

APPL Inc.
4203 West Swift Avenue
Fresno, CA 93722

ARF: 33961
APPL ID: AP99021

Method	Analyte	Result	PQL	Units	Prep Date	Analysis Date
6010B/TCLP	Barium (Ba)	381	0.007	mg/L	11/15/00	11/21/00
6010B/TCLP	Chromium (Cr)	5.9	0.005	mg/L	11/15/00	11/21/00

Printed: 11/21/00 11:16:35 AM

Metals Analysis

Montgomery Laboratories
555 East Walnut Street
Pasadena, CA 91101

Attn: Martha Frost
Project: 71620
Sample ID: 2011040020
Sample Collection Date: 11/1/00

APPL Inc.
4203 West Swift Avenue
Fresno, CA 93722

ARF: 33961
APPL ID: AP99022

Method	Analyte	Result	PQL	Units	Prep Date	Analysis Date
6010B/TCLP	Barium (Ba)	721	0.007	mg/L	11/15/00	11/21/00
6010B/TCLP	Chromium (Cr)	Not detected	0.005	mg/L	11/15/00	11/21/00

Printed: 11/21/00 11:16:36 AM

Metals Analysis

Montgomery Laboratories
555 East Walnut Street
Pasadena, CA 91101

APPL Inc.
4203 West Swift Avenue
Fresno, CA 93722

Attn: Martha Frost

Project: 71620

ARF: 33961

Sample ID: 2011040021

APPL ID: AP99023

Sample Collection Date: 11/1/00

Method	Analyte	Result	PQL	Units	Prep Date	Analysis Date
6010B/TCLP	Barium (Ba)	740	0.007	mg/L	11/15/00	11/21/00
6010B/TCLP	Chromium (Cr)	Not detected	0.005	mg/L	11/15/00	11/21/00

Printed: 11/21/00 11:16:36 AM

Metals Analysis

Montgomery Laboratories
555 East Walnut Street
Pasadena, CA 91101

APPL Inc.
4203 West Swift Avenue
Fresno, CA 93722

Attn: Martha Frost

Project: 71620

Sample ID: 2011040022

Sample Collection Date: 11/1/00

ARF: 33961

APPL ID: AP99024

Method	Analyte	Result	PQL	Units	Prep Date	Analysis Date
6010B/TCLP	Barium (Ba)	757	0.007	mg/L	11/15/00	11/21/00
6010B/TCLP	Chromium (Cr)	5.5	0.005	mg/L	11/15/00	11/21/00

Printed: 11/21/00 11:16:37 AM

Method Blank

EPA 8081A OCL Soil

APPL Inc.
4203 West Swift Avenue
Fresno, CA 93722

Blank Name/QCG: **001115S - 30975**
Batch ID: $8081S-001115A

Sample Type	Analyte	Result	PQL	Units	Extraction Date	Analysis Date
BLANK	2,4-DDD	Not detected	50	ug/kg	11/15/00	11/16/00
BLANK	2,4-DDE	Not detected	50	ug/kg	11/15/00	11/16/00
BLANK	2,4-DDT	Not detected	50	ug/kg	11/15/00	11/16/00
BLANK	4,4'-DDE	Not detected	50	ug/kg	11/15/00	11/16/00
BLANK	4,4'-DDT	Not detected	50	ug/kg	11/15/00	11/16/00
BLANK	4,4'-TDE/DDD	Not detected	50	ug/kg	11/15/00	11/16/00
BLANK	Surrogate: DECA	56.0	32-117	%	11/15/00	11/16/00
BLANK	Surrogate: TCMX	87.3	39-151	%	11/15/00	11/16/00

Run #: 61
Instrument: ECD02
Sequence: 001115
Initials: MA

Laboratory Control Spike Recovery
EPA 8081A OCL Soil

APPL ID: **001115S-99023 LCS - 30975**
Batch ID: $8081S-001115A

APPL Inc.
4203 West Swift Avenue
Fresno, CA 93722

Compound Name	Spike Level ug/kg	SPK Result ug/kg	SPK % Recovery	Recovery Limits
4,4'-DDE	167	126	75.4	58-127
4,4'-DDT	167	99.5	59.6	27-142
4,4'-TDE/DDD	167	119	71.3	51-129
Surrogate: DECA	167	105	62.9	32-117
Surrogate: TCMX	167	151	90.4	39-151

Comments:

Primary	SPK
Extraction Date :	11/15/00
Analysis Date :	11/16/00
Instrument :	ECD02
Run :	1115069
Analyst :	MA

Matrix Spike Recoveries

EPA 8081A OCL Soil

APPL ID: **001115S-99023 MS - 30975**
Batch ID: $8081S-001115A

APPL Inc.
4203 West Swift Avenue
Fresno, CA 93722

Compound Name	Spike Lvl ug/kg	Matrix Result ug/kg	SPK Result ug/kg	DUP Result ug/kg	SPK % Recovery	DUP % Recovery	Recovery Limits	RPD %	RPD Limits
4'-DDE	167	ND	173	163	104	97.6	72-130	6.0	30
4'-DDT	167	ND	118	112	70.7	67.1	34-145	5.2	30
4'-TDE/DDD	167	ND	130	120	77.8	71.9	61-137	8.0	30
urrogate: DECA	167	NA	126	119	75.4	71.3	55-132		
urrogate: TCMX	167	NA	174	154	104	92.2	66-122		

Comments:

Primary	SPK	DUP
Extraction Date :	11/15/00	11/15/00
Analysis Date :	11/16/00	11/16/00
Instrument :	ECD02	ECD02
Run :	1115070	1115074
Analyst :	MA	

METALS BLANK

APPL Inc.
4203 West Swift Avenue
Fresno, CA 93722

Method	Analyte	Result	PQL	Units	Prep Date	Analysis Date	QC Group
6010B/TCLP	Barium (Ba)	Not detected	0.007	mg/L	11/15/00	11/21/00	001115A
6010B/TCLP	Chromium (Cr)	Not detected	0.005	mg/L	11/15/00	11/21/00	001115A

Printed: 11/21/00 11:03:03 AM

Laboratory Control Spike Recoveries

METALS

'PL Inc.
03 West Swift Avenue
esno, CA 93722

Method	Compound Name	Spike Lvl mg/L	SPK Res mg/L	DUP Res mg/L	SPK % Recovery	DUP % Recovery	Recovery Limits	Extract Date-Spk	Analysis Date-Spk	Extract Date-Dup	Analysis Date-Dup	QC Group
A 6010B	Barium (Ba)	250	244	242	97.6	96.8	80-120	11/15/00	11/21/00	11/15/00	11/21/00	001115A-30566
A 6010B	Chromium (Cr)	250	248	248	99.2	99.2	80-120	11/15/00	11/21/00	11/15/00	11/21/00	001115A-30566

Comments:

Printed: 11/21/00 11:03:00 AM

Montgomery Watson Laboratories
555 E. Walnut St., Pasadena, CA 91101
PHONE: 626-568-6400/FAX: 626-568-6324

ACKNOWLEDGMENT OF SAMPLES RECEIVED

Kerr McGee Henderson Plant
P.O. Box 55
Henderson, NV 89009
Attn: Susan Crowley
Phone: (702) 651-2234

Customer Code: KERRMCGEE-NV
PO#: SMC-06109901
Group#: 71620
Project#: CLO4
Proj Mgr: Andrew Eaton

The following samples were received from you on **11/04/00**. They have been scheduled for the tests listed beside each sample. If this information is incorrect, please contact your service representative. Thank you for using Montgomery Watson Laboratories.

Sample#	Sample Id	Tests Scheduled	Matrix	Sample Date
2011040014	PILE 1	CUSTSUB	Soil	13-oct-2000 09:30:0
2011040015	PILE 2	CUSTSUB	Soil	13-oct-2000 09:40:0
2011040016	PILE 3	CUSTSUB	Soil	13-oct-2000 09:50:0
2011040017	RUNOFF 20'	CUSTSUB	Soil	13-oct-2000 09:50:0
2011040018	RUNOFF 50'	CUSTSUB	Soil	13-oct-2000 09:55:0
2011040019	FOOT PRINT PILE	CUSTSUB	Soil	13-oct-2000 09:55:0
2011040020	BACKGROUND SOIL	CUSTSUB	Soil	01-nov-2000 13:30:0
2011040021	FOOT PRINT PILE 2	CUSTSUB	Soil	01-nov-2000 13:30:00
2011040022	FOOT PRINT PILE 3	CUSTSUB	Soil	01-nov-2000 13:30:00

Test Acronym Description

Test Acronym	Description
CUSTSUB	Subcontracted Analyses-soils

71620

MONTGOMERY WATSON LABORATORIES **CHAIN OF CUSTODY RECORD**

555 E. Walnut St., Pasadena, CA 91101
(626) 568-6400 (800) 566-5227

MWLABS USE ONLY:

LOGIN COMMENTS: NCO

SAMPLES CHECKED/LOGGED IN BY: 1CC

SAMPLE TEMP. RECEIPT AT LAB: 5°C

BLUE ICE: FROZEN ✓ PARTIALLY FROZEN 1t4 THAWED ___

TO BE COMPLETED BY SAMPLER:

PROJECT NAME:

PROJECT JOB # / P.O.#:

REFER TO ATTACHED BOTTLE ORDER FOR ANALYSES ☒ (check for yes)

ANALYSES REQUIRED (mark an 'X' in all tests required for each sample line): SEE BOTTLE

SAMPLER(S): PRINTED NAME AND SIGNATURE: Susan Crowley

TIME	DATE	LOCATION	IDENTIFIER	GRAB	COMP	SAMPLER COMMENTS
	10-13-00		SEE BOTTLES			
9:30	10-13		PILE 1			
9:40			PILE 2			
9:50			PILE 3			
9:50			RUNOFF - 20'			
9:55			RUNOFF - 50'			
9:55			FOOT PRINT - PILE			
13:30	11-1		Background SOIL			
13:30	11-1		FOOTPRINT - PILE 2			
13:30	11-1		FOOTPRINT - PILE 3			

RUN PAST HOLDING TIME

	SIGNATURE	PRINT NAME	COMPANY/TITLE	DATE	TIME
RELINQUISHED BY:	Mark J. Porterfield	Mark J. Porterfield	Kerr-McGee / Sr. Env. Spec.	11/3/00	0851
RECEIVED BY:	[illegible]	Mike Calvert	MWL	11/4/00	10:30
RELINQUISHED BY:					
RECEIVED BY:					
RELINQUISHED BY:					
RECEIVED BY:					

COC

ATTACHMENT 2

-

New Fields
Risk Assessment

KERR-MCGEE CHEMICAL LLC
8000 W. LAKE MEAD DR.
P. O. BOX 55
HENDERSON, NV 89015 89009-7000(POB)

FACSIMILE TRANSMITTAL SHEET

TO:	FROM:
Mrs. Brenda Pohlman	Everette M. Spore
COMPANY: NEVADA DEPT OF ENV PROTECTION	DATE: March 28, 2001
FAX NUMBER: 702-486-2863	TOTAL NO. OF PAGES INCLUDING COVER: 3
PHONE NUMBER:	SENDER'S REFERENCE NUMBER:
RE:	YOUR REFERENCE NUMBER:

X URGENT X FOR REVIEW ☐ PLEASE COMMENT ☐ PLEASE REPLY ☐ PLEASE RECYCLE

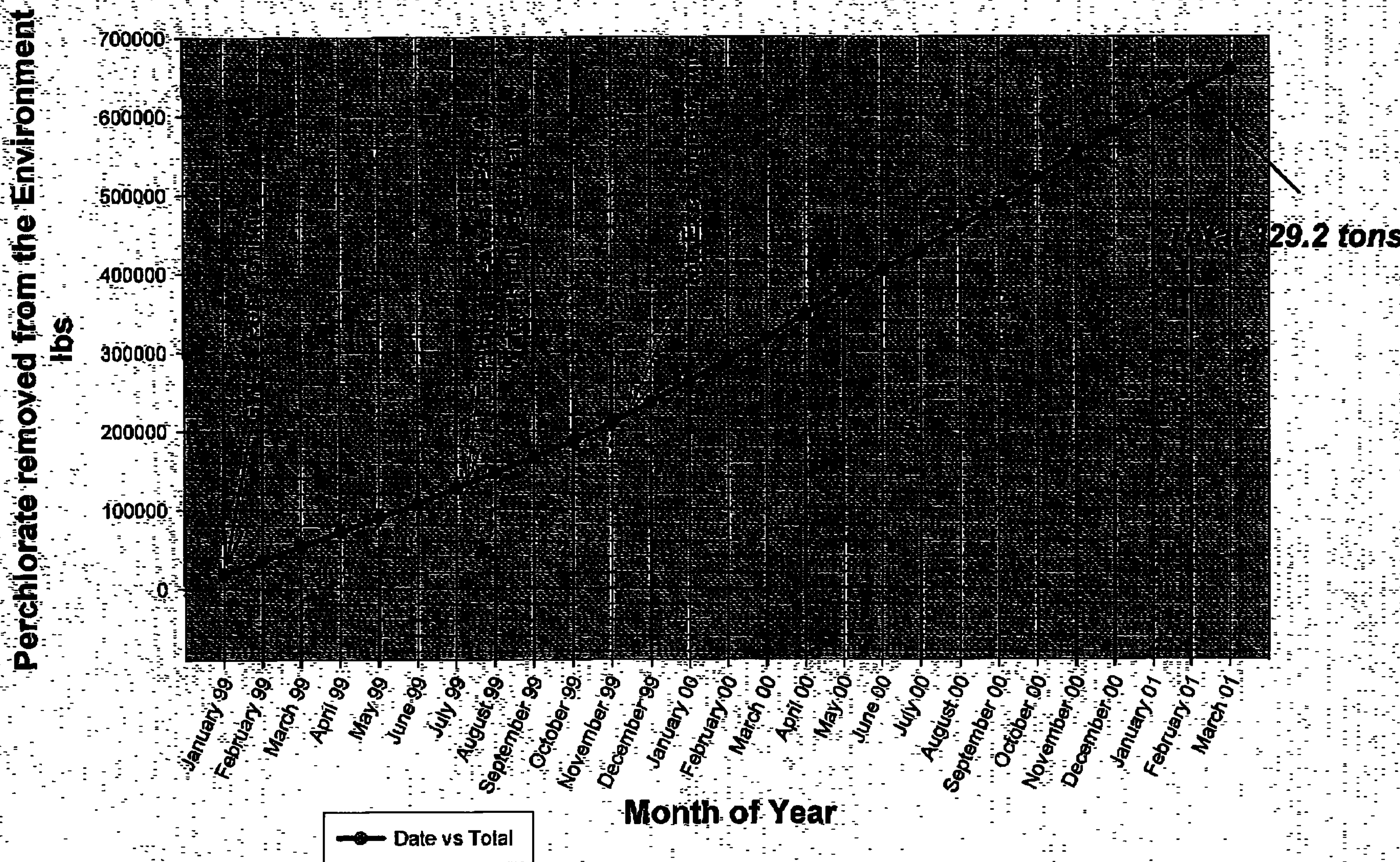
NOTES/COMMENTS:

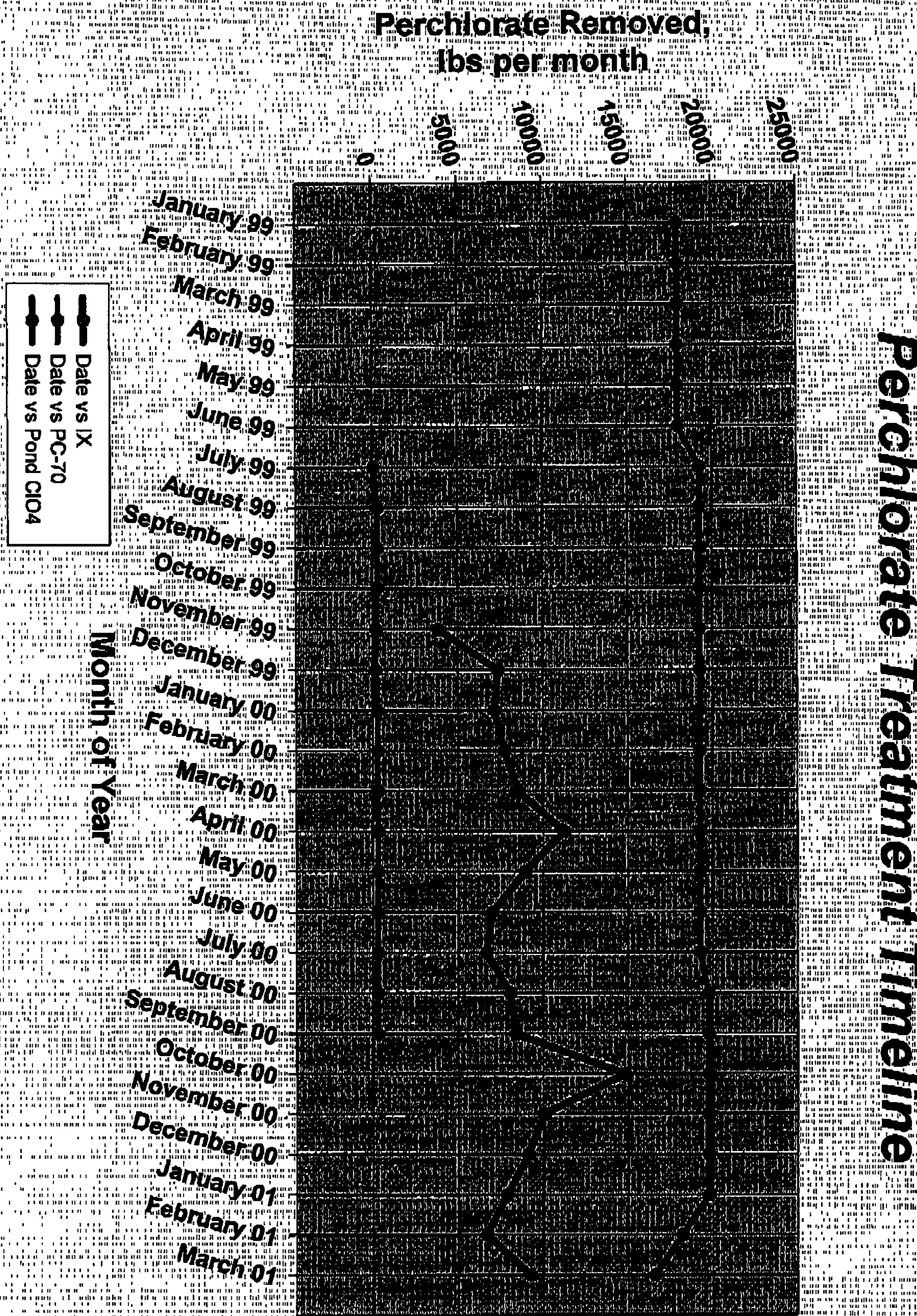
Brenda,

Per your phone message and our conversation of today, I am enclosing the plot of rate of perchlorate removal per month and per method. Also enclosed is the summation plot of removal by time. The actual numbers are through the 26th of March and are as follows:
GW-11 Pond – 255.9 tons
Temp IX – 71.4 tons
Pittman Lateral well (PC-70) – 1.9 tons
Total – 329.2 tons of perchlorate removed

Everette M. Spore
Manager of Engineering
Kerr-McGee Chemical LLC
8000 W. Lake Mead Dr.
Henderson, NV 89015
702 651 2352
fax 702 651 2250
email espore@kmg.com

Perchlorate Treatment Results




Perchlorate Treatment Timeline
Perchlorate Removed, lbs per month
0
5000
10000
15000
20000
25000
January 99
February 99
March 99
April 99
May 99
June 99
July 99
August 99
September 99
October 99
November 99
December 99
January 00
February 00
March 00
April 00
May 00
June 00
July 00
August 00
September 00
October 00
November 00
December 00
January 01
February 01
March 01
Month of Year
Date vs IX
Date vs PC-70
Date vs Pond ClO4

3/26/01 KMCC/EPA/NDEP

Additional opportunities for perchlorate capture - short term

Is there an opportunity to capture, if so, how?

History - seep discovered in '99. Flow ave. 360 gpm on-line since 11/99. Existing NPDES permit only for surface water - qualifies for intake credits under Great Lakes Initiative-like process. 70 tons perchlorate removed.

200+ tons captured by chromium system.
~45 days/year flow exceeds capability of system.

Calgon's IX Catalytic system install is underway. Will treat 825 gpm 65 gpm - onsite (1500 ppm), 400 gpm - Athens Rd (200 ppm), existing well PC-70 plus additional wells, 360 gpm - seep area at 100ppm 1.2 million pounds per year net destruction. Need building permit from Clark County - hoping to have it by the end of this week.

825 gpm discharge permit has limits set - TDS is key limitation. Got mixing zone. Amount based on TMDL for TDS. Has discussed amendment of permit to incorporate groundwater in permit. Plant will be mechanically complete by Oct. Allowed 2 mo. period for startup.
If they run plant at full capacity, can't also run IX system at seep. 825 gpm at 350ppm

Issue w/ gw is trace concentrations of pesticides. Will have GAC prior to plant.

COH says it will take 5 months to get permits from them before they can bury piping. Not likely that they can treat water from PL before Oct.

Wells on-site collecting less H_2O since system started. Only at 25-30 gpm. Gearing up to install slurry wall across site. Hope to raise flow level. Will start mid-May.

Installing 43,000' of pipeline from LS1 up to plant. LS2 will be at PL. Haven't started burying pipe yet because still working on legal aspects of access agreements. Will take 6-8 weeks to install.

Between now and Oct. bring 35 million gal seep water up to pond to dilute to 12,000 ppm TDS. Can't bring any more water up, need extra capacity in pond for startup of system. Reserving 35 million gal. capacity for water that might not meet discharge specifications.

Kerr McGee / NDEP 3/20/01 telephone

Opportunities to capture ClO_4^- closer to wash.
EPA wants KMCC to show up at meeting w/ plans already made

Pat has concerns about drawbacks to some of the options.
Double IX capacity:
don't have rights of way, pipeline not right size
Doug would like to see option evaluations laid out.

Baseline
Keith laying out evaluation of current system. 825 gpm plant will use up TDS TMDL for LV Wash.
Long term plan for seep is what has already been committed to.

EPA observations/perceptions: feel that there are opportunities to capture additional wash. Want KMCC to intercept.
Are there some relatively simple possibilities for capture in the short term.

KMCC has submitted package to Leo for gw treatment.
Doubling IX system would require 6+ months.
Exceed 400+ for 45 days of the year. Also need to look at additional opportunities for capture - shallow trenches, shallow wells, in addition to seep. Currently don't have treatment capacity.

Pipeline will be built end of April. Doug wants to know if gw or seep water could be moved to pond.

Need 35 million gal in pond - 2 months of seep flow. Want to pump more but can't - need to leave half the pond capacity.

1x 1st lift Station
Athens Road 2nd lift station

Also looking at pumping gw at Pittman Lateral to pond. COH told KMCC that getting permits, leases and other legal issues - PC70 to lift station #2. COH says 5 months is optimistic.

At one point trucked 20,000 gal/week. Stopped when NPDES permit was issued. Could resume trucking - probably not major impact. Maybe could put a well in near seep but have problems again in pumps, pipelines, electrical lines. Surface pipelines would not last in that environment.

Looking at pumping out of PC99 - BMI property.
6 inch well, 100 gpm pipe to 1st lift station and up to pond 400-500' spool of line 4" line

Call Mike Girard

PETER G. MORROS
Director

STATE OF NEVADA
KENNY C. GUINN
Governor

ALLEN BIAGGI
Administrator

(702) 486-2850

FAX (702) 486-2863

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

DIVISION OF ENVIRONMENTAL PROTECTION

(Las Vegas Office)
555 E. Washington, Suite 4300
Las Vegas, Nevada 89101-1049

March 19, 2001

Mr. Steve Groat
1708 Window Rock Dr.
Henderson, NV 89014

Subject: Policy Regarding the Remediation of Impacted Soil and Groundwater Related to a Nearby Contamination Site

Dear Mr. Groat:

This letter has been provided in response to your inquiry regarding the Nevada Division of Environmental Protection's (NDEP) policy regarding contaminated groundwater related to third party impacts. The property in question is near the intersection of Gibson Road and American Pacific Drive.

To date, the NDEP has never taken action against a party where there is no evidence that said party contributed to the perchlorate contamination. Additionally, NDEP has identified Kerr McGee Chemical LLC and American Pacific Corporation as responsible parties in this case. As such, Kerr McGee Chemical LLC and American Pacific Corporation have voluntarily conducted groundwater investigations and remediation activities regarding the perchlorate contaminated aquifer in Henderson. NDEP has no plans to commence enforcement actions against any additional parties.

Should you have any questions or need additional information, please contact me at (702) 486-2857.

Sincerely,

Brenda Pohlmann

Brenda Pohlmann
Chief, LV Operations

BLP:blp

cc: Jeff Gibson, 3770 Howard Hughes Pkwy., Ste. 300, Las Vegas, NV 89109

PETER G. MORROS
Director

(702) 486-2850

STATE OF NEVADA
KENNY C. GUINN
Governor

ALLEN BIAGGI
Administrator

FAX (702) 486-2863

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

DIVISION OF ENVIRONMENTAL PROTECTION

(Las Vegas Office)
555 E. Washington, Suite 4300
Las Vegas, Nevada 89101-1049

March 19, 2001

Mr. Dave Brown, Plans Examiner II
Clark County Department of Building
500 S. Grand Central Parkway, 1st Floor
PO Box 553530
Las Vegas, NV 89155-3530

RE: Kerr McGee Chemical LLC Application Number 00-15161

Dear Mr. Brown:

At the request of the Nevada Division of Environmental Protection (NDEP), Kerr McGee is proceeding with engineering and construction plans related to a facility designed to reduce perchlorate in water. NDEP has regulatory oversight of this project and is functioning as the United States Environmental Protection Agency's (USEPA) delegated implementing agency. Drawing review and approval for the facility will be provided by NDEP.

If you have any questions concerning this matter, please feel free to contact me at (702) 486-2858.

Sincerely,

Brenda Pohlmann

Brenda Pohlmann
Chief, LV Operations

cc: Doug Zimmerman, NDEP/Carson City
Larry Bowerman, USEPA, 75 Hawthorne St., San Francisco, CA 94105-3901
Susan Crowley, Kerr McGee, PO Box 55, Henderson, NV 89009-7000

Originator: Kaplan.Mitch @ epamail.epa.gov
From: DZIMMERM @ NDEP-CC (Doug Zimmerman)
To: Brenda Pohlmann
Fwd By: DZIMMERM @ NDEP-CC (Doug Zimmerman)
Subject: fwd: Accelerated Remedial Measures for Perchlorate at Kerr McGee

===NOTE==============1/02/00==5:01pm====================================
CC: DZIMMERM @ NDEP-CC (Doug Zimmerman)

** Message may be incomplete in this note due to:
** Message text too large
** The complete message is attached.

======== Original Message ========
Doug and Brenda- This memo is a followup to the discussions that we've had on December 14th and the 15th as well as the meeting we had with Kerr McGee in Henderson on December 5, 2000. The discussions on the 14th centered on what could be done to speed up Kerr McGee's perchlorate cleanup efforts. KMCC's current timetable is to begin operation of an area-wide treatment system by the end of 2001. We also spoke about the possibility of NDEP issuing an order (Consent Agreement or Unilateral) to Kerr McGee, within the next couple of months, specifying exactly what measures we would like them to implement and a specific timetable for implementation of those measures. We are providing you with our current thoughts about what we can reasonably expect Kerr McGee to do regarding the accelerated remediation of perchlorate. We are aware that these ideas are subject to change pending review of Kerr McGee's hydrogeologic investigation report of conditions near Las Vegas Wash, which we expect to receive during the first week of January 2001.

EPA has some basic concerns with Kerr McGee's current approach to perchlorate remediation and the framework under which this remediation would occur.

1. The proposal presented by Kerr McGee is in effect a voluntary cleanup action. There is currently no enforcement mechanism in place which would clearly define what steps will be taken and a specific schedule that would be followed. NDEP did enter into a Consent Agreement with Kerr McGee which provided a structure for previous work that Kerr McGee has carried out. Our recollection is that the first Consent Agreement with Kerr McGee envisioned a second Agreement once additional information had been gathered. We appear to be at the point where a second Agreement would be appropriate.

2. Kerr McGee's current proposal contains no additional plans for remedial activities near Las Vegas Wash, despite the fact that concentrations of perchlorate in Lake Mead at the intake point for Las Vegas' drinking water, have exceeded the current EPA reference dose of 4-18 ppb.

3. The current proposal doesn't take full advantage of Kerr McGee's available assets or the opportunities that have opened up as the result of the ongoing investigation near Las Vegas Wash.

Following are some ideas for additional steps that we feel could be taken on a shorter term basis than that which Kerr McGee has proposed including some suggestions that Kerr McGee provided at the meeting we had with them on December 5, 2000.

Las Vegas Wash:

1. By the end of March 2001 add another ion exchange unit to the 2 units already operating at the Wash which are treating the water from the ground water seep. Addition of the third unit could increase the capacity of the treatment system to approximately 800 gpm. From our observations of ground water and surface water conditions near Las Vegas Wash and the seep, there appears to be sufficient water to fully utilize the expanded system.

2. By the end of March 2001 install ground water extraction wells and/or a series of trenches near Las Vegas Wash to capture the additional groundwater/surface water. A short pipeline along the surface could convey the water to the ion exchange system. 2 units could be operated while the third is down for resin replacement.

3. Operate the ion exchange units near the Wash during 2001 and 2002 or until the perchlorate concentrations in Las Vegas Wash show significant decreases as a result of pumping and treatment of ground water at the Pittman Lateral.

Pittman Lateral:

Begin extraction of ground water from wells along the lateral in April 2001 when the pipeline is scheduled for completion. This water would be pumped to the evaporation pond. An analysis of whether the pond has sufficient capacity to support this action for 8 months should be conducted. The addition of a slurry wall immediately downgradient of the pumping wells might increase the efficiency of the extraction system. The issue of pumping ground water containing organic compounds and other hazardous wastes, which may be limited due to language with Kerr McGee's NPDES permit, needs to be resolved by NDEP.

Treatment Plant:

The current design capacity (825 gpm) of the proposed treatment plant may not be adequate, considering the additional volume of water that could be captured at Las Vegas Wash (800 gpm total), the 400 gpm or more of water that could be pumped at the Pittman Lateral and the 40-60 gpm of water being pumped at the chrome treatment line. An increase in capacity to 1200-1500 gpm should be considered.

Pipeline:

We should find out the design capac...y of the pipeline and determine if ..s capicity can be increased to 1500 gpm, if needed. This could be a limiting factor in KMCC's ability to deal with the additional water from Las Vegas Wash, in which case other means of transporting water from the seep to the treatment plant would have to be found. Another option would be to continue to treat seep water in the ion exchange units at the wash until perchlorate concentrations drop to acceptable levels.

Chrome Treatment Line:

Kerr McGee has suggested construction of a slurry wall immediately downgradient of this line of pumping wells. This could increase the capture efficiency of the pumping system. As with the use of a slurry wall at the Pittman Lateral, there could be a problem of elevated ground water levels immediately upgradient of the walls. If slurry walls are constructed, the upgradient extraction systems must be designed to fully extract the ground water flow being intercepted by the slurry wall.

Cost-Benefit Analysis:

If Kerr McGee has not done so already, a cost-benefit analysis should be done to see if it is more cost-effective to operate an expanded ion exchange system at Las Vegas Wash for 1-3 years as opposed to operating an expanded overall ion exchange system which would not become operational until late 2001.

We hope these ideas will be helpful in your efforts to craft an Order to Kerr McGee for an accelerated effort to remediate perchlorate. We had discussed the possibility of getting Jeff Scott to visit KMCC and take a look at the evaporation pond, the ground water seep and Las Vegas Wash as well as to meet Allan Biaggi. The earliest dates that would work for Jeff, Larry and myself are January 8th or 9th. The meeting could also be held at your office in Carson City. Let us know what will work for Allan Biaggi and you guys and if we can be of further assistance. Please call Larry Bowerman at (415) 744-2051 or Mitch Kaplan at (415) 744-2063.
======== Fwd by: BPOHLMAN @ ND ========
Hi Mitch,
It looks as if we will be able to do the meeting on the 9th. Allen is available and so is SNWA. It would work best for us if the meeting was in Las Vegas so we could take Jeff out in the field and let him see the wash for himself. We thought we would spend the morning in the field and then meet the folks from SNWA after lunch for an hour or two. Let us know if that will still work for you and what your travel arrangement

---

===========ATTACHED=FILE(S)===
File(s):ORIGINAL.MSG
Detach to:J:\USERS\BPOHLMAN\PERCHLOR\ARTICLES

Perchlorate

PETER G. MORROS
Director

STATE OF NEVADA
KENNY C. GUINN
Governor

ALLEN BIAGGI
Administrator

(702) 486-2850

FAX (702) 486-2863

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

DIVISION OF ENVIRONMENTAL PROTECTION

(Las Vegas Office)
555 E. Washington, Suite 4300
Las Vegas, Nevada 89101-1049

RECEIVED
MAR - 7 2001
ENVIRONMENTAL PROTECTION

March 6, 2001

Ms. Susan M. Crowley
Staff Environmental Specialist
Kerr-McGee Chemical LLC
PO Box 55
Henderson, NV 89009

RE: Perchlorate Remediation Project; Ion Exchange System, at the Henderson Facilities

Dear Ms. Crowley:

I have reviewed the preliminary draft plans and the Remediation procedures for the above mentioned project. The plans and the procedures seem to be adequate and meet our minimum requirements. Therefore, the Division's Bureau of Water Pollution Control grants its **conditional approval** pending your response to the following items:

1- A complete final set of plans and specifications, **wet stamped**, signed, and dated by a registered Professional Engineer in the State of Nevada.

2- An Operation and Maintenance Manual to be developed and sent to this office for review and approval.

3- A registered professional engineer **must provide** this office with certification that the project was constructed in accordance with the plans and specifications upon completion of construction. All addenda and change orders must be approved by the division.

Review or approval of facilities plans, design drawings and specifications or other documents by or for the division is for administrative purposes only and dose not relieve the owner of the responsibility to properly plan, design, build and effectively operate and maintain the facility as required under law, regulation, permits, and good management practices. The division is not responsible for increased costs resulting from defects in the design, plans and specifications or pertinent documents.

The Permittee is responsible for all the permits required which may include, but not limited to:

Dam permits	- Division of Water Resources
Well Permits	- Division of Water Resources
404 Permits	- Army Corps of Engineers/NDEP
Air Permits	- NDEP
Local Permits	- Local Government
Health Permits	- Local Government

If you have any further questions, please feel free to contact me at (702) 486-2853.

Sincerely,

Nadir E. Sous, Supervisor
Staff Engineer/ Technical Services
Bureau of Water Pollution Control

cc: Darrell Rasner, NDEP/Carson City
Leo Drozdoff, NDEP/Carson City
Jon Palm, NDEP/Carson City
Doug Zimmerman, NDEP/Carson City
Brenda Pohlman, NDEP/Las Vegas
Dave Brown, Clark County Dept. Of Buildg., 500 S. Grandcentral pky 1st flr, PO Box 553530, Las Vegas, Nevada 89155-3530

NEWFIELDS

FOCUSED RISK ASSESSMENT FOR PARCEL 9N

CLARK COUNTY, NEVADA

March 2001

1550 HARBOR BOULEVARD, SUITE 130
WEST SACRAMENTO, CALIFORNIA 95691-3826
916.374.9050 *tel.* ~ *916*.374.9080 *fax*

FOCUSED RISK ASSESSMENT FOR PARCEL 9N

CLARK COUNTY, NEVADA

March 22, 2001

Prepared by

NEWFIELDS

NEWFIELDS, INC.
1550 HARBOR BLVD., SUITE 130
WEST SACRAMENTO, CALIFORNIA 95691

FOCUSED RISK ASSESSMENT
FOR PARCEL 9N

CLARK COUNTY, NEVADA

The material and data in this report were prepared under the supervision and direction of the undersigned.

NEWFIELDS, INC.

Lee R. Shull, Ph.D.
Director, Health and Risk Services

Mark K. Jones
Senior Toxicologist/Project Manager

Mark A. Bowland
Staff Toxicologist

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FOCUSED RISK ASSESSMENT FOR PARCEL 9N

1. INTRODUCTION

This report presents the results of a focused risk assessment conducted to estimate the potential risk to human health from chemicals detected in soil collected from Parcel 9N in Clark County, Nevada. The assessment was used to define the magnitude and probability of threats to human health potentially posed by chemicals in soil at the site.

1.1 Purpose of Report

The purpose of the risk assessment is to estimate the potential risks to human health associated with exposure to chemicals in soil at the site. The extent of the potential risk is dependent on the degree to which people are exposed, which is mainly influenced by the types, frequencies, and duration of activities conducted at the site. Therefore, in this evaluation, a variety of possible activities associated with a wide range of potential exposures are quantified.

1.2 Methodology

This risk assessment follows the basic procedures outlined in the U.S. Environmental Protection Agency's (EPA) *Risk Assessment Guidance for Superfund: Volume I—Human Health Evaluation Manual* (EPA, 1989). Other guidance documents consulted include:

- EPA. 1991. Risk Assessment Guidance for Superfund: Volume I—Human Health Evaluation Manual. Supplemental Guidance.
- EPA. 1992. Guidelines for Exposure Assessment.

2. SITE CHARACTERIZATION

2.1 Chemicals of Potential Concern (COPCs)

All chemicals analyzed for in the samples are considered chemicals of potential concern (COPCs) and are quantitatively evaluated in this assessment. These chemicals are 2,4-DDD, 2,4-DDE, 2,4-DDT, 4,4'-DDE, and 4,4'-DDT. Although barium and chromium were also analyzed for, these metals were only analyzed by TCLP and are therefore not included in this assessment.

2.2 Data Evaluation

The exposure point concentrations used in the risk assessment are based upon measured concentrations at the site. Because of the number of samples collected, the maximum concentration for each COPC was used in the assessment. In addition, because toxicity criteria do not exist for 2,4-DDD, 2,4-DDE, and 2,4-DDT, concentrations of these chemicals (when detected) were summed with their respective 4,4'- compound. Table 1 summarizes the data for the assessment.

Table 1. Soil Data for Parcel 9N

Chemical	Pile 1	Pile 2	Pile 3	Runoff 20'	Runoff 50'	Foot-print Pile	Back-ground Soil	Foot-print Pile 2	Foot-print Pile 3
2,4-DDD	<0.17	<0.05	<0.17	<0.05	<0.05	<0.08	<0.05	<0.05	<0.05
2,4-DDE	0.067	0.130	0.160	0.110	<0.05	0.047	0.030	0.036	0.034
2,4-DDT	<0.17	<0.05	<0.17	<0.05	<0.05	<0.08	<0.05	<0.05	<0.05
4,4'-DDE	0.057	0.100	0.140	0.096	<0.05	0.040	0.038	0.048	0.047
4,4'-DDT	0.057	0.090	0.100	0.090	<0.05	0.036	<0.05	<0.05	<0.05
Sum -DDE	0.124	0.230	**0.300**	0.206	NA	0.087	0.068	0.084	0.081
Sum -DDT	0.057	0.090	**0.100**	0.090	NA	0.036	NA	NA	NA

Note: All values are in mg/kg.
Values in **bold** are the exposure point concentrations used in the risk assessment.

3. EXPOSURE ASSESSMENT

The exposure assessment step in a risk assessment combines information about the chemical concentrations in site media with assumptions about how a potential receptor could contact the impacted media. The result is an estimation of the level of intake, or dose, of a chemical.

3.1 Potential Receptor Populations

The risk assessment is based on the assumption that land use for the site will be residential. It is anticipated that evaluation of these populations will also address potential risks to less intensely exposed populations in the area (*e.g.*, commercial workers, visitors to the site).

3.2 Potential Exposure Pathways

An exposure route describes the mechanism, such as direct ingestion, by which a chemical enters an organism. This section describes how the evaluated populations (residents) could be exposed to chemicals in soil at the site.

3.2.1 Direct Soil Exposure

Direct soil exposure is associated with an individual's direct contact with soil through ingestion or skin contact. In order for these exposure pathways to occur, the soil must be available for direct contact. Direct contact with soil via incidental ingestion and dermal contact is evaluated in this assessment.

3.2.2 Indirect Exposure to Chemicals in Soil

Indirect exposure to chemicals in soil can occur when chemicals migrate from the original media (soil) to a new media (*e.g.*, air) with which populations could come into contact. Chemicals entrained on soil particles can potentially become airborne, resulting in possible human exposure. Exposure to COPCs bound to dust particles are evaluated using the EPA's Particulate Emission Factor (PEF) approach (EPA, 2000).

3.3 Exposure Parameters

Exposure parameters refer to all of the variables (*e.g.*, ingestion rate, exposure frequency, body weight) used to calculate a daily human dose or intake level. The average daily dose (ADD) of each non-carcinogenic COPC is averaged over the estimated period of exposure (referred to as the averaging time), that varies for different types of receptor populations. The ADD is expressed in units of milligrams per kilogram per day (mg/kg-d). The daily dose of a potentially carcinogenic COPC is averaged over the lifetime of the exposed individual. The daily dose of each potentially carcinogenic COPC is referred to as the lifetime average daily dose (LADD) and also has units of mg/kg-d.

This risk assessment has been performed deterministically. All exposure parameters and assumptions used in the focused risk assessment are presented in Table 2. These conservative default values are based on standard EPA guidance values.

Table 2. Residential Exposure Factors

Parameter	Abbrev.	Value	Units	Reference
Dermal absorption fraction	ABS	0.03	---	EPA, 2000
Particulate emission factor	PEF	1.316×10^9	m^3/kg	EPA, 2000
Dermal adherence factor, adult	AF_a	0.07	mg/cm^2	EPA, 2000
Dermal adherence factor, child	AF_c	0.2	mg/cm^2	EPA, 2000
Averaging time, carcinogenic	AT_c	70	years	EPA, 1991
Averaging time, non-carcinogenic	AT_{nc}	30	years	Based on ED_r
Adult body weight	BW_a	70	kg	EPA, 1991
Child body weight	BW_c	15	kg	EPA, 1991
Exposure frequency	EF_r	350	days/year	EPA, 1991
Exposure duration, adult	ED_a	24	years	EPA, 1991
Exposure duration, child	ED_c	6	years	EPA, 1991
Adult inhalation rate	IRA_a	20	m^3/day	EPA, 1991
Child inhalation rate	IRA_c	10	m^3/day	EPA, 1991
Available skin surface area, adult	SA_a	5,700	cm^2/day	EPA, 2000
Available skin surface area, child	SA_c	2,800	cm^2/day	EPA, 2000
Adult soil ingestion rate	IRS_a	100	mg/day	EPA, 1991
Child soil ingestion rate	IRS_c	200	mg/day	EPA, 1991

3.4 Quantification Of Exposure

The risks associated with exposure to COPCs depend not only on the concentrations of COPCs, but also on the extent to which receptors are exposed. For example, the risks associated with exposure to COPCs for one hour per day are less than those associated with exposure at the same concentrations for two hours per day. Because risks depend upon both the concentration and the extent of the exposure, the assumptions regarding the extent of exposure are discussed in this section for each of the complete exposure pathways identified above.

In this section, the concentrations of COPCs at the points of potential human exposure are combined with assumptions about the behavior of the populations potentially at risk in order to estimate the average daily dose (ADD) of COPCs that may be taken in by the exposed individuals. Later, in the risk characterization step of the assessment, the ADDs are combined with toxicity parameters for COPCs to estimate whether the calculated intake levels pose a threat to human health. The equations used to characterize exposure via each potentially complete exposure pathway for each receptor type are presented in Table 3.

Table 3. Exposure Equations

$$(L)ADD(mg/kg-day)=\frac{EF_r\,[(\frac{IFS_{adj}}{10^6\,mg/kg})+(\frac{SFS_{adj}\ x\ ABS}{10^6\,mg/kg})+(\frac{InhF_{adj}}{PEF})]}{AT}$$

Where:

$$IFS_{adj}=\frac{ED_c\times IRS_c}{BW_c}+\frac{(ED_r\;\;ED_c)\times IRS_a}{BW_a}$$

$$SFS_{adj}=\frac{ED_c\times AF\ x\ SA_c}{BW_c}+\frac{(ED_r\;\;ED_c)\times AF\times SA_a}{BW_a}$$

$$InhF_{adj}=\frac{ED_c\times IRA_c}{BW_c}+\frac{(ED_r\;\;ED_c)\times IRA_a}{BW_a}$$

4. TOXICITY ASSESSMENT

This section describes the toxicity of the COPCs at the site. Toxicity values, when available, are published by EPA in the on-line Integrated Risk Information System ([IRIS]; EPA, 2001). Cancer slope factors (CSFs) are chemical-specific, experimentally derived potency values that are used to calculate the risk of cancer resulting from exposure to potentially carcinogenic chemicals. A higher value implies a more potent carcinogen. Reference doses (RfDs) are experimentally derived "no-effect" levels used to quantify the extent of toxic effects other than cancer due to exposure to chemicals. Here, a lower value implies a more potent toxicant. These criteria are generally developed by EPA risk assessment work groups and listed in EPA risk assessment guidance documents and databases. Toxicity criteria were not developed for compounds that do not have criteria published in the above sources. Available toxicity values for all site COPCs are provided in Table 4.

Table 4. Toxicity Criteria

Chemical	**RfD (mg/kg-d)** Oral	**RfD (mg/kg-d)** Inhalation	**CSF (mg/kg-d)$^{-1}$** Oral	**CSF (mg/kg-d)$^{-1}$** Inhalation
4,4'-DDE	NE	NE	0.34	0.34
4,4'-DDT	5×10^{-4}	5×10^{-4}	0.34	0.34

Note: All values from EPA (2001).
NE = none established.

5. RISK CHARACTERIZATION

In the last step of a risk assessment, the estimated rate at which a person intakes a COPC is compared with information about the toxicity of that COPC to estimate the potential risks to human health posed by exposure to the COPC. This step is known as the risk characterization. In the risk characterization, cancer risks are evaluated separately from non-cancer health threats. The methods used for assessing cancer and non-cancer health risks are discussed below.

5.1 Methods for Assessing Cancer Risks

In the risk characterization, carcinogenic risk is estimated as the incremental probability of an individual developing cancer over a lifetime as a result of a chemical exposure. Carcinogenic risks are evaluated by multiplying the estimated average exposure rate (*i.e.*, LADD calculated in the exposure assessment) by the chemical's CSF. The CSF converts estimated daily intakes averaged over a lifetime to incremental risk of an individual developing cancer. Because cancer risks are averaged over a person's lifetime, longer-term exposure to a carcinogen will result in higher risks than shorter-term exposure to the same carcinogen, if all other exposure assumptions are constant. Theoretical risks associated with low levels of exposure in humans are assumed to be directly related to an observed cancer incidence in animals associated with high levels of exposure. According to EPA (1989), this approach is appropriate for theoretical upper bound cancer risks of less than 1×10^{-2}. The following equations were used to calculate chemical-specific risks and total risks:

$$Risk = LADD \times CSF$$

where

LADD = lifetime average daily dose (mg/kg-d)
CSF = cancer slope factor (mg/kg-d)$^{-1}$

and

$$Total\ Carcinogenic\ Risk = \sum Individual\ Risk$$

It is assumed that cancer risks from various exposure routes are additive. Thus, the result of the assessment is a high-end estimate of the total carcinogenic risk. High-end carcinogenic risk estimates are compared to EPA acceptable risk range of one in ten thousand (10^{-4}) and one in one million (10^{-6}). If the estimated risk falls within or below this risk range, the chemical is considered unlikely to pose an unacceptable carcinogenic health risk to individuals under the given exposure conditions. A risk level of 1×10^{-6} represents a probability of one in one million that an individual could develop cancer from exposure to the potential carcinogen under a defined set of exposure assumptions.

5.2 Methods for Assessing Non-Cancer Health Effects

Non-cancer health threats are estimated by comparing the estimated average exposure rate (*i.e.*, ADDs estimated in the exposure assessment) with an exposure level at which no adverse health effects are expected to occur for a long period of exposure (*i.e.*, the RfDs listed in Section 4.0). ADDs and RfDs are compared by dividing the ADD by the RfD to obtain the ADD:RfD ratio, as follows:

$$\textit{Hazard Quotient} = \frac{ADD}{RfD}$$

where

ADD	=	average daily dose (mg/kg-d)
RfD	=	reference dose (mg/kg-d)

The ADD-to-RfD ratio is known as a hazard quotient. If a person's average exposure is less than the RfD (*i.e.*, if the hazard quotient is less than one), the chemical is considered unlikely to pose a significant non-carcinogenic health hazard to individuals under the given exposure conditions. Unlike carcinogenic risk estimates, a hazard quotient is not expressed as a probability. Therefore, while both cancer and non-cancer risk characterizations indicate a relative potential for adverse effects to occur from exposure to a chemical, a non-cancer health threat estimate is not directly comparable with a cancer risk estimate.

If more than one pathway is evaluated, the hazard quotients for each pathway are summed to determine whether exposure to a combination of pathways poses a health concern. This sum of the hazard quotients is known as a hazard index.

$$\textit{Hazard Index} = \sum \textit{Hazard Quotients}$$

5.3 Risk Assessment Results

This section presents the results of the focused risk assessment prepared for soil samples collected from Parcel 9N. Because exposures to carcinogenic chemicals are considered by EPA to be cumulative, the upper-bound incremental cancer risks associated with each soil exposure pathway were summed. The calculated non-carcinogenic hazard indices and theoretical upper-bound incremental lifetime cancer risks (ILCR) for each exposure pathway for residential receptors are presented in Table 5.

Table 5. Non-Cancer Hazard Indices and Theoretical Upper-Bound Incremental Lifetime Cancer Risks for Hypothetical Future On-Site Residents

Chemical	Soil Conc. (mg/kg)	ADD (mg/kg-d)	LADD (mg/kg-d)	RfDo (mg/kg-d)	CSF $(mg/kg\text{-}d)^{-1}$	HQ/HI	ILCR
Soil Ingestion							
- DDE	0.3	3.8×10^{-6}	4.7×10^{-7}	NE	0.34	NA	2×10^{-7}
- DDT	0.1	1.3×10^{-6}	1.6×10^{-7}	5.0×10^{-4}	0.34	0.0026	5×10^{-8}
- Total Soil Ingestion						0.0026	2×10^{-7}
Dermal Contact							
- DDE	0.3	3.2×10^{-7}	4.4×10^{-8}	NE	0.34	NA	2×10^{-8}
- DDT	0.1	1.1×10^{-7}	1.5×10^{-8}	5.0×10^{-4}	0.34	0.00021	5×10^{-9}
- Total Dermal Contact						0.00021	2×10^{-8}
Inhalation							
- DDE	0.3	1.5×10^{-10}	3.4×10^{-11}	NE	0.34	NA	1×10^{-11}
- DDT	0.1	4.9×10^{-11}	1.1×10^{-11}	5.0×10^{-4}	0.34	<0.0001	4×10^{-12}
- Total Inhalation					–	<0.0001	2×10^{-11}
TOTAL						**0.0028**	$\mathbf{2 \times 10^{-7}}$

NE = None established
NA = Not applicable

5.4 Uncertainty Analysis

Risk estimates are values that have uncertainties associated with them. These uncertainties, which arise at every step of a risk assessment, are evaluated to provide an indication of the relative degree of uncertainty associated with a risk estimate. In this section, a qualitative discussion of the uncertainties associated with the estimation of risks for the site is presented.

Risk assessments are not intended to estimate actual risks to a receptor associated with exposure to chemicals in the environment. Risk assessment is a means of estimating the probability that an adverse health effect (*e.g.*, cancer, and impaired reproduction) will occur in a receptor. The multitude of conservative assumptions used in risk assessments guard against underestimation of risks.

Risk estimates are calculated by combining site data, assumptions about individual receptor's exposures to impacted media, and toxicity data. The uncertainties in this risk assessment can be grouped into three main categories that correspond to these steps:

- Uncertainties in environmental sampling and analysis
- Uncertainties in assumptions concerning exposure scenarios
- Uncertainties in toxicity data and dose-response extrapolations

It is possible to quantify the uncertainty in a risk assessment through the use of Monte Carlo simulations in the risk calculations. Risk assessments with quantitative uncertainty analyses are called "probabilistic evaluations." Instead of calculating risks using point estimates, which are often upper-bound values, for each parameter, as was done at the facility, a probability distribution function representing a range of data is used. A computer model performs the risk calculations up to 10,000 times, and each iteration incorporates a different combination of data from the various probability distribution functions. The result is a distribution of risks instead of a single value.

In general, theoretical risks calculated in probabilistic risk assessments are lower and more realistic than those calculated in deterministic evaluations, and because the result is a distribution and not a point estimate, there is a greater level of certainty associated with the calculated risks. Regulatory agencies recognize the usefulness of a quantitative uncertainty analysis. However, probabilistic methods were not used in this assessment.

5.4.1 Uncertainty in Site Characterization

This risk assessment is based on the sampling results obtained from the previous investigations at the property reported by ERM-West, Inc. Errors in sampling results can arise from the field sampling, laboratory analyses, and data analyses. Errors in laboratory analysis procedures are possible, although the impacts of these sorts of errors on the risk estimates are likely to be low. The environmental sampling at a site is one source of uncertainty in the evaluation. However, the sampling and analysis data should be sufficient to characterize the impacts and the associated potential risks.

5.4.2 Uncertainty in the Exposure Assessment

In this risk assessment, the exposure assessment is based on a number of assumptions with varying degrees of uncertainty. Uncertainties can arise from the types of exposures examined, the points of potential human exposure, the concentrations of COPCs at the points of human exposure, and the intake assumptions. The selection of exposure pathways is a process that attempts to identify the most probable potentially harmful exposure scenarios. For soil samples collected from Parcel 9N, all potential primary exposure pathways were evaluated. While exposure pathways other than the ones evaluated could exist, these exposures are expected to be much lower than the risks associated with the pathways considered in this risk assessment, and would be insignificant contributors to overall health risks in the site.

The risks calculated depend largely on the assumptions used to calculate the level of COPC intake. For this assessment, point estimates were used. The use of these point estimates makes it likely that the risk is not underestimated, and may in fact be overestimated. In addition, the amount that each of the COPCs might be absorbed into the body may be quite different from the amount of chemical that is actually contacted (*i.e.*, bioavailability). In this assessment, oral and inhalation bioavailabilities of COPCs is conservatively assumed to be 100 percent. Actual chemical- and site-specific values are likely to be much less than this conservative default value.

5.4.3 Toxicological Data and Dose Response Extrapolations

The availability and quality of toxicological data is another source of uncertainty in the risk assessment. Uncertainties associated with animal and human studies may have influenced the toxicity criteria. Carcinogenic criteria are classified according to the amount of evidence available that suggests human carcinogenicity. EPA assigns each carcinogen a designation of A through E, dependent upon the strength of the scientific evidence for carcinogenicity. In the establishment of the non-carcinogenic criteria, conservative multipliers, known as uncertainty and modifying factors, are used.

Uncertainties in Animal and Human Studies

Extrapolation of toxicological data from animal tests is one of the largest sources of uncertainty in a risk assessment. There may be important, but unidentified, differences in uptake, metabolism, and distribution of chemicals in the body between the test species and humans. For the most part, these uncertainties are addressed through use of conservative assumptions in establishing values for RfDs and CSFs, which results in the likelihood that the risk is overstated.

Typically, animals are administered high doses (*e.g.*, maximum tolerated dose) of a chemical in a standard diet or in air. Humans may be exposed to much lower doses in a highly variable diet, which may affect the toxicity of the chemical. In these studies, animals, usually laboratory rodents, are exposed daily to the chemical agent for various periods of time up to their 2-year lifetimes. Humans have an average 70-year lifetime and may be exposed either intermittently or regularly for an exposure period ranging from months to a full lifetime. Because of these differences, it is not surprising that extrapolation error is a large source of uncertainty in a risk assessment.

Even if studies of chemical effect in humans are available, they generally are for workplace exposures far in excess of those expected in the environment. Uncertainties can be large because the activity patterns, exposure duration and frequency, individual susceptibility, and dose may not be the same in the study populations as in the individuals exposed to environmental concentrations. Because conservative methods are used in developing the RfDs and CSFs, the possibility of underestimating risks is low.

6. SUMMARY

This focused risk assessment has evaluated potential risks to human health associated with chlorinated pesticides detected in samples collected from Parcel 9N. For carcinogens, because exposures are considered by EPA to be cumulative, the upper-bound incremental cancer risks associated with each exposure pathway are summed. The calculated upper-bound incremental cancer risks were then compared to the EPA acceptable risk range of 10^{-6} to 10^{-4}. If the estimated risks exceed 10^{-4}, this is an indication that incremental cancer risks may be associated with the site. For non-carcinogens, multiple chemical exposures were evaluated by summing the non-carcinogenic hazard quotients for all COPCs for each route of exposure to obtain a HI for that COPC. If the estimated ratios are in excess of unity (1.0), this is an indication that adverse health effects may result from exposure to the COPCs at the site.

For hypothetical on-site residential exposures to soil, the total upper-bound incremental cancer risk is 2×10^{-7}. This value is below EPA's acceptable risk range of 10^{-6} to 10^{-4}. The non-carcinogenic HI for hypothetical on-site residential exposures to soil is 0.0028. Because this value is less than 1.0, there appears to be no significant, adverse non-carcinogenic health effects to hypothetical on-site residents associated with the site.

7. REFERENCES

Nevada Division of Environmental Protection (NDEP). 1996. Nevada Administrative Code Chapter NAC 445A. Adopted Permanent Regulation of the Nevada State Environmental Commission. LCB File No. R119-96.

U.S. Environmental Protection Agency (EPA). 1989. Risk Assessment Guidance for Superfund: Volume I—Human Health Evaluation Manual (Part A). Interim Final. Office of Emergency and Remedial Response, Washington, D.C. EPA/540/1-89/002. December.

U.S. Environmental Protection Agency (EPA). 1991. Risk Assessment Guidance for Superfund: Volume I—Human Health Evaluation Manual. Supplemental Guidance 'Standard Default Exposure Factors'. Office of Emergency and Remedial Response, Washington, D.C. OSWER Directive 9285.3-03. March.

U.S. Environmental Protection Agency (EPA). 1992. Guidelines for Exposure Assessment. Federal Register, 57(104):22888-22938. May 29.

U.S. Environmental Protection Agency (EPA). 2000. Region 9 Preliminary Remediation Goals (PRGs) 2000.

U.S. Environmental Protection Agency (EPA). 2001. Integrated Risk Information System. EPA on-line database: www.epa.gov/ngispgm3/iris/.

From: SCROWLEY @ KMG.com (Crowley, Susan)
To: Brenda Pohlmann
Subject: RE: GPS Coordinates

===NOTE==============2/09/01=11:05am=====================================
Brenda,
Based upon a number of responses - we've decided to use the "area wide coordinate" system (to satisfy the City of Henderson) and to have everything also translated to state plane, because that's what all of our maps are based upon. Our interaction with the City will consists of easement documents but we'll place all the locations which are needed on our own mapping system (state plane). Sounds like most folks you work with can handle the state plane - so that appears a good choice. Thanks for asking around for me.

Susan M. Crowley
Kerr-McGee Chemical LLC
(702) 651-2234
(702) 592-7727 cell
(702) 651-2310 fax

-----Original Message-----
From: Brenda Pohlmann [mailto:bpohlman.ndep-lv@ndep.carson-city.nv.us]
Sent: Tuesday, February 08, 2000 2:22 PM
To: rbamford@ndep.carson-city.nv.us
Cc: scrowley@kmg.com
Subject: GPS Coordinates

======== Original Message ========
Everyone,
We are moving forward on design of the well field in the Pittman Lateral area. Kerr-McGee and NDEP (Bureau of Water Pollution Control) have agreed on an approach for discharge of groundwater (from in this area - others are yet to be addressed), treated to remove perchlorate.

The first step is physical location of the well field on a map in relation to other wells that are already installed. At the onset we need to use a coordinate system, either state plane or the "area wide coordinate" system. We share information with you and want tit to be useful as is, if possible. What coordinate systems do you use ?

Susan M. Crowley
Kerr-McGee Chemical LLC
(702) 651-2234
(702) 592-7727 cell
(702) 651-2310 fax
======== Fwd by: Brenda Pohlma ========
Rob,
What system are you guys using up there?
======== Fwd by: RBAMFORD @ ND ========
Hello Brenda,

We have a standard of UTM, Zone 11, with a Datum of NAD83, using units of meters. We will take anything and convert it into UTM; don't let that stop anyone from giving us good GPS'd data.

As a background we chose UTM because:
- That's what EPA and USGS use for statewide datasets in NV;
- It's easy to calculate distance and use in the field;
- It is a good resolution for statewide scopes. Many county agencies (or local research) will use State Plane because it is very accurate for smaller areas (than UTM) and they often need a high degree of accuracy for managing parcels, and water rights and legal issues and such.

If your partners don't like UTM, decimal degrees would be our second choice. Decimal Degrees (DD) is "the universal conversion standard." Just about any GIS or conversion program will handle DD. If you or they would like I have a freeware conversion application I can point you to.

We have more information available about GPS on our NDEP Spatial Lab Site. Check out //10.131.54.67 or //sgi (they are both the same site) and select the GPS icon. We have some documents about GPS, our resources, and standards.

Good luck, and if need be forward my number.

Rob
x3157
======== Fwd by: Brenda Pohlma ========
Thanks Rob. FYI Susan

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JAN 19 01

January 16, 2001

VIA FACSIMILE AND FIRST CLASS MAIL

Doug Zimmerman
Department of Conservation
and Natural Resources
Nevada Division of Environmental Protection
333 W. Nye Lane
Carson City, Nevada 89706-0851

Dear Mr. Zimmerman:

Enclosed is a draft of a proposed Phase II Consent Agreement between Kerr-McGee Chemical LLC and NDEP. It is modeled closely upon the Phase I agreement of July 1999. Kerr-McGee has asked me to handle contacts and inquiries from Nevada regarding this draft.

Kerr-McGee stands ready to finalize the Phase II agreement as promptly as possible. In this regard, you should know that the Company plans to provide a 30-day opportunity for public comment on the long-term remedy in order to comply with the National Contingency Plan. We will be prepared to enter the Phase II agreement once the comment period has run and there is a chance to take due account of any comments received. In light of the prior NPDES permit proceeding and broad awareness in the Las Vegas area of the issue being addressed by NDEP and Kerr-McGee, we do not anticipate extensive public comments on the remedy issue. Nevertheless, you will appreciate that Kerr-McGee needs to meet the NCP public comment requirement before the consent agreement becomes final.

Sincerely,

John T. Smith II

DRAFT

CONSENT AGREEMENT

This Consent Agreement is made and entered into this _______ day of February 2001, by and between the State of Nevada, Department of Conservation and Natural Resources, Division of Environmental Protection ("NDEP" or "Division") and Kerr-McGee Chemical LLC, a Delaware Limited Liability Company ("Kerr-McGee"). Kerr-McGee and the Division are referred to collectively herein as the "Parties."

WHEREAS, the Parties entered a Consent Agreement in July 1999, (the "Phase I Agreement"), to govern implementation of a removal action addressing perchlorate contaminated surface water in a seep adjacent to the Las Vegas Wash;

WHEREAS, Kerr-McGee began in November 1999, the treatment of perchlorate contaminated seep water using a temporary, ion-exchange system and has discharged effluent from the system under Clean Water Act permits issued by the Division;

WHEREAS, Kerr-McGee continues to conduct removal activities and, consistent with Paragraph II.3. of the Phase I Agreement, Kerr-McGee has submitted a Phase II Workplan setting forth a proposed long-term remedy for perchlorate contamination in the seep and in groundwater at Henderson;

WHEREAS, consistent with Paragraph II.4. of the Phase I agreement, the Parties have been cooperating in resolving issues regarding discharge of groundwater after treatment for perchlorate, including issues relating to necessary permits, and, on August 7, 2000, NDEP issued Kerr-McGee a five-year permit for discharge of effluent from a proposed remedial system, which includes the possibility of Division authorization of discharge of treated groundwater as well as seep water;

WHEREAS, Kerr-McGee wants to cooperate fully with the Division in addressing the problem of perchlorate contamination in the Henderson, Nevada area, while preserving its rights to seek contribution from third parties who are likely to share responsibility for this contamination, including, but not limited to, the United States Navy and PEPCON;

NOW THEREFORE, in consideration of and in exchange for the mutual undertakings and covenants herein, intending to be legally bound hereby, the Division and Kerr-McGee agree as follows:

I. STATEMENT OF PURPOSE

The Division and Kerr-McGee are entering into this Agreement to document their respective rights and responsibilities during the conduct of a perchlorate remedial action designed to reduce the amount of perchlorate reaching the Las Vegas Wash and Lake Mead in both the near and long-term, and to continue to provide for reimbursement to the Division of Kerr-McGee's fair share of oversight costs incurred by the Division with respect to cleanup of perchlorate contamination in the groundwater.

II. WORK TO BE PERFORMED

1. The parties intend that the work to be performed in accordance with this Agreement shall be carried out in manner consistent with applicable federal and Nevada statutes, implementing regulations, and with the National Contingency Plan, 40 C.F.R. § 300.1 *et seq*.

2. Upon execution of this Agreement, Kerr-McGee shall promptly complete design and initiate construction of a treatment system capable of treating 825 gallons per minute to achieve 97 percent removal of the perchlorate for discharge in accordance with the permit limits set forth in NPDES Permit No. NV0023060 of August 7, 2000.

3. Within 45 days of execution of this Agreement, Kerr-McGee shall submit a revised Phase II Workplan and detailed schedule for completion of design and construction of this treatment system. Upon its approval, this Workplan shall become an enforceable obligation pursuant to this Consent Agreement. The parties will endeavor to reach mutual agreement on any changes to the Workplan after its submission, but, failing such agreement, the Division's written determination of necessary changes shall control, subject, however, to Kerr-McGee's right to seek dispute resolution pursuant to Section IV below.

III. STIPULATED PENALTIES

Unless there has been a written modification approved by NDEP, any failure by Kerr-McGee to meet a schedule deadline or an approved Workplan condition may result in NDEP assessing stipulated penalties against Kerr-McGee. All penalty amounts are maximum amounts. Nothing in this Agreement shall be construed to limit in any manner NDEP's discretion with respect to whether to take enforcement action or to assess less than the maximum penalty. Failure to commence, perform and/or complete work as described in the approved Workplan in a manner acceptable to NDEP at the scheduled time will result in the following penalties subject, however, to a cap of $250,000:

Period of Noncompliance	Maximum Penalty per Day
1st – 7th day	$ 1,000
8th – 21st day	$ 2,500
22nd day and thereafter	$ 5,000

The assessment of stipulated penalties shall not alter Kerr-McGee's obligation to comply with the terms of this Agreement.

IV. DISPUTE RESOLUTION

1. The Parties shall use their best efforts informally and in good faith to resolve any dispute or differences of opinion. The Parties agree that the procedures contained in this Section are the sole and exclusive procedures for resolving disputes arising under this Consent Agreement. If Kerr-McGee fails to follow any of the requirements contained in this Section, then it shall have waived its right to further consideration of the dispute in issue.

2. If Kerr-McGee disagrees, in whole or in part, with any written determination by the Division pursuant to this Consent Agreement, Kerr-McGee shall notify the Division in writing of the dispute ("Notice of Dispute").

3. Any dispute that arises under or with respect to this Consent Agreement shall in the first instance be the subject of informal negotiations between the Parties. The period for informal negotiations shall not exceed ten (10) days following the date the dispute arises, unless such period is extended by written agreement of the Parties. The dispute shall be considered to have arisen when the Division receives a written Notice of Dispute.

4. In the event that the Parties cannot resolve a dispute by informal negotiations under the preceding paragraph, then the position advanced by the Division shall be considered binding unless, within ten (10) days after the conclusion of the informal negotiation period, Kerr-McGee invokes the formal dispute resolution procedures of this Section by serving on the Division Administrator a written Statement of Position which shall set forth the specific points of the dispute, the position Kerr-McGee claims should be adopted as consistent with the requirements of this Consent Agreement, the basis for Kerr-McGee's position, any factual data, analysis or opinion supporting that position, any supporting documentation relied upon by Kerr-McGee, and any matters which it considers necessary for the Administrator's determination. The

Statement of Position also may include a request for an opportunity to make an oral presentation of factual data, supporting documentation and expert testimony to the Administrator and to answer questions that the Administrator may pose. It is within the sole discretion of the Administrator to grant or deny a request for an oral presentation.

5. Within fifteen (15) days following receipt of a Statement of Position, or after any oral presentation by Kerr-McGee, the Administrator shall issue his/her decision. The Administrator's written decision shall include a response to Kerr-McGee's arguments and evidence. The written decision of the Administrator shall be incorporated into and become an enforceable element of this Consent Agreement, and shall be considered the Division's final decision as provided in paragraph 6 of this Section.

6. As to any final Division decision, Kerr-McGee may, as appropriate, pursue the dispute before the State Environmental Commission ("SEC") as a "contested case" pursuant to NRS §§ 233B.010 *et seq.* and NAC §§ 445.988 – 445.995, and shall be entitled to both administrative and judicial review as provided therein.

V. FORCE MAJEURE

1. Kerr-McGee shall perform the requirements of this Consent Agreement within the time limits prescribed, unless the performance is prevented or delayed by events which constitute a *force majeure*. Kerr-McGee shall have the burden of proving such a *force majeure.* A *force majeure*, for purposes of this Consent Agreement, is defined as any event arising from causes not reasonably foreseeable and beyond the reasonable control of Kerr-McGee, or of any person or entity controlled by Kerr-McGee, which delays or prevents the timely performance of any obligation under this Consent Agreement despite Kerr-McGee's best efforts to fulfill such obligation. A *force majeure* may include: extraordinary weather events, natural disasters, strikes

and lockouts [by other than Kerr-McGee employees], national emergencies, delays in obtaining access or use of property not owned or controlled by Kerr-McGee despite timely best efforts to obtain such access or use approval, and delays in obtaining any required approval or permit from the Division or any other public agency that occur despite Kerr-McGee's complete, timely and appropriate submission of all information and documentation required for approval or applications for permits within a timeframe that would allow the work to proceed in a manner contemplated by the schedule of the Consent Agreement. A *force majeure* does not include (i) increased costs of the work to be performed under the Consent Agreement, (ii) financial inability to complete the work or (iii) normal precipitation events.

2. If any event occurs or has occurred that may delay the performance of Kerr-McGee's obligations under this Consent Agreement, whether or not caused by a *force majeure* event, Kerr-McGee shall notify the Division orally within two (2) business days of when Kerr-McGee first knew that the event might cause a delay. If Kerr-McGee wishes to claim a *force majeure* event, then within five (5) business days thereafter, Kerr-McGee shall provide to the Division a written explanation and description of the obligation(s) delayed or affected by the *force majeure* event; the reasons for the delay; the anticipated duration of the delay; a schedule for implementation of any measures to be taken to prevent or mitigate the delay or the effect of the delay; Kerr-McGee's rationale for attributing such delay to a *force majeure* event; and a statement as to whether, in the opinion of Kerr-McGee, such event may cause or contribute to an imminent and substantial hazard to human health, welfare, or the environment. Kerr-McGee shall include with any notice all available documentation supporting its claim that the delay was attributable to a *force majeure*. Failure to comply with the above requirements shall preclude Kerr-McGee from asserting any claim of *force majeure* for that event.

3. The Division shall notify Kerr-McGee in writing of its *force majeure* determination within ten (10) days after receipt of the written notice from Kerr-McGee. If the Division determines that the delay has been or will be caused by circumstances constituting a *force majeure* event, the time for performance of the obligations under this Consent Agreement that are affected by the *force majeure* event will be extended by the Division in writing for such time as the Division determines is necessary to complete those obligations. An extension of the time for performance of the obligations affected by the *force majeure* event shall not, of itself, extend the time for performance of any other obligation, unless Kerr-McGee can demonstrate to the Division's satisfaction that more than one obligation was affected by the *force majeure* event.

4. In the event that the Division and Kerr-McGee cannot agree that any delay or failure has been or will be caused by circumstances constituting a *force majeure*, of if there is no agreement on the length of the extension, the dispute shall be resolved in accordance with the dispute resolution provisions set forth in Section V of this Consent Agreement.

VI. REIMBURSEMENT OF OVERSIGHT COSTS

1. Kerr-McGee shall reimburse the Division for costs reasonably incurred for the oversight of this Consent Agreement, following the effective date and for the effective period of this Consent Agreement.

2. The Division shall account for oversight costs associated with implementing this Consent Agreement and related work and shall submit to Kerr-McGee copies of all invoices on a quarterly basis, commencing with the first full calendar quarter after the effective date of this Consent Agreement. Submittals shall be made promptly after the Division's internal review. Such invoices shall contain sufficient detail to identify individual daily time entries and all invoices or cost details for administrative and vendor expenses (such as travel, training,

equipment, photocopying expense and similar items). These invoices shall be prepared consistent with standard State billing practices and shall not require the creation of new billing practices. Amounts due hereunder shall be paid within thirty (30) days after receipt by Kerr-McGee of the invoices. Kerr-McGee may dispute particular invoiced costs if it determines that the Division has made an accounting error or if it alleges that the particular cost is not reimbursable pursuant to paragraph 3. In the event of any such dispute, Kerr-McGee shall pay in a timely fashion undisputed costs. With respect to the disputed cost, Kerr-McGee may pay such amount under protest and without prejudice to recovery of all or any portion thereof at the conclusion of any dispute resolution timely commenced pursuant to Section IV.

3. All payments due by Kerr-McGee shall be by checks payable to the State of Nevada for the full amount due and owing to:

Nevada Division of Environmental Protection
333 W. Nye Lane
Carson City, Nevada 89710

ATTENTION: Chief, Bureau of Corrective Actions

All checks shall reference the Site and Kerr-McGee's name and address.

VII. RESERVATION OF RIGHTS

1. The Division reserves all of its statutory and regulatory powers, authorities, rights, and remedies, both legal and equitable, which may pertain to Kerr-McGee's failure to comply with any of the requirements of this Consent Agreement or of any requirement of federal or state laws, regulations, or permit conditions. Except as provided in Section VIII (Other Claims; Covenant Not to Sue), this Consent Agreement shall not be construed as a covenant not to sue, release, waiver, or limitation of any rights, remedies, powers, and/or authorities, civil or criminal, which the Division has under any applicable statutory or common law authority of the State.

This Consent Agreement in no way relieves Kerr-McGee of its responsibility to comply with any federal, state or local law or regulation.

2. The Division reserves the right to disapprove work performed by Kerr-McGee pursuant to this Consent Agreement subject to Dispute Resolution under Section IV.

3. The Division reserves any and all legal rights and equitable remedies available to enforce (1) the provisions of this Agreement, or (2) any applicable provision of state or federal law.

4. Kerr-McGee reserves all rights, claims and/or defenses it may have in any action brought or taken by the Division, the EPA or any third party pursuant to applicable law, with respect to the specific claims that can be asserted and further reserves the right to pursue potentially responsible parties to recover all costs incurred in the performance of this Agreement.

5. Nothing in this Consent Agreement shall be construed as an admission of liability by Kerr-McGee.

VIII. OTHER CLAIMS; COVENANT NOT TO SUE

Nothing in this Consent Agreement shall constitute or be construed as a release from, or covenant not to sue with respect to, any claim, cause of action, demand or defense in law or equity, against any person, firm, partnership, or corporation for, or in respect of any liability it may have arising out of or relating in any way to the generation, storage, treatment, handling, management, transportation, release, threatened release, or disposal of any perchlorate at or otherwise associated with the Site, except that the Division covenants not to sue Kerr-McGee with respect to perchlorate contamination at Henderson, Nevada so long as Kerr-McGee is in compliance with the terms of this Consent Agreement.

IX. APPLICABLE LAW

This Agreement shall be construed in accordance with and governed by the law of the State of Nevada.

X. EFFECTIVE DATE

This Agreement shall become effective when it is fully executed by the parties. The effective date will be the date of last signature.

XI. TERMINATION

This Agreement shall terminate upon the occurrence of any of the following events:

1. Any agency or department of the United States government asserts and undertakes lead responsibility for addressing perchlorate contamination at Henderson.

2. The Division, Kerr-McGee and any other Party(ies) enter a new consent agreement to govern long-term remedial action with respect to perchlorate contamination and/or other contamination in groundwater at Henderson, and this later agreement expressly supersedes the present Agreement.

3. Upon application by Kerr-McGee for termination of this Consent Agreement, Kerr-McGee demonstrates to the satisfaction of the Division that response activities have reduced perchlorate concentrations in the Henderson groundwater to a point that continued operation of the treatment system is unlikely to result in further measurable benefit to water quality in the Las Vegas Wash or Lake Mead.

XII. SIGNATORIES

Each undersigned individual represents and warrants that he or she is fully authorized by the party he or she represents to enter into this Agreement and to legally bind such party to the terms and conditions of this Agreement.

IN WITNESS WHEREOF, the Division and Kerr-McGee execute this Consent Agreement by their duly authorized representatives on this _____ day of February, 2001.

THE STATE OF NEVADA DIVISION OF ENVIRONMENTAL PROTECTION	KERR-McGEE CHEMICAL LLC
By:	By:
Name:	Name:
Title:	Title:

APPROVED AS TO FORM ONLY this _____ day of __________, 2001.

ATTORNEY GENERAL

ALLEN BIAGGI, *Administrator*

(775) 687-4670

TDD 687-4678

Administration
Facsimile 687-5856

Water Pollution Control
Facsimile 687-4684

Mining Regulation and Reclamation
Facsimile 684-5259

STATE OF NEVADA
KENNY C. GUINN
Governor

R. MICHAEL TURNIPSEED, *Director*

Waste Management
Corrective Actions
Federal Facilities

Air Quality
Water Quality Planning

Facsimile 687-6396

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

DIVISION OF ENVIRONMENTAL PROTECTION

333 W. Nye Lane, Room 138
Carson City, Nevada 89706

January 4, 2001

Kerr-McGee Chemical Corporation
Attn: Ms. Susan Crowley
P.O. Box 55
Henderson, NV 89009-7000

Dear Ms. Crowley:

Please find attached the quarterly billing for the periods 04/01/00 through 06/30/00 and 07/01/00 through 09/30/00 for our Consent Agreement relating to the Kerr-McGee site in Henderson, Nevada.

The total amount requested at this time is $6,200.81 and is detailed as follows:

Billing #6	(04/01/00-06/30/00)	$3,601.78
Billing #7	(07/01/00-09/30/00)	$2,599.03

Should you have any question, please contact Doug Zimmerman (Ext. 3127), Jennifer Carr (Ext. 3020), or Lauri Dunn (Ext. 3119).

Sincerely,

Allen Biaggi
Allen Biaggi
Administrator

AB/ld:88-BILL.LTR
Attachments
cc: Doug Zimmerman/Jennifer Carr (w/attachments)
Dan Stewart (w/attachments)
Lauri Dunn (w/attachments)

NV Div. Environmental Protection & Kerr McGee Chemical
SCHEDULE OF EXPENDITURES AND RECONCILIATION
BCA: Kerr-McGee Perchlorate Agreement
For the Period Covered: 07/01/97 - 09/30/00
Agreement Budget Period: 07/28/99 - Open

* OVERALL - COMBINED *

REVENUES

BILLINGS	Budget	SFY98 07/01/97-06/30/98	SFY99 07/01/98-06/30/99	SFY00 07/01/99-06/30/00	SFY01 07/01/00-06/30/00	Cumulative Revenue	Variances Favorable (Unfavorable)	%
#1 Payment (SFY98)		40,286.35				40,286.35		
#2 Payment (SFY99)			12,780.13			12,780.13		
#3 Payment (-09/30/99)				2,717.51		2,717.51		
#4 Payment (-12/31/99)				6,267.52		6,267.52		
#5 Payment (-03/31/00)				3,535.31		3,535.31		
ACTUAL CASH RECEIVED TO DATE:		40,286.35	12,780.13	12,520.34	0.00	65,586.82		
TOTAL REVENUE	72,694.94	40,286.35	12,780.13	16,122.12	2,599.03	71,787.64	(907.30)	-1.25%

EXPENDITURES	Budget*	SFY1998 07/01/97-06/30/98	SFY1999 07/01/98-06/30/99	SFY00 07/01/99-06/30/00	SFY01 07/01/00-06/30/00	Cumulative Expenditures	Variances Favorable (Unfavorable)	%
Salary/Fringe Benefits	39,202.52	15,182.37	10,017.52	12,136.49	1,956.46	39,292.84	(90.32)	-0.23%
Travel	3,049.40	1,180.46	718.94	962.95	151.50	3,013.85	35.55	1.17%
Operating	1,395.02	474.22	375.80	340.52	0.00	1,190.54	204.48	14.66%
Training	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%
Contracts	21,471.13	20,610.20	25.00	0.00	0.00	20,635.20	835.93	3.89%
Total Direct	65,118.07	37,447.25	11,137.26	13,439.96	2,107.96	64,132.43	985.64	1.51%
Indirect Costs	7,576.87	2,839.10	1,642.87	2,682.16	491.07	7,655.20	(78.33)	-1.03%
TOTAL EXPENDITURES	72,694.94	40,286.35	12,780.13	16,122.12	2,599.03	71,787.63	907.31	1.25%

*Note: Budget is based on State Budgets for each Fiscal Year.

Fee Share Expended	71,787.63
Less Fee cash on hand	(65,586.82)
	6,200.81
Billing #6	3,601.78
Billing #7	2,599.03
Adjusted Billing #6 & 7:	6,200.81

File Name: I:\123DATA\ACCOUNT\FEDGRT00\BFF-88.WK3

Lauri Dunn 12/20/2000
Prepared By: (OFPM) Date

Theresa Cooke 12/28/00
Reviewed By: (OFPM) Date

Doug Zimmerman 1/02/01
Approved By: (BCA Bureau Chief) Date

NV Div. Environmental Protection & Kerr McGee Chemical
SCHEDULE OF EXPENDITURES AND RECONCILIATION
For the Period Covered: 07/01/99 - 06/30/00
Agreement Budget Period: 07/28/99 - Open

* SFY00 (07/01/99 - 06/30/00)*

REVENUES	Budget	SFY2000 YTD Revenues	Variances Favorable (Unfavorable)	%
#3 Payment (-09/30/99)		2,717.51		
#4 Payment (-12/31/99)		6,267.52		
#5 Payment (-03/31/00)		3,535.31		
#6 Payment (-06/30/00)				
TOTAL CASH RECEIVED TO DATE:		12,520.34		
TOTAL REVENUE	18,789.00	16,122.12	(2,666.88)	-14.2%

(73.6 Report Dated:) 09/30/00

EXPENDITURES	Budget*	SFY2000 YTD Expenditures	Variances Favorable (Unfavorable)	%
Salary/Fringe Benefits	14,000.00	12,136.49	1,863.51	13.3%
Travel	1,150.00	962.95	187.05	16.3%
Operating	545.00	340.52	204.48	0.0%
Training	0.00	0.00	0.00	0.0%
Contracts	0.00	0.00	0.00	0.0%
Total Direct	15,695.00	13,439.96	2,255.04	14.4%
Indirect Costs	3,094.00	2,682.16	411.84	13.3%
TOTAL EXPENDITURES	18,789.00	16,122.12	2,666.88	14.2%

*Note: Total is based on State Budgets for each Fiscal Year.

Fee Share Expended	16,122.12
Less Fee cash on hand	(12,520.34)
Requested Billing #6:	3,601.78
Adjusted Billing #6:	**3,601.78**

Lauri Dernn
Prepared By: (OFPM) 12/20/2000 Date

Theresa Cooker
Reviewed By: (OFPM) 12/28/00 Date

Doug Zimmer
Approved By: (BCA Bureau Chief) 1/02/01 Date

NV Div. Environmental Protection & Kerr McGee Chemical
SCHEDULE OF EXPENDITURES AND RECONCILIATION
For the Period Covered: 07/01/00 - 09/30/00
Agreement Budget Period: 07/28/99 - Open

*** SFY01 (07/01/00 - 06/30/01)***

REVENUES	Budget	SFY2001 YTD Revenues	Variances Favorable (Unfavorable)	%
#7 Payment (-09/30/00)				
TOTAL CASH RECEIVED TO DATE:		0.00		
TOTAL REVENUE		2,599.03	2,599.03	0.0%

(73.6 Report Dated: 10/31/00

EXPENDITURES	Budget*	SFY2001 YTD Expenditures	Variances Favorable (Unfavorable)	%
Salary/Fringe Benefits	0.00	1,956.46	(1,956.46)	0.0%
Travel	0.00	151.50	(151.50)	0.0%
Operating	0.00	0.00	0.00	0.0%
Training	0.00	0.00	0.00	0.0%
Contracts	0.00	0.00	0.00	0.0%
Total Direct	0.00	2,107.96	(2,107.96)	0.0%
Indirect Costs	0.00	491.07	(491.07)	0.0%
TOTAL EXPENDITURES	0.00	2,599.03	(2,599.03)	0.0%

*Note: Total is based on State Budgets for each Fiscal Year.

Fee Share Expended	2,599.03
Less Fee cash on hand	0.00
Requested Billing #7:	2,599.03
Adjusted Billing #7:	**2,599.03**

Lauri Dunn 12/20/2000
Prepared By: (OFPM) Date

Theresa Cooker 12/08/00
Reviewed By: (OFPM) Date

Doug Zimmerman 1/02/01
Approved By: (BCA Bureau Chief) Date

From: Kaplan.Mitch @ epamail.epa.gov
To: BPOHLMAN @ NDEP-LV, Doug Zimmerman
Subject: Accelerated Remedial Measures for Perchlorate at Kerr McGee

===NOTE===============12/20/00==5:58pm=====================================
CC:
Barton.Dana @ epamail.epa.gov, Bowerman.Larry @ epamail.epa.gov, Kemmerer.John @ epamail.epa.gov, Scott.Jeff @ epamail.epa.gov, Seter.David @ epamail.epa.gov, Takata.Keith @ epamail.epa.gov, Vaille.Rich @ epamail.epa.gov, Vanderpool.Lisa @ epamail.epa.gov

Doug and Brenda- This memo is a followup to the discussions that we've had on December 14th and the 15th as well as the meeting we had with Kerr McGee in Henderson on December 5, 2000. The discussions on the 14th centered on what could be done to speed up Kerr McGee's perchlorate cleanup efforts. KMCC's current timetable is to begin operation of an area-wide treatment system by the end of 2001. We also spoke about the possibility of NDEP issuing an order (Consent Agreement or Unilateral) to Kerr McGee, within the next couple of months, specifying exactly what measures we would like them to implement and a specific timetable for implementation of those measures. We are providing you with our current thoughts about what we can reasonably expect Kerr McGee to do regarding the accelerated remediation of perchlorate. We are aware that these ideas are subject to change pending review of Kerr McGee's hydrogeologic investigation report of conditions near Las Vegas Wash, which we expect to receive during the first week of January 2001.

EPA has some basic concerns with Kerr McGee's current approach to perchlorate remediation and the framework under which this remediation would occur.

1. The proposal presented by Kerr McGee is in effect a voluntary cleanup action. There is currently no enforcement mechanism in place which would clearly define what steps will be taken and a specific schedule that would be followed. NDEP did enter into a Consent Agreement with Kerr McGee which provided a structure for previous work that Kerr McGee has carried out. Our recollection is that the first Consent Agreement with Kerr McGee envisioned a second Agreement once additional information had been gathered. We appear to be at the point where a second Agreement would be appropriate.

2. Kerr McGee's current proposal contains no additional plans for remedial activities near Las Vegas Wash, despite the fact that concentrations of perchlorate in Lake Mead at the intake point for Las Vegas' drinking water, have exceeded the current EPA reference dose of 4-18 ppb.

3. The current proposal doesn't take full advantage of Kerr McGee's available assets or the opportunities that have opened up as the result of the ongoing investigation near Las Vegas Wash.

Following are some ideas for additional steps that we feel could be taken on a shorter term basis than that which Kerr McGee has proposed including some suggestions that Kerr McGee provided at the meeting we had with them on December 5, 2000.

Las Vegas Wash:

1. By the end of March 2001 add another ion exchange unit to the 2 units already operating at the Wash which are treating the water from the ground water seep. Addition of the third unit could increase the capacity of the treatment system to approximately 800 gpm. From our observations of ground water and surface water conditions near Las Vegas Wash and the seep, there appears to be sufficient water to fully utilize the expanded system.

2. By the end of March 2001 install ground water extraction wells and/or a series of trenches near Las Vegas Wash to capture the additional groundwater/surface water. A short pipeline along the surface could convey the water to the ion exchange system. 2 units could be operated while the third is down for resin replacement.

3. Operate the ion exchange units near the Wash during 2001 and 2002 or until the perchlorate concentrations in Las Vegas Wash show significant decreases as a result of pumping and treatment of ground water at the Pittman Lateral.

Pittman Lateral:

Begin extraction of ground water from wells along the lateral in April 2001 when the pipeline is scheduled for completion. This water would be pumped to the evaporation pond. An analysis of whether the pond has sufficient capacity to support this action for 8 months should be conducted. The addition of a slurry wall immediately downgradient of the pumping wells might increase the efficiency of the extraction system. The issue of pumping ground water containing organic compounds and other hazardous wastes, which may be limited due to language with Kerr McGee's NPDES permit, needs to be resolved by NDEP.

Treatment Plant:

The current design capacity (825 gpm) of the proposed treatment plant may not be adequate, considering the additional volume of water that could be captured at Las Vegas Wash (800 gpm total), the 400 gpm or more of water that could be pumped at the Pittman Lateral and the 40-60 gpm of water being pumped at the chrome treatment line. An increase in capacity to 1200-1500 gpm should be considered.

Pipeline:

We should find out the design capacity of the pipeline and determine if its capacity can be increased to 1500 gpm, if needed. This could be a limiting factor in KMCC's ability to deal with the additional water from Las Vegas Wash, in which case other means of transporting water from the seep to the treatment plant would have to be found. Another option would be to continue to treat seep water in the ion exchange units at the wash until perchlorate concentrations drop to acceptable levels.

Chrome Treatment Line:

Kerr McGee has suggested construction of a slurry wall immediately downgradient of this line of pumping wells. This could increase the capture efficiency of the pumping system. As with the use of a slurry wall at the Pittman Lateral, there could be a problem of elevated ground water levels immediately upgradient of the walls. If slurry walls are constructed, the upgradient extraction systems must be designed to fully extract the ground water flow being intercepted by the slurry wall.

Cost-Benefit Analysis:

If Kerr McGee has not done so already, a cost-benefit analysis should be done to see if it is more cost-effective to operate an expanded ion exchange system at Las Vegas Wash for 1-3 years as opposed to operating an expanded overall ion exchange system which would not become operational until late 2001.

We hope these ideas will be helpful in your efforts to craft an Order to Kerr McGee for an accelerated effort to remediate perchlorate. We had discussed the possibility of getting Jeff Scott to visit KMCC and take a look at the evaporation pond, the ground water seep and Las Vegas Wash as well as to meet Allan Biaggi. The earliest dates that would work for Jeff, Larry and myself are January 8th or 9th. The meeting could also be held at your office in Carson City. Let us know what will work for Allan Biaggi and you guys and if we can be of further assistance. Please call Larry Bowerman at (415) 744-2051 or Mitch Kaplan at (415) 744-2063.

KMCLLC / NDEP / EPA Meeting

December 5, 2000

- General Update on Current Remediation Efforts
  - Presentation of mass removals at remediation locations
    - Groundwater pond capture
    - PC-70 water collection
    - Seep water capture and treatment

- Report of Supplemental Work Plan Activities
  - Groundwater tracer study describing groundwater velocities
  - Nested well installation/area reconnaissance/wash bank groundwater sampling

- Long-Term Remedy Technology Selection. Activities Undertaken While Final Decisions Were Made – Building Permits / Easement Procurement, Etc.
  - Collection system March 31, 2001
  - Treatment facility – technology selection

- Status of NDEP Approved NPDES Permit
  - Wash tracer study – in conjunction with SNWA and wash coordination team
  - Technical basis for TDS removal feasibility report prepared by Parsons for the HISSC – evaluation of extension of this feasibility study to the discharge matrix
  - WET test protocol development
  - Exclusion of groundwater processing unless discharge water meets the wash discharge standards (The appropriate approval will be needed form NDEP (Water Pollution Control) before any groundwater (other than GWTP and limited PC-70 groundwater) can be processed.)

- NDEP question about feasibility of treating more water in the temporary IX system.

From: SCROWLEY @ KMG.com (Crowley, Susan)
To: Doug Zimmerman, BPOHLMAN @ NDEP-LV ("'Pohlmann, Brenda'")
Subject: Update on Perchlorate Activities

===NOTE===============11/21/00==2:41pm=======================================
CC:
KBAILEY @ KMG.com ("Bailey, Keith"), pcorbett @ kmg.com ("Corbett, Pat"), EKRISH @ KMG.com ("Krish, Ed"), espore @ kmg.com ("Spore, Everette"), rstater @ kmg.com ("Stater, Rick")

Doug,
Earlier today I briefly updated you on perchlorate issues. This e-mail follows up that brief discussion:

* Kerr-McGee has now committed itself to the single permanent technology of ion exchange for perchlorate removal from water. I believe we have talked about our IX plans before - but in essence the permanent IX system will utilize a similar method to that being employed on a temporary basis for perchlorate removal from water, followed by a perchlorate destruction process. Kerr-McGee will be addressing all the needed changes to allow this to happen - including modification of any permits (building, discharge or whatever else may be needed).
* Ed Krish is in the process of preparing a report describing the full range of activities in the seep area - covered by the supplemental Work Plan. This will include addressing the Brenda's earlier question related to the feasibility of recovering additional water (extracting groundwater) in the seep's vicinity.
* Kerr-McGee is nearing completion on the easements for the transfer pipeline. The last easement to be finalized is the passthrough under Boulder Hwy, between BMI and Kerr-McGee.

Please feel free to call me if you have any questions?

Susan M. Crowley
Kerr-McGee Chemical LLC
(702) 651-2234
(702) 592-7727 cell
(702) 651-2310 fax

KERR-McGEE CHEMICAL LLC
POST OFFICE BOX 55 - HENDERSON, NEVADA 89009

SEP 28 01

November 9, 2000

Mr. LaVerne Rosse
Deputy Administrator
State of Nevada
Division of Environmental Protection
333 W. Nye Lane
Carson City, NV 89710

Subject: Closed Hazardous Waste Landfill
2000 Post Closure Monitoring Results

Dear Mr. Rosse:

Kerr-McGee Chemical Corporation's (KMCC) Henderson facility conducted RCRA groundwater monitoring as required by 40 CFR 265.92 (d)(1) in May 2000. The wells sampled are associated with the post closure requirements of the on-site closed hazardous waste landfill. Analytical results were compared with 1982/83 baseline values as required under 40 CFR 265.93 (c). All significant changes in downgradient water quality represented a movement towards improved quality.

Notice of a statistically significant change of an upgradient well groundwater quality parameter is made herein pursuant to 40 CFR 265.93 (c)(1). Because the downgradient conditions continue to indicate a better groundwater quality than is apparent upgradient of the landfill, there is no indication the landfill has impacted water quality parameters in the vicinity of the landfill.

In 1982, a monitoring program was established with one upgradient and three downgradient wells to follow the groundwater quality in the closed hazardous waste landfill area. M-5 was the upgradient well. M-6, M-7 and H-28 were the downgradient wells. During the 2000 post closure sampling, a statistically significant change from baseline of the historical **upgradient** well M-5 was detected for parameters of pH, specific conductance (SpCd) and total organic halides (TOX or TOH). Please see Table 1. The change from baseline was trending towards a **quality improvement** for parameters of pH and TOX. The trend for SpCd was toward higher level. This change is consistent with past sampling efforts. This same trend has been apparent since 1991 monitoring.

All statistically significant changes from baseline detected in the **downgradient** monitoring wells described below reflect a groundwater **quality improvement** when compared to the 1982/83 baseline values of upgradient well M-5. Please see Table 1. All parameters, pH, SpCd, TOC and TOX moved in the direction of quality improvement in all three downgradient wells, M-6A, M-7A and H-28. Additional groundwater samples were collected, as required under 40 CFR 265.93 (c)(2), and analyzed for pH, SpCd, TOC and TOX at each well showing a significant difference from the historical upgradient well concentrations.

Statistically, analysis of the resampled parameters did show support for:

1. An increase in pH in M-5A, M-6A, M-7A and H-28, towards better water quality.

2. A decrease in SpCd in M-6A, M-7A and H-28, towards better water quality.

3. An increase in SpCd in 5A, the upgradient well.

4. A decrease in TOC in M-5A, M-6A, M-7A and H-28, towards better water quality.

4. A decrease in TOX in M-5A, M-6A, M-7A and H-28, towards better water quality.

The downgradient change from baseline was trending towards a **quality improvement** for parameters of pH, SpCd, TOC and TOX. This change is consistent with past sampling efforts. This same trend has been apparent since 1991 monitoring.

Water levels, statistical comparisons and analytical results are attached as Table 1. Resample results are attached as Table 2.

Based on information herein and the information presented since the June 1984 Closure/Post Closure Plan (revised October 1984) was submitted, the closed landfill has been demonstrated to have no impact on groundwater quality.

Please feel free to contact me at (702) 651-2234, if you have any questions. Thank you.

Sincerely,

SMCrowley

Susan M. Crowley
Staff Environmental Specialist

Certified Mail

cc: FRStater
MJPorterfield

smc\Landfill Monitoring to NDEP 06-00.doc

TABLE 1. KERR-McGEE CHEMICAL CORPORATION - HENDERSON, NV
Hazardous Waste Landfill Post Closure Monitoring
2000

Well #	Date	Water Level (feet)	Total Chromium (ppm)	Iron (ppm)	Manganese (ppm)	Sodium (ppm)	Chloride (ppm)	Sulfate (ppm)	Phenols (ppb)	TOC (ppm)	TOX (ppm)	pH	Specific Conductance (umhos/cm)
M-5A	07/24/00	1708.46	0.02	5.3	1.6	1500	4300	2900	2.77	34.5	6.8	7.03	11500
										46.1	5.8	7.11	11300
										36.0	5.0	7.06	11300
										41.9	5.4	7.18	11200
							M-5A Average			39.6	5.7	7.10	11325
							M-5A Standard Deviation			4.7	0.7	0.06	109
							Background (M-5) *			62.3	47.7	6.34	10469
							M-5A t-Test			**0.92**	**5.03**	**4.00**	**7.99**
M-6A	07/24/00	1688.87	0.01	4	0.46	1200	4000	3100	4.34	1.2	0.7	7.41	6550
										1.4	0.7	7.41	6640
										1.1	0.6	7.45	6680
										0.9	0.4	7.43	6680
							M-6A Average			1.1	0.6	7.43	6638
							M-6A Standard Deviation			0.2	0.1	0.02	53
							Background (M-5) *			62.3	47.7	6.34	10469
							M-6A t-Test			**2.48**	**5.65**	**7.07**	**36.76**
M-7A	07/24/00	1693.00	0.045	29	0.69	1300	2000	2200	3.24	1.5	1.9	7.49	6760
										1.4	2.0	7.58	6780
										1.9	1.9	7.45	7030
										1.3	1.9	7.51	6980
							M-7A Average			1.5	1.9	7.51	6888
							M-7A Standard Deviation			0.2	0.1	0.05	119
							Background (M-5) *			62.3	47.7	6.34	10469
							M-7A t-Test			**2.46**	**5.48**	**7.58**	**33.18**
H-28	07/24/00	1700.48	1.1	450	17	1200	2500	1500	4.05	5.2	1.5	7.3	6470
										2.4	1.9	7.3	6800
										6.0	1.9	7.3	6680
										3.7	2.0	7.4	6240
							H-28 Average			4.3	1.8	7.34	6548
							H-28 Standard Deviation			1.4	0.2	0.03	213
							Background (M-5) *			62.3	47.7	6.34	10469
							H-28 t-Test			**2.35**	**5.50**	**6.47**	**33.35**
Field Blank	07/24/00	NA	ND	ND	ND	ND	ND	ND	<10	<1.0	<0.01	6.80	5

* Values are the result of 16 replicates (4 per quarter from 6/82 to 3/83)
** H-28 well found with a blockage in the upper portion. Water level and sampling not possible for this sampling event.

TABLE 2.
Hazardous Waste Landfill Post Closure Monitoring - 2000 Confirmatory Resample

Well #	Date	TOC (mg/l)	TOX (mg/l)	pH	Specific Conductance (umhos/cm)
M-5A	09/21/00	41.00	10.10	7.05	12000
		38.50	8.30	7.12	11500
		40.00	8.80	7.09	11500
		36.70	9.70	7.08	11200
	M-5A Average	39.05	9.23	7.09	11550
	M-5A Standard Deviation	1.62	0.71	0.03	287
	Background (M-5) *	62.3	47.7	6.34	10469
	M-5 t-Test	**0.94**	**4.61**	**4.85**	**8.44**
M-6A	09/21/00	1.80	0.50	7.34	7050
		1.80	0.80	7.21	6880
		2.00	0.70	7.30	6880
		1.80	0.70	7.30	6900
	M-6A Average	1.85	0.68	7.29	6928
	M-6A Standard Deviation	0.09	0.11	0.05	71
	Background (M-5) *	62.3	47.7	6.34	10469
	M-6A t-Test	**2.45**	**5.64**	**6.15**	**33.74**
M-7A	09/21/00	1.90	2.70	7.47	7800
		2.00	3.20	7.51	8200
		1.86	2.50	7.52	8350
		1.70	2.56	7.48	8070
	M-7A Average	1.87	2.74	7.50	8105
	M-7A Standard Deviation	0.11	0.28	0.02	202
	Background (M-5) *	62.3	47.7	6.34	10469
	M-7A t-Test	**2.45**	**5.37**	**7.08**	**7.13**
H-28	09/21/00	6.10	1.90	7.34	6500
		4.30	2.10	7.52	6450
		4.60	1.80	7.51	6250
		6.50	1.90	7.48	6800
	H-28 Average	5.38	1.93	7.46	6500
	H-28 Standard Deviation	0.94	0.11	0.07	197
	Background (M-5) *	62.3	47.7	6.34	10469
	H-28 t-Test	**2.31**	**5.49**	**7.26**	**34.34**
Field Blank	09/21/00	<1.0	<0.01	6.8	5

* Values are the result of 16 replicates (4 per quarter from 6/82 to 3/83)

PETER G. MORROS, Director

ALLEN BIAGGI, *Administrator*

(775) 687-4670

TDD 687-4678

Administration
Water Pollution Control
Facsimile 687-5856

Mining Regulation and Reclamation
Facsimile 684-5259

STATE OF NEVADA
KENNY C. GUINN
Governor

Waste Management
Corrective Actions
Federal Facilities

Air Quality
Water Quality Planning
Facsimile 687-6396

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

DIVISION OF ENVIRONMENTAL PROTECTION

333 W. Nye Lane, Room 138
Carson City, Nevada 89706-0851

November 7, 2000

Ms. Susan Crowley
Kerr-McGee Chemical LLC
P.O. Box 55
Henderson, Nevada 89009

RE: Compliance Evaluation Inspection Report for NV0000078 - Response Review

Dear Ms. Crowley:

The Nevada Division of Environmental Protection has reviewed your responses to our June 6, 2000 compliance evaluation inspection report. All of our inspection comments have been adequately addressed.

It does appears from the iso-pleth you provided that there are elevated levels of perchlorate in the ground water just west of the AP ponds, in addition to the elevated levels from Units 4 and 5. However, these issues will be addressed with the remediation and characterization efforts being coordinated with the Division's Bureau of Corrective Actions and yourself.

Finally, based upon the outcome of the televising of the storm water lines, Kerr-McGee must present a plan to reduce the levels of perchlorate entering the storm water system.

Thank you for the thorough response to our inspection comments. If there are any questions on the report or this letter, please call me at (775) 687-4670 ext. 3151.

Sincerely,

Joseph L. Maez

Joseph L. Maez, P.E.
Technical Services Branch
Bureau of Water Pollution Control

CC: Darrell Rasner, P.E.,NDEP
Jennifer Carr, P.E., CEM, NDEP
Tom Huetterman, WTR-7, U.S. EPA Region 9, 75 Hawthorne Street, San Francisco, CA, 94105

PETER G. MORROS, Director

L.H. DODGION, *Administrator*

(702) 687-4670
TDD 687-4678

Administration
Mining Regulation and Reclamation
Water Pollution Control
Facsimile 687-5856

STATE OF NEVADA
BOB MILLER
Governor

Waste Management
Corrective Actions
Federal Facilities

Air Quality
Water Quality Planning
Facsimile 687-6396

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

DIVISION OF ENVIRONMENTAL PROTECTION

333 W. Nye Lane, Room 138
Carson City, Nevada 89706-0851

F A X

DATE: 10/11/00

TO: Susan Crowley

FAX NUMBER: 702-651-2310

FAXED

FROM:

STATE OF NEVADA KENNY C. GUINN, *Governor*
Department of Conservation and Natural Resources
Division of Environmental Protection

JENNIFER L. CARR, P.E., C.E.M.
Supervisor, Remediation Branch
Bureau of Corrective Actions

333 W. Nye Lane (775) 687-4670, Ext. 3020
Carson City. Nevada 89706-0851 Fax: (775) 687-6396
E-mail: jcarr@ndep.carson-city.nv.us

SUBJECT/COMMENTS:

NUMBER OF PAGES INCLUDING COVER PAGE: 2
IF YOU HAVE ANY QUESTIONS PLEASE CALL: (702) 687-4670, ext. 3141

(0)-1991

KERR-McGEE CHEMICAL LLC
POST OFFICE BOX 55 - HENDERSON, NEVADA 89009

October 11, 2000

Ms. Jennifer Carr
Nevada Division of Environmental Protection
123 West Nye Lane
Carson City, NV

Dear. Ms. Carr:

Subject: Work Plan for Debris Removal – Warm Springs and Boulder Hwy

Please find attached a Work Plan covering activities related to removal of debris from the northwest corner of Warm Springs Rd and Boulder Hwy. It is Kerr-McGee's intent to proceed as quickly as possible and request NDEP concurrence on the stated activities. This can be provided in the form of a signature below. Please feel free to call me at (702) 651-2234 if you have any questions. Thank you.

Jennifer L. Carr 10/11/00
NDEP Approval

Sincerely,

SM Crowley

Susan M. Crowley
Staff Environmental Specialist

cc: Robin Bain, BMI
PSCorbett
MJPorterfield
EMSpore
FRStater

From: SCROWLEY @ KMG.com (Crowley, Susan)
To: Doug Zimmerman, Jennifer Carr
Subject: Debris Work Plan

===NOTE==============10/11/00==5:59pm===================================
CC:
RBain @ BasicCo.com ("'Bain, Robin'"), pcorbett @ kmg.com ("Corbett, Pat"), espore @ kmg.com ("Spore, Everette"), rstater @ kmg.com ("Stater, Rick")

....

Jennifer,
Attached is the finalized Work Plan, with your comment included. There will be a hard copy of this in overnight service tomorrow, for delivery Friday. Thanks again for your consideration on this - and the speedy turn around.

<<Work Plan.PDF>>

Susan M. Crowley
Kerr-McGee Chemical LLC
(702) 651-2234
(702) 592-7727 cell
(702) 651-2310 fax

WORK PLAN
REMOVAL OF DEBRIS
FROM THE CORNER OF WARM SPRINGS RD
& BOULDER HWY

History
Kerr-McGee Chemical LLC is moving forward (with NDEP's approval) on construction plans for a perchlorate remediation process to be located on-site at the Henderson NV manufacturing facility. Remediation is intended to include water from the general location of the wash and so pipeline transport of this water, to and from the wash area, is being arranged. The pipelines will run from the wash area south along Pabco Rd and cross under Boulder Hwy, near the intersection of Boulder Hwy with Warm Springs Rd.

To accomplish the transfer under Boulder Hwy, Kerr-McGee intends to use the "BMI Siphon", which has for several decades, until recently, conveyed stormwater from the BMI facilities area under Boulder Hwy for ultimate transport to the Las Vegas Wash. With the recent construction of Warm Springs Rd this "BMI siphon" line under Boulder Hwy is no longer needed. Storm water has been redirected to prevent flooding of Warm Springs Rd. Thus the "BMI siphon" is available, if appropriately prepared, to function as a transfer line under Boulder Hwy of the perchlorate remediated water, being returned to the wash area.

To evaluate the suitability of the line for Kerr-McGee's use, Kerr-McGee contracted with Abe Sewer and Plumbing to camera view the line. Seeing the line was intact, with just minor repairs needed, Kerr-McGee then requested the contractor remove the sediment from the line, so that any necessary repairs could be made and the line prepared for its new use. The sediment (approximately 15 cubic yards) was placed in small piles beside the mid-point manhole (on the northwest corner of Warm Springs and Boulder Hwy), as well as at the line's termination point (east of Boulder Hwy). Several of the small piles in the vicinity of the mid-point manhole were spread to allow continued access to the area as the job progressed. The line is now clean and ready for consideration of use in the perchlorate remediation pipeline construction process.

Characterization
The material pulled from the mid-point manhole was sampled and analyzed for:
- Volatile Organics – EPA 8260B
- Semi-Volatiles – EPA 8270
- Perchlorate – EPA 314
- Organochlorine Pesticides – EPA 8081A, Dec 1996
- TCLP 8 Metals – EPA 6010 & EPA 7470A (Mercury)
- TPH – EPA 8015M

Analytical results show very low levels of only two organic compounds (DDT @ 200 ppb and DDE @ 100 ppb) and very low levels of metals (chromium @ 0.024 ppm and barium @ 1.7 ppm). All other analytes were returned as non-detected.

Work Proposed

Kerr-McGee proposes to remove the debris collected from the line at the mid-point manhole and transport this to the interim storage area within the confines of the BMI Common Area Upper Ponds. This interim storage area is currently being utilized to hold remediated material (from the Interim Remedial Measures (IRM) recently conducted under approved NDEP work plans at the BMI Common Areas Mohawk Area and Lower Ponds) until their final disposition is determined. Chemloc 411, a spray rubberized polymer, will be applied to the debris in the storage area to prevent wind, rain, and dust transport (as was also applied for the IRM material). In order to understand the matrix, as the debris is collected and removed, Kerr-McGee proposes to collect three samples representative of the material being transported. These representative samples will be composites made up of equal portions from the top, middle and bottom thirds of a pile. In addition to the piles, approximately 3 inches of substrate soil under each pile will be removed to ensure each entire pile has been collected.

Once the piles are collected and the immediate substrate soil has been removed from an area, a discrete sample of the soil in each pile's footprint will be collected.

In addition, two samples will be collected from the surface to 3 inch depth in the runoff area where the water carrying the sediments out of the siphon drained surficially. The first sample will be collected 20 foot from the pile area in the direction of runoff and the second will be 50 foot from the pile area in the direction of runoff.

All samples will be analyzed for Organochlorine Pesticides (DDT and DDE analytical method) as well as TCLP metals - chromium and barium, utilizing the same methods mentioned above.

Results will be evaluated to determine whether material transfer was complete and will be reported to NDEP. At that time the property owner, Basic Environmental Company, will request written confirmation from NDEP that this property requires no further remedial action as a result of this debris removal and that the current NFA status remains unchanged.

Susan M. Crowley scrowley@kmg.com
Kerr-McGee Chemical LLC
8000 West Lake Mead Dr.
Henderson, NV 89015
(702) 651-2234 office (702) 592-7727 cel
(702) 651-2310 fax

facsimile transmittal

To:	Jennifer Carr	**Fax:**	(775) 687-6396
From:	Susan M. Crowley	**Date:**	10/11/00
Re:	Debris Removal	**Pages:**	4, including cover sheet
CC:			

☐ **Urgent** X **For Review** X **Please Comment** ☐ **Please Reply** ☐ **Please Recycle**

Jennifer:

Please find attached the draft work plan. I'll call you this afternoon to see if you have any comments. Fee free to call me as well (707-592-7727) if you have any questions. Thanks.

Susan

Susan

KERR-McGEE CHEMICAL LLC
POST OFFICE BOX 55 - HENDERSON, NEVADA 89009

October 11, 2000

Ms. Jennifer Carr
Nevada Division of Environmental Protection
123 West Nye Lane
Carson City, NV

Dear. Ms. Carr:

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____
NDEP Approval

Sincerely,

Susan M. Crowley
Staff Environmental Specialist

cc: Robin Bain, BMI
PSCorbett
MJPorterfield
EMSpore
FRStater

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FROM THE CORNER OF WARM SPRINGS RD & BOULDER HWY

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Analytical results show very low levels of only two organic compounds (DDT @ 200 ppb and DDE @ 100 ppb) and very low levels of metals (chromium @ 0.024 ppm and barium @ 1.7 ppm). All other analytes were returned as non-detected.

<u>Work Proposed</u>

Kerr-McGee proposes to remove the debris collected from the line at the mid-point manhole and transport this to the interim storage area within the confines of the BMI Common Area Upper Ponds. This interim storage area is currently being utilized to hold remediated material (from the Interim Remedial Measures (IRM) recently conducted under approved NDEP work plans at the BMI Common Areas Mohawk Area and Lower Ponds) until their final disposition is determined. Chemloc 411, a spray rubberized polymer, will be applied to the debris in the storage area to prevent wind, rain, and dust transport (as was also applied for the IRM material). In order to understand the matrix, as the debris is collected and removed, Kerr-McGee proposes to collect three samples representative of the material being transported. These representative samples will be composites made up of equal portions from the top, middle and bottom thirds of a pile. In addition to the piles, approximately 3 inches of substrate soil under each pile will be removed to ensure each entire pile has been collected.

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All samples will be analyzed for DDT and DDE as well as TCLP metals, utilizing the same methods mentioned above.

? OK - Report all 8081 that lab compiles

Results will be evaluated to determine whether material transfer was complete and will be reported to NDEP. At that time the property owner, Basic Environmental Company, will request written confirmation from NDEP that this property requires no further remedial action as a result of this debris removal and that the current NFA status remains unchanged.

Km

CLARK COUNTY HEALTH DISTRICT

P.O. BOX 3902 • 625 SHADOW LANE • LAS VEGAS, NEVADA 89127 • 702-385-1291 • FAX 702-384-5342

October 10, 2000

OCT 23 00

Ms. Susan Crowley, Environmental Manager
Kerr McGee Chemical LLC
P. O. Box 55
Henderson, NV 89009

Re: Notice of Alleged Violation and **Request for Response** (SW00-324)

Dear Ms. Crowley:

This serves as a formal notification to you that Clark County Health District (CCHD) staff and two citizens witnessed an employee of Abe's Plumbing, with a truck, bearing Nevada license plate #46508P, and the words "Abe's Vactor Service, 385-5220, S002P, VWW08, and license #13516;" jetting out an underground pipe and dumping wastewater and sludge from the pipe onto the ground at the northwest corner of Boulder Highway and Warm Springs Road, Unincorporated Clark County, NV. These incidents occurred during 10:30 a.m. to 10:45 a.m., on August 22, 2000, and at 11:00 a.m. on August 23, 2000.

The sludge dumped onto the above-mentioned site was sampled by CCHD staff and analyzed by EPA method 8260B for Volatile Organic Compounds; by EPA method 8270C for Semi-Volatile Organic Compounds; for Inorganic Non-Metals (Perchlorate); by EPA method 8081A for Organochlorine Pesticides; for TCLP-8 Metals; by EPA method 7470A for Mercury; and by EPA method 8015A for Total Extractable Petroleum Hydrocarbons (TPH). The analytical results indicate that the sludge was positive for 4,4-DDE (110 μg/kg) and 4,4-DDT (200 μg/kg). The CCHD considers the sludge a U-listed hazardous waste (U061), pursuant to 40 Code of Federal Regulations (CFR), Part 261.33, as the sludge was most likely contaminated by discarded commercial chemical products, container residue, or spill residues thereof, from DDT that was formerly manufactured at the BMI complex.

You must immediately cease and desist from dumping sludge onto the above-mentioned property. You are directed to cleanup and properly dispose of the sludge that was dumped, and to provide the CCHD with disposal receipts verifying proper disposal of the sludge within 30 days upon receipt of this letter. You are further directed to submit a report prepared by a certified environmental manager verifying proper remediation of the above-mentioned site to the CCHD.

Please be advised that the above practice is in violation of the Federal Clean Water Act and Nevada Revised Statutes 444.630, Unlawful Disposal of Garbage or Sewage, and is subject to a fine and a civil penalty of at least $250.00 but not more than $2,000.00, as well as any penalties levied due to the above violation. Enclosed is a copy of the aforementioned NRS for your information. This incident is being considered for prosecution.

Please contact Messrs. Shane Martin or Glenn Savage at (702) 383-1027, or email us at ***cleanup@cchd.org***, should you have any questions regarding this matter.

Sincerely,

Environmental Health Division

Shane Martin

Shane Martin, MBA, R.E.H.S.
Environmental Health Specialist

Glenn D. Savage

Glenn D. Savage, R.E.H.S.
Environmental Health Supervisor

SM/GS

Enclosure: NRS 444.630, 40 CFR Part 261.33
Chemical Analytical Results for Project SW00-324

cc: Jeff Johnson, Nevada Division of Environmental Protection

Clark County Health District
625 Shadow Lane
Las Vegas, Nevada 89106
(702) 385-1291
Environmental Health Fax (702) 383-1445

Fax Cover Sheet

Company Name:	NDEP
Contact Name:	Jeff Johnson
Fax Number:	(775) 687-6396

Sender:	Shane Martin
Department:	CCHD
Description:	

Number of pages, including cover:	9
Date Sent:	

If there are any problems with this transmission, please call: (702) 383-1275 during the hours of 8:00AM to 4:30PM Monday through Friday.

NOTES

This map is for assessment use only and does NOT represent a survey. No liability is assumed for the accuracy of the data delineated herein.

Information on roads and other non-assessed parcels may be obtained from the Road Document Listing in the Assessor's Office.

This map is compiled from official records, including surveys and deeds, but only contains the information required for assessment. See the recorded documents for more detailed legal information.

MAP LEGEND

AVERAGE OR VALUE 45

ASSESSOR'S PARCELS - CLARK CO., NV.
M. W. Schofield, Assessor

PARCEL BOUNDARY	001 1.05 PARCEL NUMBER ACREAGE
SUBD BOUNDARY	202 PARCEL SUB/SEQ NUMBER
ROAD EASEMENT	PLAT RECORDING NUMBER
PU/LD BOUNDARY	5 BLOCK NUMBER
NON-PARCEL LOT LINE	LOT NUMBER
MATCH LINE	GLS GOV. LOT NUMBER
ROAD ID NUMBER	

BOOK T22S R62E

	R61E	R62E	R63E
T21S	162	160	169
T22S	177	178	179
T23S	188	190	199

Scale: 1"=200'

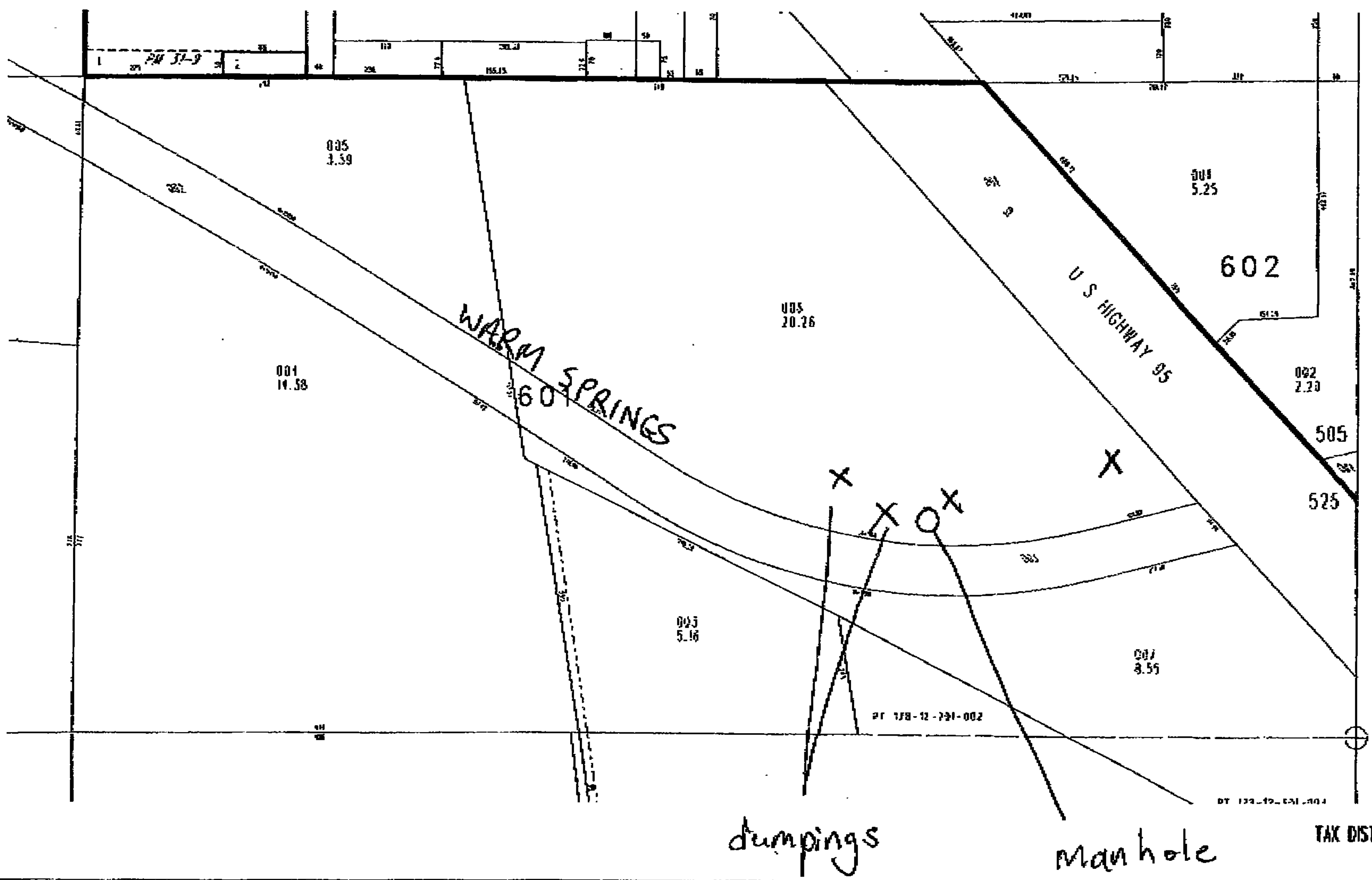
SEC 12

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Rev: 09/17/98

MAP S 2 NE 4

178-12-6



TAX DIST 505,525

M.W. Schofield, Assessor

Real Property Parcel Record

General Information			
Parcel No.	Owner and Mailing Address	Location Address City/Township	Assessor Description
178-12-601-006	BASIC ENVIRONMENTAL CO L L C 875 W WARM SPRINGS RD HENDERSON NV 89015-4063	UNINCORP. COUNTY	PT S2 NE4 SEC 12 22 62

Recorded Document No.	Recorded Date	Vesting
9999:9999999	99/99/9999	NO STATUS

Click here to view the Assessor Map for this parcel number.

Click On Parcel For Ownership History Information: 178-12-601-006

Assessment Information			*Supplemental Value*		
Tax District	Appraisal Year		Fiscal Year	Supplemental Improvement Value	Supplemental Improvement Account Number
525	2000		00-01		

Real Property Assessed Value						
Fiscal Year	Land	Improvements	Personal Property	Exempt	Gross Assessed	Taxable Value Land+Imp.
1999-00	283640	0	0	0	283640	810400
2000-01	609830	0	0	0	609830	1742370

Click here for Treasurer Information regarding real property taxes.

Estimated Lot Size		*Appraisal Information*			
Estimated Lot (Width x Depth)	**Estimated Size**	**Original Const.Yr.**	**Last Sale Price Month/Year**	**Land Use**	**Dwelling Units**
	Square Feet			VACANT	
	20.26 Acres				

******* NO RESIDENTIAL APPRAISAL RECORD FOR THIS PARCEL *******

AssessorMap Viewing Guidelines
In order to view the Assessor map you must have Adobe Acrobat Reader installed on your computer system. **THE ADOBE ACROBAT READER IS FREE.** **If you have the Reader installed, to view map click on the following numbers 178126** **If you do not have the Reader it can be downloaded from the Adobe site by clicking the following button. Once you have downloaded and installed the Reader from the Adobe site, it is not necessary to perform the download a second time to access the maps.** Get Acrobat Reader

NOTE: THIS RECORD IS FOR ASSESSMENT USE ONLY. NO LIABILITY IS ASSUMED AS TO THE ACCURACY OF THE DATA DELINEATED HEREON.

CLARK COUNTY ASSESSOR

Government Center, 500 South Grand Central Parkway, Las Vegas, Nevada 89155-1401

702-455-3882 (INFORMATION)

Solid Waste File Memorandum

File: SW00-324

Shane Martin

From: Shane Martin, MBA, R.E.H.S., Senior Environmental Health Specialist

Subject: Memo to Record

Date: September 28, 2000

On August 23, 2000, at 11:00 a.m., I responded to a complaint at the northwest corner of Boulder Highway and Warm Springs Road where I observed an operator of a truck, bearing Nevada license plate #46508P, and the words "Abe's Vactor Service, 385-5220, S002P, VWW08, and Lic #13516," dumping water/sludge onto the ground behind the truck. I spoke with the operator, named Glenn Currey, who said that he was jetting out an underground pipe that connected from Kerr McGee and ran below ground under Boulder Highway to the Joker's Wild parking lot and across Pabco Road. I asked Mr. Currey what the pipe contained and he said it was a stormwater pipe that was filled with sand and gravel. I asked Mr. Currey who told him to dump the sludge onto the vacant lot and he said that Mr. Everett Spore with Kerr McGee was the person who told him to dump there. He gave me Mr. Everett Spore's phone number - 596-9402.

I met with A.C. Crisp, who worked for Pacific Process, the contractor who was hired by Kerr McGee to clean out the abandoned 24" underground pipe. Mr. Crisp said that Timet granted Kerr McGee an easement to allow them to use the underground pipe, which they are no longer using. Mr. Crisp said that Landwell, which is owned by Timet, Kerr McGee, and Pioneer, is the owner of the property.

Mr. Crisp took me on a tour of the pipe line and showed me where it originated and where it ended. The pipe line originated on Timet's property inside of their property boundary where there was a large concrete opening and a dry creek leading into the concrete opening that ran west under Kerr McGee's fence line. The pipe line ended on the other side of Boulder Highway south of Pabco Road and the Joker's Wild Casino.

I called Mr. Everett Spore, Engineering Manager, Kerr McGee, who met us at the property where the pipe was being cleaned out. I asked Mr. Spore if they took any analytical samples of the sludge contained inside the pipe and he said to contact Susan Crowley, Environmental Manager, Kerr McGee, at 651-2234, for further information. Mr. Spore said that he gave authorization to Abe's Plumbing to dump onto the property, which is owned by Landwell.

On August 24, 2000, at 3:30 p.m., I revisited the site and obtained six soil samples of the sludge that was dumped onto the ground and submitted them to Nevada Environmental Laboratories for analytical testing - TCLP RCRA 8 Metals, Perchlorate, EPA 8260 Volatiles, Total Petroleum Hydrocarbons (TPH), EPA 8081 Pesticides, and EPA 8270 Semi Volatiles.

On September 28, 2000, I returned a call to Mr. Glenn Currey with Abe's Plumbing, at 385-5220. Mr. Currey called us to find out about a bill that we submitted to Abe's Plumbing for analytical testing of the sludge dumped at the northwest corner of Warm Springs Road and Boulder Highway. Mr. Currey said that Abe's Plumbing was not responsible for the dumping or paying the analytical fees because Mr. Everett Spore, Engineering Manager, Kerr McGee, hired Abe's Plumbing and authorized them to dump onto their property. Mr. Currey said that he normally would have taken the sludge to Apex Landfill, but Mr. Spore told him to dump it onto their property.

At 10:30 a.m., I called Mr. Spore with Kerr McGee, at 651-2352, and left a message for him because he was not available. I also called 651-2234 and left a message for Susan Crowley, Environmental Manager, Kerr McGee.

G:\SMartin\444630\2000\sw00324a.wpd

VOLUNTARY STATEMENT

SW00-324

THIS PORTION TO BE COMPLETED BY OFFICER

Specific Crime: NRS 444.630, Unlawful Disposal of Garbage or Sewage | Date Occurred: | Time Occurred:

Location of Occurrence: ☐ City ☐ County

COMPLAINANT'S INFORMATION (*Please Print Legibly*)

Can you identify the Suspect?	Name (Last/First/Middle) Please Print (Mr./Mrs./Ms.)	Date of Birth	Social Security #
☐ Yes ☒ No	LEE, CARLOS	10/20/65	560-17-6212

Race	Sex	Height	Weight	Hair	Eyes	Work Schd. (Hours)	(Days Off)	Business/School

Residence Address: (Number & Street)	Bldg./Apt. #	City	State	Zip Code	Res. Phone: / Bus. Phone:
					Bus. Phone: 450-3549

Bus. (Local) Address: (Number & Street)	Bldg./Apt. #	City	State	Zip Code	Occupation	Depart Date (if visitor)
3595 E. PATRICK LN #1200		LAS VEGAS	NV	89120	INVESTIGATOR	

Best place to contact you during the day: Bus. @ 10:30 - 10:45 AM | Best time to contact you during the day:

DETAILS On 8/22/00, I, along with my co-worker, Fred Douglas, were driving southbound on Boulder Hwy preparing to turn right at Warm Springs. We saw a large utility truck apparently dumping an unknown substance (appeared to be mud like debris) from a large canister which was attached to the truck. The truck also had what appeared to be some type of drill or pipe extended from it to beneath the desert surface. We stopped and photographed the activity. The business listed on the large truck was Abe's Vactor Service, license #13516. There was also a full size pick up truck (white) that was parked beside the utility truck. There were 2 Caucasian males working with the equipment.
Info on truck - Abe's Vactor Service, S002P, VWWW08, Hydro Jetting, Plumbing Sewer Svc

Do you intend to pursue a possible reward within the purview of NRS 444.640, Reward for information leading to arrest and conviction of violator? (Copy attached) (*Reward is available only when a fine is paid).* ☒ Yes ☐ No
I am including (Number) 3 photographs taken on (Date) 8/22/00 with this complaint as evidence.

I HAVE READ THIS STATEMENT AND I AFFIRM TO THE TRUTH AND ACCURACY OF THE FACTS CONTAINED HEREIN. THIS STATEMENT WAS COMPLETED AT (LOCATION) Boulder Highway and Warm Springs, Hend, NV
ON THE 23rd DAY OF August AT 11:30 (AM/PM), ~~19~~ 2000

Carlos [signature]
SIGNATURE OF PERSON GIVING STATEMENT

Witness: Shane Martin
(SIGNATURE)

Witness: Shane Martin
(PRINTED)

8/23/00
DATE

White/Original Yellow/Informant

Clark County Health District

Page___of___

VOLUNTARY STATEMENT

THIS PORTION TO BE COMPLETED BY OFFICER

Specific Crime: NRS 444.630, Unlawful Disposal of Garbage or Sewage | Date Occurred | Time Occurred

Location of Occurrence ☐ City ☐ County

COMPLAINANT'S INFORMATION (*Please Print Legibly*)

Can you identify the Suspect?	Name (Last/First/Middle) *Please Print* (Mr./Mrs./Ms.)	Date of Birth	Social Security #
☐ Yes ☒ No	Douglas, Frederick J. Mr.	4/2/65	409-29-4776

Race	Sex	Height	Weight	Hair	Eyes	Work Schd. (Hours)	(Days Off)	Business/School

Residence Address: (Number & Street)	Bldg./Apt. #	City	State	Zip Code	Res. Phone: / Bus. Phone:
					Bus. Phone: 450-3574

Bus. (Local) Address: (Number & Street)	Bldg./Apt. #	City	State	Zip Code	Occupation	Depart Date (if visitor)
3595 E Patrick	1200	Las Vegas	NV	89120	Ins. Claims	

Best place to contact you during the day: Business
Best time to contact you during the day: all day

DETAILS

On tues (10:30-10:45 am) 22 Aug, I observed a truck belonging to Abe's vactor service at Warm Springs and Boulder Hwy. The truck was dumping the contents from it's container onto the ground at the northwest corner of the intersection. I cannot identify the contents. The suction tube of the truck was inside a manhole. I'm unsure if anything was being sucked out of the hole. The contents on the ground were brown in color. When I returned to the site the next day, I noticed the same or similar truck vamming at a manhole. Truck had Abe's Vactor logo License # 13516 S08ZP VWW08

Do you intend to pursue a possible reward within the purview of NRS 444.640, Reward for information leading to arrest and conviction of violator? (Copy attached) *(Reward is available only when a fine is paid).* ☒ Yes ☐ No

I am including (Number) three photographs taken on (Date) 22 Aug. 00 with this complaint as evidence.

I HAVE READ THIS STATEMENT AND I AFFIRM TO THE TRUTH AND ACCURACY OF THE FACTS CONTAINED HEREIN. THIS STATEMENT WAS COMPLETED AT (LOCATION) Warm Springs and Boulder Hwy
ON THE 23rd DAY OF August AT 11:15 (AM/PM), ~~19~~ 2000.

[signature]
SIGNATURE OF PERSON GIVING STATEMENT

Witness: Shane Martin
(SIGNATURE)

Witness: Shane Martin
(PRINTED)

8/23/00
DATE

White/Original Yellow/Informant

NEL LABORATORIES

ENT:	Clark County Health District	CLIENT ID:	SW00-324
OJECT ID:	Abes Plumbing/Timet	DATE SAMPLED:	8/24/00
ROJECT #:	SW00-324	NEL SAMPLE ID:	L0008292-01

TEST:	**Organochlorine Pesticides by EPA 8081A, Dec. 1996**		
METHOD:	EPA 8081	ANALYST:	JRW - Las Vegas Division
MATRIX:	Solid	EXTRACTED:	8/25/00
DILUTION:	1	ANALYZED:	8/28/00

PARAMETER	Result		Reporting Limit
ldrin	ND		5. µg/kg
lpha-BHC	ND		5. µg/kg
eta-BHC	ND		5. µg/kg
elta-BHC	ND		5. µg/kg
amma-BHC (Lindane)	ND		5. µg/kg
lpha-chlordane	ND		5. µg/kg
amma-chlordane	ND		5. µg/kg
hlordane	ND		20. µg/Kg
,4-DDD	ND		5. µg/kg
,4-DDE	110	µg/kg	5. µg/kg
,4-DDT	200	µg/kg	10 µg/kg
ieldrin	ND		5. µg/kg
ndosulfan I	ND		5. µg/kg
ndosulfan II	ND		5. µg/kg
ndosulfan sulfate	ND		5. µg/kg
ndrin	ND		5. µg/kg
ndrin aldehyde	ND		5. µg/kg
ndrin ketone	ND		5. µg/kg
leptachlor	ND		5. µg/kg
leptachlor epoxide	ND		5. µg/kg
lethoxychlor	ND		20. µg/kg
oxaphene	ND		60. µg/kg

QUALITY CONTROL DATA:

Surrogate	% Recovery	Acceptable Range
Decachlorobiphenyl	109	54 - 140
Tetrachloro-m-xylene	94	52 - 135

ND - Not Detected

This report shall not be reproduced except in full, without the written approval of the laboratory.

NEL LABORATORIES
Reno • Las Vegas • Boise
Phoenix • Sacramento

Las Vegas Division
4208 Arcata Way, Suite A • Las Vegas, NV 89030
(702) 657-1010 • Fax: (702) 657-1577
1-888-368-3282

RECEIVED
SEP 12 2000
CCHD ENV HEALTH

CLIENT: Clark County Health District
625 Shadow Lane
Las Vegas, NV 89127
ATTN: Shane Martin

PROJECT NAME: Abes Plumbing/Timet
PROJECT NUMBER: SW00-324

NEL ORDER ID: L0008292

Attached are the analytical results for samples in support of the above referenced project.

Samples submitted for this project were not sampled by NEL Laboratories. Samples were received by NEL in good condition, under chain of custody on 8/24/00.

Should you have any questions or comments, please feel free to contact our Client Services department at (702) 657-1010.

Some QA results have been flagged as follows:

C - Sample concentration is a least 5 times greater than spike contribution. Spike recovery criteria do not apply.
J - This concentration should be considered an estimate due laboratory control sample failure.
J1 - The batch MS and/or MSD were outside acceptance limits. The batch LCS was acceptable.

Stan Van Wagenen
Laboratory Manager

Date 9/1/00

CERTIFICATIONS:

	Reno	Las Vegas	S. California
Arizona	AZ0520	AZ0518	AZ0605
California	1707	2002	2264
US Army Corps of Engineers	Certified	Certified	

	Reno	Las Vegas	S. California
Idaho	Certified	Certified	
Montana	Certified	Certified	
Nevada	NV033	NV052	CA084
L.A.C.S.D.			10228

NEL LABORATORIES

RECEIVED SEP 19 2000 CCHD ENV HEALTH

CLIENT:	Clark County Health District	CLIENT ID:	SW00-324
PROJECT ID:	Abes Plumbing/Timet	DATE SAMPLED:	8/24/00
PROJECT #:	SW00-324	NEL SAMPLE ID:	L0008292-01

TEST:	**Volatile Organic Compounds by EPA 8260B, December 1996**		
METHOD:	EPA 8260B	EXTRACTED:	8/31/00
MATRIX:	Solid	ANALYZED:	8/31/00
DILUTION:	1	ANALYST:	CHG - Las Vegas Division

PARAMETER	Result µg/kg	Reporting Limit	PARAMETER	Result µg/kg	Reporting Limit
Acetone	ND	25. µg/kg	1,1-Dichloropropene	ND	5. µg/kg
Benzene	ND	5. µg/kg	cis-1,3-Dichloropropene	ND	5. µg/kg
Bromobenzene	ND	5. µg/kg	trans-1,3-Dichloropropene	ND	5. µg/kg
Bromochloromethane	ND	5. µg/kg	Ethylbenzene	ND	5. µg/kg
Bromodichloromethane	ND	5. µg/kg	Hexachlorobutadiene	ND	5. µg/kg
Bromoform	ND	5. µg/kg	2-Hexanone	ND	25. µg/kg
Bromomethane	ND	5. µg/kg	Iodomethane	ND	5. µg/kg
2-Butanone	ND	25. µg/kg	Isopropylbenzene	ND	5. µg/kg
n-Butylbenzene	ND	5. µg/kg	p-Isopropyltoluene	ND	5. µg/kg
sec-Butylbenzene	ND	5. µg/kg	Methylene chloride (Dichloromethane)	ND	5. µg/kg
tert-Butylbenzene	ND	5. µg/kg	4-Methyl-2-pentanone	ND	25. µg/kg
Carbon disulfide	ND	5. µg/kg	MTBE	ND	5. µg/kg
Carbon tetrachloride	ND	5. µg/kg	Naphthalene	ND	10. µg/kg
Chlorobenzene	ND	5. µg/kg	n-Propylbenzene	ND	5. µg/kg
Chloroethane	ND	5. µg/kg	Styrene	ND	5. µg/kg
Chloroform	ND	5. µg/kg	1,1,1,2-Tetrachloroethane	ND	5. µg/kg
Chloromethane	ND	5. µg/kg	1,1,2,2-Tetrachloroethane	ND	5. µg/kg
2-Chlorotoluene	ND	5. µg/kg	Tetrachloroethene (PCE)	ND	5. µg/kg
4-Chlorotoluene	ND	5. µg/kg	Toluene	ND	5. µg/kg
Dibromochloromethane	ND	5. µg/kg	1,2,3-Trichlorobenzene	ND	5. µg/kg
1,2-Dibromo-3-chloropropane (DBCP)	ND	5. µg/kg	1,2,4-Trichlorobenzene	ND	5. µg/kg
1,2-Dibromoethane (EDB)	ND	5. µg/kg	1,1,1-Trichloroethane (1,1,1-TCA)	ND	5. µg/kg
Dibromomethane	ND	5. µg/kg	1,1,2-Trichloroethane (1,1,2-TCA)	ND	5. µg/kg
1,2-Dichlorobenzene (o-DCB)	ND	5. µg/kg	Trichloroethene (TCE)	ND	5. µg/kg
1,3-Dichlorobenzene (m-DCB)	ND	5. µg/kg	Trichlorofluoromethane (Freon 11)	ND	10. µg/kg
1,4-Dichlorobenzene (p-DCB)	ND	5. µg/kg	1,2,3-Trichloropropane	ND	5. µg/kg
Dichlorodifluoromethane (Freon 12)	ND	5. µg/kg	1,2,4-Trimethylbenzene	ND	5. µg/kg
1,1-Dichloroethane (1,1-DCA)	ND	5. µg/kg	1,3,5-Trimethylbenzene	ND	5. µg/kg
1,2-Dichloroethane (1,2-DCA)	ND	5. µg/kg	Vinyl chloride	ND	5. µg/kg
1,1-Dichloroethene (1,1-DCE)	ND	5. µg/kg	o-Xylene	ND	5. µg/kg
cis-1,2-Dichloroethene	ND	5. µg/kg	m,p-Xylene	ND	10. µg/kg
trans-1,2-Dichloroethene	ND	5. µg/kg			
1,2-Dichloropropane	ND	5. µg/kg			
1,3-Dichloropropane	ND	5. µg/kg			
2,2-Dichloropropane	ND	10. µg/kg			

QUALITY CONTROL DATA:

Surrogate	% Recovery	Acceptable Range
4-Bromofluorobenzene	98	74 - 121
Dibromofluoromethane	95	80 - 120
Toluene-d8	103	81 - 117

ND - Not Detected

NEL LABORATORIES

CLIENT:	Clark County Health District	CLIENT ID:	SW00-324
PROJECT ID:	Abes Plumbing/Timet	DATE SAMPLED:	8/24/00
PROJECT #:	SW00-324	NEL SAMPLE ID:	L0008292-01
TEST:	**Semi-Volatile Organic Compounds by EPA 8270C, Dec. 1996**		
METHOD:	EPA 8270	EXTRACTED:	8/30/00
MATRIX:	Solid	ANALYZED:	8/30/00
DILUTION:	1	ANALYST:	VMM - Reno Division

PARAMETER	Result µg/kg	Reporting Limit	PARAMETER	Result µg/kg	Reporting Limit
Acenaphthene	ND	500. µg/kg	4,6-Dinitro-2-methyl phenol	ND	2500. µg/kg
Acenaphthylene	ND	500. µg/kg	2,4-Dinitrotoluene (DNT)	ND	500. µg/kg
Aniline	ND	1000. µg/kg	2,6-Dinitrotoluene (DNT)	ND	500. µg/kg
Anthracene	ND	500. µg/kg	2,4-Dinitrophenol	ND	2500. µg/kg
Azobenzene	ND	500. µg/kg	Di-n-octyl phthalate	ND	500. µg/kg
Benzo (a) anthracene	ND	500. µg/kg	Fluoranthene	ND	500. µg/kg
Benzo (b&k) fluoranthene	ND	500. µg/kg	Fluorene	ND	500. µg/kg
Benzoic Acid	ND	2500. µg/kg	Hexachlorobenzene	ND	500. µg/kg
Benzo (g,h,i) perylene	ND	500. µg/kg	Hexachlorobutadiene	ND	500. µg/kg
Benzo (a) pyrene	ND	500. µg/kg	Hexachlorocyclopentadiene	ND	500. µg/kg
Benzyl alcohol	ND	1000. µg/kg	Hexachloroethane	ND	500. µg/kg
bis (2-Chloroethyl) ether	ND	500. µg/kg	Indeno (1,2,3-c,d) pyrene	ND	500. µg/kg
bis (2-Chloroethoxy) methane	ND	500. µg/kg	Isophorone	ND	500. µg/kg
bis (2-chloroisopropyl) ether	ND	500. µg/kg	2-Methylnaphthalene	ND	500. µg/kg
bis (2-Ethylhexyl)phthalate	ND	500. µg/kg	2-Methylphenol	ND	500. µg/kg
Butylbenzylphthalate	ND	500. µg/kg	3,4-Methylphenol (isomeric pair)	ND	500. µg/kg
4-Bromophenyl phenyl ether	ND	500. µg/kg	Naphthalene	ND	500. µg/kg
Carbazole	ND	500. µg/kg	2-Nitroaniline	ND	2500. µg/kg
4-Chloroanaline	ND	1000. µg/kg	3-Nitroaniline	ND	2500. µg/kg
4-Chloro-3-methyl phenol	ND	1000. µg/kg	4-Nitroaniline	ND	1000. µg/kg
2-Chloronaphthalene	ND	500. µg/kg	Nitrobenzene	ND	500. µg/kg
2-Chlorophenol	ND	500. µg/kg	2-Nitrophenol	ND	500. µg/kg
4-Chlorophenyl phenyl ether	ND	500. µg/kg	4-Nitrophenol	ND	2500. µg/kg
Chrysene	ND	500. µg/kg	N-Nitrosodi-n-propylamine	ND	500. µg/kg
Dibenzo (a,h) anthracene	ND	500. µg/kg	N-Nitroso-Dimethylamine	ND	500. µg/kg
Dibenzofuran	ND	500. µg/kg	N-Nitrosodiphenylamine	ND	500. µg/kg
Di-n-butyl phthalate	ND	500. µg/kg	Pentachlorophenol	ND	2500. µg/kg
1,2-Dichlorobenzene (o-DCB)	ND	500. µg/kg	Phenol	ND	500. µg/kg
1,3-Dichlorobenzene (m-DCB)	ND	500. µg/kg	Phenanthrene	ND	500. µg/kg
1,4-Dichlorobenzene (p-DCB)	ND	500. µg/kg	Pyrene	ND	500. µg/kg
2,4-Dichlorophenol	ND	500. µg/kg	Pyridine	ND	500. µg/kg
3,3'-Dichlorobenzidine	ND	1000. µg/kg	1,2,4-Trichlorobenzene	ND	500. µg/kg
Diethylphthalate	ND	500. µg/kg	2,4,5-Trichlorophenol	ND	500. µg/kg
2,4-Dimethylphenol	ND	1000. µg/kg	2,4,6-Trichlorophenol	ND	500. µg/kg
Dimethylphthalate	ND	500. µg/kg			

QUALITY CONTROL DATA:

Surrogate	% Recovery	Acceptable Range
2,4,6-Tribromophenol	79	19 - 122
2-Fluorobiphenyl	86	30 - 115
2-Fluorophenol	83	25 - 121
Nitrobenzene-d5	79	23 - 120
p-Terphenyl-d14	118	18 - 137
Phenol-d5	77	24 - 113

ND - Not Detected

NEL LABORATORIES

CLIENT:	Clark County Health District	CLIENT ID:	**Method Blank**
PROJECT ID:	Abes Plumbing/Timet	DATE SAMPLED:	NA
PROJECT #:	SW00-324	NEL SAMPLE ID:	000831SD60_1A-BLK
TEST:	**Volatile Organic Compounds by EPA 8260B, December 1996**		
METHOD:	EPA 8260B	ANALYST:	CHG - Las Vegas Division
MATRIX:	Solid	EXTRACTED:	8/31/00
		ANALYZED:	8/31/00

PARAMETER	Result µg/kg	Reporting Limit	PARAMETER	Result µg/kg	Reporting Limit
Acetone	ND	25 µg/kg	1,1-Dichloropropene	ND	5 µg/kg
Benzene	ND	5 µg/kg	cis-1,3-Dichloropropene	ND	5 µg/kg
Bromobenzene	ND	5 µg/kg	trans-1,3-Dichloropropene	ND	5 µg/kg
Bromochloromethane	ND	5 µg/kg	Ethylbenzene	ND	5 µg/kg
Bromodichloromethane	ND	5 µg/kg	Hexachlorobutadiene	ND	5 µg/kg
Bromoform	ND	5 µg/kg	2-Hexanone	ND	25 µg/kg
Bromomethane	ND	5 µg/kg	Iodomethane	ND	5 µg/kg
2-Butanone	ND	25 µg/kg	Isopropylbenzene	ND	5 µg/kg
n-Butylbenzene	ND	5 µg/kg	p-Isopropyltoluene	ND	5 µg/kg
sec-Butylbenzene	ND	5 µg/kg	Methylene chloride (Dichloromethane)	ND	5 µg/kg
tert-Butylbenzene	ND	5 µg/kg	4-Methyl-2-pentanone	ND	25 µg/kg
Carbon disulfide	ND	5 µg/kg	MTBE	ND	5 µg/kg
Carbon tetrachloride	ND	5 µg/kg	Naphthalene	ND	10 µg/kg
Chlorobenzene	ND	5 µg/kg	n-Propylbenzene	ND	5 µg/kg
Chloroethane	ND	5 µg/kg	Styrene	ND	5 µg/kg
Chloroform	ND	5 µg/kg	1,1,1,2-Tetrachloroethane	ND	5 µg/kg
Chloromethane	ND	5 µg/kg	1,1,2,2-Tetrachloroethane	ND	5 µg/kg
2-Chlorotoluene	ND	5 µg/kg	Tetrachloroethene (PCE)	ND	5 µg/kg
4-Chlorotoluene	ND	5 µg/kg	Toluene	ND	5 µg/kg
Dibromochloromethane	ND	5 µg/kg	1,2,3-Trichlorobenzene	ND	5 µg/kg
1,2-Dibromo-3-chloropropane (DBCP)	ND	5 µg/kg	1,2,4-Trichlorobenzene	ND	5 µg/kg
1,2-Dibromoethane (EDB)	ND	5 µg/kg	1,1,1-Trichloroethane (1,1,1-TCA)	ND	5 µg/kg
Dibromomethane	ND	5 µg/kg	1,1,2-Trichloroethane (1,1,2-TCA)	ND	5 µg/kg
1,2-Dichlorobenzene (o-DCB)	ND	5 µg/kg	Trichloroethene (TCE)	ND	5 µg/kg
1,3-Dichlorobenzene (m-DCB)	ND	5 µg/kg	Trichlorofluoromethane (Freon 11)	ND	10 µg/kg
1,4-Dichlorobenzene (p-DCB)	ND	5 µg/kg	1,2,3-Trichloropropane	ND	5 µg/kg
Dichlorodifluoromethane (Freon 12)	ND	5 µg/kg	1,2,4-Trimethylbenzene	ND	5 µg/kg
1,1-Dichloroethane (1,1-DCA)	ND	5 µg/kg	1,3,5-Trimethylbenzene	ND	5 µg/kg
1,2-Dichloroethane (1,2-DCA)	ND	5 µg/kg	Vinyl chloride	ND	5 µg/kg
1,1-Dichloroethene (1,1-DCE)	ND	5 µg/kg	o-Xylene	ND	5 µg/kg
cis-1,2-Dichloroethene	ND	5 µg/kg	m,p-Xylene	ND	10 µg/kg
trans-1,2-Dichloroethene	ND	5 µg/kg			
1,2-Dichloropropane	ND	5 µg/kg			
1,3-Dichloropropane	ND	5 µg/kg			
2,2-Dichloropropane	ND	10 µg/kg			

QUALITY CONTROL DATA:

Surrogate	% Recovery	Acceptable Range
4-Bromofluorobenzene	98	74 - 121
Dibromofluoromethane	97	80 - 120
Toluene-d8	103	81 - 117

ND - Not Detected

NEL LABORATORIES

CLIENT:	Clark County Health District	CLIENT ID:	**Method Blank**
PROJECT ID:	Abes Plumbing/Timet	DATE SAMPLED:	NA
PROJECT #:	SW00-324	NEL SAMPLE ID:	0830E2-BLK
TEST:	**Semi-Volatile Organic Compounds by EPA 8270C, Dec. 1996**		
METHOD:	EPA 8270	ANALYST:	VMM - Reno Division
MATRIX:	Solid	EXTRACTED:	8/30/00
		ANALYZED:	8/30/00

PARAMETER	Result µg/kg	Reporting Limit	PARAMETER	Result µg/kg	Reporting Limit
Acenaphthene	ND	500 µg/kg	4,6-Dinitro-2-methyl phenol	ND	2500 µg/kg
Acenaphthylene	ND	500 µg/kg	2,4-Dinitrotoluene (DNT)	ND	500 µg/kg
Aniline	ND	1000 µg/kg	2,6-Dinitrotoluene (DNT)	ND	500 µg/kg
Anthracene	ND	500 µg/kg	2,4-Dinitrophenol	ND	2500 µg/kg
Azobenzene	ND	500 µg/kg	Di-n-octyl phthalate	ND	500 µg/kg
Benzo (a) anthracene	ND	500 µg/kg	Fluoranthene	ND	500 µg/kg
Benzo (b&k) fluoranthene	ND	500 µg/kg	Fluorene	ND	500 µg/kg
Benzoic Acid	ND	2500 µg/kg	Hexachlorobenzene	ND	500 µg/kg
Benzo (g,h,i) perylene	ND	500 µg/kg	Hexachlorobutadiene	ND	500 µg/kg
Benzo (a) pyrene	ND	500 µg/kg	Hexachlorocyclopentadiene	ND	500 µg/kg
Benzyl alcohol	ND	1000 µg/kg	Hexachloroethane	ND	500 µg/kg
bis (2-Chloroethyl) ether	ND	500 µg/kg	Indeno (1,2,3-c,d) pyrene	ND	500 µg/kg
bis (2-Chloroethoxy) methane	ND	500 µg/kg	Isophorone	ND	500 µg/kg
bis (2-chloroisopropyl) ether	ND	500 µg/kg	2-Methylnaphthalene	ND	500 µg/kg
bis (2-Ethylhexyl)phthalate	ND	500 µg/kg	2-Methylphenol	ND	500 µg/kg
Butylbenzylphthalate	ND	500 µg/kg	3,4-Methylphenol (isomeric pair)	ND	500 µg/kg
4-Bromophenyl phenyl ether	ND	500 µg/kg	Naphthalene	ND	500 µg/kg
Carbazole	ND	500 µg/kg	2-Nitroaniline	ND	2500 µg/kg
4-Chloroanaline	ND	1000 µg/kg	3-Nitroaniline	ND	2500 µg/kg
4-Chloro-3-methyl phenol	ND	1000 µg/kg	4-Nitroaniline	ND	1000 µg/kg
2-Chloronaphthalene	ND	500 µg/kg	Nitrobenzene	ND	500 µg/kg
2-Chlorophenol	ND	500 µg/kg	2-Nitrophenol	ND	500 µg/kg
4-Chlorophenyl phenyl ether	ND	500 µg/kg	4-Nitrophenol	ND	2500 µg/kg
Chrysene	ND	500 µg/kg	N-Nitrosodi-n-propylamine	ND	500 µg/kg
Dibenzo (a,h) anthracene	ND	500 µg/kg	N-Nitroso-Dimethylamine	ND	500 µg/kg
Dibenzofuran	ND	500 µg/kg	N-Nitrosodiphenylamine	ND	500 µg/kg
Di-n-butyl phthalate	ND	500 µg/kg	Pentachlorophenol	ND	2500 µg/kg
1,2-Dichlorobenzene (o-DCB)	ND	500 µg/kg	Phenol	ND	500 µg/kg
1,3-Dichlorobenzene (m-DCB)	ND	500 µg/kg	Phenanthrene	ND	500 µg/kg
1,4-Dichlorobenzene (p-DCB)	ND	500 µg/kg	Pyrene	ND	500 µg/kg
2,4-Dichlorophenol	ND	500 µg/kg	Pyridine	ND	500 µg/kg
3,3'-Dichlorobenzidine	ND	1000 µg/kg	1,2,4-Trichlorobenzene	ND	500 µg/kg
Diethylphthalate	ND	500 µg/kg	2,4,5-Trichlorophenol	ND	500 µg/kg
2,4-Dimethylphenol	ND	1000 µg/kg	2,4,6-Trichlorophenol	ND	500 µg/kg
Dimethylphthalate	ND	500 µg/kg			

QUALITY CONTROL DATA:

Surrogate	% Recovery	Acceptable Range
2,4,6-Tribromophenol	84	19 - 122
2-Fluorobiphenyl	90	30 - 115
2-Fluorophenol	86	25 - 121
Nitrobenzene-d5	83	23 - 120
p-Terphenyl-d14	135	18 - 137
Phenol-d5	80	24 - 113

ND - Not Detected

NEL LABORATORIES

CLIENT:	Clark County Health District	CLIENT ID:	**SW00-324**
PROJECT ID:	Abes Plumbing/Timet	DATE SAMPLED:	8/24/00
PROJECT #:	SW00-324	NEL SAMPLE ID:	L0008292-01

TEST:	**Inorganic Non-Metals**
MATRIX:	Solid

PARAMETER	RESULT	REPORTING LIMIT	D. F.	METHOD	UNITS	ANALYZED
Perchlorate	ND	40.	1	EPA 314	µg/kg	8/29/00

D.F. - Dilution Factor

ND - Not Detected

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NEL LABORATORIES

CLIENT:	Clark County Health District	CLIENT ID:	**Method Blank**
PROJECT ID:	Abes Plumbing/Timet	DATE SAMPLED:	NA
PROJECT #:	SW00-324	NEL SAMPLE ID:	000829CLO4S-BLK

TEST: **Non-Metals**

PARAMETER	RESULT	REPORTING LIMIT	D. F.	METHOD	UNITS	ANALYZED
Perchlorate	ND	40	1	EPA 314	µg/kg	8/29/00

D.F. - Dilution Factor

ND - Not Detected

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NEL LABORATORIES

CLIENT:	Clark County Health District	CLIENT ID:	SW00-324
PROJECT ID:	Abes Plumbing/Timet	DATE SAMPLED:	8/24/00
PROJECT #:	SW00-324	NEL SAMPLE ID:	L0008292-01

TEST:	**Organochlorine Pesticides by EPA 8081A, Dec. 1996**		
METHOD:	EPA 8081	ANALYST:	JRW - Las Vegas Division
MATRIX:	Solid	EXTRACTED:	8/25/00
DILUTION:	1	ANALYZED:	8/28/00

PARAMETER	Result	Reporting Limit
Aldrin	ND	5. µg/kg
alpha-BHC	ND	5. µg/kg
beta-BHC	ND	5. µg/kg
delta-BHC	ND	5. µg/kg
gamma-BHC (Lindane)	ND	5. µg/kg
Alpha-chlordane	ND	5. µg/kg
Gamma-chlordane	ND	5. µg/kg
Chlordane	ND	20. µg/Kg
4,4-DDD	ND	5. µg/kg
4,4-DDE	110 µg/kg	5. µg/kg
4,4-DDT	200 µg/kg	10 µg/kg
Dieldrin	ND	5. µg/kg
Endosulfan I	ND	5. µg/kg
Endosulfan II	ND	5. µg/kg
Endosulfan sulfate	ND	5. µg/kg
Endrin	ND	5. µg/kg
Endrin aldehyde	ND	5. µg/kg
Endrin ketone	ND	5. µg/kg
Heptachlor	ND	5. µg/kg
Heptachlor epoxide	ND	5. µg/kg
Methoxychlor	ND	20. µg/kg
Toxaphene	ND	60. µg/kg

QUALITY CONTROL DATA:

Surrogate	% Recovery	Acceptable Range
Decachlorobiphenyl	109	54 - 140
Tetrachloro-m-xylene	94	52 - 135

ND - Not Detected

NEL LABORATORIES

CLIENT:	Clark County Health District	CLIENT ID:	**Method Blank**
PROJECT ID:	Abes Plumbing/Timet	DATE SAMPLED:	NA
PROJECT #:	SW00-324	NEL SAMPLE ID:	000825PSTS-BLK

TEST:	**Organochlorine Pesticides by EPA 8081A, Dec. 1996**		
METHOD:	EPA 8081	ANALYST:	JRW - Las Vegas Division
MATRIX:	Solid	EXTRACTED:	8/25/00
		ANALYZED:	8/28/00

PARAMETER	Result	Reporting Limit
Aldrin	ND	5. µg/kg
alpha-BHC	ND	5. µg/kg
beta-BHC	ND	5. µg/kg
delta-BHC	ND	5. µg/kg
gamma-BHC (Lindane)	ND	5. µg/kg
Alpha-chlordane	ND	5. µg/kg
Gamma-chlordane	ND	5. µg/kg
Chlordane	ND	20. µg/kg
4,4-DDD	ND	5. µg/kg
4,4-DDE	ND	5. µg/kg
4,4-DDT	ND	5. µg/kg
Dieldrin	ND	5. µg/kg
Endosulfan I	ND	5. µg/kg
Endosulfan II	ND	5. µg/kg
Endosulfan sulfate	ND	5. µg/kg
Endrin	ND	5. µg/kg
Endrin aldehyde	ND	5. µg/kg
Endrin ketone	ND	5. µg/kg
Heptachlor	ND	5. µg/kg
Heptachlor epoxide	ND	5. µg/kg
Methoxychlor	ND	20. µg/kg
Toxaphene	ND	60. µg/kg

QUALITY CONTROL DATA:

Surrogate	% Recovery	Acceptable Range
Decachlorobiphenyl	65	54 - 140
Tetrachloro-m-xylene	59	52 - 135

ND - Not Detected

NEL LABORATORIES

CLIENT:	Clark County Health District		CLIENT ID:	**SW00-324**
PROJECT ID:	Abes Plumbing/Timet		DATE SAMPLED:	8/24/00
PROJECT #:	SW00-324		NEL SAMPLE ID:	L0008292-01

TEST: **TCLP-8 Metals**
MATRIX: Solid

PARAMETER	RESULT mg/L	REPORTING LIMIT	D. F.	METHOD	TCLP/STLC EXTRACTION DATE	DIGESTED	ANALYZED
Arsenic	ND	0.1 mg/L	1	EPA 6010	8/27/00	8/28/00	8/28/00
Barium	1.7	1. mg/L	1	EPA 6010	8/27/00	8/28/00	8/28/00
Cadmium	ND	0.01 mg/L	1	EPA 6010	8/27/00	8/28/00	8/28/00
Chromium	0.024	0.01 mg/L	1	EPA 6010	8/27/00	8/28/00	8/28/00
Lead	ND	0.05 mg/L	1	EPA 6010	8/27/00	8/28/00	8/28/00
Mercury	ND	0.002 mg/L	10	EPA 7470A	8/27/00	8/28/00	8/28/00
Selenium	ND	0.1 mg/L	1	EPA 6010	8/27/00	8/28/00	8/28/00
Silver	ND	0.02 mg/L	1	EPA 6010	8/27/00	8/28/00	8/28/00

D.F. - Dilution Factor

ND - Not Detected

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NEL LABORATORIES

CLIENT:	Clark County Health District	CLIENT ID:	**Method Blank**
PROJECT ID:	Abes Plumbing/Timet	DATE SAMPLED:	NA
PROJECT #:	SW00-324	NEL SAMPLE ID:	L08254HGTCLP-BLK

TEST: **TCLP by EPA 1311, July 1992 & Mercury by EPA 7470A, July 1992**
MATRIX: TCLP Extract

PARAMETER	RESULT	REPORTING LIMIT	D. F.	METHOD	TCLP/STLC EXTRACTION DATE	DIGESTED	ANALYZED
Mercury	ND	0.0002 mg/L	1	EPA 7470A	8/27/00	8/28/00	8/28/00

D.F. - Dilution Factor

ND - Not Detected

NEL LABORATORIES

CLIENT:	Clark County Health District	CLIENT ID:	**Method Blank**
PROJECT ID:	Abes Plumbing/Timet	DATE SAMPLED:	NA
PROJECT #:	SW00-324	NEL SAMPLE ID:	L08254I-T8-BLK

TEST:	**TCLP by EPA 1311, July 1992 & 7 Metals by EPA 6010A, July 1992**
MATRIX:	TCLP Extract

PARAMETER	RESULT	REPORTING LIMIT	D. F.	METHOD	TCLP/STLC EXTRACTION DATE	DIGESTED	ANALYZED
Arsenic	ND	0.1 mg/L	1	EPA 6010	8/27/00	8/28/00	8/28/00
Barium	ND	1. mg/L	1	EPA 6010	8/27/00	8/28/00	8/28/00
Cadmium	ND	0.01 mg/L	1	EPA 6010	8/27/00	8/28/00	8/28/00
Chromium	ND	0.01 mg/L	1	EPA 6010	8/27/00	8/28/00	8/28/00
Lead	ND	0.05 mg/L	1	EPA 6010	8/27/00	8/28/00	8/28/00
Selenium	ND	0.1 mg/L	1	EPA 6010	8/27/00	8/28/00	8/28/00
Silver	ND	0.02 mg/L	1	EPA 6010	8/27/00	8/28/00	8/28/00

D.F. - Dilution Factor

ND - Not Detected

NEL LABORATORIES

CLIENT: Clark County Health District
PROJECT ID: Abes Plumbing/Timet
PROJECT #: SW00-324

TEST: Total Extractable Petroleum Hydrocarbons by EPA Method 8015M, December 1996
METHOD: EPA 8015M
ORDER ID: L0008292
MATRIX: Solid ANALYST: JRW - Las Vegas Division

CLIENT SAMPLE ID	SAMPLE DATE	NEL SAMPLE ID	RESULT mg/kg	C.R.	Reporting Limit	Surrogate Recovery*	EXTRACTED	ANALYZED
SW00-324	8/24/00	L0008292-01	30	D	20. mg/kg	108 %	8/30/00	8/28/00

C.R.: Carbon Range

D Diesel Range Organics (C10 to C28).

QUALITY CONTROL DATA (Total for Diesel Range):

Sample ID	Result	Acceptable Range	Surrogate Recovery*	Sample Number
Blank, 000825TPH-BLK	ND	< 20 mg/kg	92 %	NA
LCS, 000825TPHS1-LCS	79 %	54 - 91 %	121 %	NA
LCSD, 000825TPHS1-LCSD	71 %	54 - 91 %	107 %	NA
MS, 000825TPHS1-MS	77 %	34 - 110 %	101 %	L0008296-01
MSD, 000825TPHS1-MSD	80 %	34 - 110 %	103 %	L0008296-01

*** Surrogate used was Octacosane, acceptance limits 55-130%.**

ND - Not Detected

NEL LABORATORIES
Reno • Las Vegas • Boise
Phoenix • So. California

Las Vegas Division • 4208 Arcata Way, Ste. A • Las Vegas, NV 89030
702-657-1010 • Fax: 702-657-1577 • 888-368-3282

CHAIN OF CUSTODY

NEL Work Order: L0008292

Project Name: Abes Plumbing/Timet	Project Number: SW00-324
Purchase Order Number:	Sampled By: Shane Martin

Company: CCHD
Attention: Shane Martin
Address: P.O. Box 3902, Las Vegas, NV 89127
Phone Number: 702-383-1275
Fax Number: 386-8540
Billing Address: same as above
Expected Due Date: 5 days

Requested Turnaround: ✓ 5-day ___ 2-day ___ 1-day ___ Other

Analysis: TCLP RCRA Metals; Perchlorate; 8260-Volatiles; TPH; 8081-Pesticides; 8270-Semi-Volatiles

Time/Date Sampled	Customer Sample Identification	N.E.L. Identification	# of Containers	Matrix (Box #1)	Preservative (Box #2)	TCLP RCRA Metals	Perchlorate	8260-Volatiles	TPH	8081-Pesticides	8270-Semi-Volatiles								Remarks
8/24/00 3:30 p	SW00-324	01	6	SD	E	✓	✓	✓	✓	✓	✓								

Custody Seal intact? Y N None Temp. 17°C
Condition when received: good

Box #1		
DW - Drinking Water	SD - Solid	
WW - Waste Water	AQ - Aqueous	
OL - Oil/Organic Liquid	A - Air	

Box #2	
A. HCl	E. Ice Only
B. HNO_3	F. Other ______
C. H_2SO_4	G. Not Preserved
D. NaOH	

	Relinquished by (Print)	(Signature)	Date/Time	Received by (Print)	(Signature)	Date/Time
1	Shane Martin	Shane Martin	8/24/00 4:55pm	Bruce Cunningham	B. C[illegible]	8/24/00, 4:55p
2						
3						

UNLAWFUL DISPOSAL OF GARBAGE OR SEWAGE

444.630 Penalty; enforcement; identification of violator.

1. As used in this section, "garbage" includes swill, refuse, cans, bottles, paper, vegetable matter, carcass of any dead animal, offal from any slaughter pen or butcher shop, trash or rubbish.

2. Every person who willfully places, deposits or dumps, or who causes to be placed, deposited or dumped, or who causes or allows to overflow, any sewage, sludge, cesspool or septic tank effluent, or accumulation of human excreta, or any garbage, in or upon any street, alley, public highway or road in common use, or upon any public park or other public property other than property designated or set aside for such a purpose by the governing body having charge thereof, or upon any private property into or upon which the public is admitted by easement, license or otherwise, is guilty of a misdemeanor and, if the convicted person agrees, he shall be sentenced to perform 10 hours of work for the benefit of the community under the conditions prescribed in NRS 176.087.

3. Except as otherwise provided in NRS 444.585, ownership of garbage does not transfer from the person who originally possessed it until it is received for transport by a person authorized to dispose of solid waste pursuant to this chapter or until it is disposed of at a municipal disposal site. Identification of the owner of any garbage which is disposed of in violation of subsection 2 creates a reasonable inference that the owner is the person who disposed of the garbage. The fact that the disposal of the garbage was not witnessed does not, in and of itself, preclude the identification of its owner.

4. All:

(a) Health officers and their deputies;

(b) Game wardens;

(c) Police officers of cities and towns;

(d) Sheriffs and their deputies;

(e) Other peace officers of the State of Nevada; and

(f) Other persons who are specifically designated by the local government to do so,

shall, within their respective jurisdictions, enforce the provisions of this section.

5. A district health officer or his deputy or other person specifically designated by the local government to do so may issue a citation for any violation of this section which occurs within his jurisdiction.

6. To effectuate the purposes of this section, the persons charged with enforcing this section may request information from any:

(a) Agency of the state or its political subdivisions.

(b) Employer, public or private.

(c) Employee organization or trust of any kind.

(d) Financial institution or other entity which is in the business of providing credit reports.

(e) Public utility.

Each of these persons and entities, their officers and employees, shall cooperate by providing any information in their possession which may aid in the location and identification of a person believed to be in violation of subsection 2. A disclosure made in good faith pursuant to this subsection does not give rise to any action for damages for the disclosure.

[1:83:1953] + [2:83:1953]—(NRS A 1957, 262; 1967, 580; 1969, 126; 1981, 858; 1983, 856; 1989, 484; 1991, 1672; 1993, 814)

444.635 Civil penalties; collection; use of money restricted.

1. Any person convicted of violating NRS 444.555 and, in addition to the penalty imposed in NRS 444.583 or 444.630, any person convicted of violating NRS 444.583 or 444.630 is liable for a civil penalty, upon each such conviction.

2. Every court, before whom a defendant is convicted of a violation of NRS 444.555, 444.583 or 444.630, shall order the defendant to pay a civil penalty which is at least $250 but not more than $2,000. If so provided by the court, the penalty may be paid in installments.

3. The health authority or division of environmental protection of the state department of conservation and natural resources may attempt to collect all such penalties and installments which are in default in any manner provided by law for the enforcement of a judgment.

4. Each court which receives money under the provisions of this section shall forthwith remit the money to the division of environmental protection or, if health authority initiated the action, the district health department which shall deposit the money with the state treasurer for credit in a separate account in the state general fund or with the county treasurer for deposit in an account for the district health department, as the case may be. Money so deposited must be used only to pay rewards pursuant to NRS 444.640 or for the management of solid waste and paid as other claims against the state or local governments are paid.

(Added to NRS by 1987, 1490; A 1991, 1673)

444.640 Reward for information leading to arrest and conviction of violator; regulations.

1. The division of environmental protection of the state department of conservation and natural resources or the district health department shall offer a reward, in an amount equal to 50 percent of the civil penalty imposed pursuant to NRS 444.635, for information leading to the arrest and conviction of any person violating NRS 444.555 or 444.630. The reward must be paid upon his conviction and the payment in full of the penalty. The reward must be distributed equally among the persons who supplied the information which led to the arrest and conviction.

2. The state environmental commission or district board of health may adopt regulations necessary to carry out the provisions of this section.

(Added to NRS by 1987, 1491)

444.645 Notice of provision of NRS 444.555 or 444.630 to be posted; offer of reward.

1. The division of environmental protection of the state department of conservation and natural resources, and the district health officer in his district or the board of county commissioners in a county without a district health officer shall post notices of the provisions of NRS 444.555 or 444.630, whichever is appropriate.

2. The notice must also contain an offer of a reward for information leading to the arrest and conviction of any person violating NRS 444.555 or 444.630.

(Added to NRS by 1987, 1491)

Industry and EPA hazardous waste No.	Hazardous waste	Hazard code
K148	Residues from coal tar distillation, including but not limited to, still bottoms	(T)

[46 FR 4618, Jan. 16, 1981; 60 FR 7849, Feb. 9, 1995]

EDITORIAL NOTE: For FEDERAL REGISTER citations affecting §261.32, see the List of CFR Sections Affected in the Finding Aids section of this volume.

§261.33 Discarded commercial chemical products, off-specification species, container residues, and spill residues thereof.

The following materials or items are hazardous wastes if and when they are discarded or intended to be discarded as described in §261.2(a)(2)(i), when they are mixed with waste oil or used oil or other material and applied to the land for dust suppression or road treatment, when they are otherwise applied to the land in lieu of their original intended use or when they are contained in products that are applied to the land in lieu of their original intended use, or when, in lieu of their original intended use, they are produced for use as (or as a component of) a fuel, distributed for use as a fuel, or burned as a fuel.

(a) Any commercial chemical product, or manufacturing chemical intermediate having the generic name listed in paragraph (e) or (f) of this section.

(b) Any off-specification commercial chemical product or manufacturing chemical intermediate which, if it met specifications, would have the generic name listed in paragraph (e) or (f) of this section.

(c) Any residue remaining in a container or in an inner liner removed from a container that has held any commercial chemical product or manufacturing chemical intermediate having the generic name listed in paragraphs (e) or (f) of this section, unless the container is empty as defined in §261.7(b) of this chapter.

[*Comment:* Unless the residue is being beneficially used or reused, or legitimately recycled or reclaimed; or being accumulated, stored, transported or treated prior to such use, re-use, recycling or reclamation, EPA considers the residue to be intended for discard, and thus, a hazardous waste. An example of a legitimate re-use of the residue would be where the residue remains in the container and the container is used to hold the same commercial chemical product or manufacturing chemical intermediate it previously held. An example of the discard of the residue would be where the drum is sent to a drum reconditioner who reconditions the drum but discards the residue.]

(d) Any residue or contaminated soil, water or other debris resulting from the cleanup of a spill into or on any land or water of any commercial chemical product or manufacturing chemical intermediate having the generic name listed in paragraph (e) or (f) of this section, or any residue or contaminated soil, water or other debris resulting from the cleanup of a spill, into or on any land or water, of any off-specification chemical product and manufacturing chemical intermediate which, if it met specifications, would have the generic name listed in paragraph (e) or (f) of this section.

[*Comment:* The phrase "commercial chemical product or manufacturing chemical intermediate having the generic name listed in . . ." refers to a chemical substance which is manufactured or formulated for commercial or manufacturing use which consists of the commercially pure grade of the chemical, any technical grades of the chemical that are produced or marketed, and all formulations in which the chemical is the sole active ingredient. It does not refer to a material, such as a manufacturing process waste, that contains any of the substances listed in paragraph (e) or (f). Where a manufacturing process waste is deemed to be a hazardous waste because it contains a substance listed in paragraph (e) or (f), such waste will be listed in either §261.31 or §261.32 or will be identified as a hazardous waste by the characteristics set forth in subpart C of this part.]

(e) The commercial chemical products, manufacturing chemical intermediates or off-specification commercial chemical products or manufacturing chemical intermediates referred to in paragraphs (a) through (d) of this section, are identified as acute hazardous wastes (H) and are subject to be the small quantity exclusion defined in §261.5(e).

[*Comment:* For the convenience of the regulated community the primary hazardous properties of these materials have been indicated by the letters T (Toxicity), and R (Reactivity). Absence of a letter indicates that the compound only is listed for acute toxicity.]

These wastes and their corresponding EPA Hazardous Waste Numbers are:

Hazardous waste No.	Chemical abstracts No.	Substance
P023	107–20–0	Acetaldehyde, chloro-
P002	591–08–2	Acetamide, N-(aminothioxomethyl)-
P057	640–19–7	Acetamide, 2-fluoro-
P058	62–74–8	Acetic acid, fluoro-, sodium salt
P002	591–08–2	1-Acetyl-2-thiourea
P003	107–02–8	Acrolein
P070	116–06–3	Aldicarb
P203	1646–88–4	Aldicarb sulfone.
P004	309–00–2	Aldrin
P005	107–18–6	Allyl alcohol
P006	20859–73–8	Aluminum phosphide (R,T)
P007	2763–96–4	5-(Aminomethyl)-3-isoxazolol
P008	504–24–5	4-Aminopyridine
P009	131–74–8	Ammonium picrate (R)
P119	7803–55–6	Ammonium vanadate
P099	506–61–6	Argentate(1-), bis(cyano-C)-, potassium
P010	7778–39–4	Arsenic acid H_3AsO_4
P012	1327–53–3	Arsenic oxide As_2O_3
P011	1303–28–2	Arsenic oxide As_2O_5
P011	1303–28–2	Arsenic pentoxide
P012	1327–53–3	Arsenic trioxide
P038	692–42–2	Arsine, diethyl-
P036	696–28–6	Arsonous dichloride, phenyl-
P054	151–56–4	Aziridine
P067	75–55–8	Aziridine, 2-methyl-
P013	542–62–1	Barium cyanide
P024	106–47–8	Benzenamine, 4-chloro-
P077	100–01–6	Benzenamine, 4-nitro-
	100–44–7	Benzene, (chloromethyl)-
	51–43–4	1,2-Benzenediol, 4-[1-hydroxy-2-(methylamino)ethyl]-, (R)-
P046	122–09–8	Benzeneethanamine, alpha,alpha-dimethyl-
P014	108–98–5	Benzenethiol
P127	1563–66–2	7-Benzofuranol, 2,3-dihydro-2,2-dimethyl-, methylcarbamate.
P188	57–64–7	Benzoic acid, 2-hydroxy-, compd. with (3aS-cis)-1,2,3,3a,8,8a-hexahydro-1,3a,8-trimethylpyrrolo[2,3-b]indol-5-yl methylcarbamate ester (1:1).
P001	81–81–2	2H-1-Benzopyran-2-one, 4-hydroxy-3-(3-oxo-1-phenylbutyl)-, & salts, when present at concentrations greater than 0.3%
P028	100–44–7	Benzyl chloride
P015	7440–41–7	Beryllium powder
P017	598–31–2	Bromoacetone
P018	357–57–3	Brucine
P045	39196–18–4	2-Butanone, 3,3-dimethyl-1-(methylthio)-, O-[methylamino)carbonyl] oxime
P021	592–01–8	Calcium cyanide
P021	592–01–8	Calcium cyanide $Ca(CN)_2$

Hazardous waste No.	Chemical abstracts No.	Substance
P189	55285–14–8	Carbamic acid, [(dibutylamino)- thio]methyl-, 2,3-dihydro-2,2-dimethyl- 7-benzofuranyl ester.
P191	644–64–4	Carbamic acid, dimethyl-, 1-[(dimethyl-amino)carbonyl]- 5-methyl-1H- pyrazol-3-yl ester.
P192	119–38–0	Carbamic acid, dimethyl-, 3-methyl-1- (1-methylethyl)-1H- pyrazol-5-yl ester.
P190	1129–41–5	Carbamic acid, methyl-, 3-methylphenyl ester.
P127	1563–66–2	Carbofuran.
P022	75–15–0	Carbon disulfide
P095	75–44–5	Carbonic dichloride
P189	55285–14–8	Carbosulfan.
P023	107–20–0	Chloroacetaldehyde
P024	106–47–8	p-Chloroaniline
P026	5344–82–1	1-(o-Chlorophenyl)thiourea
P027	542–76–7	3-Chloropropionitrile
P029	544–92–3	Copper cyanide
P029	544–92–3	Copper cyanide Cu(CN)
P202	64–00–6	m-Cumenyl methylcarbamate.
P030	....	Cyanides (soluble cyanide salts), not otherwise specified
P031	460–19–5	Cyanogen
P033	506–77–4	Cyanogen chloride
P033	506–77–4	Cyanogen chloride (CN)Cl
P034	131–89–5	2-Cyclohexyl-4,6-dinitrophenol
P016	542–88–1	Dichloromethyl ether
P036	696–28–6	Dichlorophenylarsine
P037	60–57–1	Dieldrin
P038	692–42–2	Diethylarsine
P041	311–45–5	Diethyl-p-nitrophenyl phosphate
P040	297–97–2	O,O-Diethyl O-pyrazinyl phosphorothioate
P043	55–91–4	Diisopropylfluorophosphate (DFP)
P004	309–00–2	1,4,5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexa- chloro-1,4,4a,5,8,8a,-hexahydro-, (1alpha,4alpha,4abeta,5alpha,8alpha,8abeta)-
P060	465–73–6	1,4,5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexa- chloro-1,4,4a,5,8,8a-hexahydro-, (1alpha,4alpha,4abeta,5beta,8beta,8abeta)-
P037	60–57–1	2,7:3,6-Dimethanonaphth[2,3-b]oxirene, 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-, (1aalpha,2beta,2aalpha,3beta,6beta,6aalpha,7beta, 7aalpha)-
P051	72–20–8	2,7:3,6-Dimethanonaphth [2,3-b]oxirene, 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-, (1aalpha,2beta,2abeta,3alpha,6alpha,6abeta,7beta, 7aalpha)-, & metabolites
P044	60–51–5	Dimethoate
P046	122–09–8	alpha,alpha-Dimethylphenethylamine
P191	644–64–4	Dimetilan.
P047	534–52–1	4,6-Dinitro-o-cresol, & salts
P048	51–28–5	2,4-Dinitrophenol
P020	88–85–7	Dinoseb
P085	152–16–9	Diphosphoramide, octamethyl-
P111	107–49–3	Diphosphoric acid, tetraethyl ester
P039	298–04–4	Disulfoton
P049	541–53–7	Dithiobiuret
P185	26419–73–8	1,3-Dithiolane-2-carboxaldehyde, 2,4-dimethyl-, O- [(methylamino)- carbonyl]oxime.
P050	115–29–7	Endosulfan
P088	145–73–3	Endothall
P051	72–20–8	Endrin
P051	72–20–8	Endrin, & metabolites
P042	51–43–4	Epinephrine
P031	460–19–5	Ethanedinitrile
P194	23135–22–0	Ethanimidothioc acid, 2-(dimethylamino)-N-[[(methylamino) carbonyl]oxy]-2-oxo-, methyl ester.
P066	16752–77–5	Ethanimidothioic acid, N-[[(methylamino)carbonyl]oxy]-, methyl ester
P101	107–12–0	Ethyl cyanide
P054	151–56–4	Ethyleneimine
P097	52–85–7	Famphur
P056	7782–41–4	Fluorine
P057	640–19–7	Fluoroacetamide
P058	62–74–8	Fluoroacetic acid, sodium salt
P198	23422–53–9	Formetanate hydrochloride.
P197	17702–57–7	Formparanate.
P065	628–86–4	Fulminic acid, mercury(2+) salt (R,T)
P059	76–44–8	Heptachlor
P062	757–58–4	Hexaethyl tetraphosphate
P116	79–19–6	Hydrazinecarbothioamide
P068	60–34–4	Hydrazine, methyl-
P063	74–90–8	Hydrocyanic acid
P063	74–90–8	Hydrogen cyanide

Hazardous waste No.	Chemical abstracts No.	Substance
P096	7803–51–2	Hydrogen phosphide
P060	465–73–6	Isodrin
P192	119–38–0	Isolan.
P202	64–00–6	3-Isopropylphenyl N-methylcarbamate.
P007	2763–96–4	3(2H)-Isoxazolone, 5-(aminomethyl)-
P196	15339–36–3	Manganese, bis(dimethylcarbamodithioato-S,S')-,
P196	15339–36–3	Manganese dimethyldithiocarbamate.
P092	62–38–4	Mercury, (acetato-O)phenyl-
P065	628–86–4	Mercury fulminate (R,T)
P082	62–75–9	Methanamine, N-methyl-N-nitroso-
P064	624–83–9	Methane, isocyanato-
P016	542–88–1	Methane, oxybis[chloro-
P112	509–14–8	Methane, tetranitro- (R)
P118	75–70–7	Methanethiol, trichloro-
P198	23422–53–9	Methanimidamide, N,N-dimethyl-N'-[3-[[(methylamino)-carbonyl]oxy]phenyl]-, monohydrochloride.
P197	17702–57–7	Methanimidamide, N,N-dimethyl-N'-[2-methyl-4-[[(methylamino)carbonyl]oxy]phenyl]-
P050	115–29–7	6,9-Methano-2,4,3-benzodioxathiepin, 6,7,8,9,10,10-hexachloro-1,5,5a,6,9,9a-hexahydro-, 3-oxide
P059	76–44–8	4,7-Methano-1H-indene, 1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-
P199	2032–65–7	Methiocarb.
	16752–77–5	Methomyl
	60–34–4	Methyl hydrazine
	624–83–9	Methyl isocyanate
P069	75–86–5	2-Methyllactonitrile
P071	298–00–0	Methyl parathion
P190	1129–41–5	Metolcarb.
P128	315–8–4	Mexacarbate.
P072	86–88–4	alpha-Naphthylthiourea
P073	13463–39–3	Nickel carbonyl
P073	13463–39–3	Nickel carbonyl $Ni(CO)_4$, (T-4)-
P074	557–19–7	Nickel cyanide
P074	557–19–7	Nickel cynaide $Ni(CN)_2$
P075	[1]54–11–5	Nicotine, & salts
P076	10102–43–9	Nitric oxide
P077	100–01–6	p-Nitroaniline
P078	10102–44–0	Nitrogen dioxide
P076	10102–43–9	Nitrogen oxide NO
P078	10102–44–0	Nitrogen oxide NO_2
P081	55–63–0	Nitroglycerine (R)
P082	62–75–9	N-Nitrosodimethylamine
P084	4549–40–0	N-Nitrosomethylvinylamine
P085	152–16–9	Octamethylpyrophosphoramide
P087	20816–12–0	Osmium oxide OsO_4, (T-4)-
P087	20816–12–0	Osmium tetroxide
P088	145–73–3	7-Oxabicyclo[2.2.1]heptane-2,3-dicarboxylic acid
P194	23135–22–0	Oxamyl.
P089	56–38–2	Parathion
P034	131–89–5	Phenol, 2-cyclohexyl-4,6-dinitro-
P048	51–28–5	Phenol, 2,4-dinitro-
P047	[1]534–52–1	Phenol, 2-methyl-4,6-dinitro-, & salts
P020	88–85–7	Phenol, 2-(1-methylpropyl)-4,6-dinitro-
P009	131–74–8	Phenol, 2,4,6-trinitro-, ammonium salt (R)
P128	315–18–4	Phenol, 4-(dimethylamino)-3,5-dimethyl-, methylcarbamate (ester).
	2032–65–7	Phenol, (3,5-dimethyl-4-(methylthio)-, methylcarbamate
	64–00–6	Phenol, 3-(1-methylethyl)-, methyl carbamate.
	2631–37–0	Phenol, 3-methyl-5-(1-methylethyl)-, methyl carbamate.
P092	62–38–4	Phenylmercury acetate
P093	103–85–5	Phenylthiourea
P094	298–02–2	Phorate
P095	75–44–5	Phosgene
P096	7803–51–2	Phosphine
P041	311–45–5	Phosphoric acid, diethyl 4-nitrophenyl ester
P039	298–04–4	Phosphorodithioic acid, O,O-diethyl S-[2-(ethylthio)ethyl] ester
P094	298–02–2	Phosphorodithioic acid, O,O-diethyl S-[(ethylthio)methyl] ester
P044	60–51–5	Phosphorodithioic acid, O,O-dimethyl S-[2-(methylamino)-2-oxoethyl] ester
P043	55–91–4	Phosphorofluoridic acid, bis(1-methylethyl) ester
P089	56–38–2	Phosphorothioic acid, O,O-diethyl O-(4-nitrophenyl) ester
P040	297–97–2	Phosphorothioic acid, O,O-diethyl O-pyrazinyl ester

Hazardous waste No.	Chemical abstracts No.	Substance
P097	52–85–7	Phosphorothioic acid, O-[4-[(dimethylamino)sulfonyl]phenyl] O,O-dimethyl ester
P071	298–00–0	Phosphorothioic acid, O,O,-dimethyl O-(4-nitrophenyl) ester
P204	57–47–6	Physostigmine.
P188	57–64–7	Physostigmine salicylate.
P110	78–00–2	Plumbane, tetraethyl-
P098	151–50–8	Potassium cyanide
P098	151–50–8	Potassium cyanide K(CN)
P099	506–61–6	Potassium silver cyanide
P201	2631–37–0	Promecarb
P070	116–06–3	Propanal, 2-methyl-2-(methylthio)-, O-[(methylamino)carbonyl]oxime
P203	1646–88–4	Propanal, 2-methyl-2-(methyl-sulfonyl)-, O-[(methylamino)carbonyl] oxime.
P101	107–12–0	Propanenitrile
P027	542–76–7	Propanenitrile, 3-chloro-
P069	75–86–5	Propanenitrile, 2-hydroxy-2-methyl-
P081	55–63–0	1,2,3-Propanetriol, trinitrate (R)
P017	598–31–2	2-Propanone, 1-bromo-
P102	107–19–7	Propargyl alcohol
P003	107–02–8	2-Propenal
P005	107–18–6	2-Propen-1-ol
P067	75–55–8	1,2-Propylenimine
P102	107–19–7	2-Propyn-1-ol
P008	504–24–5	4-Pyridinamine
P075	[1]54–11–5	Pyridine, 3-(1-methyl-2-pyrrolidinyl)-, (S)-, & salts
P204	57–47–6	Pyrrolo[2,3-b]indol-5-ol, 1,2,3,3a,8,8a-hexahydro-1,3a,8-trimethyl-, methylcarbamate (ester), (3aS-cis)-.
P114	12039–52–0	Selenious acid, dithallium(1+) salt
P103	630–10–4	Selenourea
P104	506–64–9	Silver cyanide
P104	506–64–9	Silver cyanide Ag(CN)
P105	26628–22–8	Sodium azide
P106	143–33–9	Sodium cyanide
P106	143–33–9	Sodium cyanide Na(CN)
P108	[1]57–24–9	Strychnidin-10-one, & salts
P018	357–57–3	Strychnidin-10-one, 2,3-dimethoxy-
P108	[1]57–24–9	Strychnine, & salts
P115	7446–18–6	Sulfuric acid, dithallium(1+) salt
P109	3689–24–5	Tetraethyldithiopyrophosphate
P110	78–00–2	Tetraethyl lead
P111	107–49–3	Tetraethyl pyrophosphate
P112	509–14–8	Tetranitromethane (R)
P062	757–58–4	Tetraphosphoric acid, hexaethyl ester
P113	1314–32–5	Thallic oxide
P113	1314–32–5	Thallium oxide Tl_2O_3
P114	12039–52–0	Thallium(I) selenite
P115	7446–18–6	Thallium(I) sulfate
P109	3689–24–5	Thiodiphosphoric acid, tetraethyl ester
P045	39196–18–4	Thiofanox
P049	541–53–7	Thioimidodicarbonic diamide $[(H_2N)C(S)]_2NH$
P014	108–98–5	Thiophenol
P116	79–19–6	Thiosemicarbazide
P026	5344–82–1	Thiourea, (2-chlorophenyl)-
P072	86–88–4	Thiourea, 1-naphthalenyl-
P093	103–85–5	Thiourea, phenyl-
P185	26419–73–8	Tirpate.
P123	8001–35–2	Toxaphene
P118	75–70–7	Trichloromethanethiol
P119	7803–55–6	Vanadic acid, ammonium salt
P120	1314–62–1	Vanadium oxide V_2O_5
P120	1314–62–1	Vanadium pentoxide
P084	4549–40–0	Vinylamine, N-methyl-N-nitroso-
P001	[1]81–81–2	Warfarin, & salts, when present at concentrations greater than 0.3%
P205	137–30–4	Zinc, bis(dimethylcarbamodithioato-S,S')-,
P121	557–21–1	Zinc cyanide
P121	557–21–1	Zinc cyanide $Zn(CN)_2$
P122	1314–84–7	Zinc phosphide Zn_3P_2, when present at concentrations greater than 10% (R,T)
P205	137–30–4	Ziram.

[1] CAS Number given for parent compound only.

(f) The commercial chemical products, manfacturing chemical intermediates, or off-specification commercial chemical products referred to in paragraphs (a) through (d) of this section, are identified as toxic wastes (T), unless otherwise designated and are subject to the small quantity generator exclusion defined in § 261.5 (a) and (g).

[*Comment:* For the convenience of the regulated community, the primary hazardous properties of these materials have been indicated by the letters T (Toxicity), R (Reactivity), I (Ignitability) and C (Corrosivity). Absence of a letter indicates that the compound is only listed for toxicity.]

These wastes and their corresponding EPA Hazardous Waste Numbers are:

Hazardous waste No.	Chemical abstracts No.	Substance
U394	30558–43–1	A2213.
U001	75–07–0	Acetaldehyde (I)
U034	75–87–6	Acetaldehyde, trichloro-
U187	62–44–2	Acetamide, N-(4-ethoxyphenyl)-
U005	53–96–3	Acetamide, N-9H-fluoren-2-yl-
[illegible]	[1]94–75–7	Acetic acid, (2,4-dichlorophenoxy)-, salts & esters
[illegible]	141–78–6	Acetic acid ethyl ester (I)
[illegible]	301–04–2	Acetic acid, lead(2+) salt
U214	563–68–8	Acetic acid, thallium(1+) salt
see F027	93–76–5	Acetic acid, (2,4,5-trichlorophenoxy)-
U002	67–64–1	Acetone (I)
U003	75–05–8	Acetonitrile (I,T)
U004	98–86–2	Acetophenone
U005	53–96–3	2-Acetylaminofluorene
U006	75–36–5	Acetyl chloride (C,R,T)
U007	79–06–1	Acrylamide
U008	79–10–7	Acrylic acid (I)
U009	107–13–1	Acrylonitrile
U011	61–82–5	Amitrole
U012	62–53–3	Aniline (I,T)
U136	75–60–5	Arsinic acid, dimethyl-
U014	492–80–8	Auramine
U015	115–02–6	Azaserine
U365	2212–67–1	H-Azepine-1-carbothioic acid, hexahydro-, S-ethyl ester.
U010	50–07–7	Azirino[2',3':3,4]pyrrolo[1,2-a]indole-4,7-dione, 6-amino-8-[[(aminocarbonyl)oxy]methyl]-1,1a,2,8,8a,8b-hexahydro-8a-methoxy-5-methyl-, [1aS-(1aalpha, 8beta,8aalpha,8balpha)]-
U280	101–27–9	Barban.
U278	22781–23–3	Bendiocarb.
U364	22961–82–6	Bendiocarb phenol.
U271	17804–35–2	Benomyl.
U157	56–49–5	Benz[j]aceanthrylene, 1,2-dihydro-3-methyl-
U016	225–51–4	Benz[c]acridine
U017	98–87–3	Benzal chloride
U192	23950–58–5	Benzamide, 3,5-dichloro-N-(1,1-dimethyl-2-propynyl)-
U018	56–55–3	Benz[a]anthracene
U094	57–97–6	Benz[a]anthracene, 7,12-dimethyl-
U012	62–53–3	Benzenamine (I,T)
[illegible]	492–80–8	Benzenamine, 4,4'-carbonimidoylbis[N,N-dimethyl-
[illegible]	3165–93–3	Benzenamine, 4-chloro-2-methyl-, hydrochloride
[illegible]	60–11–7	Benzenamine, N,N-dimethyl-4-(phenylazo)-
U328	95–53–4	Benzenamine, 2-methyl-
U353	106–49–0	Benzenamine, 4-methyl-
U158	101–14–4	Benzenamine, 4,4'-methylenebis[2-chloro-
U222	636–21–5	Benzenamine, 2-methyl-, hydrochloride
U181	99–55–8	Benzenamine, 2-methyl-5-nitro-
U019	71–43–2	Benzene (I,T)
U038	510–15–6	Benzeneacetic acid, 4-chloro-alpha-(4-chlorophenyl)-alpha-hydroxy-, ethyl ester
U030	101–55–3	Benzene, 1-bromo-4-phenoxy-
U035	305–03–3	Benzenebutanoic acid, 4-[bis(2-chloroethyl)amino]-
U037	108–90–7	Benzene, chloro-
U221	25376–45–8	Benzenediamine, ar-methyl-
U028	117–81–7	1,2-Benzenedicarboxylic acid, bis(2-ethylhexyl) ester
U069	84–74–2	1,2-Benzenedicarboxylic acid, dibutyl ester
U088	84–66–2	1,2-Benzenedicarboxylic acid, diethyl ester
U102	131–11–3	1,2-Benzenedicarboxylic acid, dimethyl ester

Hazardous waste No.	Chemical abstracts No.	Substance
U107	117–84–0	1,2-Benzenedicarboxylic acid, dioctyl ester
U070	95–50–1	Benzene, 1,2-dichloro-
U071	541–73–1	Benzene, 1,3-dichloro-
U072	106–46–7	Benzene, 1,4-dichloro-
U060	72–54–8	Benzene, 1,1'-(2,2-dichloroethylidene)bis[4-chloro-
U017	98–87–3	Benzene, (dichloromethyl)-
U223	26471–62–5	Benzene, 1,3-diisocyanatomethyl- (R,T)
U239	1330–20–7	Benzene, dimethyl- (I,T)
U201	108–46–3	1,3-Benzenediol
U127	118–74–1	Benzene, hexachloro-
U056	110–82–7	Benzene, hexahydro- (I)
U220	108–88–3	Benzene, methyl-
U105	121–14–2	Benzene, 1-methyl-2,4-dinitro-
U106	606–20–2	Benzene, 2-methyl-1,3-dinitro-
U055	98–82–8	Benzene, (1-methylethyl)- (I)
U169	98–95–3	Benzene, nitro-
U183	608–93–5	Benzene, pentachloro-
U185	82–68–8	Benzene, pentachloronitro-
U020	98–09–9	Benzenesulfonic acid chloride (C,R)
U020	98–09–9	Benzenesulfonyl chloride (C,R)
U207	95–94–3	Benzene, 1,2,4,5-tetrachloro-
U061	50–29–3	Benzene, 1,1'-(2,2,2-trichloroethylidene)bis[4-chloro-
U247	72–43–5	Benzene, 1,1'-(2,2,2-trichloroethylidene)bis[4- methoxy-
U023	98–07–7	Benzene, (trichloromethyl)-
U234	99–35–4	Benzene, 1,3,5-trinitro-
U021	92–87–5	Benzidine
U202	[1]81–07–2	1,2-Benzisothiazol-3(2H)-one, 1,1-dioxide, & salts
U278	22781–23–3	1,3-Benzodioxol-4-ol, 2,2-dimethyl-, methyl carbamate.
U364	22961–82–6	1,3-Benzodioxol-4-ol, 2,2-dimethyl-,
U203	94–59–7	1,3-Benzodioxole, 5-(2-propenyl)-
U141	120–58–1	1,3-Benzodioxole, 5-(1-propenyl)-
U367	1563–38–8	7-Benzofuranol, 2,3-dihydro-2,2-dimethyl-
U090	94–58–6	1,3-Benzodioxole, 5-propyl-
U064	189–55–9	Benzo[rst]pentaphene
U248	[1]81–81–2	2H-1-Benzopyran-2-one, 4-hydroxy-3-(3-oxo-1-phenyl-butyl)-, & salts, when present at concentrations of 0.3% or less
U022	50–32–8	Benzo[a]pyrene
U197	106–51–4	p-Benzoquinone
U023	98–07–7	Benzotrichloride (C,R,T)
U085	1464–53–5	2,2'-Bioxirane
U021	92–87–5	[1,1'-Biphenyl]-4,4'-diamine
U073	91–94–1	[1,1'-Biphenyl]-4,4'-diamine, 3,3'-dichloro-
U091	119–90–4	[1,1'-Biphenyl]-4,4'-diamine, 3,3'-dimethoxy-
U095	119–93–7	[1,1'-Biphenyl]-4,4'-diamine, 3,3'-dimethyl-
U401	97–74–5	Bis(dimethylthiocarbamoyl) sulfide.
U400	120–54–7	Bis(pentamethylene)thiuram tetrasulfide.
U225	75–25–2	Bromoform
U030	101–55–3	4-Bromophenyl phenyl ether
U128	87–68–3	1,3-Butadiene, 1,1,2,3,4,4-hexachloro-
U172	924–16–3	1-Butanamine, N-butyl-N-nitroso-
U031	71–36–3	1-Butanol (I)
U159	78–93–3	2-Butanone (I,T)
U160	1338–23–4	2-Butanone, peroxide (R,T)
U053	4170–30–3	2-Butenal
U074	764–41–0	2-Butene, 1,4-dichloro- (I,T)
U143	303–34–4	2-Butenoic acid, 2-methyl-, 7-[[2,3-dihydroxy-2-(1-methoxyethyl)-3-methyl-1-oxobutoxy]methyl]-2,3,5,7a-tetrahydro-1H-pyrrolizin-1-yl ester, [1S-[1alpha(Z),7(2S*,3R*),7aalpha]]-
U031	71–36–3	n-Butyl alcohol (I)
U392	2008–41–5	Butylate.
U136	75–60–5	Cacodylic acid
U032	13765–19–0	Calcium chromate
U372	10605–21–7	Carbamic acid, 1H-benzimidazol-2-yl, methyl ester.
U271	17804–35–2	Carbamic acid, [1-[(butylamino)carbonyl]-1H-benzimidazol-2-yl]-, methyl ester.
U375	55406–53–6	Carbamic acid, butyl-, 3-iodo-2-propynyl ester.
U280	101–27–9	Carbamic acid, (3-chlorophenyl)-, 4-chloro-2-butynyl ester.
U238	51–79–6	Carbamic acid, ethyl ester
U178	615–53–2	Carbamic acid, methylnitroso-, ethyl ester
U373	122–42–9	Carbamic acid, phenyl-, 1-methylethyl ester.
U409	23564–05–8	Carbamic acid, [1,2-phenylenebis (iminocarbonothioyl)]bis-, dimethyl ester.
U097	79–44–7	Carbamic chloride, dimethyl-

Hazardous waste No.	Chemical abstracts No.	Substance
U379	136–30–1	Carbamodithioic acid, dibutyl, sodium salt.
U277	95–06–7	Carbamodithioic acid, diethyl-, 2-chloro-2-propenyl ester.
U381	148–18–5	Carbamodithioic acid, diethyl-, sodium salt.
U383	128–03–0	Carbamodithioic acid, dimethyl, potassium salt.
U382	128–04–1	Carbamodithioic acid, dimethyl-, sodium salt.
U376	144–34–3	Carbamodithioic acid, dimethyl-, tetraanhydrosulfide with orthothioselenious acid.
U378	51026–28–9	Carbamodithioic acid, (hydroxymethyl)methyl-, monopotassium salt.
U384	137–42–8	Carbamodithioic acid, methyl-, monosodium salt.
U377	137–41–7	Carbamodithioic acid, methyl,- monopotassium salt.
U389	2303–17–5	Carbamothioic acid, bis(1-methylethyl)-, S-(2,3,3-trichloro-2-propenyl) ester.
U392	2008–41–5	Carbamothioic acid, bis(2-methylpropyl)-, S-ethyl ester.
U391	1114–71–2	Carbamothioic acid, butylethyl-, S-propyl ester.
U386	1134–23–2	Carbamothioic acid, cyclohexylethyl-, S-ethyl ester.
U390	759–94–4	Carbamothioic acid, dipropyl-, S-ethyl ester.
U387	52888–80–9	Carbamothioic acid, dipropyl-, S-(phenylmethyl) ester.
U385	1929–77–7	Carbamothioic acid, dipropyl-, S-propyl ester.
U114	[1]111–54–6	Carbamodithioic acid, 1,2-ethanediylbis-, salts & esters
U062	2303–16–4	Carbamothioic acid, bis(1-methylethyl)-, S-(2,3-dichloro-2-propenyl) ester
U279	63–25–2	Carbaryl.
'72	10605–21–7	Carbendazim.
7	1563–38–8	Carbofuran phenol.
.5	6533–73–9	Carbonic acid, dithallium(1+) salt
u033	353–50–4	Carbonic difluoride
U156	79–22–1	Carbonochloridic acid, methyl ester (I,T)
U033	353–50–4	Carbon oxyfluoride (R,T)
U211	56–23–5	Carbon tetrachloride
U034	75–87–6	Chloral
U035	305–03–3	Chlorambucil
U036	57–74–9	Chlordane, alpha & gamma isomers
U026	494–03–1	Chlornaphazin
U037	108–90–7	Chlorobenzene
U038	510–15–6	Chlorobenzilate
U039	59–50–7	p-Chloro-m-cresol
U042	110–75–8	2-Chloroethyl vinyl ether
U044	67–66–3	Chloroform
U046	107–30–2	Chloromethyl methyl ether
U047	91–58–7	beta-Chloronaphthalene
U048	95–57–8	o-Chlorophenol
U049	3165–93–3	4-Chloro-o-toluidine, hydrochloride
U032	13765–19–0	Chromic acid H_2CrO_4, calcium salt
U050	218–01–9	Chrysene
U393	137–29–1	Copper, bis(dimethylcarbamodithioato-S,S')-,
U393	137–29–1	Copper dimethyldithiocarbamate.
U051	....	Creosote
U052	1319–77–3	Cresol (Cresylic acid)
U053	4170–30–3	Crotonaldehyde
U055	98–82–8	Cumene (I)
U246	506–68–3	Cyanogen bromide (CN)Br
U386	1134–23–2	Cycloate.
U197	106–51–4	2,5-Cyclohexadiene-1,4-dione
U056	110–82–7	Cyclohexane (I)
U129	58–89–9	Cyclohexane, 1,2,3,4,5,6-hexachloro-, (1alpha,2alpha,3beta,4alpha,5alpha,6beta)-
57	108–94–1	Cyclohexanone (I)
0	77–47–4	1,3-Cyclopentadiene, 1,2,3,4,5,5-hexachloro-
.58	50–18–0	Cyclophosphamide
U240	[1]94–75–7	2,4-D, salts & esters
U059	20830–81–3	Daunomycin
U366	533–74–4	Dazomet.
U060	72–54–8	DDD
U061	50–29–3	DDT
U062	2303–16–4	Diallate
U063	53–70–3	Dibenz[a,h]anthracene
U064	189–55–9	Dibenzo[a,i]pyrene
U066	96–12–8	1,2-Dibromo-3-chloropropane
U069	84–74–2	Dibutyl phthalate
U070	95–50–1	o-Dichlorobenzene
U071	541–73–1	m-Dichlorobenzene
U072	106–46–7	p-Dichlorobenzene
U073	91–94–1	3,3'-Dichlorobenzidine
U074	764–41–0	1,4-Dichloro-2-butene (I,T)

Hazardous waste No.	Chemical abstracts No.	Substance
U075	75–71–8	Dichlorodifluoromethane
U078	75–35–4	1,1-Dichloroethylene
U079	156–60–5	1,2-Dichloroethylene
U025	111–44–4	Dichloroethyl ether
U027	108–60–1	Dichloroisopropyl ether
U024	111–91–1	Dichloromethoxy ethane
U081	120–83–2	2,4-Dichlorophenol
U082	87–65–0	2,6-Dichlorophenol
U084	542–75–6	1,3-Dichloropropene
U085	1464–53–5	1,2:3,4-Diepoxybutane (I,T)
U108	123–91–1	1,4-Diethyleneoxide
U028	117–81–7	Diethylhexyl phthalate
U395	5952–26–1	Diethylene glycol, dicarbamate.
U086	1615–80–1	N,N'-Diethylhydrazine
U087	3288–58–2	O,O-Diethyl S-methyl dithiophosphate
U088	84–66–2	Diethyl phthalate
U089	56–53–1	Diethylstilbesterol
U090	94–58–6	Dihydrosafrole
U091	119–90–4	3,3'-Dimethoxybenzidine
U092	124–40–3	Dimethylamine (I)
U093	60–11–7	p-Dimethylaminoazobenzene
U094	57–97–6	7,12-Dimethylbenz[a]anthracene
U095	119–93–7	3,3'-Dimethylbenzidine
U096	80–15–9	alpha,alpha-Dimethylbenzylhydroperoxide (R)
U097	79–44–7	Dimethylcarbamoyl chloride
U098	57–14–7	1,1-Dimethylhydrazine
U099	540–73–8	1,2-Dimethylhydrazine
U101	105–67–9	2,4-Dimethylphenol
U102	131–11–3	Dimethyl phthalate
U103	77–78–1	Dimethyl sulfate
U105	121–14–2	2,4-Dinitrotoluene
U106	606–20–2	2,6-Dinitrotoluene
U107	117–84–0	Di-n-octyl phthalate
U108	123–91–1	1,4-Dioxane
U109	122–66–7	1,2-Diphenylhydrazine
U110	142–84–7	Dipropylamine (I)
U111	621–64–7	Di-n-propylnitrosamine
U403	97–77–8	Disulfiram.
U390	759–94–4	EPTC.
U041	106–89–8	Epichlorohydrin
U001	75–07–0	Ethanal (I)
U404	121–44–8	Ethanamine, N,N-diethyl-
U174	55–18–5	Ethanamine, N-ethyl-N-nitroso-
U155	91–80–5	1,2-Ethanediamine, N,N-dimethyl-N'-2-pyridinyl-N'-(2-thienylmethyl)-
U067	106–93–4	Ethane, 1,2-dibromo-
U076	75–34–3	Ethane, 1,1-dichloro-
U077	107–06–2	Ethane, 1,2-dichloro-
U131	67–72–1	Ethane, hexachloro-
U024	111–91–1	Ethane, 1,1'-[methylenebis(oxy)]bis[2-chloro-
U117	60–29–7	Ethane, 1,1'-oxybis-(I)
U025	111–44–4	Ethane, 1,1'-oxybis[2-chloro-
U184	76–01–7	Ethane, pentachloro-
U208	630–20–6	Ethane, 1,1,1,2-tetrachloro-
U209	79–34–5	Ethane, 1,1,2,2-tetrachloro-
U218	62–55–5	Ethanethioamide
U226	71–55–6	Ethane, 1,1,1-trichloro-
U227	79–00–5	Ethane, 1,1,2-trichloro-
U410	59669–26–0	Ethanimidothioic acid, N,N'- [thiobis[(methylimino)carbonyloxy]]bis-, dimethyl ester
U394	30558–43–1	Ethanimidothioic acid, 2-(dimethylamino)-N-hydroxy-2-oxo-, methyl ester.
U359	110–80–5	Ethanol, 2-ethoxy-
U173	1116–54–7	Ethanol, 2,2'-(nitrosoimino)bis-
U395	5952–26–1	Ethanol, 2,2'-oxybis-, dicarbamate.
U004	98–86–2	Ethanone, 1-phenyl-
U043	75–01–4	Ethene, chloro-
U042	110–75–8	Ethene, (2-chloroethoxy)-
U078	75–35–4	Ethene, 1,1-dichloro-
U079	156–60–5	Ethene, 1,2-dichloro-, (E)-
U210	127–18–4	Ethene, tetrachloro-
U228	79–01–6	Ethene, trichloro-
U112	141–78–6	Ethyl acetate (I)
U113	140–88–5	Ethyl acrylate (I)
U238	51–79–6	Ethyl carbamate (urethane)

Hazardous waste No.	Chemical abstracts No.	Substance
U117	60–29–7	Ethyl ether (I)
U114	111–54–6	Ethylenebisdithiocarbamic acid, salts & esters
U067	106–93–4	Ethylene dibromide
U077	107–06–2	Ethylene dichloride
U359	110–80–5	Ethylene glycol monoethyl ether
U115	75–21–8	Ethylene oxide (I,T)
U116	96–45–7	Ethylenethiourea
U076	75–34–3	Ethylidene dichloride
U118	97–63–2	Ethyl methacrylate
U119	62–50–0	Ethyl methanesulfonate
U407	14324–55–1	Ethyl Ziram.
U396	14484–64–1	Ferbam.
U120	206–44–0	Fluoranthene
U122	50–00–0	Formaldehyde
U123	64–18–6	Formic acid (C,T)
U124	110–00–9	Furan (I)
U125	98–01–1	2-Furancarboxaldehyde (I)
U147	108–31–6	2,5-Furandione
U213	109–99–9	Furan, tetrahydro-(I)
U125	98–01–1	Furfural (I)
[illegible]24	110–00–9	Furfuran (I)
	18883–66–4	Glucopyranose, 2-deoxy-2-(3-methyl-3-nitrosoureido)-, D-
	18883–66–4	D-Glucose, 2-deoxy-2-[[(methylnitrosoamino)-carbonyl]amino]-
U126	765–34–4	Glycidylaldehyde
U163	70–25–7	Guanidine, N-methyl-N′-nitro-N-nitroso-
U127	118–74–1	Hexachlorobenzene
U128	87–68–3	Hexachlorobutadiene
U130	77–47–4	Hexachlorocyclopentadiene
U131	67–72–1	Hexachloroethane
U132	70–30–4	Hexachlorophene
U243	1888–71–7	Hexachloropropene
U133	302–01–2	Hydrazine (R,T)
U086	1615–80–1	Hydrazine, 1,2-diethyl-
U098	57–14–7	Hydrazine, 1,1-dimethyl-
U099	540–73–8	Hydrazine, 1,2-dimethyl-
U109	122–66–7	Hydrazine, 1,2-diphenyl-
U134	7664–39–3	Hydrofluoric acid (C,T)
U134	7664–39–3	Hydrogen fluoride (C,T)
U135	7783–06–4	Hydrogen sulfide
U135	7783–06–4	Hydrogen sulfide H_2S
U096	80–15–9	Hydroperoxide, 1-methyl-1-phenylethyl- (R)
U116	96–45–7	2-Imidazolidinethione
U137	193–39–5	Indeno[1,2,3-cd]pyrene
U375	55406–53–6	3-Iodo-2-propynyl n-butylcarbamate.
U396	14484–64–1	Iron, tris(dimethylcarbamodithioato-S,S′)-,
U190	85–44–9	1,3-Isobenzofurandione
U140	78–83–1	Isobutyl alcohol (I,T)
U141	120–58–1	Isosafrole
U142	143–50–0	Kepone
U143	303–34–4	Lasiocarpine
U144	301–04–2	Lead acetate
U146	1335–32–6	Lead, bis(acetato-O)tetrahydroxytri-
U145	7446–27–7	Lead phosphate
[illegible]	1335–32–6	Lead subacetate
	58–89–9	Lindane
[illegible]	70–25–7	MNNG
U147	108–31–6	Maleic anhydride
U148	123–33–1	Maleic hydrazide
U149	109–77–3	Malononitrile
U150	148–82–3	Melphalan
U151	7439–97–6	Mercury
U384	137–42–8	Metam Sodium.
U152	126–98–7	Methacrylonitrile (I, T)
U092	124–40–3	Methanamine, N-methyl- (I)
U029	74–83–9	Methane, bromo-
U045	74–87–3	Methane, chloro- (I, T)
U046	107–30–2	Methane, chloromethoxy-
U068	74–95–3	Methane, dibromo-
U080	75–09–2	Methane, dichloro-
U075	75–71–8	Methane, dichlorodifluoro-
U138	74–88–4	Methane, iodo-

Hazardous waste No.	Chemical abstracts No.	Substance
U119	62–50–0	Methanesulfonic acid, ethyl ester
U211	56–23–5	Methane, tetrachloro-
U153	74–93–1	Methanethiol (I, T)
U225	75–25–2	Methane, tribromo-
U044	67–66–3	Methane, trichloro-
U121	75–69–4	Methane, trichlorofluoro-
U036	57–74–9	4,7-Methano-1H-indene, 1,2,4,5,6,7,8,8-octachloro-2,3,3a,4,7,7a-hexahydro-
U154	67–56–1	Methanol (I)
U155	91–80–5	Methapyrilene
U142	143–50–0	1,3,4-Metheno-2H-cyclobuta[cd]pentalen-2-one, 1,1a,3,3a,4,5,5,5a,5b,6-decachlorooctahydro-
U247	72–43–5	Methoxychlor
U154	67–56–1	Methyl alcohol (I)
U029	74–83–9	Methyl bromide
U186	504–60–9	1-Methylbutadiene (I)
U045	74–87–3	Methyl chloride (I,T)
U156	79–22–1	Methyl chlorocarbonate (I,T)
U226	71–55–6	Methyl chloroform
U157	56–49–5	3-Methylcholanthrene
U158	101–14–4	4,4′-Methylenebis(2-chloroaniline)
U068	74–95–3	Methylene bromide
U080	75–09–2	Methylene chloride
U159	78–93–3	Methyl ethyl ketone (MEK) (I,T)
U160	1338–23–4	Methyl ethyl ketone peroxide (R,T)
U138	74–88–4	Methyl iodide
U161	108–10–1	Methyl isobutyl ketone (I)
U162	80–62–6	Methyl methacrylate (I,T)
U161	108–10–1	4-Methyl-2-pentanone (I)
U164	56–04–2	Methylthiouracil
U010	50–07–7	Mitomycin C
U365	2212–67–1	Molinate.
U059	20830–81–3	5,12-Naphthacenedione, 8-acetyl-10-[(3-amino-2,3,6-trideoxy)-alpha-L-lyxo-hexopyranosyl)oxy]-7,8,9,10-tetrahydro-6,8,11-trihydroxy-1-methoxy-, (8S-cis)-
U167	134–32–7	1-Naphthalenamine
U168	91–59–8	2-Naphthalenamine
U026	494–03–1	Naphthalenamine, N,N′-bis(2-chloroethyl)-
U165	91–20–3	Naphthalene
U047	91–58–7	Naphthalene, 2-chloro-
U166	130–15–4	1,4-Naphthalenedione
U236	72–57–1	2,7-Naphthalenedisulfonic acid, 3,3′-[(3,3′-dimethyl[1,1′-biphenyl]-4,4′-diyl)bis(azo)bis[5-amino-4-hydroxy]-, tetrasodium salt
U279	63–25–2	1-Naphthalenol, methylcarbamate.
U166	130–15–4	1,4-Naphthoquinone
U167	134–32–7	alpha-Naphthylamine
U168	91–59–8	beta-Naphthylamine
U217	10102–45–1	Nitric acid, thallium(1+) salt
U169	98–95–3	Nitrobenzene (I,T)
U170	100–02–7	p-Nitrophenol
U171	79–46–9	2-Nitropropane (I,T)
U172	924–16–3	N-Nitrosodi-n-butylamine
U173	1116–54–7	N-Nitrosodiethanolamine
U174	55–18–5	N-Nitrosodiethylamine
U176	759–73–9	N-Nitroso-N-ethylurea
U177	684–93–5	N-Nitroso-N-methylurea
U178	615–53–2	N-Nitroso-N-methylurethane
U179	100–75–4	N-Nitrosopiperidine
U180	930–55–2	N-Nitrosopyrrolidine
U181	99–55–8	5-Nitro-o-toluidine
U193	1120–71–4	1,2-Oxathiolane, 2,2-dioxide
U058	50–18–0	2H-1,3,2-Oxazaphosphorin-2-amine, N,N-bis(2-chloroethyl)tetrahydro-, 2-oxide
U115	75–21–8	Oxirane (I,T)
U126	765–34–4	Oxiranecarboxyaldehyde
U041	106–89–8	Oxirane, (chloromethyl)-
2	123–63–7	Paraldehyde
U391	1114–71–2	Pebulate.
U183	608–93–5	Pentachlorobenzene
U184	76–01–7	Pentachloroethane
U185	82–68–8	Pentachloronitrobenzene (PCNB)
See F027	87–86–5	Pentachlorophenol
U161	108–10–1	Pentanol, 4-methyl-
U186	504–60–9	1,3-Pentadiene (I)

Hazardous waste No.	Chemical abstracts No.	Substance
U187	62–44–2	Phenacetin
U188	108–95–2	Phenol
U048	95–57–8	Phenol, 2-chloro-
U039	59–50–7	Phenol, 4-chloro-3-methyl-
U081	120–83–2	Phenol, 2,4-dichloro-
U082	87–65–0	Phenol, 2,6-dichloro-
U089	56–53–1	Phenol, 4,4'-(1,2-diethyl-1,2-ethenediyl)bis-, (E)-
U101	105–67–9	Phenol, 2,4-dimethyl-
U052	1319–77–3	Phenol, methyl-
U132	70–30–4	Phenol, 2,2'-methylenebis[3,4,6-trichloro-
U411	114–26–1	Phenol, 2-(1-methylethoxy)-, methylcarbamate.
U170	100–02–7	Phenol, 4-nitro-
See F027	87–86–5	Phenol, pentachloro-
See F027	58–90–2	Phenol, 2,3,4,6-tetrachloro-
See F027	95–95–4	Phenol, 2,4,5-trichloro-
See F027	88–06–2	Phenol, 2,4,6-trichloro-
U150	148–82–3	L-Phenylalanine, 4-[bis(2-chloroethyl)amino]-
U145	7446–27–7	Phosphoric acid, lead(2+) salt (2:3)
U087	3288–58–2	Phosphorodithioic acid, O,O-diethyl S-methyl ester
U189	1314–80–3	Phosphorus sulfide (R)
U190	85–44–9	Phthalic anhydride
U191	109–06–8	2-Picoline
U179	100–75–4	Piperidine, 1-nitroso-
U400	120–54–7	Piperidine, 1,1'-(tetrathiodicarbonothioyl)-bis-
U383	128–03–0	Potassium dimethyldithiocarbamate.
U378	51026–28–9	Potassium n-hydroxymethyl- n-methyldi-thiocarbamate.
U377	137–41–7	Potassium n-methyldithiocarbamate.
U192	23950–58–5	Pronamide
U194	107–10–8	1-Propanamine (I,T)
U111	621–64–7	1-Propanamine, N-nitroso-N-propyl-
U110	142–84–7	1-Propanamine, N-propyl- (I)
U066	96–12–8	Propane, 1,2-dibromo-3-chloro-
U083	78–87–5	Propane, 1,2-dichloro-
U149	109–77–3	Propanedinitrile
U171	79–46–9	Propane, 2-nitro- (I,T)
U027	108–60–1	Propane, 2,2'-oxybis[2-chloro-
U193	1120–71–4	1,3-Propane sultone
See F027	93–72–1	Propanoic acid, 2-(2,4,5-trichlorophenoxy)-
U235	126–72–7	1-Propanol, 2,3-dibromo-, phosphate (3:1)
U140	78–83–1	1-Propanol, 2-methyl- (I,T)
U002	67–64–1	2-Propanone (I)
U007	79–06–1	2-Propenamide
U084	542–75–6	1-Propene, 1,3-dichloro-
U243	1888–71–7	1-Propene, 1,1,2,3,3,3-hexachloro-
U009	107–13–1	2-Propenenitrile
U152	126–98–7	2-Propenenitrile, 2-methyl- (I,T)
U008	79–10–7	2-Propenoic acid (I)
U113	140–88–5	2-Propenoic acid, ethyl ester (I)
U118	97–63–2	2-Propenoic acid, 2-methyl-, ethyl ester
U162	80–62–6	2-Propenoic acid, 2-methyl-, methyl ester (I,T)
U373	122–42–9	Propham.
U411	114–26–1	Propoxur.
U387	52888–80–9	Prosulfocarb.
U194	107–10–8	n-Propylamine (I,T)
U083	78–87–5	Propylene dichloride
U148	123–33–1	3,6-Pyridazinedione, 1,2-dihydro-
U196	110–86–1	Pyridine
U191	109–06–8	Pyridine, 2-methyl-
U237	66–75–1	2,4-(1H,3H)-Pyrimidinedione, 5-[bis(2-chloroethyl)amino]-
U164	56–04–2	4(1H)-Pyrimidinone, 2,3-dihydro-6-methyl-2-thioxo-
U180	930–55–2	Pyrrolidine, 1-nitroso-
U200	50–55–5	Reserpine
U201	108–46–3	Resorcinol
U202	[1] 81–07–2	Saccharin, & salts
U203	94–59–7	Safrole
U204	7783–00–8	Selenious acid

Hazardous waste No.	Chemical abstracts No.	Substance
U204	7783–00–8	Selenium dioxide
U205	7488–56–4	Selenium sulfide
U205	7488–56–4	Selenium sulfide SeS_2 (R,T)
U376	144–34–3	Selenium, tetrakis(dimethyldithiocarbamate).
U015	115–02–6	L-Serine, diazoacetate (ester)
See F027	93–72–1	Silvex (2,4,5-TP)
U379	136–30–1	Sodium dibutyldithiocarbamate.
U381	148–18–5	Sodium diethyldithiocarbamate.
U382	128–04–1	Sodium dimethyldithiocarbamate.
U206	18883–66–4	Streptozotocin
U103	77–78–1	Sulfuric acid, dimethyl ester
U277	95–06–7	Sulfallate.
U189	1314–80–3	Sulfur phosphide (R)
See F027	93–76–5	2,4,5-T
U402	1634–02–2	Tetrabutylthiuram disulfide.
U207	95–94–3	1,2,4,5-Tetrachlorobenzene
U208	630–20–6	1,1,1,2-Tetrachloroethane
U209	79–34–5	1,1,2,2-Tetrachloroethane
U210	127–18–4	Tetrachloroethylene
See F027	58–90–2	2,3,4,6-Tetrachlorophenol
U213	109–99–9	Tetrahydrofuran (I)
U401	97–74–5	Tetramethylthiuram monosulfide.
U214	563–68–8	Thallium(I) acetate
U215	6533–73–9	Thallium(I) carbonate
U216	7791–12–0	Thallium(I) chloride
U216	7791–12–0	Thallium chloride Tlcl
U217	10102–45–1	Thallium(I) nitrate
U366	533–74–4	2H-1,3,5-Thiadiazine- 2-thione, tetrahydro-3,5-dimethyl-
U218	62–55–5	Thioacetamide
U410	59669–26–0	Thiodicarb.
U153	74–93–1	Thiomethanol (I,T)
U244	137–26–8	Thioperoxydicarbonic diamide $[(H_2N)C(S)]_2S_2$, tetramethyl-
U402	1634–02–2	Thioperoxydicarbonic diamide, tetrabutyl.
U403	97–77–8	Thioperoxydicarbonic diamide, tetraethyl.
U409	23564–05–8	Thiophanate-methyl.
U219	62–56–6	Thiourea
U244	137–26–8	Thiram
U220	108–88–3	Toluene
U221	25376–45–8	Toluenediamine
U223	26471–62–5	Toluene diisocyanate (R,T)
U328	95–53–4	o-Toluidine
U353	106–49–0	p-Toluidine
U222	636–21–5	o-Toluidine hydrochloride
U389	2303–17–5	Triallate.
U011	61–82–5	1H-1,2,4-Triazol-3-amine
U227	79–00–5	1,1,2-Trichloroethane
U228	79–01–6	Trichloroethylene
U121	75–69–4	Trichloromonofluoromethane
See F027	95–95–4	2,4,5-Trichlorophenol
See F027	88–06–2	2,4,6-Trichlorophenol
U404	121–44–8	Triethylamine.
U234	99–35–4	1,3,5-Trinitrobenzene (R,T)
U182	123–63–7	1,3,5-Trioxane, 2,4,6-trimethyl-
U235	126–72–7	Tris(2,3-dibromopropyl) phosphate
U236	72–57–1	Trypan blue
U237	66–75–1	Uracil mustard
U176	759–73–9	Urea, N-ethyl-N-nitroso-
U177	684–93–5	Urea, N-methyl-N-nitroso-
U385	1929–77–7	Vernolate.
U043	75–01–4	Vinyl chloride
U248	[1] 81–81–2	Warfarin, & salts, when present at concentrations of 0.3% or less
U239	1330–20–7	Xylene (I)
U200	50–55–5	Yohimban-16-carboxylic acid, 11,17-dimethoxy-18-[(3,4,5-trimethoxybenzoyl)oxy]-, methyl ester, (3beta,16beta,17alpha,18beta,20alpha)-
U407	14324–55–1	Zinc, bis(diethylcarbamodithioato-S,S')-
U249	1314–84–7	Zinc phosphide Zn_3P_2, when present at concentrations of 10% or less

[1] CAS Number given for parent compound only.

PETER G. MORROS
Director

(702) 486-2850

STATE OF NEVADA
KENNY C. GUINN
Governor

ENVIRONMENTAL PROTECTION
OCT 10 00

ALLEN BIAGGI
Administrator

FAX (702) 486-2863

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

DIVISION OF ENVIRONMENTAL PROTECTION

(Las Vegas Office)
555 E. Washington, Suite 4300
Las Vegas, Nevada 89101-1049

October 9, 2000

Ms. Susan M. Crowley
Staff Environmental Specialist
Kerr McGee Chemical LLC
PO Box 55
Henderson, NV 89009-7000

RE: Hydrogeologic Investigation Report

Dear Ms. Crowley:

On September 20, 2000, Everette Spore and you met with representatives of the Nevada Division of Environmental Protection (NDEP) to discuss various issues associated with Kerr McGee's on-going investigation and removal of perchlorate from the Las Vegas Wash area. The possibility of employing a modified long-term remediation system was evaluated. This system involves the use of ion exchange for perchlorate remediation versus a biological destruction method.

During this meeting Kerr McGee also provided NDEP with an update on the status of various investigation related activities. These included the installation and sampling of nested wells near the Las Vegas Wash, seep area reconnaissance and a groundwater tracer study. NDEP expressed a desire to see this information and it was agreed that a report would be forthcoming to NDEP within approximately six weeks.

In this report, please provide an analysis of potential short-term options for immediate groundwater treatment in the Las Vegas Wash area. In particular, please look at potentially extracting groundwater and utilizing the existing ion exchange system to treat the water prior to discharge. If you have any questions concerning this matter, please feel free to contact me at 486-2857.

Sincerely,

Brenda Pohlmann

Brenda Pohlmann
Remedial Action Program Supervisor
Las Vegas Bureau of Corrective Actions

BLP:blp

cc: Doug Zimmerman, Chief, Bureau of Corrective Actions
Jennifer Carr, Bureau of Corrective Actions
Pat Corbett, Kerr-McGee Chemical LLC, Kerr McGee Center, PO Box 25861, Oklahoma City, OK 73125
Barry Conaty, Cutler & Stanfield, L.L.P, 700 Fourteenth Street, N.W., Washington DC 20005
Pat Mulroy, Southern Nevada Water Authority, 1001 S. Valley View Blvd., Las Vegas, NV 89153
Larry Bowerman, USEPA Region 9, 75 Hawthorne St., WST-5, San Francisco, CA 94105
Mitch Kaplan, USEPA Region 9, 75 Hawthorne St., WST-5, San Francisco, CA 94105

Department of Parks & Recreation

2601 E Sunset Rd • Las Vegas NV 89120
(702) 455-8200 • Fax (702) 455-8234

Glenn Trowbridge, Director • Patricia Marchese, Assistant Director

October 5, 2000

OCT 10 2000

Brenda Pohlmann
Remedial Action Program Supervisor
Las Vegas Bureau of Corrective Actions
Nevada Division of Environmental Protection

RE: Pabco Seep Berm

Dear Ms. Pohlmann:

Thank you for your letter dated September 28, 2000 regarding the Pabco seep earthen berm. The berm will be removed immediately. The contractor has been notified and the removal is being coordinated with Kerr McGee.

On May 4, 2000 a proposal was submitted to Kerr McGee and NDEP to prevent sloughing of material from the berm resulting from recreational use in the area. Based on your September 28, 2000, letter it is surmised that the proposal was rejected and the berm will not be used to prevent untreated perchlorate laden water from entering the Las Vegas Wash during times of shut down of the Kerr McGee perchlorate treatment system.

Clark County Parks and Recreation in the development of the Wetlands Park is committed to working closely with you and your agency to improve the water quality of the Las Vegas Wash.

If you have any questions, please contact me at 455-8287.

Sincerely,

Bruce Sillitoe

Bruce Sillitoe
Principal Park Planner

cc: Doug Zimmerman, Chef, Bureau of Corrective Actions
Leo Drozdoff, Chief, Bureau of Water Pollution Control
Susan Crowley, Kerr McGee Chemical LLC
Jeff Harris, Manager of Park Planning, Clark County Parks and Recreation

PETER G. MORROS
Director

(702) 486-2850

STATE OF NEVADA
KENNY C. GUINN
Governor

ALLEN BIAGGI
Administrator

FAX (702) 486-2863

ENVIRONMENTAL PROTECTION

SEP 29 00

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

DIVISION OF ENVIRONMENTAL PROTECTION

(Las Vegas Office)
555 E. Washington, Suite 4300
Las Vegas, Nevada 89101-1049

September 28, 2000

Mr. Bruce Sillitoe
Park Planner
Clark County Parks and Recreation
2601 E. Sunset Road
Las Vegas, NV 89120

RE: Pabco Seep Berm

Dear Mr. Sillitoe:

During the course of the last several months, there have been a number of discussions between you and representatives of the Nevada Division of Environmental Protection (NDEP) concerning an earthen berm that was constructed during the course of the dewatering for the Pabco Erosion Control Structure. Clark County Parks and Recreation constructed this berm with the belief that it would assist in minimizing the amount of perchlorate entering Las Vegas Wash during your construction activities.

Concerns have been raised that this earthen berm may have a negative impact on Kerr McGee's perchlorate remediation system which is located downstream of the berm. We are aware that Kerr McGee has had to shut their intercept pumps down on several occasions when large quantities of silt were released from the berm. Additionally, there is concern that part of the berm may slough and further hinder Kerr McGee's remediation. The effort that Kerr McGee is currently undertaking near the Las Vegas Wash is imperative for this community and is of utmost importance to NDEP. We have concerns with any activities occurring near Las Vegas Wash which may impair Kerr McGee's attempts to maximize perchlorate removal from the groundwater and wash system.

Due to these concerns, NDEP will require that the earthen berm be removed as soon as practicable, preferably within the next fourteen days. A schedule for berm removal activities should be submitted to this office within five days. Please schedule any earthmoving activities with Kerr McGee so as to not interrupt their intercept system. If you have any questions concerning this matter, please feel free to contact me at 486-2857.

Sincerely,

Brenda Pollman

Brenda Pohlmann
Remedial Action Program Supervisor
Las Vegas Bureau of Corrective Actions

BLP:blp

cc: Doug Zimmerman, Chief, Bureau of Corrective Actions
Leo Drozdoff, Chief, Bureau of Water Pollution Control
Susan Crowley, Kerr McGee Chemical LLC

KERR-McGEE CHEMICAL LLC
POST OFFICE BOX 55 - HENDERSON, NEVADA 89009

September 15, 2000

Ms. Brenda Pohlmann
Remediation Branch Supervisor
Nevada Division of Environmental Protection
555 E. Washington, Suite 4300
Las Vegas, NV 89101

Dear Ms. Pohlmann:

Subject: Perchlorate Activity Status

Following is the current status of Kerr-McGee Chemical LLC s (Kerr-McGee) perchlorate related activities as outlined in the Perchlorate Consent Agreement (July 26, 1999) and its supporting Work Plans:

- Kerr-McGee s commitment to remove perchlorate from surfacing groundwater, or the seep , is continuing, utilizing Calgon Carbon s ion exchange process. To date, 40.4 tons have been removed since ion exchange operation began in November 1999. While the stream flow dropped as the summer continued, flow increased during late August and has been rising steadily since that time. The stream flow was about 210 gpm during July and risen to about 280 in mid-September. Perchlorate concentration rose through the summer as well and stabilized in August at about 100 ppm. These conditions appear typical of summertime conditions in the stream, although they represent lower flows than seen during 1999 s summertime period. Although the ion exchange system is running well, we continue to have occasional operational difficulties due to the Clark County earthen dam, installed upgradient from the stream capture point. The dam continues to deteriorate. In addition, as the winter approaches and seep stream flow increases the impact of the earthen dam is unknown. Kerr-McGee is hopeful that the dam will be removed by Clark County, at the earliest possibility.

- On-site groundwater continues to be extracted and treated for chromium removal, then placed in the on-site groundwater holding basin for eventual treatment for perchlorate removal. Since initiation of impoundment in December 1998, considering the average perchlorate concentration of 1,500 ppm, 182 tons of perchlorate have been removed from the on-site shallow groundwater. The holding basin has had a very high evaporation rate due to lower than normal rainfall and above average temperature and wind conditions.

- Kerr-Gee is continued transfer of groundwater extracted from the Pittman Lateral area to its groundwater holding basin through September 12th. September 12th the pump utilized to transfer the groundwater was remove to allow the groundwater tracer test (briefly described below) to be completed. Over the 387 days this transfer has been active, approximately 1.84 tons of perchlorate have been removed from the groundwater.

- Field activities to investigate hydrologic condition in the seep vicinity are continuing. Completed are the nested well installations, the seep area reconnaissance and the near wash groundwater seep sampling. Groundwater tracer studies are underway as of this writing, following and NDEP approved Groundwater Tracer Work Plan. Tracer work is being completed at three location; the seep area, the COH RIB area, and lastly the Pittman Lateral area. The tracer study should be complete in early fourth quarter 2000.

- NDEP, Bureau of Water Pollution Control, issued an NPDES discharge permit (NV 0023060) for perchlorate treated waters. Compliance sampling associated with this permit has begun. In addition a Las Vegas Wash Tracer Work Plan is under development to confirm the mixing zone assumptions supplied in support of the NPDES Permit application.
- Engineering (by Biothane Corporation and Applied Research Associates) is nearing completion on the perchlorate treatment system. The cost estimate and schedule were received early in July for Kerr-McGee internal review and approval. Issued for construction drawings are expected in early October. Pre-construction activities, such as site preparation, have begun at the Henderson plant. Additional activities are pending a grading permit, currently in Clark County Planning and Zoning's control. This permit is pending a process approval letter from NDEP, Nadir Sous (Las Vegas office), to continue the grading permit review process. Draft documents (drawings) have been submitted to NDEP s Las Vegas office for Mr. Sous s review. Issued for construction drawings, which are wet stamped, will be forwarded, as available. It is expected that slightly over a year will be needed to construct and start up the biological treatment facility once internal approval and NDEP approvals have been received.
- Transfer pipeline and lift station # 2 engineering drawings are nearly complete. Draft easements have been prepared for the entire run of the pipeline and for lift station # 2. Access negotiations continue with the property owners. Maintenance work has begun on the section of existing pipeline that will be used to cross Warm Springs Rd. and Boulder Highway for the treated water return to the seep stream. This work is expected to be complete in the fourth quarter 2000.
- Kerr-McGee has been requested by NDEP to draft a second Consent Agreement as a follow-on to the existing Consent Agreement. The second Agreement would cover the permanent perchlorate treatment system, while the first covered the temporary seep issues.

KMC is committed to act responsibly and cooperate fully with local, state, and federal officials in determining appropriate remedial actions. Please feel free to contact me at (702) 651-2200 if you have any questions related to this information. Thank you.

Sincerely,

SMCrowley

Susan M. Crowley
Staff Environmental Specialist

By certified mail

cc: PSCorbett
EMSpore
FRStater
TWReed
WOGreen
RHJones
LKBailey
ALDooley
Rick Simon, ENSR
Robert Kelso, NDEP
Doug Zimmerman, NDEP
Jeanne-Marie Bruno, Metro Water District Of Southern California
Barry Conaty, City of Henderson
Pat Mulroy, Southern Nevada Water Authority
Kevin Mayer, EPA Region IX

PETER G. MORROS
Director

STATE OF NEVADA
KENNY C. GUINN
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DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL PROTECTION
(Las Vegas Office)
555 E. Washington, Suite 4300
Las Vegas, Nevada 89101-1049

September 14, 2000

Ms. Susan M. Crowley
Staff Environmental Specialist
Kerr-McGee Chemical LLC
PO Box 55
Henderson, NV 89009

RE: Perchlorate Remediation Project; Biological Treatment System, at the Henderson Facilities

Dear Ms. Crowley:

I have reviewed the preliminary draft plans and the Remediation procedures for the above mentioned project. The plans and the procedures seem to be adequate and meet our minimum requirements. Therefore, the Division's Bureau of Water Pollution Control grants its **conditional approval** pending your response to the following items:

1- A complete final set of plans and specifications, **wet stamped**, signed, and dated by a registered Professional Engineer in the State of Nevada.

2- An Operation and Maintenance Manual to be developed and sent to this office for review and approval.

3- A registered professional engineer **must provide** this office with certification that the project was constructed in accordance with the plans and specifications upon completion of construction. All addenda and change orders must be approved by the division.

Review or approval of facilities plans, design drawings and specifications or other documents by or for the division is for administrative purposes only and dose not relieve the owner of the responsibility to properly plan, design, build and effectively operate and maintain the facility as required under law, regulation, permits, and good management practices. The division is not responsible for increased costs resulting from defects in the design, plans and specifications or pertinent documents.

The Permittee is responsible for all the permits required which may include, but not limited to:

Dam permits	- Division of Water Resources
Well Permits	- Division of Water Resources
404 Permits	- Army Corps of Engineers/NDEP
Air Permits	- NDEP
Local Permits	- Local Government
Health Permits	- Local Government

If you have any further questions, please feel free to contact me at (702) 486-2853.

Sincerely,

Nadir E. Sous, Supervisor
Staff Engineer
Bureau of Water Pollution Control

cc: Darrell Rasner, NDEP/Carson City
Leo Drozdoff, NDEP/Carson City
Cathe Pool, NDEP/Carson City
Doug Zimmerman, NDEP/Carson City
Brenda Pohlman, NDEP/Las Vegas
Dave Brown, Clark County Dept. Of Buildg., 500 s. Grandcentral pky 1st flr, PO Box 553530, Las Vegas, Nevada 89155-3530

Nevada Division of Environmental Protection

AUTHORIZATION TO DISCHARGE

In compliance with the provisions of the Federal Water Pollution Control Act as amended, (33 U.S.C. 1251 et. seq; the "Act"), and Chapter 445A of the Nevada Revised Statutes,

Kerr-McGee Chemical, LLC
P.O. Box 55
Henderson, NV 89015

RECEIVED
AUG 9 2000
ENVIRONMENTAL PROTECTION
LAS VEGAS

is authorized to discharge from a facility located at

8000 Lake Mead Drive
Henderson, Nevada
Latitude 36° 5" 15'
Longitude 114° 59" 30'

to receiving waters named

Las Vegas Wash from Telephone Road to the confluence of discharges from City of Las Vegas and Clark County wastewater treatment plants (NAC 445A.199)

in accordance with effluent limitations, monitoring requirements, and other conditions set forth in Part I, II and III hereof.

This permit shall become effective on August 7, 2000.

This permit and the authorization to discharge shall expire at midnight, August 7, 2005.

Signed this 7 day of August, 2000.

Catherine R. Pool, P.E.
Supervisor Permitting Branch
Bureau of Water Pollution Control

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PART I

I.A. EFFLUENT LIMITATIONS, MONITORING REQUIREMENTS AND CONDITIONS

I.A.1. During the period beginning on the effective date of this permit, and lasting until the permit expires, the permittee is authorized to discharge treated "seep" water, treated groundwater from the on-site chromium treatment system and upon approval from the Division, other sources of treated groundwater (e.g. Pittman Lateral) from **Outfall 001.**

Effluent samples taken in compliance with the monitoring requirements specified below shall be taken after treatment and prior to mixing with the receiving waters. Effluent samples are designated as **EFF**. Influent samples are to be taken at the headworks prior to treatment and are designated as **INF**. LW6.05, LW0.55, LW5.5 (previously LVW-2 LVW-5 and LM-6) are at designated sampling locations in the Las Vegas Wash.

The discharge shall be limited and monitored by the permittee as specified below:

TABLE I.1

PARAMETERS	EFFLUENT DISCHARGE LIMITATIONS			MONITORING REQUIREMENTS		
	30 Day Ave. mg/l	7 day Average mg/l	30 Day Ave. lb/day	Sample Location(s)	Measurement Frequency	Sample Type
Flow	1.22 MGD	1.4 MGD	NA	EFF	Continuous	Flow meter
BOD_5 (inhibited)	25 mg/l	40 mg/l	254 lb/day	INF, EFF	Weekly	Discrete
Perchlorate-Ion Exchange	97%* removal	Monitor and Report	Monitor & Report	INF, EFF	Weekly	Daily discrete samples, composited weekly
	*or 3 mg/l whichever is greater					
Perchlorate-Bioreactor	99%* removal	Monitor and Report	50 lb/day	INF, EFF	Weekly	Daily discrete samples, composited weekly
	*or 3 mg/l whichever is greater					
pH	between 6.5 and 9 standard units			EFF	Weekly	Discrete
Hexavalent Chromium	Monitor & Report	0.010 mg/l	Monitor & Report	INF, EFF	Weekly	Discrete
Total Chromium	Monitor & Report	0.1 mg/l	Monitor & Report	INF, EFF	Weekly	Discrete
Total Suspended Solids	135 mg/l	Monitor & Report	Monitor & Report	EFF	Weekly	Discrete
Iron, Total	10 mg/l	Monitor & Report	Monitor & Report	EFF	Weekly	Discrete
Manganese	5 mg/l	NA	Monitor and Report	EFF	Weekly	Discrete

PARAMETERS	EFFLUENT DISCHARGE LIMITATIONS			MONITORING REQUIREMENTS		
	30 Day Ave. mg/l	7 day Average mg/l	30 Day Ave. lb/day	Sample Location(s)	Measurement Frequency	Sample Type
Total Phosphorus as P	Monitor & Report	Monitor & Report	20 lb/day*	INF, EFF	Weekly	Discrete
	*If the load of Total Phosphorous in the Las Vegas Wash exceeds 434 lb/day March 1 - October 31st, the Permittee shall negotiate an Individual Waste Load Allocation or another approved mechanism which ensures the WQS will be met.			LW0.55	Twice/month	Discrete
Ammonia as N	Monitor & Report	Monitor & Report	40 lb/day*	EFF	Weekly	Discrete
	*If the load of Total Ammonia in the Las Vegas Wash exceeds 970 lb/day April 1- September 30, the Permittee shall negotiate an Individual Waste Load Allocation or another approved mechanism which ensures the WQS will be met.			LW0.55	Twice/month	Discrete
Attachment A	The permittee shall demonstrate that there is no increase in the concentration or loading of the "other" constituents as a result of the discharge. The permittee shall only be responsible for utilizing results which are greater than the PQL, however, all data above the MDL shall be reported.			EFF	Quarterly	Discrete
Color	Monitor & Report			INF, EFF	Weekly	Discrete
Total Inorganic Nitrogen as N	Monitor & Report			INF, EFF	Weekly	Discrete
Un-Ionized Ammonia as N	Monitor & Report			INF, EFF	Weekly	Calculated
Total Dissolved Solids	Monitor & Report			INF, EFF	Weekly	Discrete
Sulfide	Monitor & Report			INF, EFF	Weekly	Discrete
Oil and Grease	Monitor & Report			INF, EFF	Weekly	Discrete
Boron	Monitor & Report			EFF	Weekly	Discrete
Dissolved Oxygen	Monitor & Report			EFF	Weekly	Discrete
Nitrate as N	Monitor & Report			EFF	Weekly	Discrete
Kjeldahl Nitrogen as N	Monitor & Report			INF, EFF	Weekly	Discrete
Chloride	Monitor & Report			INF, EFF	Weekly	Discrete

PARAMETERS	EFFLUENT DISCHARGE LIMITATIONS			MONITORING REQUIREMENTS		
	30 Day Ave. mg/l	7 day Average mg/l	30 Day Ave. lb/day	Sample Location(s)	Measurement Frequency	Sample Type
Radium 226 + 228	Monitor & Report			EFF	Weekly	Discrete
Gross Alpha	Monitor & Report			EFF	Weekly	Discrete
Chlorate (ClO3)	Monitor & Report			INF, EFF	Weekly	Discrete
Acute WET	See permit condition I.A.15.			EFF	Monthly	Discrete

I.A.2. **Mixing Zone** The permit allows the following mixing zone in the Las Vegas Wash: from Outfall 001 to the end of the mixing zone defined as the Las Vegas Wash control point identified as LW5.5 (previously LM-6) located approximately one mile downstream of where Telephone Line road crosses Las Vegas Wash. The discharge is to be limited to maintain compliance with the downstream limits listed below. Samples are to be taken at the following locations: upstream samples are to be taken 150 feet upstream of the discharge in the Las Vegas Wash, downstream samples are to be taken at LW5.5, and the upgradient groundwater monitoring well (UPMW) at the Kerr McGee facility, at the frequencies defined in Table I.2.

Table I.2

PARAMETERS	DOWNSTREAM ACTION THRESHOLDS apply at LW5.5		MONITORING REQUIREMENTS		
	30 day average	Daily Max	Sample Locations	Measurement Frequency	Sample type*
Total Dissolved Solids	2400 mg/L	Monitor & Report	Upstream, LW6.05, LW5.5	Twice/month	Discrete
			UPMW	Quarterly	
Total Inorganic Nitrogen	17 mg/l	Monitor & Report	Upstream, LW6.05, LW5.5	Twice/month	Discrete
			UPMW	Quarterly	
Color	Monitor & Report		Upstream, LW6.05, LW5.5	Twice/month	Discrete
Radium 226 + 228	Monitor & Report		Upstream, LW6.05, LW5.5	Twice/month	Discrete
Gross Alpha	Monitor & Report		Upstream, LW6.05, LW5.5	Twice/month	Discrete
Iron	Monitor & Report		Upstream, LW6.05, LW5.5	Twice/month	Discrete
			UPMW	Quarterly	
Manganese	Monitor & Report		Upstream, LW6.05, LW5.5	Twice/month	Discrete

PARAMETERS	DOWNSTREAM ACTION THRESHOLDS apply at LW5.5		MONITORING REQUIREMENTS		
	30 day average	Daily Max	Sample Locations	Measurement Frequency	Sample type*
Manganese	Monitor & Report		UPMW	Quarterly	Discrete
Molybdenum	Monitor & Report		Upstream, LW6.05, LW5.5	Twice/month	Discrete
			UPMW	Quarterly	
Copper	Monitor & Report		Upstream, LW6.05, LW5.5	Twice/month	Discrete
			UPMW	Quarterly	
Chromium	Monitor & Report		Upstream, LW6.05, LW5.5	Twice/month	Discrete
			UPMW	Quarterly	
Boron	Monitor & Report		Upstream, LW6.05, LW5.5	Twice/month	Discrete
			UPMW	Quarterly	
Fluoride	Monitor & Report		Upstream, LW6.05, LW5.5	Twice/month	Discrete
			UPMW	Quarterly	
Chloride	Monitor & Report		Upstream, LW6.05, LW5.5	Twice/month	Discrete
			UPMW	Quarterly	
Attachment A	Monitor & Report		Upstream, LW6.05, LW5.5	Annually	Discrete

* The Permittee may composite LV Wash samples upon receiving Division approval of a sampling plan.

I.A.2.a. On a quarterly basis, the permittee shall submit an evaluation of the data collected pursuant to Table 1.2 at Telephone Line Road in the Las Vegas Wash (LVW6.05, previously LVW-2).

b. Within 30 days after the submission of the first quarterly analysis under subsection a. which shows that the 95th percentile of the data collected at Telephone Line for a pollutant in Table 1.2 exceeds an applicable water quality standard for that pollutant and the data show that the discharge authorized by this permit was a significant contributor to such exceedance, the permittee shall submit a plan to investigate such exceedance. The plan may include a monitoring strategy, an evaluation of the standard and/or the location of the control point, and such other measures as the permittee deems appropriate. The plan shall include a schedule for the investigation. In developing the plan, the permittee will seek to work cooperatively with other dischargers to the Las Vegas Wash. The investigation plan must be approved by the Division.

c. Upon approval of the investigation plan, the permittee shall implement the plan, working with other Las Vegas Wash dischargers to the extent reasonably possible. Upon completion of the investigation, the permittee shall submit a report to the Division with recommendations for future actions.

I.A.3. **Narrative Standards** *NAC 445A.121* Discharges shall not cause the following standards to be violated in any surface waters of the state. Waters must be free from:

a. substances that will settle to form sludge or bottom deposits in amounts sufficient to be unsightly, putrescent or odorous;

b. floating debri, oil, grease, scum, and other floating materials in amounts sufficient to be unsightly;

c. materials in amounts sufficient to produce taste or odor in the water or detectable off-flavor in the flesh of fish or in amounts sufficient to change the existing color, turbidity or other conditions in the receiving stream to such a degree as to create a public nuisance;

d. high temperature, biocides, organisms pathogenic to human beings, toxic, corrosive or other deleterious substances at levels or combinations sufficient to be toxic to human, animal, plant or aquatic life;

e. radioactive materials must not result in accumulations of radioactivity in plants or animals that result in a hazard to humans or harm to aquatic life;

f. untreated or uncontrolled wastes or effluents that are reasonably amenable to treatment or control;

g. substances or conditions which interfere with the beneficial use of the receiving waters.

h. The narrative standards are not considered violated when the natural conditions of the receiving water are outside the established limits, including periods of high or low flow. Where effluents are discharged to such waters, the discharges are not considered a contributor to substandard conditions provided maximum treatment in compliance with permit requirements is maintained.

I.A.4 Upon obtaining one year of data, the permittee may request a reduction in monitoring frequency and analytical parameters. The request shall include a demonstration that the reduction is justified due to the consistent nature of the discharge and the ability of the discharge to meet the permit limits.

I.A.5. There shall be no objectionable odors from the collection system, treatment facility or disposal area, or sludge treatment, use, storage or disposal area.

I.A.6. There shall be no discharge of substances, which are associated with the Permittee's operation, that would cause a violation of water quality standards of the State of Nevada.

I.A.7. There shall be no discharge from the collection, treatment and disposal facilities except as authorized by this permit.

I.A.8. The treatment and disposal facility shall be fenced and posted.

I.A.9. The collection, treatment and disposal facilities shall be constructed in conformance with plans approved by the Administrator. The plans must be approved by the Administrator prior to the start of construction. All changes to the approved plans must be approved by the Administrator.

I.A.10. The facility shall be operated in accordance with the Operations and Maintenance (O&M) Manual which must be approved by the Administrator.

I.A.11. There shall be no discharge of floating solids or visible foam in other than trace amounts.

I.A.12. Facilities that generate and dispose of sludge shall monitor the concentrations of arsenic, cadmium, chromium, copper, lead, mercury, molybdenum, nickel, selenium, zinc, and pesticides and report in mg/dry Kg of sludge.

Dry Sludge Disposal rate in metric tons/yr.	**Frequency**
>0 - <290	Each year
≥290 -<1500	once a quarter
≥1500 -<15000	once every 2 months
≥15000	once a month

I.A.13. **Annual Fee** The permittee shall remit an annual review and services fee in accordance with NAC 445A.232 starting **July 1, 2000** and every year thereafter until the permit is terminated.

I.A.14. The treatment facility shall be operated by a Nevada Certified Environmental Manager (CEM). The Discharge Monitoring Reports (DMRs) must be signed by the CEM. The first DMR submitted under this permit must include the written designation of the CEM (required by Part III A.2) as the authorized representative to sign the DMRs. If the CEM changes, a new designation letter must be submitted.

I.A.15. **Whole Effluent Toxicity Testing** Upon written notification by the Division, the permittee shall conduct monthly toxicity tests on 24-hour composite effluent samples as described below on the discharge from Outfall 001. (The Division will require this testing after the issues with constituents not associated with the operations of the permittee are resolved.)

a. **Acute Toxicity**
The effluent shall be deemed acutely toxic when there is a statistically significant difference at the 95th% confidence interval between the survival of the control (0% effluent) test organisms and the survival of the test organisms in the 100% effluent at the following limits:
i. The survival of test organisms in the undiluted effluent sample is less than 90 percent in six (6) out of eleven (11) consecutive samples; or
ii. The survival rate of test organisms in the undiluted effluent sample is less than 70 percent in any two of eleven consecutive samples.

b. **Test Methods**
i. The acute flow through or static replacement tests shall be conducted in general accordance with the procedures set out in the latest revision of "Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms," EPA/600/4-90/027. The permittee shall conduct an acute 48-hour flow through or static replacement toxicity test using any Daphnid approved by the Division and an acute 96-hour flow through or static replacement toxicity test using fathead minnows, Pimephales promelas. After each 24-hours of the test period the dilutions shall be replaced with freshly prepared dilutions of the original effluent sample.
1. If more than 10 percent control mortality occurs, the test shall be repeated until satisfactory control survival is achieved.

I.A.15.b.i.2. The source of the dilution water shall be reported with the test results. The tests shall be run using 4 replicate chambers, with a minimum of 5 organisms per test chamber for the Daphnid and 2 organisms per test chamber for the P. Promelas.

ii. **Alternative Species and Protocols** The permittee may undertake an investigation of alternative site specific toxicity test species and alternative site specific toxicity protocols. If alternative, site-specific toxicity test species or protocols are developed as a result of work by the permittee, such species or protocols may be substituted for those specified in this permit on approval by NDEP and EPA under 40 CFR Part 136. Alternative protocols must be compared to EPA protocols to demonstrate appropriateness and reliability.

c. <u>**Testing Schedule**</u>

i. *Routine Schedule*: The Permittee shall conduct an acute toxicity test during the first week of the calendar month.

ii. *Accelerated schedule*: Whenever the effluent has been determined to be acutely toxic per I.A.15.a., the Permittee shall increase the frequency of acute toxicity testing to every other week. The accelerated testing shall also be conducted to determine an endpoint of either the LC50 or the No Observed Effects Concentration (NOEC) as defined in the above referenced method. When 4 (four) consecutive tests show greater than 70 percent survival of undiluted effluent, the Permittee may resume its routine test schedule.

d. <u>**Follow-up Responses**</u> Whenever the acute toxicity effluent limitation as defined under either paragraph I.A.15.a.i or ii has been exceeded, <u>**and**</u> one or more of the tests conducted under I.A.15.c.ii. fails, the permittee shall:

i. In general accordance with EPA manuals and EPA/600/6-91/003, EPA/600/3-88/035, or any subsequent revisions and/or methods approved by NDEP, initiate an identification investigation within 24 hours of the exceedance to identify the cause(s) of the toxicity,

   1. After the initiation of the investigation phase pursuant to this condition, the permittee may suspend the accelerated testing required by I.A.15.c.ii. as long as the routine testing required by I.A.15.c.i. is resumed.

ii. In general accordance with EPA manuals and and EPA/600/R-92/081, or any subsequent revisions and/or methods approved by NDEP, conduct an evaluation of findings where appropriate; and

iii. Notify EPA and NDEP within fifteen (15) days of becoming aware of the exceedance and provide the following:

   1. times and dates when the limitation was exceeded;
   2. the findings of the identification investigation or other investigation to identify the cause(s) of the toxicity and a plan for continuing the identification investigation if it was not conclusive;
   3. the actions the permittee has taken or will take to mitigate the impact of the discharge, to correct the noncompliance and prevent the recurrence of toxicity; and
   4. where corrective actions have not been completed, an expeditious schedule under which the corrective actions will be implemented.

e. In no event shall the discharger cause any impairment of the receiving water or of the beneficial uses, nor cause a violation of any other provision of this permit, Clean Water Act and State or local regulation or law by discharging constituents which are the responsibility of the Permittee.

I.A.15.f. **Toxicity Testing Reopener** This permit may be reopened and modified by the permitting authority to include effluent limits, additional testing and/or other appropriate actions to address demonstrated effluent toxicity. This permit may also be reopened and modified by the permitting authority to incorporate alternative permit conditions reflecting State Water Quality Standards revisions related to effluent toxicity.

g. In addition to the quarterly DMR submittals, the Permittee shall submit an **annual report** prepared by the laboratory which provides an evaluation of the survival rates of both the control and the 100% effluent. This report shall be submitted with the **fourth quarter report every year** as applicable.

I.A.16. **Schedule of Compliance** The permittee shall implement and comply with the provisions of the schedule of compliance after approval by the Administrator, including in said implementation and compliance, any additions or modifications which the Administrator may make in approving the schedule of compliance.

a. The permittee shall achieve compliance with the effluent limitations upon issuance of the permit.

b. **Total Dissolved Solids(TDS)** NAC 445A.143 Nothing in this permit condition shall alleviate the responsibility of other parties under consent agreement to the Bureau of Corrective Action for the groundwater issues at the BMI complex. Any work pertaining to TDS must recognize that the water quality standard for TDS (NAC 445A.199) must be maintained. **Prior to treating and discharging groundwater other than groundwater from the chromium treatment system,** the permittee shall submit the following information and obtain approval from the Division:

i. The permittee shall submit supporting documentation for the "Conceptual Study TDS Removal" Parsons Engineering, April 30, 1999. The supporting documentation should include equipment sizing for each piece of equipment in the cost analysis.

ii. The permittee shall submit an evaluation of alternative plans that could substantially reduce salt discharge within 270 days of the effective date of the permit. The evaluation shall include a detailed evaluation of re-use options, including the use of treated water in the plant process (and any associated cost savings), the use of treated water in a wetlands, dust control or other reuse sites determined by the permittee, precipitation of sulfate, calcium, manganese. The evaluation shall also include an analysis of the cost of discharging treated water to infiltration basins. The technical feasibility of each alternatives; total construction, operation and maintenance costs; and costs in dollars per ton of salt removed from the discharge shall be included. This work may be completed by HISSC and/or the permittee as appropriate pursuant to direction by NDEP's Bureau of Corrective Action.

iii. The permittee shall continue to participate in regional solutions to the TDS issues in the Las Vegas Wash. The permittee shall submit a quarterly report in accordance with I.B.1. which includes any progress made on reducing the TDS loading to the Wash either in directly reducing the loading to the wash from the discharge or regional projects the permittee has participated in which reduce the loading off-site in the same watershed.

c. The Permittee shall submit a plan within 90 days of the effective date of the permit to conduct a tracer study in the Las Vegas Wash to better define the end of the mixing zone. Upon Division approval of the tracer study plan, the permittee shall conduct the study. Should the results indicate that the end of the mixing zone should be moved, the permit shall be modified as a minor modification.

d. The permittee shall fully cooperate in good faith with any persons required by NDEP to treat the discharge subsequent to treatment by the permittee.

I.A.16.e. The Permittee shall submit an Operation and Maintenance manual for the bioreactor plant within 6 months of the plant coming on-line. The O/M manual shall also include a sampling plan for all monitoring activities.

I.B. MONITORING AND REPORTING

I.B.1. Reporting

a. **Annual Reports**

i. The fourth quarter report shall contain a plot of date (x-axis) versus concentration (y-axis) for each analyzed constituent with results detected at a frequency of 25 % of the samples analyzed. The plot shall include data from the preceding five years, if available. Any data point from the current year that is greater than the limits in Part I.A.1 must be explained by a narrative.

b. **Quarterly Reporting** Monitoring results obtained pursuant to Section I.A of the permit for the previous three (3) month period shall be summarized for each month and reported on a Discharge Monitoring Report (DMR) form. The DMR is to be received in this office no later than the 28th day of the month following the completed reporting period. The Permittee shall also submit the data in electronic format compatible with the Storet database. The first report is due on October 28, 2000. Laboratory results for analyses conducted by outside laboratories must accompany the DMR.

c. **Compliance Report** Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each schedule date.

d. **Other information** Where the Permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Administrator, it shall promptly submit such facts or information.

e. **Planned changes** The Permittee shall give notice to the Administrator as soon as possible of any planned physical alterations of additions to the permitted facility. Notice is required only when the alteration or addition to a permitted facility;

i. may meet one of the criteria for determining whether a facility is a new source (40 CFR 122.29(b)); or

ii. Could significantly change the nature or increase the quantity of pollutants discharged; or

iii. results in a significant change to the permittee's sludge management practice or disposal sites.

f. **Anticipated non-compliance** The Permittee shall give advance notice to the Administrator of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

g. An original signed copy of these, and all other reports required herein, shall be submitted to the State at the following address:

Division of Environmental Protection
Bureau of Water Pollution Control
ATTN: Compliance Coordinator
333 West Nye Lane
Carson City, Nevada 89706-0851

I.B.1.h. A signed copy of all Discharge Monitoring Reports and any other reports shall be submitted to the Regional Administrator at the following address:

U.S. Environmental Protection Agency, Region IX
NPDES/DMR WTR-7-1
75 Hawthorne Street
San Francisco, CA 94105

I.B.2 **Monitoring**

a. **Representative Samples** Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge.

b. **Test Procedures** Monitoring for the analysis of pollutants shall be conducted according to test procedures approved under 40 CFR 136 published pursuant to Section 304(h) of the Act, or SW-846, or in the case of sludge disposal, approved under 40 CFR 503, or other procedures as approved by the Administrator in the permit. Analysis shall be performed by a State of Nevada certified laboratory.

c. **Recording the Results** For each measurement or sample taken pursuant to the requirements of this permit, the permittee shall record the following information:
   i. the exact place, date, and time of sampling;
   ii. the dates the analyses were performed;
   iii. the person(s) who performed the analyses;
   iv. the analytical techniques or methods used; and
   v. the results of all required analyses.

d. **Additional Monitoring by Permittee** If the permittee monitors any pollutant at the location(s) designated herein more frequently than required by this permit, using approved analytical methods as specified above, the results of such monitoring shall be included in the calculation and reporting of the values required in the Discharge Monitoring Report Form. Such increased frequency shall also be indicated on the DMR.

e. **Records Retention** All records and information resulting from the monitoring activities, permit application, reporting required by this permit, including all records of analyses performed and calibration and maintenance of instrumentation and recordings from continuous monitoring instrumentation, shall be retained for a minimum of three (3) years, or longer if required by the Administrator. Records of monitoring information required by this permit related to the permittee's sewage sludge use and/or disposal activities shall be retained for a period of at least 5 years or longer as required by 40 CFR 503.

f. **Detection Limits** All laboratory analysis conducted in accordance with this discharge permit must meet the following criteria:
   i. The most sensitive analytical method specified or approved in either 40 CFR 136 or SW-846 shall be used which is required or approved by the Nevada state laboratory certification program; and
   ii. Each parameter shall have detection at or below the permit limits or the method detection limit as defined in the analytical method; or
   iii. The Permittee is considered in compliance if the reported results are less than the established permit limit or laboratory reporting limit.

I.B.2.g. **Modification of Monitoring Frequency and Sample Type** After considering monitoring data, stream flow, discharge flow and receiving water conditions, the Administrator, may for just cause, modify the monitoring frequency and/or sample type by issuing an order to the permittee.

I.B.3. **Definitions**

a. The "30-day average discharge" means the total discharge during a month divided by the number of samples in the period that the facility was discharging. Where less than daily sampling is required by this permit, the 30-day average discharge shall be determined by the summation of all the measured discharges divided by the number of samples during the period when the measurements were made.

b. The "daily maximum" is the highest measurement during the monitoring period.

c. The "30-day average concentration", other than for fecal coliform bacteria, means the arithmetic mean of measurements made during a month. The "30-day average concentration" for fecal coliform bacteria means the geometric mean of measurements made during a month. The geometric mean is the "n^{th}" root of the product of "n" numbers. Geometric mean calculations and arithmetic mean calculations where there are non-detect results shall use one half the detection limit as the value for the non-detect results.

d. A "discrete" sample means any individual sample collected in less than 15 minutes.

e. For flow-rate measurements a "composite" sample means the arithmetic mean of no fewer than six individual measurements taken at equal time intervals for 24 hours, or for the duration of discharge, whichever is shorter.

For other than flow-rate a "composite" sample means a combination of no fewer than six individual flow-weighted samples obtained at equal time intervals for 24 hours, or for the duration of discharge, whichever is shorter. Flow-weighted sample means that the volume of each individual sample shall be proportional to the discharge flow rate at the time of sampling.

f. Acute toxicity is defined in the whole effluent testing procedures presented in this permit in I.A.15.

g. Biosolids are non-hazardous sewage sludge or domestic septage as these terms are defined in 40 CFR 503.9.

h. PQL is the Practical Quantitation Limit as defined in SW-846. MDL is the Method Detection Limit as defined in SW-846.

PART II

II.A. MANAGEMENT REQUIREMENTS

II.A.1. **Change in Discharge** All discharges authorized herein shall be consistent with the terms and conditions of this permit. The discharge of any pollutant identified in this permit more frequently than or at a level in excess of that authorized shall constitute a violation of the permit. Any anticipated facility expansions, or treatment modifications which will result in new, different, or increased discharges of pollutants must be

II.A.1.(cont) reported by submission of a new application or, if such changes will not violate the effluent limitations specified in this permit, by notice to the permit issuing authority of such changes. Any changes to the permitted treatment facility must comply with Nevada Administrative Code (NAC) 445A.283 to 445A.285. Pursuant to NAC 445A.263, the permit may be modified to specify and limit any pollutants not previously limited.

II.A.2. **Facilities Operation-Proper Operation and Maintenance** The permittee shall at all times maintain in good working order and operate as efficiently as possible all treatment or control facilities, collection systems or pump stations installed or used by the permittee to achieve compliance with the terms and conditions of this permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance/quality control procedures.

II.A.3. **Adverse Impact-Duty to Mitigate** The permittee shall take all reasonable steps to minimize releases to the environment resulting from noncompliance with any effluent limitations specified in this permit, including such accelerated or additional monitoring as necessary to determine the nature and impact of the noncomplying discharge. The Permittee shall carry out such measures, as reasonable, to prevent significant adverse impacts on human health or the environment.

II.A.4. **Noncompliance, Unauthorized Discharge, Bypassing and Upset**

a. Any diversion, bypass, spill, overflow or discharge of treated or untreated wastewater from wastewater treatment or conveyance facilities under the control of the permittee is prohibited except as authorized by this permit. In the event the permittee has knowledge that a diversion, bypass, spill, overflow or discharge not authorized by this permit is probable, the permittee shall notify the Administrator immediately.

b. The permittee shall notify the Administrator within twenty-four (24) hours of any diversion, bypass, spill, upset, overflow or release of treated or untreated discharge other than that which is authorized by the permit. A written report shall be submitted to the Administrator within five (5) days of diversion, bypass, spill, overflow, upset or discharge, detailing the entire incident including:
   i. time and date of discharge;
   ii. exact location and estimated amount of discharge;
   iii. flow path and any bodies of water which the discharge reached;
   iv. the specific cause of the discharge; and
   v. the preventive and/or corrective actions taken.

c. The following shall be included as information which must be reported within 24 hours:
   i. any unanticipated bypass which exceeds any effluent limitation in the permit;
   ii. any upset which exceeds any effluent limitation in the permit;
   iii. violation of a limitation for any toxic pollutant or any pollutant identified as the method to control a toxic pollutant.

d. The permittee shall report all instances of noncompliance not reported under Part II.A.4.b. at the time monitoring reports are submitted. The reports shall contain the information listed in Part II.A.4.b.

e. A "**bypass**" means the intentional diversion of waste streams from any portion of a treatment facility.

II.A.4.e.i. **Bypass not exceeding limitations** The Permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of paragraphs a and b of this section.

ii. **Anticipated bypass** If the Permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten days before the date of bypass.

f. **Prohibition of Bypass.** Bypass is prohibited, and the Administrator may take enforcement action against a Permittee for bypass, unless:

i. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage.

ii. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment down time. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgement to prevent a bypass which occurred during normal periods of equipment downtime or preventative maintenance; and

iii. The Permittee submitted notices as required under paragraph e of this section.

g. The Administrator may approve an anticipated bypass, after considering its adverse effects, if the Administrator determines that it will meet the three conditions listed in paragraph f of this section.

h. An "**upset**" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

i. **Effect of an upset** An upset constitutes an affirmative defense to an action brought for non-compliance with such technology-based permit effluent limitations if the requirements of paragraph j of this section are met.

j. **Conditions necessary for a demonstration of an upset** A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

i. An upset occurred and that the Permittee can identify the cause(s) of the upset;

ii. The permitted facility was at the time being properly operated; and

iii. The permittee submitted notice of the upset as required under paragraph c of this section; and

iv. The Permittee complied with any remedial measures required under II.A.3.

k. In selecting the appropriate enforcement option, the Administrator shall consider whether or not the noncompliance was the result of an upset. The burden of proof is on the permittee to establish that an upset occurred.

II.A.5. <u>**Removed Substances**</u> Solids, sludges, filter backwash, or other pollutants removed in the course of treatment or control of waste waters shall be disposed of in a manner such as to prevent any pollution from such materials from entering any navigable waters.

II.A.6. **Safeguards to Electric Power Failure** In order to maintain compliance with the effluent limitations and prohibitions of this permit the permittee shall either:

a. provide at the time of discharge an alternative power source sufficient to operate the wastewater control facilities;

b. halt or reduce all discharges upon the reduction, loss, or failure of the primary source of power to the wastewater control facilities.

II.B. RESPONSIBILITIES

II.B.1. **Right of Entry and Inspection** The permittee shall allow the Administrator and/or his authorized representatives, upon the presentation of credentials, to:

a. enter at reasonable times upon the Permittee's premises where an effluent source is located or in which any records are required to be kept under the terms and conditions of this permit;

b. have access to and copy any records required to be kept under the terms and conditions of this permit;

c. inspect at reasonable times any facilities, equipment (including monitoring ans control equipment), practices, or operations required in this permit;

d. perform any necessary sampling or monitoring to determine compliance with this permit at any location for any parameter.

II.B.2. **Transfer of Ownership or Control** In the event of any change in control or ownership of facilities from which the authorized discharge emanates, the permittee shall notify the succeeding owner or controller of the existence of this permit, by letter, a copy of which shall be forwarded to the Administrator. The Administrator may require modification or revocation and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary. ALL transfer of permits shall be approved by the Administrator.

II.B.3. **Availability of Reports** Except for data determined to be confidential under NRS 445A.665, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the office of the Administrator. As required by the Act, effluent data shall not be considered confidential. Knowingly making any false statement on any such report may result in the imposition of criminal penalties as provided for in NRS 445A.710.

II.B.4. **Furnishing False Information and Tampering with Monitoring Devices** Any person who knowingly makes any false statement, representation, or certification in any application, record, report, plan or other document filed or required to be maintained by the provisions of NRS 445A.300 to 445A.730, inclusive, or by any permit, rule, regulation or order issued pursuant thereto, or who falsifies, tampers with or knowingly renders inaccurate any monitoring device or method required to be maintained under the provisions of NRS 445A.300 to 445A.730, inclusive, or by any permit, rule, regulation or order issued pursuant thereto, is guilty of a gross misdemeanor and shall be punished by a fine of not more than $10,000 or by imprisonment. This penalty is in addition to any other penalties, civil or criminal, provided pursuant to NRS 445A.300 to 445A.730, inclusive.

II.B.5. **Penalty for Violation of Permit Conditions** Nevada Revised Statutes NRS 445A.675 provides that any person who violates a permit condition is subject to administrative and judicial sanctions as outlined in NRS 445A.690 through 445A.705.

II.B.6. **Permit Modification, Suspension or Revocation**

a. After notice and opportunity for a hearing, this permit may be modified, suspended, or revoked in whole or in part during its term for cause including, but not limited to, the following:
   i. violation of any terms or conditions of this permit; or
   ii. obtaining this permit by misrepresentation or failure to disclose fully all relevant facts; or
   iii. a change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge; or
   iv. a determination that the permitted activity endangers human health or the environment and can only be regulated to acceptable levels by permit modification or termination; or
   v. there are material and substantial alterations or additions to the permitted facility or activity; or.
   vi. the Administrator has received new information; or
   vii. the standards or regulations have changed; or
   viii. the Administrator has received notification that the permit will be transferred.

b. **Minor Modifications** With the consent of the Permittee and without public notice, the Administrator may make minor modifications in a permit to:
   i. Correct typographical errors;
   ii. Clarify permit language;
   iii. require more frequent monitoring or reporting;
   iv. change an interim compliance date in a schedule of compliance, provided the new date is not more than 120 days after the date specified in the permit and does not interfere with attainment of the final compliance date;
   v. allow for change in ownership; change the construction schedule for a new discharger provided that all equipment is installed and operational prior to discharge;
   vi. delete an outfall when the discharge from that outfall is terminated and does not result in discharge of pollutants from other outfalls except in accordance with permit limits.

II.B.7. **Toxic Pollutants** Notwithstanding Part II.B.6. above, if a toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is established under Section 307(a) of the Act for a toxic pollutant which is present in the discharge and such standard or prohibition is more stringent than any limitation for such pollutant in this permit, this permit shall be revised or modified in accordance with the toxic effluent standard or prohibition and the permittee so notified.

II.B.8. **Liability** Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable Federal, State or local laws, regulations, or ordinances.

II.B.9. **Property Rights** The issuance of this permit does not convey any property rights, in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.

II.B.10. **Severability** The provisions of this permit are severable, and if any provision of this permit, or the application of any provisions of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

II.B.11. **Duty to Comply** The Permittee shall comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Act and is grounds for enforcement action; for permit termination; revocation and reissuance, or modification; or denial of a permit renewal application.

II.B.12. **Need to Halt or Reduce Activity Not a Defense** It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with this permit.

II.B.13. **Duty to Provide Information** The Permittee shall furnish to the Administrator, within a reasonable time, any relevant information which the Administrator may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this Permit, or to determine compliance with this permit. The Permittee shall also furnish to the Administrator, upon request, copies of records required to be kept by this Permit.

PART III

III.A. OTHER REQUIREMENTS

III.A.1. **Reapplication** If the permittee desires to continue to discharge, he shall reapply not later than 180 days before this permit expires on the application forms then in use. POTW's with NPDES permits shall submit the sludge information listed at 40 CFR 501.15(a)(2) with the renewal application. The renewal application shall be accompanied by the fee required by NAC 445A.232.

III.A.2. **Signatures, certification required on application and reporting forms.**

a. All applications, reports, or information submitted to the Administrator shall be signed and certified by making the following certification.

> "I certify under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

b. All applications, reports or other information submitted to the Administrator shall be signed by one of the following:
   i. A principal executive officer of the corporation (of at least the level of vice president) or his authorized representative who is responsible for the overall operation of the facility from which the discharge described in the application or reporting form originates; or
   ii. A general partner of the partnership; or
   iii. The proprietor of the sole proprietorship; or

II.A.2.b.iv. A principal executive officer, ranking elected official or other authorized employee of the municipal, state or other public facility.

c. **Changes to Authorization**. If an authorization under paragraph b. of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph b. of this section must be submitted to the Administrator prior to or together with any reports, information, or applications to be signed by an authorized representative.

III.A.3. **Holding Pond Conditions** If any wastewater from the permittee's facility is placed in ponds, such ponds shall be located and constructed so as to:

a. contain with no discharge the once-in-the twenty-five year 24 hour storm at said location;

b. withstand with no discharge the once-in-one-hundred year flood of said location; and

c. prevent escape of wastewater by leakage other than as authorized by this permit.

III.A.4. The permittee shall notify the Administrator as soon as they know or have reason to believe:

a. That any activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":
   i. One hundred micrograms per liter (100 µg/l);
   ii. Two hundred micrograms per liter (200 µg/l) for acrolein and acrylonitrile; five hundred micrograms per liter (500 µg/l) for 2,4-dinitrophenol and for 2-methyl-4,6-dinitrophenol; and one milligram per liter (1 mg/l) for antimony;
   iii. Five times the maximum concentration value reported for that pollutant in the permit application in accordance with 40 CFR 122.21(g)(7); or
   iv. The level established by the Administrator in accordance with 40 CFR 122.44(f).

b. That any activity has occurred or will occur which would result in any discharge, on a non-routine or infrequent basis, of a toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":
   i. Five hundred micrograms per liter (500 µg/l);
   ii. One milligram per liter (1 mg/l) for antimony;
   iii. Ten (10) times the maximum concentration value reported for that pollutant in the permit application in accordance with 40 CFR 122.21(g)(7);
   iv. The level established by the Administrator in accordance with 40 CFR 122.44(f).

PETER G. MORROS, *Director*
ALLEN BIAGGI, *Administrator*
(775) 687-4670
TDD 687-4678
Administration
Water Pollution Control
Facsimile 687-5856
Mining Regulation and Reclamation
Facsimile 684-5259

STATE OF NEVADA
KENNY C. GUINN
Governor

Waste Management
Corrective Actions
Federal Facilities
Air Quality
Water Quality Planning
Facsimile 687-6396

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL PROTECTION
333 W. Nye Lane, Room 138
Carson City, Nevada 89706

August 7, 2000

John Edgecomb
Edgecomb and Blocker, LLP
311 California St., Suite 340
San Francisco, CA 94111

RE: Response to Comments on the Draft NPDES Permit for Kerr McGee NV0023060

Dear Mr. Edgecomb:

The Division has received and reviewed your comments on the above draft permit and offers the following responses.

* *Responsibility Issues* The statements in the Fact Sheet regarding responsible party have been modified. An explanation is necessary to explain why Kerr McGee is not being required to treat for the constituents which were detected above the chronic aquatic life standard. The process occurring between HISSC and the BCA to determine the responsible party is on-going and will not be impacted by the information in the Fact Sheet. 1) Kerr McGee has indicated to the Division that neither the ion exchange unit nor the biologic treatment unit would remove any of the pesticides or pesticide manufacturing by-products. If the data indicates differently, it would not change the permit as set forth in the public notice. 2) Kerr McGee did submit analytical data from what they believe will be the make-up of the final influent to the treatment system. The data is labeled "composite feed" and should be in the information you received. Please let us know if you did not receive this data.

* *Total Dissolved Solids* The Division has had several meetings with Kerr McGee on the subject of TDS and although formal written comments were not prepared, it was felt that the permit language included in the draft permit would be sufficient to obtain the additional information required by the Bureau of Water Pollution Control to determine what course of action to take regarding TDS. The mention of the HISSC in the permit condition was simply to allow Kerr McGee the ability to submit work conducted by the committee to fulfill the permit condition. It does not require that the work be conducted by HISSC. The particulars about who conducts the work is not the concern of the NPDES permit. The April 30, 1999 document does not have enough information to support a decision regarding allowing the additional load of salt to enter the Lake Mead watershed. This may have not been the purpose for which the document was prepared.

* *Data Issues* The data has been thoroughly reviewed and some modifications have been made. Attached please find the modified data table. Your input on the data issues is appreciated.

Thank you for your concern with the permit and the permitting process, the Division can make itself available to meet and discuss your concerns. Attached you will find the final permit and fact sheet. Please do not hesitate to call with any questions regarding this response at 775/687-4670 ext. 3142.

Sincerely,

Leo Drozdoff, P.E., Chief
Bureau of Water Pollution Control

(w/o attachments)
cc: Doug Zimmerman, Chief BCA
Cathe Pool, P.E.
Susan Crowley, Kerr McGee
Brenda Pohlman, NDEP LV

PETER G. MORROS, *Director*
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(775) 687-4670
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STATE OF NEVADA
KENNY C. GUINN
Governor

Waste Management
Corrective Actions
Federal Facilities
Air Quality
Water Quality Planning
Facsimile 687-6396

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL PROTECTION
333 W. Nye Lane, Room 138
Carson City, Nevada 89706

August 7, 2000

Joel Mack
Latham and Watkins
701 "B" Street, Suite 2100
San Diego, CA 92101-8197

RE: Response to Comments on the Draft NPDES Permit for Kerr McGee NV0023060

Dear Mr. Mack:

The Division has received and reviewed your comments on the above draft permit and offers the following responses.

* <u>*Insufficient Data*</u> NPDES permits can be written with no data, however, it is preferable to have data. The data provided by Kerr McGee allowed the Division to prepare a draft permit. The permit requires extensive monitoring to increase our understanding of the discharge. It was not necessary to hold up the permitting process nor the corrective action process for lack of data. The permit limits for the biologic treatment system were based on design parameters as is the common practice for systems which have not yet been constructed.

* <u>*Responsibility*</u> 1) The statements in the Fact Sheet regarding responsible party have been modified to indicate that the HISSC is investigating the other constituents. An explanation is necessary to explain why Kerr McGee is not being required to treat for the constituents which were detected above the chronic aquatic life standard. The process occurring between HISSC and the BCA to determine the responsible party is on-going and will not be impacted by the information in the Fact Sheet. 2) Upgradient well data has not been submitted to date. 3) The NPDES permit only sets permit limits for constituents which are known at this time to be the responsibility of Kerr McGee. It has not yet been determined if there is some responsibility for Boron. Please note that there is a schedule of compliance item for Total Dissolved Solids which includes Boron. 4) Please feel free to take samples for Whole Effluent Toxicity (WET) at a date earlier than what has been requested in the permit, your concern about the toxicity of the seep is appreciated. The reason the Division has delayed this testing is that the seep is currently already entering the wash and there has been no known toxicity problems in the wash to date. Until the issue of responsibility can be resolved, it was not deemed acceptable to require Kerr McGee to take samples for a parameter which may fail a WET test.

* <u>*Total Dissolved Solids*</u> The Division has had several meetings with Kerr McGee on the subject of TDS and although formal written comments were not prepared, it was felt that the permit language included in the draft permit would be sufficient to obtain the additional information required by the Bureau of Water Pollution Control to determine what course of action to take regarding TDS. The mention of the HISSC in the permit condition was simply to allow Kerr McGee the ability to submit work conducted by the committee to fulfill the permit condition. It

does not require that the work be conducted by HISSC. The particulars about who conducts the work is not the concern of the NPDES permit. The April 30, 1999 document does not have enough information to support a decision regarding allowing the additional load of salt to enter the Lake Mead watershed. This may have not been the purpose for which the document was prepared.

* *Hearing Request* The Division believes that it is in the best interest of the public to issue the proposed permit so as to allow for treatment of the perchlorate plume as soon as possible. The proposed permit allows the permittee to treat this discharge to a greater degree than is currently occurring under the temporary permit. Any delay in the construction of improved treatment facilities is unacceptable to the Division. Therefore, your request for a hearing is denied, however, we are certainly willing to maintain ongoing dialogue with you and your client on matters pertaining to this issue.

For the reasons stated above and in the fact sheet, the Division intends to issue the final permit with minor modifications as described above. Attached please find a revised final permit, and fact sheet. Thank you for your concern with the permit and the permitting process, the Division can make itself available to meet and discuss your concerns. Please do not hesitate to call with any questions regarding this response at 775/687-4670 ext. 3142.

Sincerely

Leo Drozdoff, P.E., Chief
Bureau of Water Pollution Control

Attachments NV0023060 and Fact Sheet

w/o attachments
cc: Doug Zimmerman, Chief BCA
Cathe Pool, P.E., NDEP
Susan Crowley, Kerr McGee
Brenda Pohlman, NDEP LV

NPDES Discharge Permit
Fact Sheet

Permittee Name:	Kerr McGee Chemical Corporation, LLC
Permit Number:	NV0023060
Mailing Address:	P.O. Box 55 Henderson, NV
Location:	8000 West Lake Mead Dr. Henderson, NV 89009 Latitude 36° 5" 15' Longitude 114° 59" 30'
Contact Person:	Susan Crowley, Environmental Specialist
Telephone:	(702) 651-2234

I. Status of Permit

Kerr McGee Chemical LLC entered into a Consent Agreement with the State of Nevada on July 26, 1999. The purpose of the consent agreement was to assure prompt implementation of a removal action to capture and contain perchlorate contaminated surfacing groundwater at the Las Vegas Wash "seep" and groundwater. The consent agreement contains a schedule for the initiation of remediation which did not allow enough time for the completion of a permanent permit, therefore, a temporary permit (TNEV99106) was issued on November 11, 1999 to allow the remediation efforts to go forward an additional temporary permit has been issued (TNEV200351) to allow continued treatment operations during the public notice period. The permittee submitted an NPDES permit application to the Nevada Division of Environmental Protection September 17, 1999 for a permanent discharge permit. Since that time the Division and Kerr McGee have been working to resolve several issues with the discharge.

. The Division's letter dated May 12, 2000, regarding "Notification for Accelerated Work to Abate, Mitigate and Eliminate Environmental Contaminants dated November 6, 1998" (pursuant to a consent agreement with the State of Nevada) to the Henderson Industrial Site Steering Committee and the other parties involved, requires the submittal of a workplan by July 31, 2000 to determine the need for and feasibility of treating constituents which are not associated with Kerr McGee operations.

II. Facility Description

There are two perchlorate treatment systems authorized by this permit. The first unit currently in operation under the temporary permit is an ion-exchange unit which is designed to remove 97% of the perchlorate. The ion-exchange unit is not expected to be the long term treatment unit due to costs and removal efficiency. The second unit is proposed to be an anaerobic bioreactor unit which reduces the perchlorate by 99%, followed by an aerobic BOD reduction process followed by chemical precipitation for phosphorous removal.

The capture of the "seep" is located approximately two (2) miles north of the Kerr McGee plant site and near the Las Vegas Wash. The system includes a pump station down at the wash to pump the seep water to the 11 acre double lined HDPE pond. The groundwater sources will be pumped to the pond also and then the composite wastewater will be pumped into the bioreactors. The discharge from the treatment process is gravity fed back down to the "seep" and discharged at the same location in an overflow weir arrangement.

III. Description of Discharge

The primary source of discharge water is from a surface seep north of the Kerr McGee site in the Las Vegas Wash. The seep flowrate has been estimated at 360 gallons per minute (gpm) and 100 parts per million (ppm) perchlorate. Prior to the consent agreement the seep was discharging naturally to the Las Vegas Wash untreated. The secondary source of discharge water is from groundwater sources described below. The initial discharge will consist of a small amount of groundwater from the Pitman Lateral, groundwater water treated by the chromium extraction treatment unit and "seep" water as these sources have been added to the 11 acre pond under the temporary discharge permit.

Surface Water ("seep")

The surface "seep" at the Las Vegas Wash has a flow rate of between 360 and 450 gpm and a concentration of approximately 100 ppm perchlorate. Kerr McGee determined in the process of filling out the NPDES permit application that there are organic constituents in the seep which have been attributed to other parties and which do not meet the chronic aquatic life standards. The water is currently reaching the wash untreated and therefore the removal of perchlorate will certainly improve the quality of the wash.

The permit is making use of the concept of intake credits as outlined in 40 CFR 132 for existing organic constituents found at the "seep" since it is a surface flow at the Las Vegas Wash. Intake credits as listed in 40 CFR 132 were not adopted for the state of Nevada, however, the Division is utilizing the concept as it appears to be an appropriate permitting strategy. Intake credits may be utilized provided that 1) the source of the water is the same as the water being discharged (i.e. The surfacing water is being treated and returned to the same location.), 2) the action is protective of beneficial uses and aquatic life, wildlife or human health, 3) the action does not jeopardize endangered species, 4) humans caused the conditions or sources of pollution which prevent the attainment of the WQS, and 5) the discharge conforms to the state's antidegradation policy. The Division believes that the aforementioned prerequisites are met by this discharge. In addition, all of the following criteria from 40 CFR §132 Appendix F, Procedure 5, Part D.2 and 3 (the Great Lakes Initiative) are met: 1) The seep is withdrawn and discharged into the same body of water and there are no changes to the water quality characteristics (e.g. temperature, pH, hardness), 2) The facility does not contribute additional mass of intake pollutants, which exceed the Las Vegas Was water quality standards, to it's wastewater. 3) The facility does not alter the intake pollutants chemically or physically in a manner that would cause adverse water quality impacts to occur that would not occur if the pollutants were left in stream. 4) The facility does not increase intake pollutant concentrations. 5) The timing of the discharge would not cause adverse impacts to occur that would not occur if the identified intake pollutant were left instream.

Groundwater

The permittee proposes to add two additional groundwater sources to the discharge 1) extracted groundwater from the hexavalent chrome treatment system on the Kerr McGee plant site at a flow of approximately 60 gpm maximum and 2) extracted groundwater from what is referred to as the Pitman Lateral at approximately 400 to 450 gpm. These two sources of water would be pumped to the 11 acre pond and treated for perchlorate along with the seep water.

The intake credit permitting strategy cannot be used for these groundwater sources as the rule specifically states that **groundwater** does not receive the intake credit if it contains a pollutant from human activity. Therefore, the Division is taking a phased permitting approach to these sources. The water extracted from the on-site hexavalent chrome extraction system (60 gpm, 1600 ppm perchlorate) is treated to remove chromium prior to discharge to the perchlorate removal system. However, recent data obtained by Kerr McGee shows results of alpha-BHC which exceed the chronic aquatic life water quality standard (0.14 ppb vs 0.13 ppb). Calculations demonstrate that there would essentially be an immeasurable additional loading due to the low concentration and low volume of chromium extraction treated groundwater when compared to the flow and concentration in the "seep". The importance of the chromium extraction treatment unit in the remediation goals for the facility make continuing the extraction, treatment and discharge of this fluid an environmental benefit. For this reason, the Division proposes to permit this discharge with certain conditions. The permit requires that Kerr McGee demonstrate that there is no additional loading of the constituents not being treated by Kerr McGee.

For the second groundwater source, groundwater from the Pitman Lateral (or other unidentified groundwater sources) the Division is including the possibility that these sources may be discharged at some point in the future, upon approval by the Division.

IV. Receiving Water

The receiving water for Outfall 001 is the Las Vegas Wash. The water quality standards for the toxic constituents applicable to the Las Vegas Wash are contained in NAC 445A.144, NAC 445A.199 and 40 CFR 131.36. The applicable standards are attached to this fact sheet as Attachment A. The designated beneficial uses for the appropriate reach in the Las Vegas Wash are listed in NAC 445A.198 include:

Irrigation
Watering of livestock
Recreation not involving contact with the water
Maintenance of a freshwater marsh
Propagation of wildlife
Propagation of aquatic life, excluding fish. This does not preclude the Establishment of a fishery.

This reach of the Las Vegas Wash also has an established goal of the propagation of aquatic life, including, without limitation, fish by the next triennial review.

V. Permit Application Summary

Attachment A summarizes the discharge characteristics of Outfall 001 as reported in the NPDES application 2-D dated September, 1999 with supplemental information submitted March 17 and 31, 2000. The three sources of water are shown separately for completeness. The discharge will be a composite of these three sources at varying percentages.

Mixing Zones

The permittee is requesting mixing zones for certain constituents which do not meet water quality standards at the end of pipe. Mixing zone requirements are listed at NAC 445A.295 through 302. The Division is not at this time requiring demonstration of the zone of passage for fish as it is believed that the Pabco Road erosion control structure would prohibit the movement of fish into this reach from downstream. The mixing zone regulations require that all constituents of concern receive the best degree of treatment or control practicable under existing technology prior to discharge and that the water quality standards not be violated at the end of the mixing zone. The constituents for which a mixing zone has been requested are Total Dissolved Solids (TDS), Iron, Manganese, Total Inorganic Nitrogen. The Permittee has submitted an initial cost analysis which concludes that TDS removal is too costly . Additional information is needed to verify this conclusion. Additionally, the Permittee is being required to expand the scope of this evaluation to include other discharge alternatives.

The compliance point will be the end of the mixing zone, and is initially being defined as the sampling location identifed as LM-6. The discharger is going to conduct a tracer study in the wash to better define the mixing zone and the end of the mixing zone will be adjusted depending upon the results of the tracer study.

Total Maximum Daily Load's (TMDL's)

The Permittee proposes to utilize biologic treatment for the removal of perchlorate. This process includes the addition of Nitrogen and phosphorous as nutrients. In order to maintain compliance with the TMDL's on the Wash, the Division is reallocating Total Phosphorous and Total Ammonia within the existing TMDL as described below.

Total Phosphorous as P

The existing TMDL allocated 90 lbs/day to non-point sources.

1. The total waste load allocation is 334 lb/day.
2. The average load for discharged by the permittees with allocations for 1998 was 231 lb/day.
3. The unutilized portion is 102 lb/day.
4. Take 20% of the un-utilized load which equals 20 lb/day and make it a permit limit.
5. Allow the Permittee to utilize the 20 lb/day until such time that the annual seasonal average exceed 85% of the total allocations which is 334 lb/day * 85% =283 lb/day. The Permittee will be required to make this determination as a permit requirement. In the event the point source discharges exceed the 85% load, the permittee will be required to make other arrangements to negotiate an allocation or add treatment.

Total Ammonia as N

The existing TMDL at North Shore Road is 970 lbs/day.

1. Average load at North Shore Road for April through September in 1998 was 188 lb/day.
2. 970 lbs/day - 188 lbs/day = 782 lbs/day potentially available.
3. 5% of 782 lbs/day = 39 lb/day
4. Round to 40 lbs/day. This is the waste load which will be utilized by the Permittee until such time that the average load at North Shore road equals 85% of the TMDL (824.5 lb/day) The requirement to make this determination is included in the permit. The Division does not expect that 85% of the available load will be reached in the life of the permit. In the event this does occur, the Permittee will be required to make other arrangements to negotiate an allocation

of their own. In the future, several things are planned which may change the basis for the existing TMDL; 1) Re-evaluation of the Total Ammonia TMDL, 2) The standard for un-ionized ammonia has been proposed to be changed to total ammonia.

VII. Proposed Water Quality-Based Effluent Limitations

The Nevada water quality standards require that point source discharges shall not cause a violation of any applicable water quality standards nor interfere with the attainment or maintenance of that water quality which assures the protection and propagation of a balanced indigenous population of fish and wildlife, allows recreational activities in and on the water, and meets requirements for municipal and industrial supply. Below are the permit limitations based on the reasonable potential for a constituent to exceed a water quality standard. Constituents which are listed as Monitor and Report are present in the discharge and are considered background by the permittee or based on a Reasonable Potential analysis do not have the potential to exceed the water quality standard but additional data is needed to collect more information.

TABLE I.1

PARAMETERS	EFFLUENT DISCHARGE LIMITATIONS			MONITORING REQUIREMENTS		
	30 Day Ave. mg/l	7 day Average mg/l	30 Day Ave. lb/day	Sample Location(s)	Measurement Frequency	Sample Type
Flow	1.22 MGD	1.4 MGD	NA	EFF	Continuous	Flow meter
BOD_5 (inhibited)	25 mg/l	40 mg/l	254 lb/day	INF, EFF	Weekly	Discrete
Perchlorate-Ion Exchange	97%* removal	Monitor and Report	Monitor & Report	INF, EFF	Weekly	Daily discrete samples, composited weekly
	*or 3 mg/l whichever is greater					
Perchlorate-Bioreactor	99%* removal	Monitor and Report	50 lb/day	INF, EFF	Weekly	Daily discrete samples, composited weekly
	*or 3 mg/l whichever is greater					
pH	between 6.5 and 9 standard units			EFF	Weekly	Discrete
Hexavalent Chromium	Monitor & Report	0.010 mg/l	Monitor & Report	INF, EFF	Weekly	Discrete

PARAMETERS	**EFFLUENT DISCHARGE LIMITATIONS**			**MONITORING REQUIREMENTS**		
	30 Day Ave. mg/l	**7 day Average mg/l**	**30 Day Ave. lb/day**	**Sample Location(s)**	**Measurement Frequency**	**Sample Type**
Total Chromium	Monitor & Report	0.1 mg/l	Monitor & Report	INF, EFF	Weekly	Discrete
Total Suspended Solids	135 mg/l	Monitor & Report	Monitor & Report	EFF	Weekly	Discrete
Iron, Total	10 mg/l	Monitor & Report	Monitor & Report	EFF	Weekly	Discrete
Manganese	5 mg/l	NA	Monitor and Report	EFF	Weekly	Discrete
Total Phosphorus as P	Monitor & Report	Monitor & Report	20 lb/day*	INF, EFF	Weekly	Discrete
	*If the load of Total Phosphorous in the Las Vegas Wash exceeds 434 lb/day March 1 - October 31st, the Permittee shall negotiate an Individual Waste Load Allocation or another approved mechanism which ensures the WQS will be met.			LW0.55	Twice/month	Discrete
Ammonia as N	Monitor & Report	Monitor & Report	40 lb/day*	EFF	Weekly	Discrete
	*If the load of Total Ammonia in the Las Vegas Wash exceeds 970 lb/day April 1- September 30, the Permittee shall negotiate an Individual Waste Load Allocation or another approved mechanism which ensures the WQS will be met.			LW0.55	Twice/month	Discrete
Attachment A	The permittee shall demonstrate that there is no increase in the concentration or loading of the "other" constituents as a result of the discharge. The permittee shall only be responsible for utilizing results which are greater than the PQL, however, all data above the MDL shall be reported.			EFF	Quarterly	Discrete
Color	Monitor & Report			INF, EFF	Weekly	Discrete
Total Inorganic Nitrogen as N	Monitor & Report			INF, EFF	Weekly	Discrete

PARAMETERS	EFFLUENT DISCHARGE LIMITATIONS			MONITORING REQUIREMENTS		
	30 Day Ave. mg/l	7 day Average mg/l	30 Day Ave. lb/day	Sample Location(s)	Measurement Frequency	Sample Type
Un-Ionized Ammonia as N	Monitor & Report			INF, EFF	Weekly	Calculated
Total Dissolved Solids	Monitor & Report			INF, EFF	Weekly	Discrete
Sulfide	Monitor & Report			INF, EFF	Weekly	Discrete
Oil and Grease	Monitor & Report			INF, EFF	Weekly	Discrete
Boron	Monitor & Report			EFF	Weekly	Discrete
Dissolved Oxygen	Monitor & Report			EFF	Weekly	Discrete
Nitrate as N	Monitor & Report			EFF	Weekly	Discrete
Kjeldahl Nitrogen as N	Monitor & Report			INF, EFF	Weekly	Discrete
Chloride	Monitor & Report			INF, EFF	Weekly	Discrete
Radium 226 + 228	Monitor & Report			EFF	Weekly	Discrete
Gross Alpha	Monitor & Report			EFF	Weekly	Discrete
Chlorate (ClO3)	Monitor & Report			INF, EFF	Weekly	Discrete
Acute WET	See permit condition I.A.15.			EFF	Monthly	Discrete

I.A.2. **Mixing Zone** The permit allows the following mixing zone in the Las Vegas Wash: from Outfall 001 to the end of the mixing zone defined as the Las Vegas Wash control point identified as LW5.5 (previously LM-6) located approximately one mile downstream of where Telephone Line road crosses Las Vegas Wash. The discharge is to be limited to maintain compliance with the downstream limits listed below. Samples are to be taken at the following locations: upstream samples are to be taken 150 feet upstream of the discharge in the Las Vegas Wash, downstream samples are to be taken at LW5.5, and the upgradient groundwater monitoring well (UPMW) at the Kerr McGee facility, at the frequencies defined in Table I.2.

Table I.2

PARAMETERS	DOWNSTREAM ACTION THRESHOLDS apply at LW5.5		MONITORING REQUIREMENTS		
	30 day average	Daily Max	Sample Locations	Measurement Frequency	Sample type
Total Dissolved Solids	2400 mg/L	Monitor & Report	Upstream, LW6.05, LW5.5	Twice/month	Discrete
			UPMW	Quarterly	
Total Inorganic Nitrogen	17 mg/l	Monitor & Report	Upstream, LW6.05, LW5.5	Twice/month	Discrete
			UPMW	Quarterly	
Color	Monitor & Report		Upstream, LW6.05, LW5.5	Twice/month	Discrete
Radium 226 + 228	Monitor & Report		Upstream, LW6.05, LW5.5	Twice/month	Discrete
Gross Alpha	Monitor & Report		Upstream, LW6.05, LW5.5	Twice/month	Discrete
Iron	Monitor & Report		Upstream, LW6.05, LW5.5	Twice/month	Discrete
			UPMW	Quarterly	
Manganese	Monitor & Report		Upstream, LW6.05, LW5.5	Twice/month	Discrete
			UPMW	Quarterly	
Molybdenum	Monitor & Report		Upstream, LW6.05, LW5.5	Twice/month	Discrete
			UPMW	Quarterly	
Copper	Monitor & Report		Upstream, LW6.05, LW5.5	Twice/month	Discrete
			UPMW	Quarterly	
Chromium	Monitor & Report		Upstream, LW6.05, LW5.5	Twice/month	Discrete
			UPMW	Quarterly	
Boron	Monitor & Report		Upstream, LW6.05, LW5.5	Twice/month	Discrete

PARAMETERS	DOWNSTREAM ACTION THRESHOLDS apply at LW5.5		MONITORING REQUIREMENTS		
	30 day average	Daily Max	Sample Locations	Measurement Frequency	Sample type
Boron	Monitor & Report		UPMW	Quarterly	
Fluoride	Monitor & Report		Upstream, LW6.05, LW5.5	Twice/month	Discrete
			UPMW	Quarterly	
Chloride	Monitor & Report		Upstream, LW6.05, LW5.5	Twice/month	Discrete
			UPMW	Quarterly	
Attachment A	Monitor & Report		Upstream, LW6.05, LW5.5	Annually	Discrete

I.A.2.a. On a quarterly basis the discharger shall submit an evaluation of the data collected pursuant to Table I.2 and the water quality standards at Telephone Line Road in the Las Vegas Wash (LW6.05, previously LVW-2).

b. If the evaluation shows the standard has been exceeded and that there is a potential that the exceedances are due to the discharge authorized by this permit, then on a one time basis, within 30 days the permittee shall submit a plan to investigate the exceedance. This plan may include a comprehensive monitoring strategy, an evaluation of the standard and location of the control point, along with a schedule for the investigation. The Permittee shall work cooperatively with other Las Vegas Wash dischargers in developing a comprehensive plan. This plan must be approved by the Division.

c. Upon approval of the plan the Permittee shall implement the plan and submit a report with recommendations for any future actions the Permittee finds necessary.

Toxic Pollutants

The most stringent water quality standard for the toxic pollutants from NAC 445A.144 is also shown in bold on Attachment A. A value of 400 mg/l hardness was used to calculate the aquatic life water quality standards that are based on hardness.

The pollutants which have the reasonable potential to exceed the water quality standards are shown in bold on Attachment A. The constituents which have the RP to exceed have been given limits in the permit except for those constituents which will be dealt with by the other responsible parties pursuant to the Division's May 12, 2000 letter. Those constituents have been included in the permit as Monitor and Report.

Whole Effluent Toxicity

Acute WET testing is being required in the permit upon written notification by the Division. The Division wishes to require this testing after the issues with the constituents not the responsibility of the permittee are resolved. WET testing will be performed on the discharge with no dilution of the effluent. Chronic WET testing is not being required at this time.

VIII PROPOSED EFFLUENT LIMITATIONS

Table's I.1and I.2 summarize the proposed effluent limitations for Outfall 001 and the mixing zone. All proposed effluent limitations are based on state water quality standards and are listed in the above Tables I.1and I.2. The following permit conditions are included in the Schedule of Compliance

1. **Total Dissolved Solids(TDS)** NAC 445A.143 Nothing in this permit shall alleviate the responsibility of other parties under consent agreement to the Bureau of Corrective Action for the groundwater issues at the BMI site. Any work pertaining to TDS must recognize that the water quality standard for TDS (NAC 445A.199) must be maintained. **Prior to treating and discharging groundwater other than groundwater from the chromium treatment system,** the permittee shall submit the following information and obtain approval from the Division:
    i. The permittee shall submit supporting documentation for the "Conceptual Study TDS Removal" Parsons Engineering, April 30, 1999. The supporting documentation should include equipment sizing for each piece of equipment in the cost analysis.
    ii. The permittee shall submit an evaluation of alternative plans that could substantially reduce salt discharge. The evaluation shall include a detailed evaluation of re-use options, including the use of treated water in the plant process (and any associated cost savings), the use of treated water in a wetlands, dust control or other reuse sites determined by the permittee, precipitation of sulfate, calcium, and manganese. The evaluation shall also include an analysis of the cost of discharging treated water to infiltration basins. The technical feasibility of each alternatives; total construction, operation and maintenance costs; and costs in dollars per ton of salt removed from the discharge shall be

included. This work may be completed by HISSC and/or the permittee as appropriate pursuant to direction by NDEP's Bureau of Corrective Actions.

iii. The permittee shall continue to participate in regional solutions to the TDS issues in the Las Vegas Wash. The permittee shall submit a quarterly report which includes any progress made on reducing the TDS loading to the was either in directly reducing the loading to the wash from the discharge or regional projects the permittee has participated in which reduce the loading off-site in the same watershed.

2. The permittee shall fully cooperate with any persons required by NDEP to treat the discharge subsequent to treatment by the permittee.

3. The permittee shall submit a plan within 90 days of the effective date of the permit to conduct a tracer study in the Las Vegas Wash to better define the end of the mixing zone. Upon Division approval of the tracer study plan, the permittee shall conduct the study. Should the results indicate that the end of the mixing zone should be moved, the permit shall be modified as a minor modification.

Colorado River Salinity Forum (NAC 445A.143)

The Division has received "Conceptual Study, TDS Removal, BMI Complex, HISSC, Parsons Engineering, April 30, 1999. This study concludes that TDS removal does not appear to be technically feasible. The Division is requesting additional back-up information on this study specifically technical information on the equipment and cost estimating porions. Additionally, the Division is requesting that the scope of the evaluation be expanded to include other methods of disposal, wetlands development, and reinjection. This request for additional work is included in the Schedule of Compliance.

IX Procedures for Public Comment:

The Notice of the Division's intent to issue a permit authorizing the facility to discharge to the groundwater of the State of Nevada subject to the conditions contained within the permit, is being sent to the **Las Vegas Review Journal** for publication. The notice is being mailed to interested persons on our mailing list. Anyone wishing to comment on the proposed permit can do so in writing for a period of 30 days following the date of the public notice. The comment period can be extended at the discretion of the Administrator.

A public hearing on the proposed determination can be requested by the applicant, any affected State, any affected interstate agency, the Regional Administrator or any interested agency, person or group of persons. The request must be filed within the comment period and must indicate the interest of the person filing the request and the reasons why a hearing is warranted.

Any public hearing determined by the Administrator to be held must be conducted in the geographical area of the proposed discharge or any other area the Administrator determines to be appropriate. All public hearings must be conducted in accordance with NAC 445A.238. The final determination of the Administrator may be appealed to the State Environmental Commission pursuant to NRS 445A.605.

X Proposed Determination

The Division has made the tentative determination to issue the proposed permit.

ATTACHMENT A

Water Quality Standards and Permit Application Data

Data and Limits Only Included For Compounds Which Have Detections Above the Method Detection Limit

Parameter All data is in ppb, unless otherwise specified.	**CAS #**	**Irrigation Standard**	**Livestock Watering**	**Water and Organism or Drinking Water**	**Organism only**	**Acute Aquatic Life**	**Chronic Aquatic Life**	**Las Vegas Wash Seep**	**Onsite Chromium Extraction Treatment System**	**Pittman Lateral**
Metals										
Antimony	7440-36-0			146					0.9J	
Arsenic	7440-38-2	**100**	200	50				**150**	3.8J	**125**
Arsenic (III)	22569-72-8					342(d)	**180(d)**			
Barium	7440-39-3			2000				21.4	41	220
Beryllium	7440-41-7	100		0					**0.34J**	
Boron	7440-42-8	**750**	5,000					**3,600**	**13,200**	
Cadmium	7440-43-9	10	50	5		16(d)	**2.9(d)**			
Chromium (total)	7440-47-3	**100**	1,000	100					**666**	**132**
Chromium (VI)	18540-29-9					15(d)	**10(d)**	ND		**129**
Chromium (III)	7440-47-3					4595(d)	**548(d)**			
Copper	7440-50-8	200	500	1,300		56(d)	**33(d)**	8.1	5.4	30
Iron	7439-89-6			300/600		**1,000**			**3,700**	**6,710**
Lead	7439-92-1	5,000	100	50		238	**5**			**6.3J**
Magnesium	7439-95-4			125,000/ 150,000				240,000	386,000	300,000
Manganese	7439-96-5	**200**		50/100				**1,800**	330	**1,720**
Mercury	7439-97-6		10	2		2(d)	**0.012(d)**	**1.5**		**0.092J**

J indicates the result was detected above the method detection limit but below the quantitation limit. (d) indicates dissolved.

Parameter All data is in ppb, unless otherwise specified.	**CAS #**	**Irrigation Standard**	**Livestock Watering**	**Water and Organism or Drinking Water**	**Organism only**	**Acute Aquatic Life**	**Chronic Aquatic Life**	**Las Vegas Wash Seep**	**Onsite Chromium Extraction Treatment System**	**Pittman Lateral**
Molybdenum	7439-98-7					**19**		**120**	**42**	need
Nickel	7440-02-0			13.4		3895(d)	**433(d)**	15.5	6	15.4J
Potassium	7440-09-7							45,800	36,000	40,600
Selenium	7782-49-2	20	50	50		20	**5**	**11**	**5.9**	**8J**
Sodium	7440-23-5							1,520,000	1,600,000	2,000
Strontium	7440-24-6							11,200	21,000	14,700
Thallium	7440-28-0			13				0.73	0.6J	30
Vanadium	7440-62-2							51	5.1	116
Zinc	7440-66-6	2,000	25,000	5,000		322(d)	**292(d)**		7.6J	511
General Water Quality/Miscellaneous										
pH				6-9				7.56	7.46	6.94
Color				15 units				**20**	60 color units	
MBAS				500				**730**	100	
ClO4								100,000	1,600,000	480,00
ClO3								100,000		
TDS		**1,900,000/** 3,000,000	3,000,000	500,000/ 1,000,000				**7,300,000**	**11,700,000**	**9,680,000**
TSS								13,200	43,200	
TOC								5,600	5,100	3,600

J indicates the result was detected above the method detection limit but below the quantitation limit. (d) indicates dissolved.

Parameter All data is in ppb, unless otherwise specified.	**CAS #**	**Irrigation Standard**	**Livestock Watering**	**Water and Organism or Drinking Water**	**Organism only**	**Acute Aquatic Life**	**Chronic Aquatic Life**	**Las Vegas Wash Seep**	**Onsite Chromium Extraction Treatment System**	**Pittman Lateral**
Total Inorganic Nitrogen as N	**Requirement to Maintain Existing Higher Quality in Las Vegas Wash is 20,000**							8,560	**63,000**	**21,300**
Ammonia as N	7664-41-7							150J	15,000	**need**
Nitrate+Nitrite				10,000				8,500	48,000	18,000
BOD								1,420	18,000	
COD								140,000	28,000	
Fluoride		**1,000**	2,000	2,000/4,000				**1,600**	930	
Sulfate								2,150,000	4,300,000	2,500,000
Sulfide-undissociated HS-						**2**		ND	**150**	
Chloride				250,000		860,000	230,000	**2,300,000**		**3,710,000**
Total Phosphorous								136	ND	2,300 PO4
Oil and Grease								3,800	16,000	
Gross Alpha (pCi/l)				15				52.1		
Gross Beta (pCi/l)								57.5		
Radium 226+228(pCi/l)				5				3.41 (226)		
Pesticides/Herbicides										
Aldrin	309-00-2			0	**0.0014**	3		**0.0155**		
Chlordane Alpha								**0.0025 J**		
Chlordane	57-74-9			0	0.0059	2.4	**0.0043**	**0.0044J**		**0.0054J**

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Parameter All data is in ppb, unless otherwise specified.	**CAS #**	**Irrigation Standard**	**Livestock Watering**	**Water and Organism or Drinking Water**	**Organism only**	**Acute Aquatic Life**	**Chronic Aquatic Life**	**Las Vegas Wash Seep**	**Onsite Chromium Extraction Treatment System**	**Pittman Lateral**
alpha-BHC	319-84-6			0.039	**0.13**			0.92	**0.14**	**0.771**
beta-BHC	319-85-7			0.14	**0.46**			0.372		0.166
delta-BHC	319-86-8							1.9	0.06J	1.99
2,4-D	94-75-7			70						1.14
2,4-DB										4.08
4,4' -DDT & metabolites				0		1.1	**0.001**	**0.31** NDEP data		
4-4'-DDT	50-29-3				0.0059	1.1	**0.001**			
4,4'-DDE	72-55-9				0.0059	1.1	**0.001**	**0.0073 J**		
4,4'-DDD	72-54-8				0.0084	1.1	**0.001**	**0.0114 J**		
Dalapon	75-99-0			200				0.79 J		
Dicamba	1918-00-9							0.099		0.173J
Dieldrin	60-57-1			0	0.0014	2.5	**0.0019**	**0.1**		
Dinoseb	88-85-7			7				0.39		0.604
Endosulfan	115-29-7			75		0.22	0.056			
Endrin	72-20-8			0.2	8.1	0.18	0.0023	**0.0042 J**		
Heptachlor	76-44-8			0.0021	**0.0021**	0.52	0.0038	**0.004 J**		
Heptachlor Epoxide	102-45-73			0.001	**0.0011**	0.52	0.0038	**0.0044 J**		**0.0021J**
Lindane(gamma BHC)	58-89-9			0.19	0.63	2	**0.08**	**0.098**	**0.06J**	**0.0923**
MCPA	94-74-6									

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Parameter All data is in ppb, unless otherwise specified.	**CAS #**	**Irrigation Standard**	**Livestock Watering**	**Water and Organism or Drinking Water**	**Organism only**	**Acute Aquatic Life**	**Chronic Aquatic Life**	**Las Vegas Wash Seep**	**Onsite Chromium Extraction Treatment System**	**Pittman Lateral**
Pentachlorophenol	87-86-5			1	82	9.1 @7	**5.7 @ 7**	0.017 J		0.03J
Silvex (2,4,5-TP)	95-95-4			10				0.084 J		0.51
2,4,5-T	93-76-5							0.257		0.7
Volatiles										
Bromodichloromethane	75-27-4								1.4J	
Bromoform	75-25-2								1.1J	2J
Chloroform	67-66-3			57	4700			2 J	390	
Chlorobenzene										
m-Dichlorobenzene (1,3)	541-73-1			400				0.5		
o-Dichlorobenzene (1,2)	95-50-1			400				0.6		
p-Dichlorobenzene (1,4)	106-46-7			75				0.7		
1,1-Dichloroethane	75-34-3							2J		9
Methylene chloride	75-09-2			5					2.2J	
Methyl tert-butyl ether	1634-04-4							5		
Tetrachloroethene	127-18-4			8	88.5					2J
Toluene	108-88-3			1000					1.2J	2J
Trichloroethene	79-01-6			5	810					1J

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Parameter All data is in ppb, unless otherwise specified.	CAS #	Irrigation Standard	Livestock Watering	Water and Organism or Drinking Water	Organism only	Acute Aquatic Life	Chronic Aquatic Life	Las Vegas Wash Seep	Onsite Chromium Extraction Treatment System	Pittman Lateral
Semi-Volatiles										
di-2-Ethylhexyl phthalate	117-81-7			18	59			4 J		
1,2,4-trichlorobenzene	120-82-1							2 J		

J indicates the result was detected above the method detection limit but below the quantitation limit. (d) indicates dissolved.

KERR-McGEE CHEMICAL LLC
POST OFFICE BOX 55 - HENDERSON, NEVADA 89009

July 25, 2000

Ms. Brenda Pohlmann
Remediation Branch Supervisor
Nevada Division of Environmental Protection
555 E. Washington, Suite 4300
Las Vegas, NV 89101

Dear Ms. Pohlmann:

Subject: Perchlorate Activity Status

Following is the current status of Kerr-McGee Chemical LLC's (Kerr-McGee) perchlorate related activities as outlined in the Perchlorate Consent Agreement (July 26, 1999) and its supporting Work Plans:

- Kerr-McGee's commitment to remove perchlorate from surfacing groundwater (seep) is continuing, utilizing Calgon Carbon's ion exchange process. During June 2000, 7,000 lbs of perchlorate were removed from the surface stream before it entered the wash. To date, 32.3 tons have been removed since ion exchange operation began in November 1999. The stream flow is down, dropping from an average of 250 gpm at the beginning of June to 210 gpm at the close. Perchlorate concentration is up, averaging 88 ppm over the month. These conditions appear typical of summertime conditions in the stream, although they represent lower flows than seen during 1999's summertime period. Although the ion exchange system is running well, we continue to have occasional operational difficulties due to the Clark County earthen dam installed upgradient from the stream capture point. Kerr-McGee is hopeful that this dam will be removed at the earliest opportunity.

- On-site groundwater continues to be extracted and treated for chromium removal, then placed in the on-site groundwater holding basin for eventual treatment for perchlorate removal. During June, approximately 13,150 lbs of perchlorate were removed from the shallow aquifer. Since initiation of impoundment in December 1998, considering the average perchlorate concentration of 1,500 ppm, 164 tons of perchlorate have been removed from the on-site shallow groundwater. The holding basin has had a very high evaporation rate due to lower than normal rainfall and above average temperature and wind conditions.

- Kerr-Gee is continuing transfer of groundwater extracted from the Pittman Lateral area to its groundwater holding basin by utilizing a tanker truck. Over the 239 days this transfer has been active, approximately 1.58 tons of perchlorate have been removed from the groundwater.

- Field activities to investigate hydrologic condition in the seep vicinity are continuing. The nested well installations, the seep area reconnaissance, and the near wash groundwater seep sampling are complete. Groundwater tracer studies are to be completed in September following NDEP approval of the tracer selection.

- NDEP's Bureau of Water Pollution Control is developing an NPDES discharge permit for perchlorate treated waters. Draft Permit #NEV0023060 was public noticed, and NDEP has received public comments. Until the NPDES permit is approved for use, Kerr-McGee has continued seep stream perchlorate removal under the authorization of a Temporary Discharge Permit.

- Engineering (by Biothane Corporation and Applied Research Associates) is nearing completion on the perchlorate treatment system. The cost estimate and schedule were received early in July for Kerr-McGee internal review and approval. Issued for construction drawings are expected in early August. Pre-construction activities, such as site preparation, have begun at the Henderson plant. Additional activities are pending a grading permit, currently in Clark County Planning and Zoning's control. This permit is pending reviews and resultant approval letters from NDEP and from Clark County Health District to continue the grading permit review process. Documents (drawings) have been submitted to NDEP's Las Vegas office for this review process. Additional information will be forwarded as it is available. It is expected that slightly over a year will be needed to construct and start up the biological treatment facility once internal approval and NDEP permits and approvals have been received.

- Pipeline and Lift Station #2 engineering drawings are 75 percent complete. Draft easements have been prepared for the entire run of the pipeline and for Lift Station #2. Maintenance work has begun on the section of existing pipeline that will be used to cross Warm Springs Road and Boulder Highway for the treated water return to the seep stream. This work is expected to be complete in 2-3 weeks. Legal descriptions and exhibits are being completed for the draft easements as the final engineering drawings are being completed.

- Kerr-McGee has been requested by NDEP to draft a second Consent Agreement as a follow-on to the existing Consent Agreement. The second Agreement would cover the permanent perchlorate treatment system, while the first covered the temporary seep issues.

KMC is committed to act responsibly and cooperate fully with local, state, and federal officials in determining appropriate remedial actions. Please feel free to contact me at (702) 651-2200 if you have any questions related to this information. Thank you.

Sincerely,

SM Crowley

Susan M. Crowley
Staff Environmental Specialist

By certified mail

cc: PSCorbett
EMSpore
FRStater
TWReed
WOGreen
RHJones
LKBailey
ALDooley
Rick Simon, ENSR
Robert Kelso, NDEP
Doug Zimmerman, NDEP
Jeanne-Marie Bruno, Metro Water District Of Southern California
Barry Conaty, City of Henderson
Pat Mulroy, Southern Nevada Water Authority
Kevin Mayer, EPA Region IX

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KERR-McGEE CHEMICAL LLC
POST OFFICE BOX 55 - HENDERSON, NEVADA 89009

July 11, 2000

RECEIVED
JUL 17 2000
ENVIRONMENTAL PROTECTION
LAS VEGAS OFFICE

Mr. Nadir Sous
Nevada Division of Environmental Protection
555 E. Washington, Suite 4300
Las Vegas, NV 89101

Dear Mr. Sous:

Subject: Perchlorate Remediation Technology Approval

Kerr-McGee Chemical LLC (Kerr-McGee) has signed a Consent Agreement with Nevada Division of Environmental Protection (NDEP) to work cooperatively in developing a response to perchlorate impact in the groundwater downgradient from the Kerr-McGee Henderson facility. Towards this goal, Kerr-McGee is clearing the way for construction of a process to remediate perchlorate. The process will primarily be located on Kerr-McGee's Henderson plant site, with piping utilized to transport impacted water to and from the process.

Kerr-McGee provided your office a plot plan and some preliminary drawings relating to this process several weeks ago. Attached is a more complete drawing package to assist in your review of this remedial process. Please consider these draft documents, as the "issue for construction" revision is not yet available. We provide these drafts to you now to facilitate your approval so that initial grading and site preparation can begin, as the "issued for construction drawings" are finalized.

Kerr-McGee wishes to move forward in preparing the footprint for the process, even before the final process construction drawings are in final revision. The first phase of this footprint preparation is grading and contouring the construction area, which requires a Clark County grading permit. I have attached a copy of correspondence from the Clark County Department of Building Permit Application Services, requiring NDEP approval, per VC-1750-99. We are anxious to move forward and request this approval via letter as soon as possible.

Please feel free to contact me at (702) 651-2200 if you have any questions related to this information. Thank you.

Sincerely,

SM Crowley

Susan M. Crowley
Staff Environmental Specialist

By certified mail

cc: PSCorbett w/o attachment
EMSpore w/o attachment
LKBailey w/o attachment
Cathe Pool (NDEP) w/o attachment
Brenda Pohlmann (NDEP) w/o attachment
Doug Zimmerman (NDEP) w/o attachment

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KERR-McGEE CHEMICAL LLC
POST OFFICE BOX 55 - HENDERSON, NEVADA 89009

June 14, 2000

Ms. Brenda Pohlmann
Remediation Branch Supervisor
Nevada Division of Environmental Protection
555 E. Washington, Suite 4300
Las Vegas, NV 89101

Dear Ms. Pohlmann:

Subject: Perchlorate Activity Status

Following is the current status of Kerr-McGee Chemical LLC's (Kerr-McGee) activities regarding the perchlorate issue:

- Kerr-McGee's commitment to remove perchlorate from surfacing groundwater, or the "seep", is continuing, utilizing Calgon Carbon's ion exchange process. During May 2000, 9.25 tons of perchlorate was removed from the surface stream before it entered the wash. To date, 29 tons have been removed since ion exchange operation began in November 1999. The stream flow is down, nominally 320 gpm, and perchlorate concentration is up, averaging 85 to 90 ppm. These conditions appear typical of summertime conditions in the stream. Although the ion exchange system is running well, we continue to have occasional operational difficulties due to the Clark County earthen dam, installed upgradient from the stream capture point. Kerr-McGee is hopeful that this dam will be removed at the earliest possibility.

- On-site groundwater continues to be extracted and treated for chromium removal, then placed in the on-site groundwater holding basin for eventual treatment for perchlorate removal. Since initiation of impoundment in December 1998, considering the average perchlorate concentration of 1200 to 1900 ppm, 158 tons of perchlorate have been removed from the on-site groundwater. The holding basin has had a very high evaporation rate due to lower than normal rainfall and above average temperature and wind conditions.

- Kerr-Gee is continuing transfer of groundwater extracted from the Pittman Lateral area to its groundwater holding basin. We are utilizing a tanker truck to accomplish this. Over the 218 days this transfer has been active, approximately 1.46 tons of perchlorate have been removed from the groundwater.

- NPDES Discharge Permit – NDEP, Bureau of Water Pollution Control is developing a discharge permit for perchlorate treated waters. Towards that end, Kerr-McGee filed an NPDES permit application with NDEP in later 1999. A draft permit was developed and has been issued for public notice by NDEP. Until the NPDES permit is approved for use, Kerr-McGee has continued seep stream perchlorate removal, under the authorization of a Temporary Discharge Permit.

- Engineering (currently being completed by Biothane Corporation and Applied Research Associates) is nearing completion on the biological treatment system for perchlorate. The cost estimate and schedule are expected by end of June for Kerr-McGee internal review and approval. Pre-construction activities, such as site preparation, have begun in the Henderson Plant. Additional activities are pending a grading permit, currently in Clark County Planning and Zoning's control. This permit is pending a review and resultant approval letter from NDEP to continue the grading permit review process. Documents (drawings) have been submitted to NDEP's Las Vegas office for this review process. Additional information will be forwarded, as it is available. It is expected that a year will be needed to construct the biological treatment facility once internal approval and NDEP permits and approvals have been received.

- Private Property Pipeline Easement Agreements – These are under development. At this time, none are expected to cause a construction delay.

KMC is committed to act responsibly and cooperate fully with local, state, and federal officials in determining appropriate remedial actions. Please feel free to contact me at (702) 651-2200 if you have any questions related to this information. Thank you.

Sincerely,

SMCrowley

Susan M. Crowley
Staff Environmental Specialist

By certified mail

cc: PSCorbett
EMSpore
FRStater
TWReed
WOGreen
RHJones
LKBailey
ALDooley
Rick Simon, ENSR
Robert Kelso, NDEP
Doug Zimmerman, NDEP
Jeanne-Marie Bruno, Metro Water District Of Southern California
Barry Conaty, City of Henderson
Pat Mulroy, Southern Nevada Water Authority
Kevin Mayer, EPA Region IX

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KERR-McGEE CHEMICAL LLC
POST OFFICE BOX 55 - HENDERSON, NEVADA 89009

June 30, 2000

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JUL 3 2000
ENVIRONMENTAL PROTECTION
LAS VEGAS OFFICE

Cathe Pool
Supervisor Permitting Group
Water Pollution Control
Nevada Division of Environmental Protection
333 West Nye Lane
Carson City, NV 89706-0851

Subject: NPDES Permit # 0023060

Dear Ms. Pool:

A draft NPDES Permit # 0023060, with its related Fact Sheet, was public noticed in mid-May for review and comment. Kerr-McGee comments relating to the permit itself were submitted in early June however we have had the opportunity to review the Attachment A, provided with the draft permit. We provide the attached comments in the form of a redlined Attachment A, for your consideration.

Please feel free to call me at (702) 651-2234 if you have any questions or need additional information. Thank you.

Sincerely,

Susan Crowley
Staff Environmental Specialist

Attachment

cc: EMSpore
JTSmith
FRStater
Brenda Pohlmann, NDEP
Leo Drozdoff, NDEP
Rick Simon, ENSR
Public Repository
LKBailey
WOGreen
PSCorbett
Doug Zimmerman, NDEP
Bill Gorham, ENSR
Dave Urban, ENSR

smc/NPDES Permit Attachment A Comments to Pool.doc

ATTACHMENT A

Water Quality Standards and Permit Application Data

Data and Limits Only Included For Compounds Which Have Detections Above the Method Detection Limit

Parameter All data is in ppb, unless otherwise specified.	CAS #	Irrigation Standard	Livestock Watering	Water and Organism or Drinking Water[1]	Organism only	Acute Aquatic Life	Chronic Aquatic Life	Las Vegas Wash Seep	Onsite Chromium Extraction Treatment System	Pittman Lateral
Metals										
Antimony	7440-36-0			~~146~~ 6				ND	0.9J	ND
Arsenic	7440-38-2	100	200	50				~~140~~ 115	3.8J	~~125~~ 132
Arsenic (III)	22569-72-8					342(d)	180(d)			
Barium	7440-39-3			2000				~~0.0183J~~ 21	41	220
Beryllium	7440-41-7	100		0				ND	0.34J	ND
Boron	7440-42-8	750	5,000					~~4,600~~ 3,600	~~13,000~~ 13,200	
Cadmium	7440-43-9	10	50	5		16(d)	2.9(d)	ND	ND	ND
Chromium (total)	7440-47-3	100	1,000	100				~~620~~ ND	~~490~~ 666	132
Chromium (VI)	18540-29-9					15(d)	10(d)	ND	ND	129
Chromium (III)	7440-47-3					4595(d)	548(d)	~~620~~		
Copper	7440-50-8	200	500	~~1,300~~ 1000		56(d)	33(d)	8.1	5.4	30
Iron	7439-89-6			300/600		1,000		~~100~~ ND	3,700	6,710
Lead	7439-92-1	5,000	100	50		238	5	ND	ND	~~6.3J~~ ND
Magnesium	7439-95-4			125,000/ 150,000				~~252,000~~ 240,000	~~380,000~~ 386,000	~~300,000~~ 297,000
Manganese	7439-96-5	200		50/100				1,800	330	1,720

1 The Las Vegas Wash is not designated as a drinking water supply; these standards are presented for information only.

J indicates the result was detected above the method detection limit but below the quantitation limit. (d) indicates dissolved.

Parameter All data is in ppb, unless otherwise specified.	CAS #	Irrigation Standard	Livestock Watering	Water and Organism or Drinking Water[1]	Organism only	Acute Aquatic Life	Chronic Aquatic Life	Las Vegas Wash Seep	Onsite Chromium Extraction Treatment System	Pittman Lateral
Mercury	7439-97-6		10	2		2(d)	**0.012(d)**	ND	ND	**0.092J**
Molybdenum	7439-98-7					**19**		**120**	**42**	Need
Nickel	7440-02-0			13.4		3895(d)	**433(d)**	15.5	6	15.4J
Potassium	7440-09-7							45,800	36,000	~~40,600~~ 41,200
Selenium	7782-49-2	20	50	50		20	**5**	~~12~~ 11	**5.9**	**~~8J~~ 8.1J**
Sodium	7440-23-5							1,520,000	1,600,000	~~2,000,000~~2,090,000
Strontium	7440-24-6							11,200	21,000	~~14,700~~ 15,100
Thallium	7440-28-0			~~13~~ 2	6.3			ND	0.6J	~~30~~ ND
Vanadium	7440-62-2							51	5.1	116
Zinc	7440-66-6	2,000	25,000	5,000		322(d)	**292(d)**	ND	7.6J	~~511~~ 51.1
General Water Quality/Miscellaneous										
pH				6-9				~~7.65~~ 7.56	7.46	6.94
Color				15 units				20	~~60~~ 75color units	
MBAS				500				730	~~100~~ 5,800	
ClO4								~~310,000~~ 100,000	1,600,000	480,000
ClO3								100,000		
TDS		1,900,000/ 3,000,000	3,000,000	500,000/ 1,000,000				7,300,000	~~12,000,000~~ 11,700,000	9,680,000
TSS								~~14,000~~ 13,200	43,200	
TOC								5,600	5,100	3,600

J indicates the result was detected above the method detection limit but below the quantitation limit. (d) indicates dissolved.

Parameter All data is in ppb, unless otherwise specified.	**CAS #**	**Irrigation Standard**	**Livestock Watering**	**Water and Organism or Drinking Water**[1]	**Organism only**	**Acute Aquatic Life**	**Chronic Aquatic Life**	**Las Vegas Wash Seep**	**Onsite Chromium Extraction Treatment System**	**Pittman Lateral**
Total Inorganic Nitrogen as N	**Requirement to Maintain Existing Higher Quality in Las Vegas Wash is 20,000**							~~20,000~~ 8,500	63,000	**21,300**
Ammonia as N	7664-41-7							150J	~~15,000~~ 15,200	**need**
~~Nitrate+Nitrite~~				~~10,000~~				8,500	48,000	~~18,000~~ 21,300
BOD								1,420J	18,000	
COD								140,000	28,000	
Fluoride		**1,000**	2,000	2,000/4,000				**1,600**	~~930~~ 980	
Sulfate								~~1,950,000~~ 2,150,000	4,300,000	2,500,000
Sulfide-undissociated ~~HS-~~ H_2S						**2**		ND	~~**150**~~ **35**[2]	
Chloride				250,000		~~860,000~~	~~230,000~~	2,300,000		**3,710,000**
Total Phosphoreus								136	ND	~~2,300 PO4~~
Oil and Grease								3,800	16,000	
Gross Alpha (pCi/l)				15				~~96.1~~ 52.1		
Gross Beta (pCi/l)								~~204~~[3]		
Radium 226+228(pCi/l)				5				~~595~~[4]		
Pesticides/Herbicides										

2 Total sulfide was 150 ppb. Undissociated fraction was approximately 23%, resulting in an undissociated H_2S concentration of 35 ppb.
3 Reported non-volatile beta was 57.5
4 Reported Radium 226 was 3.41. Radium 228 not available.

J indicates the result was detected above the method detection limit but below the quantitation limit. (d) indicates dissolved.

Parameter All data is in ppb, unless otherwise specified.	CAS #	Irrigation Standard	Livestock Watering	Water and Organism or Drinking Water[1]	Organism only	Acute Aquatic Life	Chronic Aquatic Life	Las Vegas Wash Seep	Onsite Chromium Extraction Treatment System	Pittman Lateral
Aldrin	309-00-2			0	**0.0014**	3		**0.0155**	ND	ND
Chlordane Alpha								**0.0025 J**	ND	ND
Chlordane	57-74-9			0	0.0059	2.4	**0.0043**	0.0044J	ND	**0.0054J**
alpha-BHC	319-84-6			0.039	**0.13**			~~65~~ 0.92	**0.14**	**0.771**
beta-BHC	319-85-7			0.14	**0.46**			0.372	ND	0.166
delta-BHC	319-86-8							~~1.71~~ 1.9	0.06J	1.99
2,4-D	94-75-7			70				ND	ND	1.14
2,4-DB								ND	ND	4.08
4,4' -DDT & metabolites				0		1.1	**0.001**	**0.31** NDEP data 0.0226J	ND	ND
4-4'-DDT	50-29-3			~~0.0059~~	0.0059	1.1	**0.001**	ND	ND	ND
4,4'-DDE	72-55-9				0.0059	1.1	**0.001**	**0.0073 J**	ND	ND
4,4'-DDD	72-54-8			~~0.0083~~	0.0084	1.1	**0.001**	**0.0114 J**	ND	ND
Dalapon	75-99-0			200				0.79 J		ND
Dicamba	1918-00-9							0.099		0.173~~J~~
Dieldrin	60-57-1			0	0.0014	2.5	**0.0019**	~~0.1~~ ND	ND	ND
Dinoseb	88-85-7			7				0.39	ND	0.604
Endosulfan	115-29-7			75		0.22	0.056	ND	ND	0.0064J
Endrin	72-20-8			0.2	~~8.1~~ 0.81	0.18	0.0023	**0.0042 J**	ND	ND
Heptachlor	76-44-8			0.0021	**0.0021**	0.52	0.0038	~~0.004 J~~ ND	ND	ND
Heptachlor Epoxide	102-45-73			~~0.01~~ 0.0010	**0.0011**	0.52	0.0038	**0.0044 J**	~~0.0044J~~ ND	**0.0021J**

J indicates the result was detected above the method detection limit but below the quantitation limit. (d) indicates dissolved.

Parameter All data is in ppb, unless otherwise specified.	CAS #	Irrigation Standard	Livestock Watering	Water and Organism or Drinking Water[1]	Organism only	Acute Aquatic Life	Chronic Aquatic Life	Las Vegas Wash Seep	Onsite Chromium Extraction Treatment System	Pittman Lateral
Lindane(gamma BHC)	58-89-9			0.19 ~~(4, NV)~~	0.63	2	0.08	~~0.110~~ 0.0511	~~0.0052J~~ 0.06J	~~0.0923~~ 0.0966
MCPA	94-74-6							~~42~~		
Pentachlorophenol	87-86-5			1 ~~(1010, NV)~~	82	~~160~~ 9.1 @7	~~55.6~~ 5.7@ 7	0.017 J		0.03J
Silvex (2,4,5-TP)	95-95-4			10				0.084 J		0.51
2,4,5-T	93-76-5							0.257	ND	~~0.7~~ 0.698
Volatiles										
Chloroform	67-66-3			57	4700			~~2 J~~ ND	430	2J
m-Dichlorobenzene (1,3)	541-73-1			400				~~0.5~~ ND	ND	
o-Dichlorobenzene (1,2)	95-50-1			400				~~0.6~~ ND	ND	
p-Dichlorobenzene (1,4)	106-46-7			75				~~0.7~~ ND	ND	
1,1-Dichloroethane	75343							2J	ND	9
Methyl Tert-butyl ether	1634-04-4							~~5~~ ND	ND	
Semi-Volatiles										
di-2-Ethylhexyl phthalate	117-81-7			~~15000~~ 6	59			~~4 J~~ ND	ND	3J
1,2,4-trichlorobenzene	120-82-1							2 J	ND	2J

J indicates the result was detected above the method detection limit but below the quantitation limit (d) indicates dissolved

KERR-McGEE CHEMICAL LLC
POST OFFICE BOX 55 - HENDERSON, NEVADA 89009

June 15, 2000

Cathe Pool
Supervisor Permitting Section
Bureau of Water Pollution Control
Nevada Division of Environmental Protection
333 West Nye Lane
Carson City, NV 89706-0851

Dear Ms. Pool:

Subject: Comment on the Public Noticed Draft NPDES Permit NV0023060

Kerr-McGee is in receipt of the publicly noticed draft NPDES Permit NV 0023060 for the perchlorate remediation effort in the Henderson area. We provide the following comments:

Cover Page:

Identify receiving water as "Las Vegas Wash from Telephone Line Road to the confluence of discharges from City of Las Vegas and Clark County <u>waste</u>water treatment plants" NAC 445A.199

I.A.1

Correct the spelling of "Pittman"

Insert the word "at": LVW-2 LVW-5 and LM-6 are at designated sampling locations in the Las Vegas Wash.

Table I.1

The note for ammonia should be clarified by adding "in the Las Vegas Wash" as follows:

*If the average annual load of Total Ammonia in the Las Vegas Wash exceeds 824.5 lb/day,

To avoid confusion, the measurement frequency for ammonia should be listed as "twice per month" rather than "bi-weekly"

Acute WET: should refer to permit condition "I.A.15" rather than "I.A.14".

Table I.1

Kerr-McGee is questioning the perchlorate mass discharge limit of 30.5 lb/day. At 1.22 mgd, 30.5 lb/day corresponds to 3 ppm. If the influent perchlorate concentration is greater than 100 ppm, then the discharge is limited to 3 ppm rather than a higher effluent concentration at 97% removal. For example, if the influent concentration is 150 ppm and the flow is 1.22 mgd, 97% removal corresponds to a discharge concentration of 4.5 ppm and mass of 45.8 lb/day. Since the composite perchlorate concentration is estimated to be 310 ppm (as provided in Table 1 of the November 2, 1999 letter from Kerr-McGee to NDEP), the discharge concentration at 97% removal would be 9.3 ppm and the mass discharge at a flow rate of 1.22 mgd would be 94.6 lb/day. Kerr-McGee is therefore requesting a 30-day average mass discharge limit of 94.6 lb/day or alternately, that **<u>no</u>** mass discharge limit for perchlorate be listed in Table I.1.

NDEP has included monitoring and reporting requirements for Chloride, Radium 226 + 228, Gross alpha radiation, and Chlorate (ClO_3). There are no applicable water quality standards for these parameters in the Las Vegas Wash. Therefore, the justification for these monitoring requirements is unclear. If NDEP is interested in collecting additional data on the quality of the Las Vegas Wash, then Kerr-McGee requests that the requirement be terminated after one year of monitoring.

I.A.2

For clarification, add a colon after "Wash" so that it reads "The permit allows . . . in the Las Vegas Wash: from Outfall 001. . . "

Add a colon after "locations" so that it reads "Samples are to be taken at the following locations: upstream samples. . . "

This paragraph should identify LVW-2 and its location.

I.A.2.a

Insert "applicable" before "water quality standards"

I.A.2.b

Insert "applicable" before "water quality standards"

I.A.15

This section should be entitled "Whole Effluent Toxicity Testing" rather than "Whole Effluent Testing".

I.A.15

The text immediately below "Acute Toxicity" is confusing, and is potentially self-contradicting. According to the text in this section, an effluent is deemed acutely toxic if either the limits under item i or ii are exceeded, regardless of whether a significant reduction in survival (relative to the control) is observed.

Further, the 90% survival limit in 100% effluent is not believed to be appropriate. When evaluating toxicity test data, one must always compare organism performance with that observed in the performance control. Following EPA guidance, a test is not acceptable if control survival is less than 90%. If one considers that survival of less than 90% in the effluent is a demonstration of an adverse effect, one runs the risk of: 1) characterizing the effluent as acutely toxic when it may not be, or 2) characterizing the effluent as not acutely toxic when toxicity is present. For example, consider the following scenario (#1):

Treatment	Number of Surviving Organisms/Number of Organisms Exposed			
	Replicate A	Replicate B	Replicate C	Replicate D
Control	9/10	9/10	9/10	9/10
100% Effluent	9/10	9/10	9/10	8/10

Under this scenario, the sample would be deemed acutely toxic even though, when compared with the concurrently conducted performance control, only one additional organism died in the effluent. This is obviously not a statistically significant reduction in survival (alpha = 0.05). Conversely, consider the following scenario (#2):

Treatment	Number of Surviving Organisms/Number of Organisms Exposed			
	Replicate A	Replicate B	Replicate C	Replicate D
Control	10/10	10/10	10/10	10/10
100% Effluent	9/10	9/10	9/10	9/10

Under this scenario, the effluent would not be deemed acutely toxic even though a significant reduction in organism survival is observed (compared with the control at the alpha = 0.05 level). Although the significant reduction in survival is slight, a clear reduction in survival that is consistent among the four effluent treatment replicates is observed. Given the two scenarios, it is clear that toxicity is better demonstrated under scenario #2 than by scenario #1.

Although the 70% survival limit (in 100% effluent) can be argued against for many of the same reasons, we agree that less than 70% survival in 100% effluent is an indication of an adverse effect, provided that acceptable control organism performance (i.e., ≥90% survival) is observed. Further, we agree that the 70% survival requirement provides an indication of toxicity without requiring statistical evaluation.

For these reasons, we suggest the following revisions:

I.A.15. <u>*Whole Effluent Testing*</u> *Upon written notification by the Division, the permittee shall conduct monthly toxicity tests on 24-hour composite effluent samples as described below on the discharge from Outfall 001. (The Division wishes to require this testing after the issues with the constituents not the responsibility of the permittee are resolved.)*

a. <u>*Acute Toxicity*</u>
The effluent shall be deemed acutely toxic when:

i. There is a statistically significant difference with 95% statistical confidence (i.e., alpha = 0.05) between the survival of the control (0% effluent) test organisms and the survival of the test organisms in the 100% effluent in six (6) out of eleven (11) consecutive samples; or

ii. The survival rate of test organisms in the undiluted effluent sample is less than 70 percent in any two of eleven consecutive samples.

Within Section I.A.15.b.i.2, it is stated that 20 organisms per test chamber are used for the daphnid and 10 organisms per test chamber will be used for *P. promelas*. Although this is standard EPA protocol for the fathead minnow tests, daphnid tests are typically conducted with 5 organisms per chamber (20 organisms per treatment). However, 20 daphnids can be tested in each replicate (80 organisms per treatment), if that was the true intent of the original permit language. We do, however, suggest the following changes:

b. <u>*Test Methods*</u>

i. The acute flow through or static replacement tests shall be conducted in general accordance with the procedures set out in the latest revision of "Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms," EPA/600/4-90/027. The permittee shall conduct an acute 48-hour flow through or static replacement toxicity test using any Daphnid approved by the Division and an acute 96-hour flow through or static replacement toxicity test using fathead minnows, <u>*Pimephales promelas.*</u> *After each 24-hours of the test period the dilutions shall be replaced with freshly prepared dilutions of the original effluent sample.*

1. If more than 10 percent control mortality occurs, the test shall be repeated until satisfactory control survival is achieved.

2. The source of the dilution water shall be reported with the test results. The tests shall be run using 4 replicate chambers per treatment, with a *minimum of 20 organisms per test chamber for the Daphnid and 10 organisms per test chamber for the P. promelas.*

Within Section I.A.15.b.ii, we feel clarification is needed and suggest the following revision.

ii. *Alternative Species and Protocols. The permittee may undertake an investigation of alternative site-specific toxicity test species and alternative site-specific toxicity protocols. Because the source water to the facility is high in total dissolved solids (TDS) ions, it may be appropriate to conduct WET tests with either a TDS-resistant species (e.g., a marine species) or a freshwater species that has been acclimated to high TDS culture water. If alternative, site-specific toxicity test species or protocols are developed as a result of work by the permittee, such species or protocols may be substituted for those specified in this permit on approval by NDEP and EPA under 40 CFR Part 136. Alternative protocols must be compared to EPA protocols to demonstrate appropriateness and reliability.*

Within Section I.A.15.c, we feel that some clarification is needed. Further, there is a reference to sub-lethal toxicity (i.e., growth) in this section although this permit requires only acute testing. Based on this, we recommend the following revisions:

I.A.15.c. Testing Schedule

i. Routine Schedule: The Permittee shall conduct an acute toxicity test during the first week of the calendar month.

ii. Accelerated schedule: Whenever the result of any one test has a survival of less than 70 percent, the Permittee shall increase the frequency of acute toxicity testing to every other week. The accelerated testing shall be based on definitive tests using serial dilutions to determine the No Observed Adverse Effects Concentration (NOAEC). The dilution series must include or bracket the critical dilution defined as the instream waste concentration (IWC) determined under low-flow conditions. Where the calculated NOAEC for survival is equal to or greater than the critical dilution in four (4) consecutive accelerated tests, the Permittee may resume its routine test schedule.

I.A.15.d.iii

Kerr-McGee agrees that EPA and NDEP can be notified that an exceedence has occurred within 15 days of becoming aware of the exceedence. However, we feel it would be extremely difficult to provide items 2 through 4 within the 15 days because these items would be only in their initial stages after 15 days. For example, acute Phase I and II TIE studies (as described in the EPA documents) may take as long as four weeks, depending on the class of toxicants implicated, the concentration and isolation procedures performed, and the analytical chemistry procedures required.

It must be emphasized that, many times toxicity is observed in effluent samples (triggering the requirement for accelerated testing and investigatory studies) that is no longer present in the effluent when investigatory studies are initiated. Consider this scenario: an unknown upstream source (e.g., a one-time application of pesticide) causes acute toxicity in the effluent. After investigatory studies are initiated, the effluent is no longer toxic. Because the effluent is not toxic, the cause of toxicity cannot be identified; in this situation, conducting additional TIE studies would be wasteful. Because of this, we have added section iv, as follows.

I.A..15.d.iv.

If while conducting tasks under items I.A.15.b. i, ii, and iii, the effluent toxicity decreases such that a NOAEC of 100% effluent is obtained (i.e., not acutely toxic as defined in Section I.A.15.a.i), the Permittee shall notify EPA and NDEP of this result and resume accelerated testing required by I.A.15.c.ii. Where the calculated NOAEC for survival is equal to or greater than the critical dilution in four (4) consecutive accelerated tests, the Permittee may resume its routine test schedule (described in I.A.15.c.i.).

I.A.15.d

"I.A.15.c.2" should be "I.A.15.c.ii".

I.A.15.d.1 "I.A.15.c.2" should be "I.A.15.c.ii".

"I.A.15.c.1" should be "I.A.15.c.i".

I.A.15.e

Add: ... for those parameters for which the permittee is responsible."

I.A.16.b

Remove the word "extraction"

I.A.16.b.iii

2nd sentence, correct the spelling of "wash"

I.A.16.b.iii

The draft permit indicates that a quarterly report is required. However, Kerr-McGee believes that an annual report will be adequate.

I.A.16.d

Kerr-McGee intends to cooperate with other responsible parties. However, to avoid misinterpretation, Kerr-McGee requests that the wording of this condition be changed to "The permittee shall cooperate in good faith..."

I.B.1.b.

Kerr-McGee requests additional time to submit the Quarterly Reports following the end of the reporting period. Because of the time required for laboratory analysis and review and report preparation Kerr-McGee requests the 28 days be changed to 58 days.

I.B.2.f.v.

This section should be labeled I.B.2.f.iii.

To address those parameters whose water quality standard is below the laboratory detection limits, the words "... or the established laboratory PQL." Should be added to this condition.

I.B.3.a

NDEP should clarify how to handle non-detects when calculating a 30-day average. That is, should non-detects be considered zero or one-half the detection limit?

II.A.4.b.

Add the word "other" so that it reads ". . . or untreated discharge other than that which is authorized by the permit."

II.A.4.f.

This clause prohibits bypass unless all three conditions are met, yet condition II.A.4.e allows bypass for essential maintenance. Since essential maintenance would not normally cause "loss of life, personal injury, or severe property damage", condition II.A.4.f.i would not be met and bypass would not be allowed. Kerr-McGee requests that the language be made consistent, such as by changing the word "and" at the end of II.A.4.f.ii to "or".

As always, please feel free to call me at (702) 651-2234, if you have any questions.

Sincerely,

SM Crowley

Susan M. Crowley
Staff Environmental Specialist

cc: LKBailey
PSCorbett
EMSpore
Rick Simon, ENSR
FRStater
Dave Urban, ENSR
Doug Zimmerman, NDEP
Brenda Pohlmann, NDEP

KERR-McGEE CHEMICAL LLC
POST OFFICE BOX 55 - HENDERSON, NEVADA 89009

FAXED 6/14/00

June 14, 2000

Ms. Brenda Pohlmann
Remediation Branch Supervisor
Nevada Division of Environmental Protection
555 E. Washington, Suite 4300
Las Vegas, NV 89101

Dear Ms. Pohlmann:

Subject: Perchlorate Activity Status

Following is the current status of Kerr-McGee Chemical LLC's (Kerr-McGee) activities regarding the perchlorate issue:

- Kerr-McGee's commitment to remove perchlorate from surfacing groundwater, or the "seep", is continuing, utilizing Calgon Carbon's ion exchange process. During May 2000, 9.25 tons of perchlorate was removed from the surface stream before it entered the wash. To date, 29 tons have been removed since ion exchange operation began in November 1999. The stream flow is down, nominally 320 gpm, and perchlorate concentration is up, averaging 85 to 90 ppm. These conditions appear typical of summertime conditions in the stream. Although the ion exchange system is running well, we continue to have occasional operational difficulties due to the Clark County earthen dam, installed upgradient from the stream capture point. Kerr-McGee is hopeful that this dam will be removed at the earliest possibility.

- On-site groundwater continues to be extracted and treated for chromium removal, then placed in the on-site groundwater holding basin for eventual treatment for perchlorate removal. Since initiation of impoundment in December 1998, considering the average perchlorate concentration of 1200 to 1900 ppm, 158 tons of perchlorate have been removed from the on-site groundwater. The holding basin has had a very high evaporation rate due to lower than normal rainfall and above average temperature and wind conditions.

- Kerr-Gee is continuing transfer of groundwater extracted from the Pittman Lateral area to its groundwater holding basin. We are utilizing a tanker truck to accomplish this. Over the 218 days this transfer has been active, approximately 1.46 tons of perchlorate have been removed from the groundwater.

- NPDES Discharge Permit – NDEP, Bureau of Water Pollution Control is developing a discharge permit for perchlorate treated waters. Towards that end, Kerr-McGee filed an NPDES permit application with NDEP in later 1999. A draft permit was developed and has been issued for public notice by NDEP. Until the NPDES permit is approved for use, Kerr-McGee has continued seep stream perchlorate removal, under the authorization of a Temporary Discharge Permit.

- Engineering (currently being completed by Biothane Corporation and Applied Research Associates) is nearing completion on the biological treatment system for perchlorate. The cost estimate and schedule are expected by end of June for Kerr-McGee internal review and approval. Pre-construction activities, such as site preparation, have begun in the Henderson Plant. Additional activities are pending a grading permit, currently in Clark County Planning and Zoning's control. This permit is pending a review

PETER G. MORROS, Director

ALLEN BIAGGI, *Administrator*

(775) 687-4670

TDD 687-4678

Administration
Water Pollution Control
Facsimile 687-5856

Mining Regulation and Reclamation
Facsimile 684-5259

STATE OF NEVADA
KENNY C. GUINN
Governor

Waste Management
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Facsimile 687-6396

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

DIVISION OF ENVIRONMENTAL PROTECTION

333 W. Nye Lane, Room 138
Carson City, Nevada 89706-0851

June 6, 2000

Mr. Joel Mack, Esq.
Latham & Watkins
701 "B" Street, Suite 2100
San Diego, CA 92101-8197

Re: Notification of Accelerated Work (dated 12 May 2000)
Your Response (dated 30 May 2000)

Dear Mr. Mack:

The Nevada Division of Environmental Protection (NDEP) has received and reviewed your response to the subject "Notification of Accelerated Work." The Division does not agree that it is premature to discuss the timetable for submitting a work plan to assess the need for and the feasibility of treating water captured and discharged by KMC for contaminants other than perchlorate.

The 1998 data show several compounds which exceed MCLs (including chlorobenzene, carbon tetrachloride, chloroform, and 1,2,4-trichlorobenzene) in one or more wells sampled. It is also my understanding that the additional round of sampling has been completed. Except for radionuclides, preliminary analytical results should be available by the third week in June thus allowing sufficient time for review and the preparation of a work plan to assess the "need for and the feasibility of treating" captured groundwater by July 31, 2000.

Please do not hesitate to contact me at (702) 687-4670, extension 3127, if you have any questions or comments regarding this matter.

Sincerely,

Doug Zimmerman

Doug Zimmerman
Chief, Bureau of Corrective Actions

PAUL R. WATKINS (1899 - 1973)
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May 30, 2000

VIA FACSIMILE AND U.S. MAIL

Doug Zimmerman
Chief, Bureau of Corrective Actions
Nevada Division of Environmental Protection
333 W. Nye Lane, room 138
Carson City, NV 89706-0851

Re: Your May 12, 2000 Letter

Dear Doug:

We have received your May 12, 2000 letter to the Steering Committee regarding certain groundwater issues and the ongoing work by Kerr-McGee Chemical Corporation ("KMCC") with respect to perchlorate. With KMCC's consent, I am responding on behalf of the members of the Steering Committee other than KMCC, which I believe appropriate under the circumstances.

First, as you know, the Steering Committee (including KMCC) is in the process of collecting and analyzing samples from numerous wells in the vicinity of the Pittman Lateral area. Once we receive and review this data, the Steering Committee will be in a position to have a dialogue with the Division with regard to what actions, if any, are appropriate with respect to any effluent from the KMCC system and which party or parties should undertake any such efforts. As we have stated in the past, we are always willing to meet with the Division to discuss appropriate action items at this site. Prior to all parties receiving and reviewing all relevant data (including the new data presently being collected), we believe it is premature to discuss the timetable for submitting any workplan.

Second, the Committee believes it inaccurate, or at most premature, to suggest that other constituents, if any, in the groundwater for which KMCC may ultimately capture and treat "are associated with BMI Complex operations." Depending on the location and nature of the materials, this statement may be false and in any case, the Committee reserves its rights to evaluate any relevant sources, whether associated with the BMI Complex or otherwise, with respect to any constituent in such groundwater.

I look forward to future discussion on these issues.

Very truly yours,

Joel H. Mack

Joel Mack
of LATHAM & WATKINS

cc: Henderson Legal Subcommittee

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"READER"

STATE OF NEVADA
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Waste Management
Corrective Actions
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Air Quality
Water Quality Planning
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DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL PROTECTION
333 W. Nye Lane, Room 138
Carson City, Nevada 89706-0851

May 12, 2000

TO: Henderson Industrial Site Steering Committee - Joel Mack and Susan Stewart
Basic Management, Incorporated - Robin Bain
Stauffer Management Company - Lee Erickson
Pioneer Chlor Alkali Company, Inc. - Sam Chamberlain
Montrose Chemical Corporation of California - Frank Bachman
Titanium Metals Corporation - Tony Garcia
Kerr-McGee Chemical LLC - Susan Crowley

RE: Notification for Accelerated Work to Abate, Mitigate and Eliminate Environmental Contaminants Dated November 6, 1998

Pursuant to the above referenced notification, the Henderson Industrial Site Steering Committee (HISSC) commenced work to address groundwater contamination down gradient of the BMI Complex. This work is in progress and consists of evaluating groundwater impacted by total dissolved solids (TDS) and other contaminants of concern. A report was submitted which addressed the feasibility of various treatment and disposal technologies associated with TDS. Additional sampling for and evaluation of the other contaminants of concern is ongoing.

As you are aware, Kerr McGee Chemical (KMC) has made significant progress in their efforts to capture and treat groundwater and surface water impacted by perchlorate. KMC is currently discharging, under a temporary permit, treated water to the Las Vegas Wash. This water and other sources of groundwater that KMC may capture and treat for perchlorate, in the near future, contain other contaminants which are associated with BMI Complex operations. An application for a five year NPDES permit for this treated water is currently being evaluated by the Division.

By this letter we are requesting HISSC to include, within the scope of the ongoing effort, an assessment of the need for and the feasibility of treating water captured and discharged by KMC for contaminants other than perchlorate. A meeting between HISSC and the Division to discuss the development of a work plan and schedule for this activity is suggested. In any event, we expect submittal of a work plan by July 31, 2000.

Please feel free to call me at 702-687-4670 ext 3127 if you have questions on this matter.

Sincerely,

Doug Zimmerman

Doug Zimmerman
Chief, Bureau of Corrective Actions

cc: City of Henderson - Barry Conaty
Southern Nevada Water Authority - Kay Brothers
Region IX, U.S. EPA - Keith Takata & Julie Anderson

5/12/00 KMCC/EPA Meeting

- Brenda Pohlman
- Susan Crowley
- Rick Stater
- Pat Corbett
- Tom Reed
- Larry Bowerman
- Mitch Kaplan
- Bill Green
- Keith Bailey
- JT
- Everett Spore

- Questions from EPA
Quick overview of investigations near LV Wash
Workplan work accomplished already (mostly)
Looked at est. gw contribution to wash.

Ed doing nested well drilling, don't have enough info yet to make conclusions.

Tracer studies - working w/ NDEP in CC on tracer study work. Will start w/ di water and see how well that's works. Bromide will be next option. Working w/ Russ Land. Russ sent KMCC a list of tracer that have been used

KERR-McGEE CHEMICAL LLC
POST OFFICE BOX 55 - HENDERSON, NEVADA 89009

May 10, 2000

Ms. Cathe Pool
Supervisor, Permits Branch
Bureau of Water Pollution Control
Nevada Division of Environmental Protection
333 West Nye Lane
Carson City, NV 89710

Dear Ms. Pool:

Subject: Temporary Permit Application for the Perchlorate Removal Action

This correspondence is intended to provide you with Kerr-McGee Chemical LLC's (Kerr-McGee) temporary discharge permit application for the Kerr-McGee Perchlorate Removal Action. This second Temporary Permit is intended to allow Kerr-McGee to remediate perchlorate in the interim period while an NPDES Permit is developed.

Please find enclosed two copies of a temporary discharge permit application for this project, as well as a check for $250 to cover the application fee. The near-term perchlorate removal action consists of capture and treatment for impacted groundwater (the seep) surfacing north of the BMI lower ponds and adjacent to the Las Vegas Wash. The water captured at the seep will be treated with ion exchange or biodegradation technologies to remove perchlorate, and the effluent will be discharged under terms of the permit. Based on our previous discussions, we understand that NDEP will permit Kerr-McGee to return water back to the seep surface flow that has concentrations of constituents, other than perchlorate, similar to those currently in the seep water.

Once again, Kerr-McGee appreciates your efforts on this project. If you have any questions please feel free to call me at (702) 651-2234. Thank you.

Sincerely,

Susan M. Crowley

Susan M. Crowley
Staff Environmental Specialist

Enclosures: Temporary Discharge Permit Application
Check No.
By Airborne Express

cc:	LKBailey	Bill Gorham, ENSR
	PSCorbett	Rick Simon, ENSR
	K Dihrberg	Dave Urban, ENSR
	WOGreen	Doug Zimmerman, NDEP
	JTSmith	Brenda Pohlmann, NDEP
	EMSpore	
	FRStater	

C:\DATA\DOCS\SMC\LTR\TEMP NPDES PERMIT - CATHE POOL CVR LTR.DOC

LIST OF REQUIRE' ENTS FOR TEMPORARY 'ERMIT APPLICATION

A temporary permit may be issued for a maximum of a 180 day (6 month) period of time, pursuant to NRS 445A.485, after which time the discharge shall cease or the discharger shall have applied for and received a Permanent Discharge Permit. A $250.00 fee is due at the time of application.

I. Owner Information

Name: Kerr-McGee Chemical LLC
Address PO Box 55
City Henderson County Clark
State Nevada Zip Code 89009
Telephone Number (702) 651-2234 Fax Number (702) 651-2310
Contact Person Susan Crowley

II. Facility/Site Information

Facility Name Kerr-McGee Chemical LLC
Facility Address 8000 West Lake Mead Drive
City Henderson County Clark
State Nevada Zip Code 89015
Telephone Number (702) 651-2234 Fax Number (702) 651-2310
Contact Person Susan Crowley
Latitude 36 deg., 5 min., 15 sec Longitude 114 deg., 59 min., 30 sec
Township 21S Range 63@
Section 30

III. Receiving Water Name Las Vegas Wash

If the discharge enters a separate storm water drainage or other system, please provide the following information:

a. the name of the owner of the drainage
b. The name of the receiving water into which the drainage system discharges; and
c. A copy of the permit, license, or equivalent written approval granted by the owner of the system for such a discharge or connection to the system

IV. A narrative description of the site & activities which require the discharge permit. Describe any treatment system and/or Best Management Practices to be used at the facility.

Please see attached sheet.

V. Water Quality Analysis (must use a Nevada State Certified Lab) to include the potential contaminants/pollutants i the discharge.

Please see attached sheet.

VI. Quantity of discharge: Flow (gallons per day) 1,440,000 gpd (1,000 gpm)

VII. Attach a topographic map and a site map showing the location of the potential discharge and a line drawing showin the general route taken by water in the facility from intake to discharge.

VIII. Existing Environmental Permits

NPDES Permit (Discharges to Surface Water) NV0000078

NEV Permit (Discharges to Ground Water) N/A

IX. I certify that I am familiar with the information contained in the application and that to the best of my knowledge an belief such information is true, complete, and accurate.

Fredrick R. Stater	Plant Manager
Printed Name of Person Signing	Title
F R Stater	May 10, 2000
Signature of Applicant	Date Application Signed

KERR-McGEE CHEMICAL CORPORATION
HENDERSON, NEVADA

11-24
1210(8)

WELLS FARGO BANK
HENDERSON, NEVADA

A SUBSIDIARY OF KERR-McGEE CORPORATION

№ 07887

TO:

VOID AFTER 6 MONTHS

MO.	DAY	YEAR		DOLLARS	CENTS
05	11	00	PAY EXACTLY $250 DOLLARS 00 CENTS	$250	00

TO THE ORDER OF
NDEP
333 W. Nye Lane
Carson City, NV 89706

KERR-McGEE CHEMICAL CORPORATION

By Gary Elmer

By [signature] 5/11/00

⑈07887⑈ ⑆121000248⑆0832402358⑈

THE ENDORSEMENT BY THE PAYEE OF THE DETACHED CHECK CONSTITUTES RECEIPT IN FULL FOR ITEMS LISTED BELOW.

KERR-McGEE CHEMICAL CORPORATION, Henderson, Nevada

RECORD OF EARNINGS AND DEDUCTIONS

EMPLOYEE NUMBER	PAY PERIOD ENDING	HOURS WORKED Reg. Hours	Overtime Hours	Total Hours	RATE
					$

GROSS PAY	DEDUCTIONS FICA OASDI	FICA MEDICARE	Fed. Tax	State Tax	City Tax		NET PAY
$							$

DATE	DESCRIPTION	AMOUNT
05/11/00	Application fee for 2nd Temporary Discharge Permit application to allow NDEP to provide a 2nd temporary permit while an NPDES permit is developed.	$250.00
	$250.00 10181.01.9606770.1321.10400	

KM-2652-3-C

PRINTED IN U.S.A.

Kerr-McGee Chemical LLC
Temporary Discharge
Permit Application

Additional Information

Attachments

Item IV Narrative Description

Ion Exchange System

Biodegradation System

Item V Water Quality Analysis

Figures

Figure 1 Site Location Map

Figure 2 Process Flow Diagram – Ion Exchange System

Figure 3 Process Flow Diagram – Biodegradation System

Item IV Narrative Description

This National Pollution Discharge Elimination System (NPDES) temporary permit application package is submitted to the Nevada Division of Environmental Protection (NDEP) for discharges from a proposed surface water treatment system operated by Kerr-McGee Chemical LLC (Kerr-McGee) in Clark County, Nevada (Figure 1, Site Location Map). In July 1999, Kerr-McGee and NDEP entered into a Consent Agreement regarding near-term and long-term reduction in the amount of perchlorate reaching the Las Vegas Wash and Lake Mead. Groundwater in the area has elevated levels of perchlorate and other constituents. This groundwater seeps to the surface into a short creek along the southern edge of the Las Vegas Wash. This temporary permit application describes a two-phased approach to remove perchlorate from the seep water prior to its entering the Las Vegas Wash. Initially ion exchange technology will be used to selectively remove perchlorate from the seep water. However, once the biological treatment system is operational, the perchlorate removal will be accomplished by this latter system.

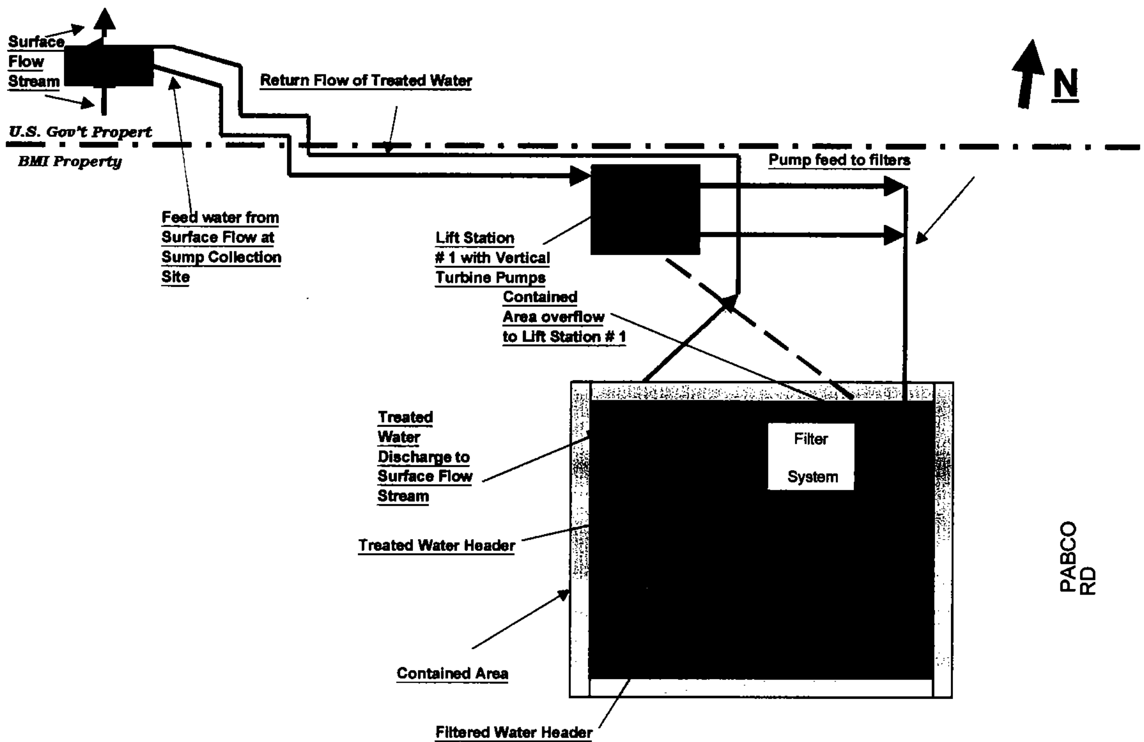
Ion Exchange System

Kerr-McGee has identified a removal technology that is capable of meeting the treatment objectives specified in the Consent Agreement in the short-term. The selected treatment technology to initially remove perchlorate from the surface water is an ion exchange system. Bench testing of this technique has demonstrated that the anticipated 97 percent reduction in perchlorate is feasible.

Water flowing from the seep will be collected in a weir-sump combination and pumped, using a sump pump, to a lift station located on BMI property. This conveyance will be by buried corrosion resistant pipeline.

The lift station is designed to hold and store a sufficient volume of water to allow for variations in processing of water by an ion exchange system. Pumps of sufficient capacity will be used to convey the water from the lift station to filters to remove particulate material and then to the ion exchange system. The ion exchange system will be contained and will be used to remove the perchlorate ion from the water. The treated water will be conveyed, via a corrosion-resistant return pipeline, to the downstream side of the weir-sump collection system for discharge. The water will be discharged to the Las Vegas Wash streambed in a non-erosive mode.

Once the ion exchange media is saturated with perchlorate, the resin will be managed in accordance with applicable regulations. It is expected that there will be multiple trains of ion exchange media for processing of this stream. Figure 2 is a process flow diagram for the ion exchange system.



Note: This figure represents a typical system layout. Field placement, if not identical, will be functionally equivalent.

Figure 2 Process Flow Diagram – Ion Exchange System

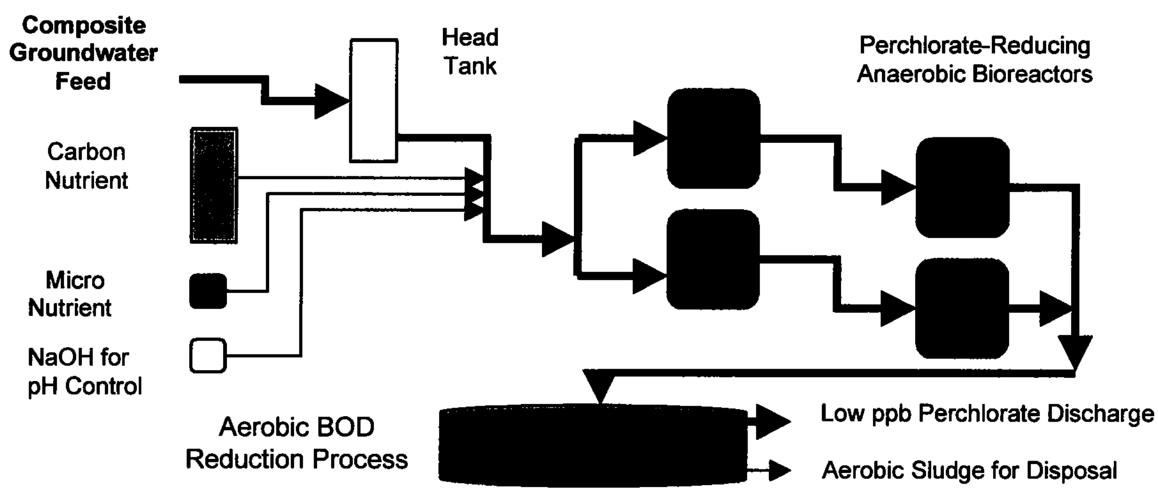
Biodegradation System

As soon as the biodegradation system is constructed and operational, the ion exchange unit will be decommissioned and the flow will be directed to the biodegradation system. In the biodegradation system, perchlorate is reduced to chloride in an anaerobic/anoxic biodegradation process. Chlorate and nitrate are simultaneously destroyed. The addition of nutrients in this process increases the biochemical oxygen demand (BOD), which is removed by subsequent conventional aerobic treatment. Perchlorate-containing water from the seep, at an average flow of 360 gallons per minute (gpm), will be pumped to a holding pond (aquifer retention basin), then into a receiver/head tank. This tank will function as a mix tank and will be designed to enable gravity flow to the rest of the process. In the event of a process interruption, water flow will automatically be diverted from the head tank to the containment pond. Figure 3 is a process flow diagram for the biodegradation system.

Nutrients, including a carbon source, are required for this biological process to work effectively. Various carbon-based nutrients have been identified that are commercially available as food process byproducts. The selected nutrients will be stored in bulk tanks or a railcar and be metered into the bioreactors. Micronutrients (phosphorus, nitrogen) will also be prepared, stored, and fed to the bioreactors. Control of pH in the reactors is necessary to maintain effective performance. Caustic (25 percent NaOH) will be used to maintain the pH.

The reactor vessels are designed as continuous-stirred-tank-reactors (CSTR) operated in series. Two trains of two reactors in series enhances the safety and robustness of this process by: 1) reducing tank size and containment considerations, 2) providing redundant process train, and 3) providing a second stage of treatment to ensure perchlorate reduction.

The BOD and total suspended solids (TSS) of the effluent anaerobic reactors will be reduced by subsequent conventional aerobic treatment prior to discharge. A small amount of aerobic sludge (biomass) will be generated as a result of this process. This sludge will be filtered and managed in accordance with applicable regulations.



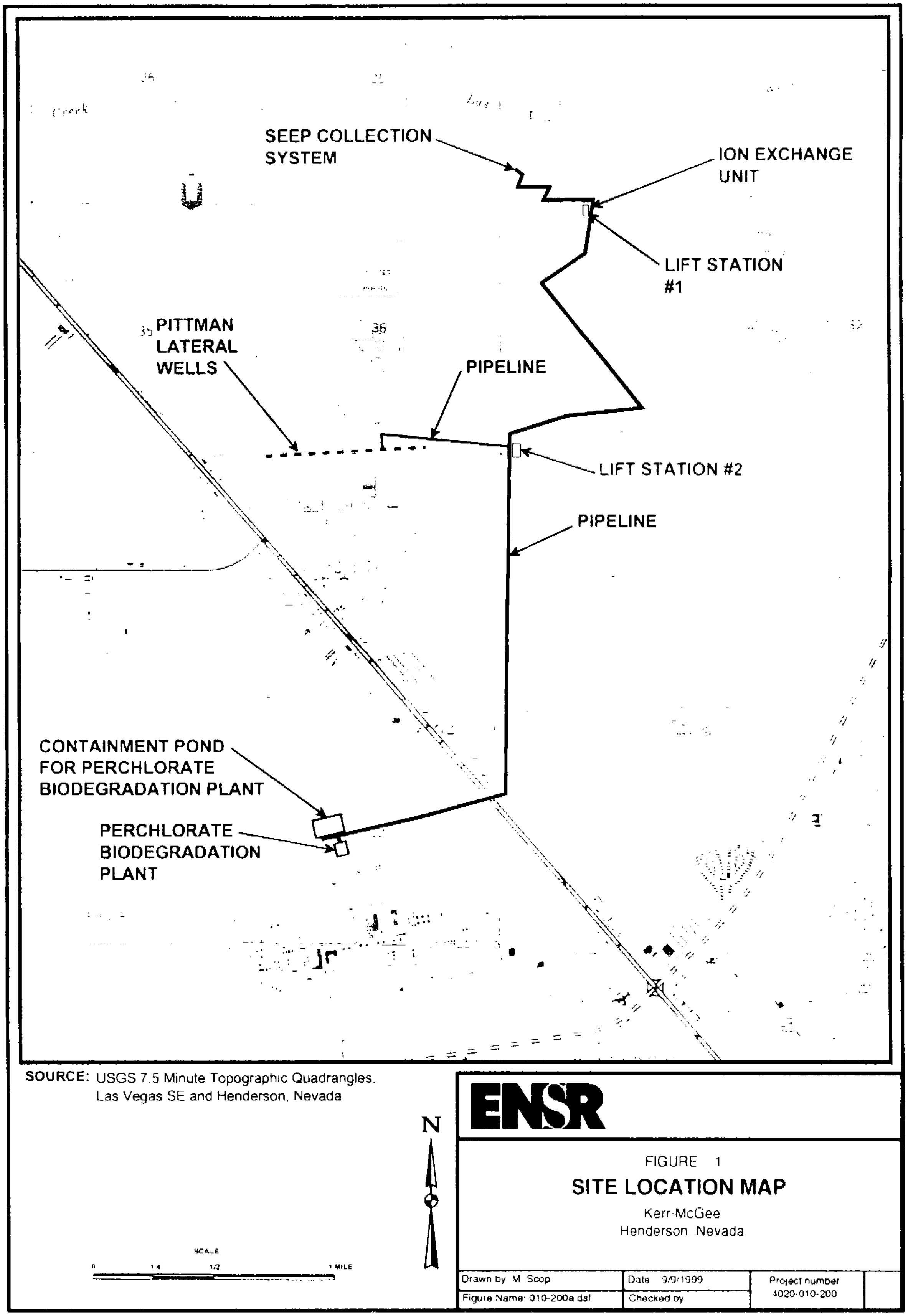
Note: This figure represents a typical system layout. Field placement, if not identical, will be functionally equivalent.

Figure 3 Process Flow Diagram – Biodegradation System

Source: Applied Research Associates, Inc.

Item V Water Quality Analysis

Data on water quality from samples analyzed by a Nevada certified lab are being obtained. They will be forwarded to the NDEP once they are validated.


SEEP COLLECTION SYSTEM
ION EXCHANGE UNIT
LIFT STATION #1
PITTMAN LATERAL WELLS
PIPELINE
LIFT STATION #2
PIPELINE
CONTAINMENT POND FOR PERCHLORATE BIODEGRADATION PLANT
PERCHLORATE BIODEGRADATION PLANT
SOURCE: USGS 7.5 Minute Topographic Quadrangles. Las Vegas SE and Henderson, Nevada
N
SCALE
0
1/4
1/2
1 MILE
ENSR
FIGURE 1
SITE LOCATION MAP
Kerr-McGee
Henderson, Nevada
Drawn by M. Scop
Date 9/9/1999
Project number 4020-010-200
Figure Name: 010-200a dsf
Checked by

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

April 26, 2000

Mr. Doug Zimmerman,
Chief, Bureau of Corrective Action
Nevada Department of Environmental Protection
333 W. Nye Lane
Carson City, Nevada 89710

Re: Kerr McGee Chemical Corporation's Workplan for Las Vegas Wash/Seep Characterization dated March 22, 2000.

Dear Mr. Zimmerman:

EPA has reviewed Kerr McGee's (KMCC) above referenced workplan and we are providing you with the following comments for your consideration:

1. As a general comment, EPA would like to express its concern that the scope of the workplan may not be comprehensive enough to achieve the goal of finding all significant remaining flows of perchlorate entering Las Vegas Wash (LVW). The steps outlined in the workplan are a good start towards achievement of this goal, but a more extensive survey and sampling program may be needed.

2. On page 2 of the workplan under Completion of Nested Monitoring Wells, Kerr McGee proposes installing monitoring well "nests" adjacent to LVW near the seep and the northern BMI ponds. This will be good for the purpose of discovering the hydraulic relationship between the northern BMI ponds, the shallow alluvial aquifer and LVW. However, looking at the larger goal of identifying all additional perchlorate migrating to LVW, trenching, hydropunching and sampling parallel to the wash would appear to be faster, less expensive and would cover a larger area.

3. On page 2 of the workplan under Completion of Ground Water Survey in Las Vegas Wash, Kerr McGee does propose a series of trenches and ground water sampling from these trenches parallel to Las Vegas Wash. As stated above, this method of investigation should form the heart of Kerr McGee's efforts to discover the significant remaining sources of perchlorate entering LVW. We suggest that the sampling interval be reduced from 1000 feet to one to two hundred feet.

If you have any questions or would like to discuss any of these issues further, please contact Mr. Mitch Kaplan of my staff at 415-744-2063.

Sincerely,

Larry Bowerman

Larry Bowerman, Chief
RCRA Corrective Action Office

cc: Brenda Pohlman, NDEP

KERR-McGEE CHEMICAL LLC
POST OFFICE BOX 55 - HENDERSON, NEVADA 89009

April 13, 2000

RECEIVED
APR 17 2000
ENVIRONMENTAL PROTECTION
LAS VEGAS OFFICE

Ms. Cathe Pool
Supervisor, Permits Branch
Bureau of Water Pollution Control
Nevada Division of Environmental Protection
333 West Nye Lane
Carson City, NV 89710

Dear Ms. Pool:

Subject: NPDES Discharge Permit Application – Mixing Zone Length

In September 1999, Kerr-McGee Chemical LLC (Kerr-McGee) submitted an NPDES Permit application for perchlorate remedial activities in the Henderson area. In support of that application, your office requested information which is provided in this correspondence.

Per your request, we have directed ENSR to perform calculations on the mixing zone length expected for the Kerr-McGee discharge to the Las Vegas Wash. Please see Attachment A for their report and supporting calculations. The calculated mixing zone length ranges from 6,700 feet to 12,000 feet depending on the model used. The models are intentionally designed very conservatively. They do not take into consideration the construction of the Pabco Road Erosion Control Structure.

In addition to the above evaluation, recent Southern Nevada Water Authority (SNWA) data on perchlorate concentrations in the Wash indicate relatively complete mixing within about 4,000 feet of where the "seep" enters the Wash. Please see Figure 1 and SNWA data plot, included as Attachment B. By the time water reaches location LM-6, it appears that perchlorate in the Wash is essentially mixed. Considering this, we propose that NDEP issue the draft NPDES permit specifying the conservative 12,000 foot mixing zone, but including a permit condition that, within a year, Kerr-McGee perform a tracer study to delineate the actual mixing zone required.

We hope this information will aid NDEP in reviewing the pending NPDES permit application. Please feel free to call me at (702) 651-2234 if you have any questions.

Sincerely,

Susan Crowley
Staff Environmental Specialist

cc: LKBailey
PSCorbett
WOGreen
EMSpore
Doug Zimmerman, NDEP
Leo Drozdoff, NDEP
Public Repository
Bill Gorham, ENSR
FRStater,
JTSmith
Brenda Pohlmann, NDEP
Rick Simon, ENSR
Dave Urban, ENSR

smc/NPDES Permit - Supporting Info-Mixing Zone Length.doc

ATTACHMENT A

Mixing Zone Length
Calculation

ENSR

Memorandum

To:	Susan Crowley/Keith Bailey - Kerr-McGee	**Date:**	April 13, 2000
From:	Dave Urban - ENSR	**File:**	
RE:	Length of Mixing Zone	**CC:**	

At the request of NDEP, ENSR has conducted a brief evaluation of the length of the mixing zone of the proposed Kerr-McGee discharge in the Las Vegas Wash. This evaluation was based on estimates of the hydraulic characteristics of the wash under average and minimum flow conditions.

As a first estimate, the estimated length of the mixing zone was based on the correlation developed by Yotsukara[1], which applies to discharges at the riverbank. The correlation, which provides an order-of-magnitude estimate of the distance in the receiving stream at which complete mixing is achieved, is:

$$L_m = 2.6U\ (B^2/H) \qquad \text{(equation 1)}$$

Where

U = average stream velocity in feet/sec
B = average stream width in feet

and

H = average stream depth in feet

The width and depth of the Las Vegas Wash were estimated to be 50 feet and 2 feet, respectively[2], assumed to be at a normal flow[3] of 166.5 mgd[4]. The width and depth of the wash at the minimum flow of 117 mgd were estimated by using the principals of hydraulic geometry. The basic equations of hydraulic geometry are[5]

$$B = aQ^b \qquad \text{(equation 2a)}$$

$$H = cQ^f \qquad \text{(equation 2b)}$$

$$U = kQ^m \qquad \text{(equation 2c)}$$

[1] Yotsukura, 1968. As referenced in Preliminary report *Techniques of Water Resources Investigations of the U.S. Geological Survey*, Measurement of Time of Travel and Dispersion by Dye Tracing, Book 3, Chapter A9, by F.A. Kilpatrick, L. A. Martens, and J.F. Wilson, 1970.
[2] Mike Goff, SNWA, April 12, 2000
[3] Letter from Susan Crowley of Kerr-McGee to Cathe Pool, NDEP, "NPDES Discharge Permit Application - Supporting Information," Attachment B Appendix, Page 3, March 17, 1999.
[4] Letter from Susan Crowley of Kerr-McGee to Cathe Pool, NDEP, "NPDES Discharge Permit Application - Supporting Information," Attachment B Appendix, Page 3, March 17, 1999.
[5] Leopold, L.B., and T.G. Maddock, "The Hydraulic Geometry of Stream Channels and Some Physiographic Implications", *U.S. Geological Survey Prof. Paper* 252, 1953.

Where Q is streamflow, B is top width, H is mean depth, U is velocity, and a, b, c, f, k, and m are numerical constants. As reported by Leopold[6], the values for b, f, and m for ephemeral streams in semi-arid United States are 0.29, 0.36, and 0.34, respectively. Solving the above equations for a, c, and k (using the assumed values of H = 2 feet, B = 50 feet, and Q = 166.5 mgd) yields the following:

$$\text{Depth (ft)} = H = 0.27Q^{0.36} \quad \text{(equation 3a)}$$

$$\text{Width (ft)} = B = 10Q^{0.29} \quad \text{(equation 3b)}$$

where Q is stream flow in cubic feet per second. Based on these equations, at 117 mgd stream flow, the width and depth are estimated to be 45 feet and 1.7 feet, respectively. Using Equation 1, the distance to complete mixing is estimated to be 6900 feet from the seep discharge.

The Las Vegas Wash and seep discharge were also modeled using CORMIX[7]. A TDS mixing zone scenario was modeled, assuming a background concentration of 1757 mg/l and a discharge concentration of 14,400 mg/l. The results of the modeling effort indicate that the water quality standard will be met at a distance of approximately 12,000 feet downstream of the discharge.

Both of the above results are judged to agree reasonably well, considering the limitations of each method and the assumptions that were made to perform the calculations. The calculations and modeling results do not consider the following:

- The presence of a flood control structure immediately downstream of the seep discharge.
- The discharge of the City of Henderson wastewater treatment plant (the flow volume is assumed to be present, but the effect of the discharge flow downstream of the seep will likely induce additional mixing).
- The effect of the "braiding" of the river.

Available data on perchlorate in the wash indicate that nearly complete mixing is achieved by a much shorter distance downstream of the seep discharge. Because of the uncertainties in the assumptions needed to perform the calculations and the order-of-magnitude confidence level in the calculated mixing zone length, it is recommended that a dye study be conducted to better define the mixing zone for this discharge.

[6] Leopold, L.B., "Downstream Change of Velocity of Rivers," *Am. J. Sci.*, vol. 251, pp. 606-624, 1953.
[7] Cornell Mixing Zone Expert System, CORMIX-GI Version 4.01b.

CALCULATIONS AND COMPUTATIONS

Project: Kerr-McGee

Project Number:
Computed by: D. Urban
Date: 4/13/00

Subject: Wash dimensions
Checked by:
Date:

Calculation of stream width + depth @ Q = 117 mgd

if $B = 50$ ft
and $H = 2$ ft
at $Q = 166.5$ mgd = 257.6 cfs

and for ephemeral stream in SW US
$b = 0.29$
$f = 0.36$
$m = 0.34$

use hydraulic geometry equations

(1) $B = aQ^b$
(2) $H = cQ^f$
(3) $U = kQ^m$

substituting known values in (1)

$$B = 50 = a(257.6)^{0.29}$$

$$a = 10$$

$$H = 2 = c(257.6)^{0.36}$$

$$c = 0.27$$

$$U = \frac{257.6 \text{ cfs}}{50 \text{ ft} \times 2 \text{ ft}} = 2.58 \frac{\text{ft}}{\text{sec}} = k(257.6)^{0.34}$$

$$k = 0.39$$

for Q = 117 mgd (181 cfs)

$B = 10(181)^{0.29} = 45.2' =$ width

$H = 0.27(181)^{0.36} = 1.75' =$ depth

$U = 0.39(181)^{0.34} = 2.28$ ft/sec = velocity

M911013

ENSR

CALCULATIONS AND COMPUTATIONS

Project:

Project Number: Computed by: Date:

Subject Checked by: Date:

Mixing Length

$$L_m = 2.6u(B^2/H)$$

$$= 2.6(2.28)\left(\frac{(45.2)^2}{1.75}\right)$$

$$= 6{,}921 \text{ ft}$$

$\therefore$ complete mixing will occur 6900 ft beyond the discharge point

```
CORMIX SESSION REPORT:
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
                  CORMIX: CORNELL MIXING ZONE EXPERT SYSTEM
                      CORMIX-GI Version 4.01b
SITE NAME/LABEL:                km - nevada
  DESIGN CASE:                  low flow - straight stream
  FILE NAME:                    C:\Alsfiles
evada\low straight.prd
Using subsystem CORMIX3:        Buoyant Surface Discharges
  Start of session:             04/13/2000--14:25:58
*****************************************************************************
SUMMARY OF INPUT DATA:
-----------------------------------------------------------------------------
AMBIENT PARAMETERS:
  Cross-section                            = bounded
  Width                           BS       = 15.24 m
  Channel regularity              ICHREG = 1
  Ambient flowrate                QA       = 5.07 m^3/s
  Average depth                   HA       = 0.43 m
  Depth at discharge              HD       = 0.43 m
  Ambient velocity                UA       = 0.7802 m/s
  Darcy-Weisbach friction factor  F        = 0.1276
    Calculated from Manning's n            = 0.035
  Wind velocity                   UW       = 2 m/s
Stratification Type               STRCND = U
  Surface density                 RHOAS  = 1000 kg/m^3
  Bottom density                  RHOAB  = 1000 kg/m^3
-----------------------------------------------------------------------------
DISCHARGE PARAMETERS:             Buoyant Surface Discharge
  Discharge located on                   = right bank/shoreline
  Discharge configuration                = flush discharge
  Distance from bank to outlet    DISTB  = 0 m
  Discharge angle                 SIGMA  = 30 deg
  Depth near discharge outlet     HD0    = 0.43 m
  Bottom slope at discharge       SLOPE  = 0 deg
  Rectangular discharge:
    Discharge cross-section area  A0     = 0.232258 m^2
    Discharge channel width       B0     = 1.524 m
    Discharge channel depth       H0     = 0.1524 m
    Discharge aspect ratio        AR     = 0.1
  Discharge flowrate              Q0     = 0.052575 m^3/s
  Discharge velocity              U0     = 0.23 m/s
  Discharge density               RHO0   = 1000 kg/m^3
  Density difference              DRHO   = 0 kg/m^3
  Buoyant acceleration            GP0    = 0 m/s^2
  Discharge concentration         C0     = 12643 mg/l
  Surface heat exchange coeff.    KS     = 0 m/s
  Coefficient of decay            KD     = 0 /s
-----------------------------------------------------------------------------
DISCHARGE/ENVIRONMENT LENGTH SCALES:
  LQ  = 0.48 m          Lm  = 0.14 m          Lbb = 0 m
  LM  = 99999 m
-----------------------------------------------------------------------------
NON-DIMENSIONAL PARAMETERS:
  Densimetric Froude number       FR0    = 99999 (based on LQ)
  Channel densimetric Froude no.  FRCH   = 99999 (based on H0)
  Velocity ratio                  R      = 0.29
-----------------------------------------------------------------------------
MIXING ZONE / TOXIC DILUTION ZONE / AREA OF INTEREST PARAMETERS:
  Toxic discharge                        = no
  Water quality standard specified       = yes
  Water quality standard          CSTD   = 143 mg/l
  Regulatory mixing zone                 = no
  Region of interest                     = 3048 m downstream
*****************************************************************************
HYDRODYNAMIC CLASSIFICATION:
```

```
  *------------------------*
  | FLOW CLASS    = FJ2 |
  *------------------------*
****************************************************************************
MIXING ZONE EVALUATION (hydrodynamic and regulatory summary):

----------------------------------------------------------------------------
X-Y-Z Coordinate system:
Origin is located at water surface and at centerline of discharge channel:
    0 m from the right bank/shore.
  Number of display steps NSTEP = 50 per module.
----------------------------------------------------------------------------
NEAR-FIELD REGION (NFR) CONDITIONS :
Note: The NFR is the zone of strong initial mixing.  It has no regulatory
  implication.  However, this information may be useful for the discharge
  designer because the mixing in the NFR is usually sensitive to the
  discharge design conditions.
  Pollutant concentration at edge of NFR = 35.25 mg/l
  Dilution at edge of NFR                = 358.7
  NFR Location:                        x = 32279.71 m
    (centerline coordinates)           y = 11.53 m
                                       z = 0 m
  NFR plume dimensions:       half-width = 7.62 m
                               thickness = 3.65 m
----------------------------------------------------------------------------
Buoyancy assessment:
  The effluent density is equal or about about equal to the surrounding
  ambient water density at the discharge level.
  Therefore, the effluent behaves essentially as NEUTRALLY BUOYANT.
----------------------------------------------------------------------------
Weak contact/interaction of the discharge plume with one bank/shore occurs
  within the NFR.
----------------------------------------------------------------------------
The REGION OF INTEREST (ROI) specification occurs before the near-field
  mixing (NFR) regime has been completed.  Specification of ROI is highly
  restrictive.
----------------------------------------------------------------------------
FAR-FIELD MIXING SUMMARY:
  Plume becomes vertically fully mixed WITHIN NEAR-FIELD at 0 m
  downstream, but RE-STRATIFIES LATER and is not mixed in the far-field.
************************ TOXIC DILUTION ZONE SUMMARY ************************
No TDZ was specified for this simulation.
********************** REGULATORY MIXING ZONE SUMMARY **********************
At the end of the NFR, the plume POSITION EXCEEDS SPECIFIED LIMITS for
  the regulatory mixing zone (RMZ) and/or the region of interest (ROI).
Specifications for the ROI may be overly restrictive.
  Use a larger ROI value in a subsequent iteration!
********************* FINAL DESIGN ADVICE AND COMMENTS **********************
REMINDER:  The user must take note that HYDRODYNAMIC MODELING by any known
  technique is NOT AN EXACT SCIENCE.
Extensive comparison with field and laboratory data has shown that the
  CORMIX predictions on dilutions and concentrations (with associated
  plume geometries) are reliable for the majority of cases and are accurate
  to within about +-50% (standard deviation).
As a further safeguard, CORMIX will not give predictions whenever it judges
  the design configuration as highly complex and uncertain for prediction.
```

```
CORMIX3 PREDICTION FILE:
33333333333333333333333333333333333333333333333333333333333333333333333333333
                      CORNELL MIXING ZONE EXPERT SYSTEM
Subsystem CORMIX3:                                            Subsystem version:
 Buoyant Surface Discharges                  CORMIX-GI Version 4.01b
-----------------------------------------------------------------------------
-----------------------------------------------------------------------------
CASE DESCRIPTION
 Site name/label:         km - nevada
 Design case:             low flow - straight stream
 FILE NAME:               C:\Alsfiles\nevada\low_straight.prd
 Time of Fortran run:     04/13/2000--14:25:58

ENVIRONMENT PARAMETERS (metric units)
 Bounded section
 BS    =      15.24  AS    =      6.50  QA    =      5.07  ICHREG= 1
 HA    =        .43  HD    =       .43
 UA    =       .780  F     =      .128  USTAR = .9853E-01
 UW    =      2.000  UWSTAR= .2198E-02
 Uniform density environment
 STRCND=  U          RHOAM = 1000.0000

DISCHARGE PARAMETERS (metric units)
 BANK  =  RIGHT      DISTB =       .00  Configuration: flush_discharge
 SIGMA =     30.00  HD0   =       .43  SLOPE =       .00
 Rectangular channel geometry:
 B0    =      1.524  H0    =      .152  A0    = .2323E+00  AR    =       .100
 U0    =       .226  Q0    =      .053        = .5258E-01
 RHO0  = 1000.0000  DRHO0 = .0000E+00  GP0   = .0000E+00
 C0    = .1264E+05  CUNITS=  mg/l
 IPOLL =  1          KS    = .0000E+00  KD    = .0000E+00

FLUX VARIABLES (metric units)
 Q0    = .5258E-01  M0    = .1190E-01  J0    = .0000E+00
 Associated length scales (meters)
 LQ    =        .48  LM    =  99999.00  Lm    =       .14  Lb    =       .00

NON-DIMENSIONAL PARAMETERS
 FR0   =  99999.00  FRCH  =  99999.00  R     =       .29

FLOW CLASSIFICATION
 333333333333333333333333333333333333333333
 3  Flow class (CORMIX3)       =     FJ2    3
 3  Applicable layer depth HS =       .43  3
 333333333333333333333333333333333333333333

MIXING ZONE / TOXIC DILUTION / REGION OF INTEREST PARAMETERS
 C0    = .1264E+05  CUNITS=  mg/l
 NTOX  =  0
 NSTD  =  1          CSTD  = .1430E+03
 REGMZ =  0
 XINT  =   3048.00  XMAX  =   3048.00

X-Y-Z COORDINATE SYSTEM:
    ORIGIN is located at the WATER SURFACE and at center of discharge
      channel/outlet:       .00 m  from the RIGHT bank/shore.
    X-axis points downstream
    Y-axis points to left as seen by an observer looking downstream
    Z-axis points vertically upward (in CORMIX3, all values Z = 0.00)
NSTEP = 50 display intervals per module
-----------------------------------------------------------------------------
-----------------------------------------------------------------------------
BEGIN MOD301: DISCHARGE MODULE

 Efflux conditions:
      X        Y        Z        S        C        BV       BH
```

.00	.00	0.00	1.0	.126E+05	.15	.76

END OF MOD301: DISCHARGE MODULE

BEGIN MOD302: ZONE OF FLOW ESTABLISHMENT

Control volume inflow:

X	Y	Z	S	C	BV	BH
.00	.00	0.00	1.0	.126E+05	.15	.76

VERTICAL MIXING occurs in the initial zone of flow establishment.
Profile definitions:
BV = Gaussian 1/e (37%) vertical thickness
BH = Gaussian 1/e (37%) horizontal half-width, normal to trajectory
S = hydrodynamic centerline dilution
C = centerline concentration (includes reaction effects, if any)

Control volume outflow:

X	Y	Z	S	C	BV	BH
.00	.00	0.00	3.0	.421E+04	.43	4.16

Cumulative travel time = 0. sec

END OF MOD302: ZONE OF FLOW ESTABLISHMENT

BEGIN MOD311: WEAKLY DEFLECTED JET (3-D)

Surface JET into a co-flow

This flow region is INSIGNIFICANT in spatial extent and will be by-passed.

END OF MOD311: WEAKLY DEFLECTED JET (3-D)

BEGIN MOD321: STRONGLY DEFLECTED JET (3-D)

JET INTERACTS WITH FAR BANK in this region.

Profile definitions:
BV = Gaussian 1/e (37%) vertical thickness
BH = Gaussian 1/e (37%) horizontal half-width, normal to trajectory
S = hydrodynamic centerline dilution
C = centerline concentration (includes reaction effects, if any)

X	Y	Z	S	C	BV	BH
.00	.00	0.00	3.0	.421E+04	.11	4.16
645.59	2.55	0.00	30.6	.413E+03	.94	4.93
1291.19	3.41	0.00	46.6	.272E+03	1.21	5.19
1936.78	4.02	0.00	59.8	.211E+03	1.39	5.37
2582.38	4.51	0.00	71.5	.177E+03	1.54	5.52
3227.97	4.92	0.00	82.2	.154E+03	1.66	5.64

"STRAIGHT RIVER"

FOR CORMIX WQS = 1300 - AMBIENT = 143 mg/l

** WATER QUALITY STANDARD OR CCC HAS BEEN FOUND **
The pollutant concentration in the plume falls below water quality standard or CCC value of .143E+03 in the current prediction interval.
This is the spatial extent of concentrations exceeding the water quality standard or CCC value.

BY INTERPOLATION WQS OF 1300 mg/l OCCURS AT 3645.7 METERS OR 11,961 FT OR 2.26 MILES DOWNSTREAM

X	Y	Z	S	C	BV	BH
3873.57	5.28	0.00	92.2	.137E+03	1.77	5.75
4519.16	5.60	0.00	101.6	.124E+03	1.86	5.84
5164.76	5.89	0.00	110.6	.114E+03	1.95	5.93
5810.35	6.16	0.00	119.2	.106E+03	2.03	6.01
6455.95	6.41	0.00	127.4	.992E+02	2.11	6.09
7101.54	6.64	0.00	135.4	.934E+02	2.18	6.16
7747.14	6.86	0.00	143.1	.883E+02	2.24	6.22
8392.73	7.07	0.00	150.6	.839E+02	2.31	6.28
9038.33	7.26	0.00	157.9	.801E+02	2.37	6.34

9683.92	7.45	0.00	165.1	.766E+02	2.42	6.40
10329.51	7.63	0.00	172.0	.735E+02	2.48	6.45
10975.11	7.80	0.00	178.8	.707E+02	2.53	6.50
11620.70	7.97	0.00	185.5	.682E+02	2.58	6.55
12266.30	8.13	0.00	192.1	.658E+02	2.63	6.60
12911.89	8.28	0.00	198.5	.637E+02	2.67	6.65
13557.49	8.43	0.00	204.8	.617E+02	2.72	6.69
14203.08	8.58	0.00	211.0	.599E+02	2.76	6.74
14848.68	8.72	0.00	217.2	.582E+02	2.80	6.78
15494.27	8.85	0.00	223.2	.566E+02	2.84	6.82
16139.87	8.98	0.00	229.1	.552E+02	2.88	6.86
16785.46	9.11	0.00	235.0	.538E+02	2.92	6.90
17431.06	9.24	0.00	240.8	.525E+02	2.96	6.94
18076.65	9.36	0.00	246.5	.513E+02	3.00	6.97
18722.24	9.48	0.00	252.1	.501E+02	3.03	7.01
19367.84	9.60	0.00	257.7	.491E+02	3.07	7.04
20013.43	9.71	0.00	263.2	.480E+02	3.10	7.08
20659.03	9.83	0.00	268.7	.471E+02	3.14	7.11
21304.62	9.94	0.00	274.1	.461E+02	3.17	7.14
21950.21	10.04	0.00	279.4	.452E+02	3.20	7.18
22595.81	10.15	0.00	284.7	.444E+02	3.23	7.21
23241.40	10.25	0.00	289.9	.436E+02	3.26	7.24
23886.99	10.35	0.00	295.1	.428E+02	3.29	7.27
24532.59	10.45	0.00	300.2	.421E+02	3.32	7.30
25178.18	10.55	0.00	305.3	.414E+02	3.35	7.33
25823.78	10.65	0.00	310.4	.407E+02	3.38	7.36
26469.37	10.74	0.00	315.4	.401E+02	3.41	7.39
27114.96	10.84	0.00	320.3	.395E+02	3.44	7.41
27760.56	10.93	0.00	325.3	.389E+02	3.47	7.44
28406.15	11.02	0.00	330.1	.383E+02	3.49	7.47
29051.74	11.11	0.00	335.0	.377E+02	3.52	7.50
29697.34	11.19	0.00	339.8	.372E+02	3.55	7.52
30342.93	11.28	0.00	344.6	.367E+02	3.57	7.55
30988.53	11.37	0.00	349.3	.362E+02	3.60	7.57
31634.12	11.45	0.00	354.0	.357E+02	3.62	7.60
32279.71	11.53	0.00	358.7	.353E+02	3.65	7.62

Cumulative travel time = 41376. sec

END OF MOD321: STRONGLY DEFLECTED JET (3-D)

Bank nearest to plume centerline has changed.
Nearest bank is now on LEFT.

** End of NEAR-FIELD REGION (NFR) **

At the end of the NFR, the plume POSITION EXCEEDS SPECIFIED LIMITS
for the regulatory mixing zone (RMZ) and/or the region of interest (ROI).
Specifications may be overly restrictive.
Use larger ROI values in subsequent iteration!
SIMULATION ENDS.

Simulation limit based on maximum specified distance = 3048.00 m.
This is the REGION OF INTEREST limitation.

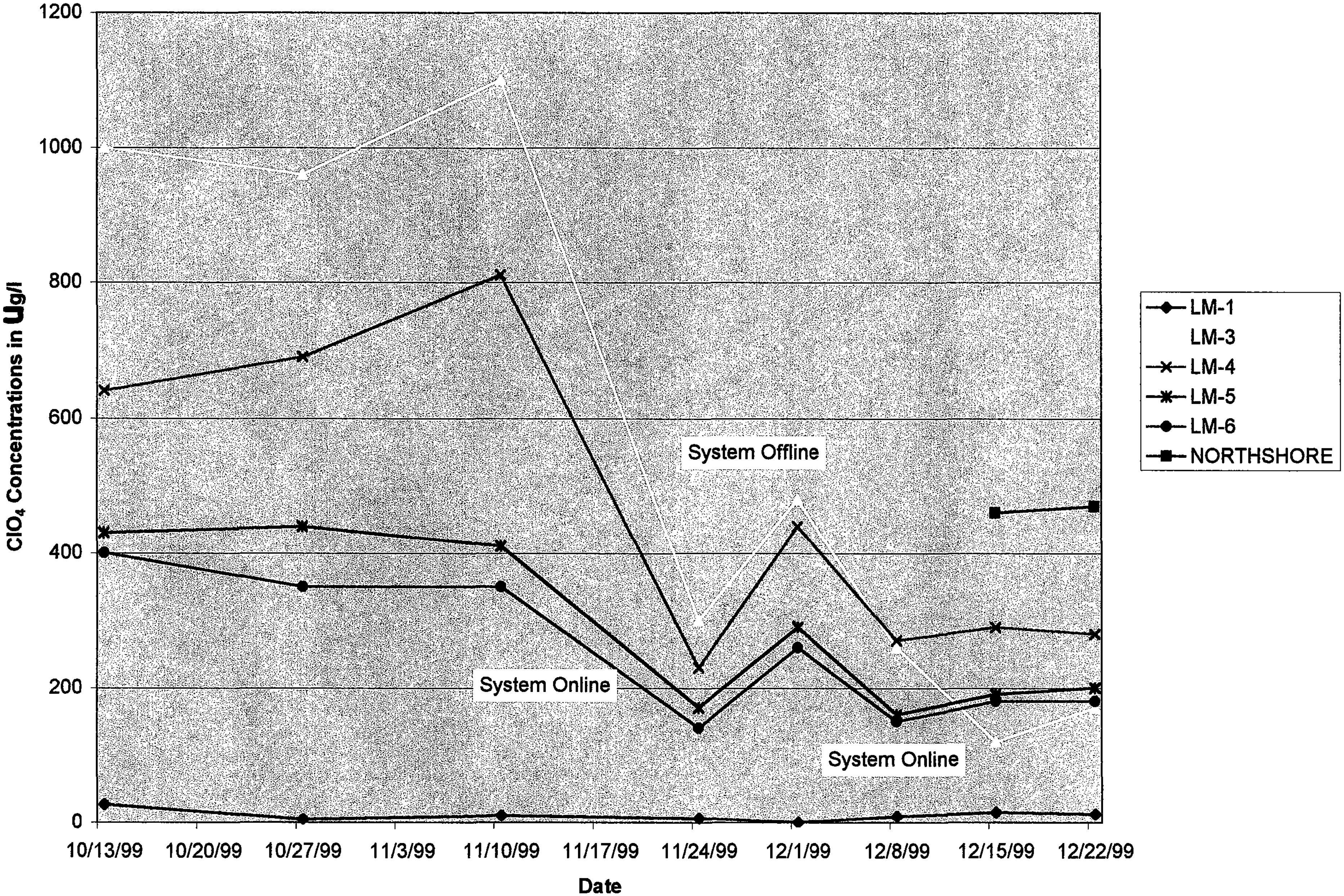
CORMIX3: Buoyant Surface Discharges End of Prediction File
333333333333333333333333333333333333333333333333333333333333333333333333333333

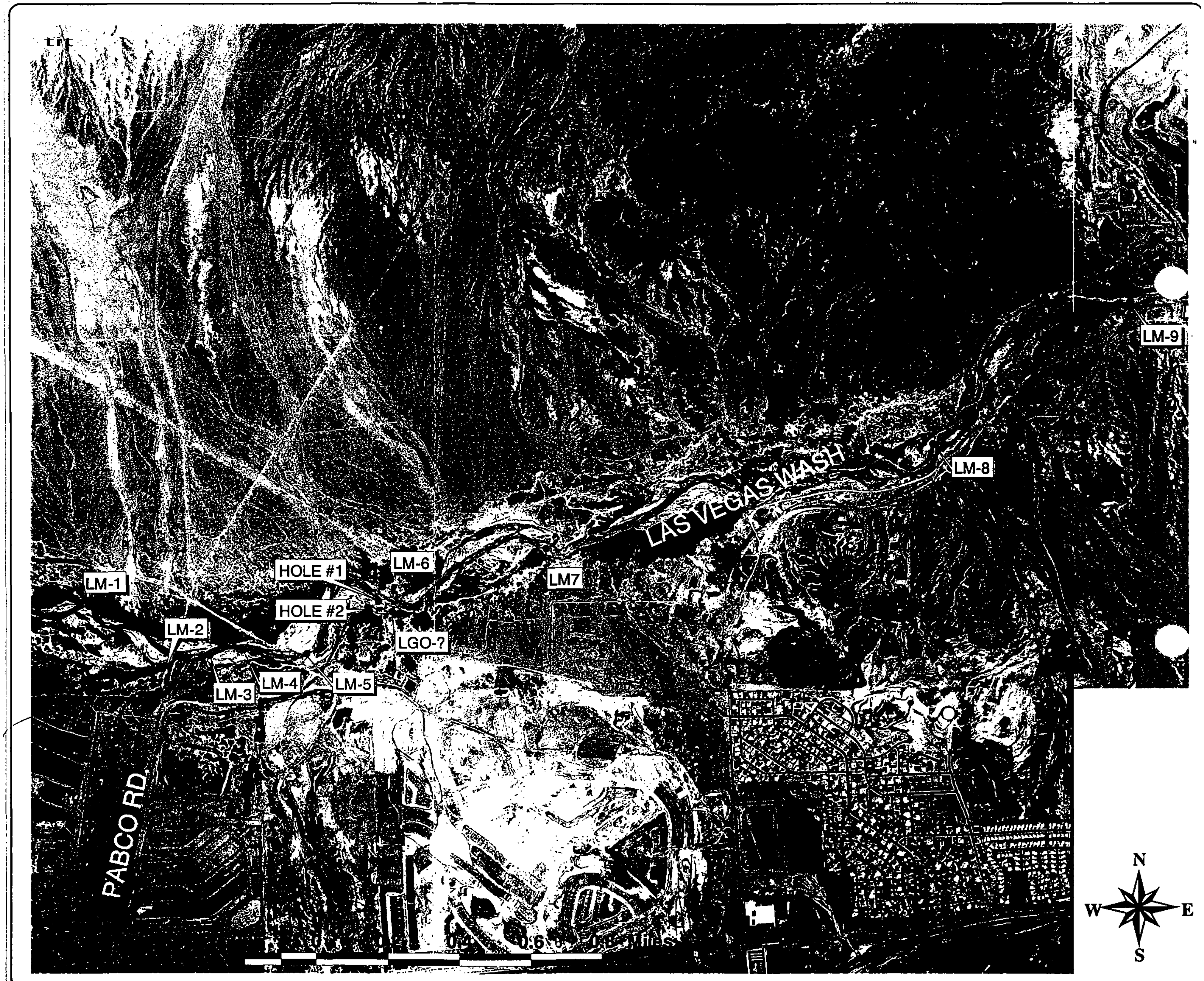
ATTACHMENT B

SNWA
Perchlorate Data

SAMPLE POINT	DATE	TIME	EC	PH	TEMP	ClO4	COMMENTS
HOLE #1	11/24/99	1300	2000	7.61	20.8	470	HAND DUG PIT
HOLE #2	11/24/99	1303	2390	7.52	21.2	600	HAND DUG PIT
LGO ?	12/1/99	1420	2670	7.98	22	2200	UPPER, WELL WATER LEVEL SAMPLE
LGO ?	12/8/99	1305	4940	7.41	21.1	1900	DEEPER, WELL SAMPLE
LM-1	10/13/99	1245	2000	8.01	27.9	27	WASH GRAB SAMPLE
LM-1	10/27/99	1130	3330	8	25.2	5	WASH GRAB SAMPLE
LM-1	11/10/99	1144	2340	8.03	26.5	10	WASH GRAB SAMPLE
LM-1	11/24/99	1150	2000	8.04	20.8	6.4	WASH GRAB SAMPLE
LM-1	12/1/99	1241	1980	8.22	20.9	0	WASH GRAB SAMPLE
LM-1	12/8/99	1148	2140	8.12	20.1	9.2	WASH GRAB SAMPLE
LM-1	12/15/99	1152	2140	8.05	18.6	15	WASH GRAB SAMPLE
LM-1	12/22/99	1200	2260	7.56	21.9	12	WASH GRAB SAMPLE
LM-2	10/13/99	1300	8250	8.05	22.1	85000	SURFACE FLOW GRAB SAMPLE
LM-2	10/27/99	1428	9710	8.01	21	77000	SURFACE FLOW GRAB SAMPLE
LM-2	11/10/99	1155	8320	7.82	21.1	68000	SURFACE FLOW GRAB SAMPLE
LM-2	11/24/99	1205	6980	7.94	15.3	25000	SURFACE FLOW GRAB SAMPLE
LM-2	12/1/99	1255	7030	7.87	19.1	62000	SURFACE FLOW GRAB SAMPLE
LM-2	12/8/99	1210	7080	7.91	14.1	29000	SURFACE FLOW GRAB SAMPLE
LM-2	12/15/99	1216	6190	7.92	12.6	25000	SURFACE FLOW GRAB SAMPLE
LM-2	12/22/99	1224	7420	7.85	15.4	25000	SURFACE FLOW GRAB SAMPLE
LM-3	10/13/99	1315	2000	8.12	28.1	1000	WASH GRAB SAMPLE
LM-3	10/27/99	1414	2270	8.19	27.2	960	WASH GRAB SAMPLE
LM-3	11/10/99	1212	2110	8.06	23.7	1100	WASH GRAB SAMPLE
LM-3	11/24/99	1218	1930	7.83	21.6	300	WASH GRAB SAMPLE
LM-3	12/1/99	1304	1900	7.83	20.8	480	WASH GRAB SAMPLE
LM-3	12/8/99	1212	2010	7.82	18.2	260	WASH GRAB SAMPLE
LM-3	12/15/99	1210	1920	7.76	19.5	120	WASH GRAB SAMPLE
LM-3	12/22/99	1235	1980	7.53	20.8	170	WASH GRAB SAMPLE
LM-4	10/13/99	1328	2010	8.17	26.8	640	WASH GRAB SAMPLE
LM-4	10/27/99	1418	2270	8.19	25.8	690	WASH GRAB SAMPLE
LM-4	11/10/99	1218	2140	7.96	23.6	810	WASH GRAB SAMPLE
LM-4	11/24/99	1225	2110	7.84	21.5	230	WASH GRAB SAMPLE
LM-4	12/1/99	1310	1970	7.89	19.8	440	WASH GRAB SAMPLE
LM-4	12/8/99	1215	2090	7.83	17.4	270	WASH GRAB SAMPLE
LM-4	12/15/99	1216	2070	7.78	18.5	290	WASH GRAB SAMPLE
LM-4	12/22/99	1240	2280	7.94	20.7	280	WASH GRAB SAMPLE
LM-5	10/13/99	1341	1990	8.15	28.1	430	WASH GRAB SAMPLE
LM-5	10/27/99	1355	2300	8.15	26.2	440	WASH GRAB SAMPLE
LM-5	11/10/99	1236	2140	8.12	24.8	410	WASH GRAB SAMPLE
LM-5	11/24/99	1245	1940	7.94	21.8	170	WASH GRAB SAMPLE
LM-5	12/1/99	1320	2020	7.91	20.9	290	WASH GRAB SAMPLE
LM-5	12/8/99	1230	2140	7.9	19.5	160	WASH GRAB SAMPLE
LM-5	12/15/99	1233	2130	7.93	19.6	190	WASH GRAB SAMPLE
LM-5	12/22/99	1316	2240	8.09	20.1	200	WASH GRAB SAMPLE
LM-6	10/13/99	1356	2010	8.22	27.2	400	WASH GRAB SAMPLE
LM-6	10/27/99	1400	2480	8.16	24.9	350	WASH GRAB SAMPLE
LM-6	11/10/99	1248	2130	8.15	24.6	350	WASH GRAB SAMPLE
LM-6	11/24/99	1308	1980	7.81	21.2	140	WASH GRAB SAMPLE
LM-6	12/1/99	1333	2010	7.96	20.5	260	WASH GRAB SAMPLE
LM-6	12/8/99	1240	2130	8	20.2	150	WASH GRAB SAMPLE
LM-6	12/15/99	1245	2130	8.05	19.5	180	WASH GRAB SAMPLE
LM-6	12/22/99	1335	2250	8.05	20	180	WASH GRAB SAMPLE

ClO_4 variation through time





LM-9
LM-8
LAS VEGAS WASH
LM7
LM-6
HOLE #1
HOLE #2
LGO-?
LM-1
LM-2
LM-3
LM-4
LM-5
PABCO RD
N
S
E
W

KERR-McGEE CHEMICAL LLC
POST OFFICE BOX 55 - HENDERSON, NEVADA 89009

April 10, 2000

RECEIVED
APR 11 2000
ENVIRONMENTAL PROTECTION
LAS VEGAS OFFICE

Cathe Pool
Supervisor, Permits Branch
Bureau of Water Pollution Control
Nevada Division of Environmental Protection
333 West Nye Lane
Carson City, NV 89710

Dear Ms. Pool:

Subject: NPDES Discharge Permit Application – Supporting Information

In September 1999 Kerr-McGee Chemical LLC (Kerr-McGee) submitted an NPDES Permit application for perchlorate remedial activities in the Henderson area. Kerr-McGee is submitting this document to supplement information given in the September 1999 application and follow-up submittals in March 2000. Attachment A and B contain information requested by your office.

We hope this information will aid Nevada Division of Environmental Protection (NDEP) in reviewing the pending NPDES permit application. Please feel free to call me at (702) 651-2234 if you have any questions.

Sincerely,

SM Crowley

Susan Crowley
Staff Environmental Specialist

cc:
EMSpore
JTSmith
FRStater
Brenda Pohlmann, NDEP
Leo Drozdoff, NDEP
Rick Simon, ENSR
Public Repository
LKBailey
WOGreen
PSCorbett
Doug Zimmerman, NDEP
Bill Gorham, ENSR
Dave Urban, ENSR

smc/NPDES Permit - Supporting Info-Diagram and Boron Info.doc

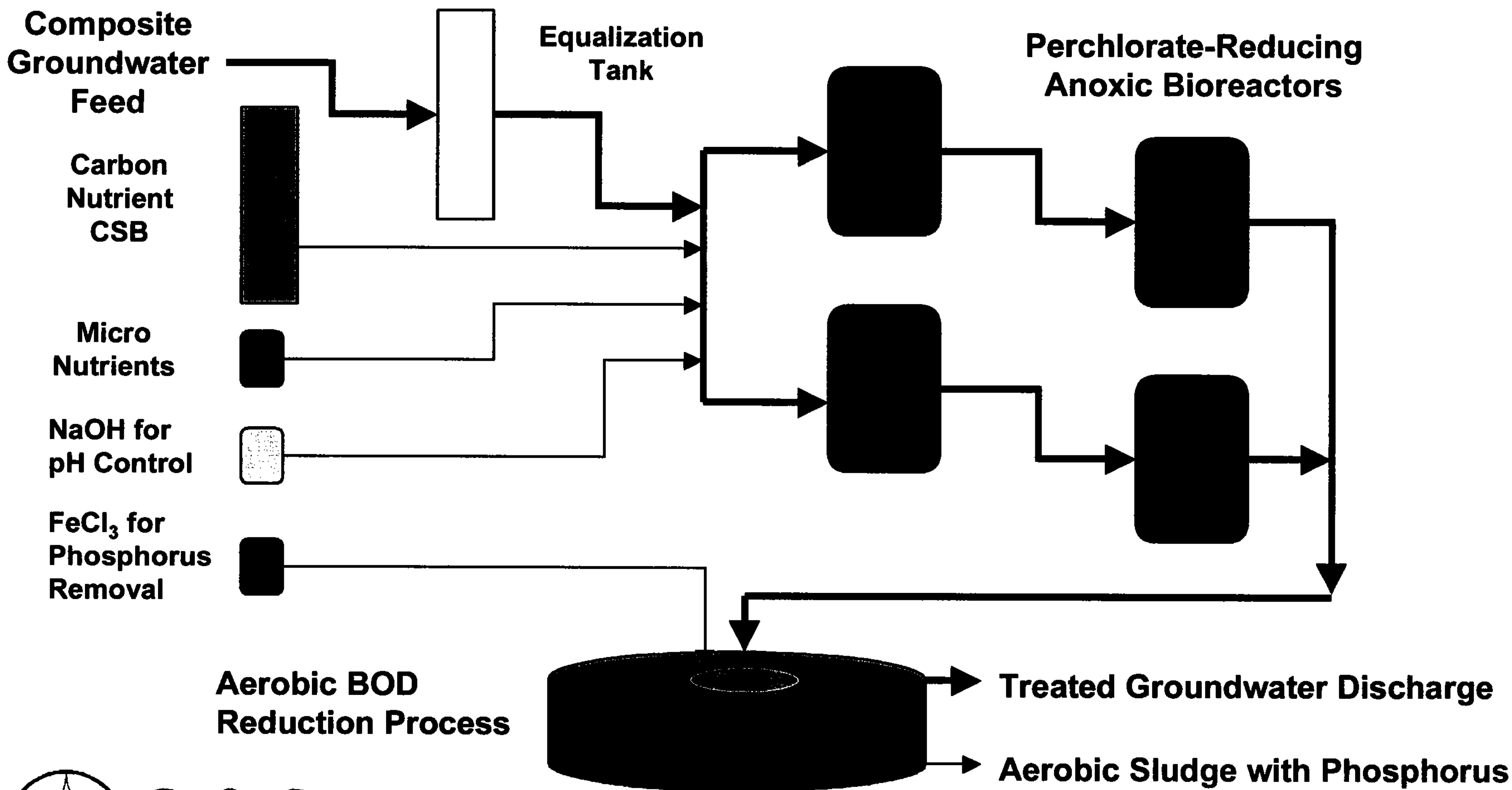
ATTACHMENT A

Perchlorate Biodegradation
Process Flow Diagram

Biodegradation of Perchlorate in Groundwater

Process Flow Diagram for Kerr-McGee Chemical LLC, Henderson, NV

Applied Research Associates, Inc.



ATTACHMENT B

National Academy of Sciences
Environmental Studies Board

Water Quality
Criteria
1972

Water Quality Criteria 1972

A Report of the
Committee on Water Quality Criteria

Environmental Studies Board

National Academy of Sciences
National Academy of Engineering

Washington, D.C., 1972

At the request of
and funded by
The Environmental Protection Agency
Washington, D.C., 1972

that the suggested maximum concentrations listed below were too high for this crop.

Recommendations

Recommendations are that maximum concentrations of arsenic in irrigation water be 0.10 mg/l for continuous use on all soils and 2 mg/l for use up to 20 years on fine textured neutral to alkaline soils.

Beryllium

Haas (1932)[408] reported that some varieties of citrus seedlings showed toxicities at 2.5 mg/l of beryllium whereas others showed toxicity at 5 mg/l in nutrient solutions. Romney et al. (1962)[455] found that beryllium at 0.5 mg/l in nutrient solutions reduced the growth of bush beans. Romney and Childress (1965)[454] found that 2 mg/l or greater in nutrient solutions reduced the growth of tomatoes, peas, soybeans, lettuce, and alfalfa plants. Additions of soluble beryllium salts at levels equivalent to 4 per cent of the cation-adsorption capacity of two acid soils reduced the yields of ladino clover. Beryllium carbonate and beryllium oxide at the same levels did not reduce yields. These results suggest that beryllium in calcareous soils might be much less active and less toxic than in acid soils. Williams and LeRiche (1968)[480] found that beryllium at 2 mg/l in nutrient solutions was toxic to mustard, whereas 5 mg/l was required for growth reductions with kale.

It seems reasonable to recommend low levels of beryllium in view of the fact that, at 0.1 mg/l, 80 pounds of beryllium would be added in 100 years using 3 acre feet of water per acre per year. In 20 years, at 0.5 mg/l, water at the same rate would add 80 pounds.

Recommendations

In view of toxicities in nutrient solutions and in soils, it is recommended that maximum concentrations of beryllium in irrigation waters be 0.10 mg/l for continuous use on all soils and 0.50 mg/l for use on neutral to alkaline fine textured soils for a 20-year period.

Boron

Boron is an essential element for the growth of plants. Optimum yields of some plants are obtained at concentrations of a few tenths mg/l in nutrient solutions. However, at concentrations of 1 mg/l, boron is toxic to a number of sensitive plants. Eaton (1935,[400] 1944[401]) determined the boron tolerance of a large number of plants and developed lists of sensitive, semitolerant, and tolerant species. These lists, slightly modified, are also given in the U.S.D.A. Handbook 60 (Salinity Laboratory 1954)[459] and are presented in Table V-14. In general, sensitive crops showed toxicities at 1 mg/l or less, semitolerant crops at 1 to 2 mg/l, and tolerant crops at 2 to 4 mg/l. At concentrations above 4 mg/l, the irrigation water was generally unsatisfactory for most crops.

TABLE V-14—Relative Tolerance of Plants to Boron

(In each group the plants first named are considered as being more tolerant and the last named more sensitive.)

Tolerant	Semitolerant	Sensitive
Athel (Tamarix aphylla)	Sunflower (native)	Pecan
Asparagus	Potato	Black Walnut
Palm (Phoenix canariensis)	Acala cotton	Persian (English) walnut
Date palm (P. dactylifera)	Pima cotton	Jerusalem artichoke
Sugar beet	Tomato	Navy bean
Mangel	Sweetpea	American elm
Garden beet	Radish	Plum
Alfalfa	Field pea	Pear
Gladiolus	Ragged Robin rose	Apple
Broadbean	Olive	Grape (Sultanina and Malaga)
Onion	Barley	Kadota fig
Turnip	Wheat	Persimmon
Cabbage	Corn	Cherry
Lettuce	Milo	Peach
Carrot	Oat	Apricot
	Zinnia	Thornless blackberry
	Pumpkin	Orange
	Bell pepper	Avocado
	Sweet potato	Grapefruit
	Lima bean	Lemon

Salinity Laboratory Staff 1954[459].

Bradford (1966),[379] in a review of boron deficiencies and toxicities, stated that when the boron content of irrigation waters was greater than 0.75 mg/l, some sensitive plants, such as citrus, begin to show injury. Chapman (1968)[387] concluded that citrus showed some mild toxicity symptoms when irrigation waters have 0.5 to 1.0 mg/l, and that when the concentration was greater than 10 mg/l pronounced toxicities were found.

Biggar and Fireman (1960)[375] and Hatcher and Bower (1958)[411] showed that the accumulation of boron in soils is an adsorption process, and that before soluble levels of 1 or 2 mg/l can be found, the adsorptive capacity must be saturated. With neutral and alkaline soils of high adsorption capacities water of 2 mg/l might be used for some time without injury to sensitive plants.

Recommendations

From the extensive work on citrus, one of the most sensitive crops, the maximum concentration of 0.75 mg boron/l for use on sensitive crops on all soils seems justified. Recommended maximum concentrations for semitolerant and tolerant plants are considered to be 1 and 2 mg/l respectively.

For neutral and alkaline fine textured soils the recommended maximum concentration of boron in irrigation water used for a 20-year period on sensitive crops is 2.0 mg/l. With tolerant plants or for shorter periods of time higher boron concentrations are acceptable.

that the suggested maximum concentrations listed below were too high for this crop.

Recommendations

Recommendations are that maximum concentrations of arsenic in irrigation water be 0.10 mg/l for continuous use on all soils and 2 mg/l for use up to 20 years on fine textured neutral to alkaline soils.

Beryllium

Haas (1932)[408] reported that some varieties of citrus seedlings showed toxicities at 2.5 mg/l of beryllium whereas others showed toxicity at 5 mg/l in nutrient solutions. Romney et al. (1962)[455] found that beryllium at 0.5 mg/l in nutrient solutions reduced the growth of bush beans. Romney and Childress (1965)[454] found that 2 mg/l or greater in nutrient solutions reduced the growth of tomatoes, peas, soybeans, lettuce, and alfalfa plants. Additions of soluble beryllium salts at levels equivalent to 4 per cent of the cation-adsorption capacity of two acid soils reduced the yields of ladino clover. Beryllium carbonate and beryllium oxide at the same levels did not reduce yields. These results suggest that beryllium in calcareous soils might be much less active and less toxic than in acid soils. Williams and LeRiche (1968)[480] found that beryllium at 2 mg/l in nutrient solutions was toxic to mustard, whereas 5 mg/l was required for growth reductions with kale.

It seems reasonable to recommend low levels of beryllium in view of the fact that, at 0.1 mg/l, 80 pounds of beryllium would be added in 100 years using 3 acre feet of water per acre per year. In 20 years, at 0.5 mg/l, water at the same rate would add 80 pounds.

Recommendations

In view of toxicities in nutrient solutions and in soils, it is recommended that maximum concentrations of beryllium in irrigation waters be 0.10 mg/l for continuous use on all soils and 0.50 mg/l for use on neutral to alkaline fine textured soils for a 20-year period.

Boron

Boron is an essential element for the growth of plants. Optimum yields of some plants are obtained at concentrations of a few tenths mg/l in nutrient solutions. However, at concentrations of 1 mg/l, boron is toxic to a number of sensitive plants. Eaton (1935,[400] 1944[401]) determined the boron tolerance of a large number of plants and developed lists of sensitive, semitolerant, and tolerant species. These lists, slightly modified, are also given in the U.S.D.A. Handbook 60 (Salinity Laboratory 1954)[459] and are presented in Table V-14. In general, sensitive crops showed toxicities at 1 mg/l or less, semitolerant crops at 1 to 2 mg/l, and tolerant crops at 2 to 4 mg/l. At concentrations above 4 mg/l, the irrigation water was generally unsatisfactory for most crops.

TABLE V-14—Relative Tolerance of Plants to Boron

(In each group the plants first named are considered as being more tolerant and the last named more sensitive.)

Tolerant	Semitolerant	Sensitive
Athel (Tamarix aphylla)	Sunflower (native)	Pecan
Asparagus	Potato	Black Walnut
Palm (Phoenix canariensis)	Acala cotton	Persian (English) walnut
Date palm (P. dactylifera)	Pima cotton	Jerusalem artichoke
Sugar beet	Tomato	Navy bean
Mangel	Sweetpea	American elm
Garden beet	Radish	Plum
Alfalfa	Field pea	Pear
Gladiolus	Ragged Robin rose	Apple
Broadbean	Olive	Grape (Sultanina and Malaga)
Onion	Barley	Kadota fig
Turnip	Wheat	Persimmon
Cabbage	Corn	Cherry
Lettuce	Milo	Peach
Carrot	Oat	Apricot
	Zinnia	Thornless blackberry
	Pumpkin	Orange
	Bell pepper	Avocado
	Sweet potato	Grapefruit
	Lima bean	Lemon

Salinity Laboratory Staff 1954[459].

Bradford (1966),[379] in a review of boron deficiencies and toxicities, stated that when the boron content of irrigation waters was greater than 0.75 mg/l, some sensitive plants, such as citrus, begin to show injury. Chapman (1968)[387] concluded that citrus showed some mild toxicity symptoms when irrigation waters have 0.5 to 1.0 mg/l, and that when the concentration was greater than 10 mg/l pronounced toxicities were found.

Biggar and Fireman (1960)[375] and Hatcher and Bower (1958)[411] showed that the accumulation of boron in soils is an adsorption process, and that before soluble levels of 1 or 2 mg/l can be found, the adsorptive capacity must be saturated. With neutral and alkaline soils of high adsorption capacities water of 2 mg/l might be used for some time without injury to sensitive plants.

Recommendations

From the extensive work on citrus, one of the most sensitive crops, the maximum concentration of 0.75 mg boron/l for use on sensitive crops on all soils seems justified. Recommended maximum concentrations for semitolerant and tolerant plants are considered to be 1 and 2 mg/l respectively.

For neutral and alkaline fine textured soils the recommended maximum concentration of boron in irrigation water used for a 20-year period on sensitive crops is 2.0 mg/l. With tolerant plants or for shorter periods of time higher boron concentrations are acceptable.

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United States
Environmental Protection
Agency

Office of Water
Regulations and Standards
Washington, DC 20460

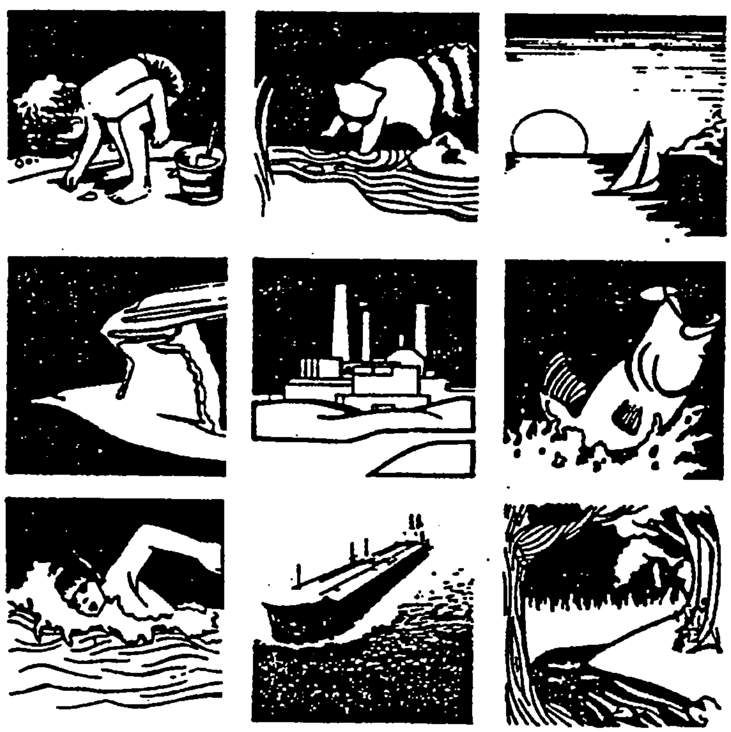
May 1, 1986

EPA

Water

EPA 440/5-86-001

QUALITY CRITERIA for WATER 1986



BORON

CRITERION:

750 ug/l for long-term irrigation on sensitive crops.

INTRODUCTION:

Boron is not found in its elemental form in nature; it is usually found as a sodium or calcium borate salt. Boron salts are used in fire retardants, the production of glass, leather tanning and finishing industries, cosmetics, photographic materials, metallurgy, and for high energy rocket fuels. Elemental boron also can be used in nuclear reactors for neutron absorption. Borates are used as "burnable" poisons.

RATIONALE:

Boron is an essential element for growth of plants but there is no evidence that it is required by animals. The maximum concentration found in 1,546 samples of river and lake waters from various parts of the United States was 5.0 mg/l; the mean value was 0.1 mg/l (Kopp and Kroner, 1967). Ground waters could contain substantially higher concentrations at certain places. The concentration in sea water is reported as 4.5 mg/l in the form of borate (NAS, 1974). Naturally occurring concentrations of boron should have no effects on aquatic life.

The minimum lethal dose for minnows exposed to boric acid at 20° C for 6 hours was reported to be 18,000 to 19,000 mg/l in distilled water and 19,000 to 19,500 mg/l in hard water (Le Clerc and Devlaminck, 1955; Le Clerc, 1960).

In the dairy cow, 16 to 20 g/day of boric acid for 40 days produced no ill effects (McKee and Wolf, 1963).

Sensitive crops have shown toxic effects at 1000 ug/l or less of boron (Richards, 1954). Bradford (1966), in a review of boron deficiencies and toxicities, stated that when the boron concentration in irrigation waters was greater than 0.75 mg/l, some sensitive plants such as citrus began to show injury. Biggar and Fireman (1960) showed that with neutral and alkaline soils of high absorption capacities, water containing 2 mg/l boron might be used for some time without injury to sensitive plants. The criterion of 750 ug/l is thought to protect sensitive crops during long-term irrigation.

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KERR-McGEE CHEMICAL LLC
POST OFFICE BOX 55 - HENDERSON, NEVADA 89009

March 31, 2000

RECEIVED
APR 5 2000
ENVIRONMENTAL PROTECTION
LAS VEGAS OFFICE

Cathe Pool
Supervisor, Permits Branch
Bureau of Water Pollution Control
Nevada Division of Environmental Protection
333 West Nye Lane
Carson City, NV 89710

Dear Ms. Pool:

Subject: NPDES Discharge Permit Application – Supporting Information

In September 1999 Kerr-McGee Chemical LLC (Kerr-McGee) submitted an NPDES Permit application for perchlorate remedial activities in the Henderson area. Kerr-McGee is submitting this document to supplement information given in the September 1999 application and a follow-up submittal in March 2000. Attachment A and B contain information requested by your office.

We hope this information will aid Nevada Division of Environmental Protection (NDEP) in reviewing the pending NPDES permit application. We look forward to meeting with NDEP to discuss this information in the near future. Please feel free to call me at (702) 651-2234 if you have any questions.

Sincerely,

S. M. Crowley

Susan Crowley
Staff Environmental Specialist

cc: EMSpore
JTSmith
FRStater
Brenda Pohlmann, NDEP
Leo Drozdoff, NDEP
Rick Simon, ENSR
Public Repository
LKBailey
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Bill Gorham, ENSR
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ATTACHMENT A

Chromium
Mixing Zone
Application

Mixing Zone Analysis for Chromium

Discussion

Total and hexavalent chromium (Cr(T) and Cr(VI), respectively) were not detected in the seep, and the levels of chromium in the treated on-site water are generally below the detection limit of 0.05 mg/l. If only these two sources are considered, there is no potential for the Kerr-McGee discharge to exceed the chromium water quality standards, and no permit limit would be required. However, the reasonable potential values for Cr(T) and Cr(VI) in the Pittman Lateral water exceed the water quality standards for these parameters. Therefore, a permit limitation must be considered, and the potential chromium levels must be addressed either through treatment or a mixing zone.

Treatment of Cr(VI) entails a reduction step to convert Cr(VI) to Cr(III), followed by precipitation and settling and/or filtration. Such a process will cost several million dollars to treat the 400-gpm stream, and the complexity of the perchlorate treatment system will increase substantially. The process will also generate a quantity of sludge for handling and disposal.

The perchlorate treatment system is expected to reduce the concentration of chromium considerably, as indicated by the results of bench-scale tests on a mix of these streams. The anoxic portion of the biological treatment system may reduce some of the Cr(VI) to Cr(III), which, in turn, would become incorporated into the biological solids.

Because of the high costs of a dedicated chromium treatment system and the potential for the perchlorate treatment system to effectively reduce chromium, Kerr-McGee believes that a dedicated chromium treatment system for the Pittman lateral stream is not justified. Alternatively, Kerr-McGee requests a mixing zone for Cr(T) and Cr(VI) in the Las Vegas Wash.

Mixing Zone Analysis

- Water Quality Standard

The most stringent water quality standard for Cr(T) is 100 ug/l (irrigation standard), and for Cr(VI) 10 ug/l (96-hr aquatic life standard). In addition, the 1-hour aquatic life standard for Cr(VI) is 15 ug/l.

- Reasonable Potential Analysis

Because the levels of chromium in the seep are below detection, and the chromium in the treated on-site water is generally below detection, the worst-case for chromium would be discharge of Pittman Lateral water only. Based on four analyses of the Pittman Lateral well PC-70, the average Cr(T) concentration is 117 ug/l and the average Cr(VI) is 100 ug/l. Maximum concentrations detected were 132 ug/l and 129 ug/l for Cr(T) and Cr(VI), respectively. Therefore, the Pittman Lateral discharge has the potential to exceed water quality standards for both Cr(T) and Cr(VI). If the Pittman Lateral water is mixed with the seep and on-site water at a design ratio of 400:360:65, the calculated maximum Cr(T) and Cr(VI) concentrations of the mixture would be 64 ug/l and 63 ug/l, respectively. Using EPA guidance on calculation of reasonable potential value, with four measurements of the Pittman Lateral, the maximum measured value is multiplied by 3.2. As a result, even with mixture with the other streams, the discharge has the potential to exceed water quality standards for both Cr(T) and Cr(VI).

- Receiving Water Characteristics

    - Flow

    The estimated low flow for the Las Vegas Wash is 117 mgd, which was assumed to include the seep flow. The basis for this estimated flow is discussed in the Appendix to Attachment B in the March 17, 2000 letter from Kerr-McGee to NDEP.

    - Quality

The SNWA monitoring data for the Las Vegas Wash for the period of June 1998 through August 1999 indicate an average chromium concentration of 6.1 ug/l[1]. The available data do not indicate whether these data represent Cr(T) or Cr(VI).

- Wasteload Allocation

Using the same procedure as that used in the Attachment B Appendix, wasteload allocations for Cr(T) and Cr(VI) were calculated:

- The total allowable load in the Las Vegas Wash is 117 mgd times the respective water quality standard. For Cr(T) the allowable load is:

  (117 mgd)(100 ug/l)(1 lb/454 x 10^6 ug)(3.79 x 10^6 liters/million gallons) = 97.7 lb/day

  and for Cr(VI):

  (117 mgd)(10 ug/l)(1 lb/454 x 10^6 ug)(3.79 x 10^6 liters/million gallons) = 9.77 lb/day

- The background load of chromium in the Las Vegas Wash is:

  (117 mgd)(6.1 ug/l)(1/454 x 10^6)(3.79 x 10^6) = 5.96 lb/day

- For Cr(T), the allowable load in the discharge (i.e. the waste load allocation, or WLA) is:

  97.7 lb/day – 5.96 lb/day = 91.7 lb/day.

  This wasteload allocation corresponds to a discharge concentration of :

  (91.7 lb/day/1.2 mgd)(454 x 10^6 ug/lb)(1 million gallons/3.79 x 10^6liters) = 9154 ug/l

  Therefore, the allowable concentration of Cr(T) in the Kerr-McGee discharge would be 9154 ug/l.

- If it is assumed that the background chromium is all Cr(VI), the allowable load in the discharge (i.e. the WLA) is:

  9.77 lb/day – 5.96 lb/day = 3.81 lb/day.

  Assuming the design flow of the treatment system, this WLA corresponds to a discharge concentration of:

  (3.81 lb/day/1.2 mgd)(454 x 10^6 ug/lb)(1 million gallons/3.79 x 10^6liters) = 380 ug/l

  Therefore, the allowable concentration of Cr(VI) in the Kerr-McGee discharge would be 380 ug/l.

- Calculation of permit limits

For Cr(T), the RPV does not exceed the WLA. Therefore, with a mixing zone, a numerical permit limit would not be needed for Cr(T).

For Cr(VI), the RPV for the Pittman Lateral well PC-70, based on four measurements, is 413 ug/l. Therefore, a numerical permit limit would be required. In the expected operation of the treatment system, the PC-70 water would contribute less than half of the total flow. As a result, the RPV of the discharge would more likely be 200 ug/l, which is below the WLA.

---

[1] The SNWA data range from 4 to 12 ug/l. The September 1998 analysis indicated a chromium concentration of 42 ug/l. This data point was considered an anomaly and was not included in the calculation of the average.

Conclusion

If a mixing zone is allowed for Cr(T), then there is no potential to exceed the water quality standard after mixing, and no numerical limit would be required in the NPDES permit. If a mixing zone is allowed for Cr(VI), then there is a potential to exceed the water quality standard if the treated water consists only of water from the Pittman Lateral well PC-70; a permit limit of 380 ug/l is proposed for Cr(VI) with a mixing zone.

ATTACHMENT B

Revised Table
Source Water Data vs.
Water Quality Standards

Table B.2
Source Water Analytical Data vs. Water Quality Standards

Parameter	units	Seep				Onsite Water			Pittman Lateral PC-70					Most Stringent Water Quality Standard
		Lancaster 05/21/99	Lancaster-grab 09/14/99	NEL - grab 09/14/99	maximum detected value	Lancaster 01/20/00	NEL 01/20/00	maximum detected value	Lancaster 4/16/99	Lancaster 4/19/99	Lancaster 4/21/99	Lancaster 4/24/99	maximum detected value	
pH	SU	7.85	7.34	7.56	7.85	7.6	7.46	7.6	7.11	7.13	6.94	7.27	7.27	6.5-9.0
ClO4 (Perchlorate)	mg/l	100			100		1600	1600	480	460	440	340	480	-
CLO3 (Chlorate)	mg/l	100			100									-
Total Dissolved Solids	mg/l	7300			7300		11700	11700	9020	9060	8980	9680	9680	1900
Total Suspended Solids	mg/l		3.7 <	13.2	13.2	51 J	43.2	51						135
Total Organic Carbon	mg/l	4.6	5.6		5.6	4.9	5.1	5.1	3.6	2.4	2.2	3	3.6	-
Total Organic Nitrogen	mg/l		1 <	0.35	1	1 <								-
TOX	mg/l													-
Sulfate	mg/l	1950	2150	1900	2150	1710	4300	4300	2180	2390	2500	2390	2500	-
Sulfide	mg/l		0.009 <	ND		0.15	0.011 <	0.15						0.002
Sulfite	mg/l		0.94 <	ND		0.94 <								-
PO4	mg/l	0.56			0.56				0.17 J	0.26	0.28	2.3	2.3	-
Phosphorus (Total)	mg/l		0.136	0.04	0.136	0.04 <	0.0085 <							-
Chloride	mg/l	2300			2300				2910	2810	2820	3710	3710	-
Cyanide	mg/l	0.004 <	0.004 <	ND		0.004 <	0.0064 <		NA	ND	ND	ND		0.0052
NO2/NO3	mg/l	6.98	8	8.5	8.5	47	48	48	NA	21.3	18	15.2	21.3	-
[illegible]	mg/l						48	48						-
Ammonia - N	mg/l		0.15 J	ND	0.15 J	15.2	15	15.2						-
BOD5	mg/l		1.42 J	ND	1.42 J	12	18	18						-
Bromide	mg/l		2 <	ND		200 <								-
Chemical Oxygen Demand	mg/l		9.6	140	140	3.1 J	28	28						-
Color	Pt-Co		20	15	20	75	60	75						-
Fluoride	mg/l		1.45	1.6	1.6	0.98	0.93	0.98						1.0
Surfactants (MBAS)	mg/l		0.73	0.25	0.73	5.8	0.1	5.8						-
Oil & Grease	mg/l		1.5 <	3.8	3.8	2.7 <	16	16						-
TKN	mg/l		0.41 J	0.35	0.41	0.63 <	0.05 <							-
Coliform, Fecal	#/100 ml		40	110	110	10 <	2 <							-
Residual Chlorine	mg/l		0.084 J	0.02	0.084	0.03 <								-
METALS														-
Aluminum	mg/l	0.22	0.052 <	0.15	0.22	0.077 <			0.059 J	ND	ND	7.77	7.77	-
Antimony	mg/l	0.025 <	0.25 <	ND		0.029 <	0.0009 J	0.029 J	ND	ND	ND	ND		4.3
Arsenic	mg/l	0.103	0.115		0.115	0.005 <	0.0038 J	0.005 J	0.129	0.128	0.132	0.125	0.132	0.100
Barium	mg/l	0.0214 J	0.0183 J	0.021	0.0214	0.0383 <	0.041	0.041	0.0262 J	0.0237 J	0.0245 J	0.22	0.22	-
Beryllium	mg/l	0.0017 <	0.00079 <	ND		0.0011 <	0.00034 J	0.001 J	ND	ND	ND	ND		0.1
Boron	mg/l			3.6	3.6	13.2	13	13.2						0.75
Cadmium	mg/l	0.0017 <	0.00063 <	ND		0.00081 <	0.00169 <		ND	ND	ND	ND		0.0029
calcium	mg/l	552			552				727	768	700	782	782	-
Chromium (Tot.)	mg/l	0.0054 <	0.0054 <	ND		0.666	0.49	0.666	0.124	0.132	0.121	0.092	0.132	0.100
Chromium (VI)	mg/l	0.003 <					0.01 <		0.129	0.114	0.102	0.055	0.129	0.010
Cobalt	mg/l	0.0055 <	0.0055 <			0.0066 <			ND	ND	ND	0.0095 J	0.0095 J	-
Copper	mg/l	0.0058 <	0.0058 <	0.0081	0.0081	0.0035 <	0.0054	0.005	ND	ND	ND	0.03	0.03	0.033
Iron	mg/l	0.016 <	0.016 <	ND		2.57	3.7	3.7	0.046 J	ND	ND	6.71	6.71	1.000
Lead	mg/l	0.0065 <	0.023 <	ND		0.025 <	0.00056 <		ND	ND	ND	ND		0.0046
Magnesium	mg/l	211	207	240	240	386	380	386	280	268	269	297	297	-
Manganese	mg/l	0.946	1.68	1.8	1.8	0.297	0.33	0.33	1.33	1.39	1.3	1.72	1.72	0.2
Mercury	mg/l	0.000042 <	0.000042 <	ND		0.0001 <	0.00007 <		0.000092 J	0.000058 J	ND	ND	0.000092 J	0.000012
Molybdenum	mg/l		0.112	0.12	0.12	0.045 J	0.042	0.045						0.019
Nickel	mg/l	0.0152 J	0.0155	ND	0.0155	0.006	0.01 <	0.01	0.0058 J	0.0069 J	0.0078 J	0.0154 J	0.0154 J	0.2
Potassium	mg/l	45.8			45.8		36	36	41.2	40.5	40.6	38.5	41.2	-
Selenium	mg/l	0.011	0.008 J	ND	0.011	0.0083 J	0.0059	0.008 J	0.0081 J	ND	0.006 J	0.0063 J	0.0081 J	0.005

Table B.2
Source Water Analytical Data vs. Water Quality Standards

Parameter	units	Seep				Onsite Water			Pittman Lateral PC-70					Most Stringent Water Quality Standard
		Lancaster 05/21/99	Lancaster-grab 09/14/99	NEL - grab 09/14/99	maximum detected value	Lancaster 01/20/00	NEL 01/20/00	maximum detected value	Lancaster 4/16/99	Lancaster 4/19/99	Lancaster 4/21/99	Lancaster 4/24/99	maximum detected value	
Silver	mg/l	0.0057 <	0.0014 <	ND		0.0017 J	0.0012 <	0.002 J	ND	ND	ND	ND		0.037
sodium	mg/l	1520			1520		1600	1600	1800	1800	1610	2090	2090	-
strontium	mg/l	11.2			11.2		21	21	14.8	15.1	15.1	14.7	15.1	-
Thallium	mg/l	0.0097 <	0.0097 <	ND		0.0092 <	0.0006 J	0.009 J	ND	ND	ND	ND		0.0063
Tin	mg/l		0.032 <	ND		0.031 <								-
vanadium	mg/l	0.051			0.051		0.0051	0.005	0.075	0.077	0.075	0.116	0.116	-
Zinc	mg/l	0.003 <	0.003 <	ND		0.0076 J	0.0036 <	0.008 J	0.026	0.0181 J	0.03	0.0511	0.0511	0.292
														-
Herbicides														-
2,4-D	ug/l	0.098 <					0.04 <		1.14	ND	ND	ND	1.14	-
Silvex (2,4,5-TP)	ug/l	0.0362 J	0.0403 J		0.0403 J	0.0297 J	0.01 <	0.03 J	0.058	ND	ND	0.51	0.51	-
2,4,5-T	ug/l	0.257			0.257		0.02 <		0.698	ND	ND	0.469 J	0.698	-
Dalapon	ug/l	0.79 J			0.79 J				ND	ND	ND	ND		-
Dinoseb	ug/l	0.39			0.39		0.01 <		0.604	ND	ND	ND	0.604	-
Dicamba	ug/l	0.099			0.099				0.112	0.13 J	0.173	0.169 J	0.173	-
MCPP	ug/l	49 <							ND	ND	ND	ND		-
MCPA **(see note on p.5)	ug/l	28000 **			28000 **				51000 **	52000 **	57000 **	40000 **	57000 **	-
2,4-DP (dichloroprop	ug/l	0.098 <					0.1 <		ND	ND	ND	ND		-
2,4-DB	ug/l	0.098 <					0.1 <		4.08	4	3.9 J	1.4 J	4.08	-
Pentachlorophenol	ug/l	0.017 J			0.017 J				0.03 J	ND	ND	ND	0.03 J	13.5
														-
alpha-BHC	ug/l	0.664	0.69	0.92	0.92	0.106	0.14	0.14	0.58	0.7	0.676	0.771	0.771	0.13
beta-BHC	ug/l	0.249	0.372	0.3	0.372	0.0011 <	0.029 <		0.11	0.123	0.138	0.166	0.166	0.46
delta-BHC	ug/l	1.68	1.71	1.9	1.9	0.0155	0.06 J	0.06	0.812	1	0.934	1.99	1.99	-
gamma-BHC (Lindane)	ug/l	0.0052 J	0.0511		0.0511	0.0196	0.06 J	0.06	0.0809	0.0762	0.0923	0.0966	0.0966	0.08
Heptachlor	ug/l	0.0019 <	0.0016 <	ND		0.0015 <	0.033 <		ND	ND	ND	ND		0.0021
Aldrin	ug/l	0.0026 J	0.0155	ND	0.0155	0.0061 <	0.03 <		ND	ND	ND	ND		0.0014
Heptachlor Epoxide	ug/l	0.0044 J	0.00181 J	ND	0.0044 J	0.00096 <	0.028 <		ND	ND	ND	0.0021 J	0.0021 J	0.0011
alpha-Endosulfan	ug/l	0.0019 <	0.002 <	ND		0.0019 <	0.032 <		ND	ND	0.0027 J	0.0064 J	0.0064 J	2
Dieldrin	ug/l	0.0039 <	0.00099 <	ND		0.00096 <	0.026 <		ND	ND	ND	ND		0.0014
4-4'-DDE	ug/l	0.0073 J	0.00099 <	ND	0.0073 J	0.00096 <	0.029 <		ND	ND	ND	ND		0.0059
Endrin	ug/l	0.0042 J	0.007 <	ND	0.007 J	0.0068 <	0.022 <		ND	ND	ND	ND		0.0023
beta-Endosulfan	ug/l	0.0039 <	0.0048 <	ND		0.0047 <	0.024 <		ND	ND	ND	ND		2
4-4'-DDD	ug/l	0.0114 J	0.0047 <	ND	0.0114 J	0.00046 <	0.018 <		ND	ND	ND	ND		0.0084
Endosulfan Sulfate	ug/l	0.0039 <	0.003 <	ND		0.0029 <	0.1 <		ND	ND	ND	ND		2
4-4'-DDT	ug/l	0.0039 <	0.0089 <	ND		0.00086 <	0.027 <		ND	ND	ND	ND		0.0059
Endrin Ketone	ug/l	0.0039 <							ND	ND	ND	ND		-
Methoxychlor	ug/l	0.019 <	0.02 <	ND		0.02 <	0.029 <		ND	ND	ND	ND		0.03
alpha chlordane	ug/l	0.0025 J		ND	0.0025 J	0.019 <	0.2 <		ND	ND	ND	ND		-
gamma chlordane	ug/l	0.0019 <		ND		0.019 <	0.2 <		0.0025 J	ND	0.0054 J	ND	0.0054 J	-
Toxaphene	ug/l	0.19 <	0.3 <	ND		0.29 <	0.1 <		ND	ND	ND	ND		0.0002
Endrin Aldehyde	ug/l	0.0039 <	0.0047 <	ND		0.0046 <	0.027 <		ND	ND	ND	ND		0.81
Aroclor - 1016	ug/l	0.097 <	0.043 <	ND		0.041 <	0.54 <		ND	ND	ND	ND		0.00045
Aroclor - 1221	ug/l	0.097 <	0.12 <	ND		0.12 <	0.44 <		ND	ND	ND	ND		0.00045
Aroclor - 1232	ug/l	0.097 <	0.047 <	ND		0.046 <	0.054 <		ND	ND	ND	ND		0.00045
Aroclor - 1242	ug/l	0.097 <	0.099 <	ND		0.096 <	0.27 <		ND	ND	ND	ND		0.00045
Aroclor - 1248	ug/l	0.097 <	0.038 <	ND		0.037 <	0.2 <		ND	ND	ND	ND		0.00045
Aroclor - 1254	ug/l	0.097 <	0.14 <	ND		0.13 <	0.13 <		ND	ND	ND	ND		0.00045
Aroclor - 1260	ug/l	0.097 <	0.036 <	ND		0.035 <	0.34 <		ND	ND	ND	ND		0.00045
														-
Semi-Volatiles:														-
Phenol	ug/l	1 <	0.3 <	ND		0.3 <	5 <		ND	ND	ND	ND		4,600,000

Table B.2
Source Water Analytical Data vs. Water Quality Standards

Parameter	units	Seep Lancaster 05/21/99	Seep Lancaster-grab 09/14/99	Seep NEL - grab 09/14/99	Seep maximum detected value	Onsite Water Lancaster 01/20/00	Onsite Water NEL 01/20/00	Onsite Water maximum detected value	Pittman Lateral PC-70 Lancaster 4/16/99	Pittman Lateral PC-70 Lancaster 4/19/99	Pittman Lateral PC-70 Lancaster 4/21/99	Pittman Lateral PC-70 Lancaster 4/24/99	Pittman Lateral PC-70 maximum detected value	Most Stringent Water Quality Standard
Bis(2-chloroethyl) ether	ug/l	1 <	0.2 <	ND		0.2 <	5 <		ND	ND	ND	ND		14
2-Chlorophenol	ug/l	1 <	0.4 <	ND		0.4 <	5 <		ND	ND	ND	ND		-
1,3-Dichlorobenzene	ug/l	1 <	0.5 J	ND	1 J	0.3 J	0.99 <	0.99 J	ND	ND	ND	1 J	1 J	2,600
1,4-Dichlorobenzene	ug/l	1 <	0.7 J	ND	1 J	0.5 J	1.16 <	1.16 J	ND	ND	ND	ND		2,600
1,2-Dichlorobenzene	ug/l	1 <	0.6 J	ND	1 J	0.8 J	0.8 <	0.8 J	ND	ND	ND	ND		17,000
2-methylphenol	ug/l	1 <							ND	ND	ND	ND		-
2-2'oxybis(1-chloropropane	ug/l	1 <							ND	ND	ND	ND		-
4-methylphenol	ug/l	3 <							ND	ND	ND	ND		-
N-nitrosodi-n-propylamine	ug/l	1 <	0.5 <	ND		0.5 <	5 <		ND	ND	ND	ND		-
N-nitrosodimethylamine	ug/l		0.3 <	ND			5 <							81
Hexachloroethane	ug/l	1 <	0.4 <	ND		0.4 <	5 <		ND	ND	ND	ND		89
Hexachloroethene	ug/l													-
Nitrobenzene	ug/l	1 <	0.7 <	ND		0.7 <	5 <		ND	ND	ND	ND		1,900
Isophorone	ug/l	1 <	0.1 <	ND		0.09 <	5 <		ND	ND	ND	ND		6,000
2-Nitrophenol	ug/l	1 <	0.3 <	ND		0.3 <	5 <		ND	ND	ND	ND		-
2,4-Dimethylphenol	ug/l	1 <	0.8 <	ND		0.8 <	5 <		ND	ND	ND	ND		-
Bis(2-chloroethoxy) methane	ug/l	1 <	0.4 <	ND		0.4 <	5 <		ND	ND	ND	ND		-
2,4 - Dichlorophenol	ug/l	1 <	0.4 <	ND		0.4 <	5 <		ND	ND	ND	ND		790
1,2,4-Trichlorobenzene	ug/l	1 J	2 J	ND	2 J	0.3 <	5 <		1 J	1 J	1 J	2 J	2 J	-
Naphthalene	ug/l	1 <	0.2 <	ND		0.2 <	5 <		ND	ND	ND	ND		-
4-chloroaniline	ug/l	1 <							ND	ND	ND	ND		-
Hexachlorobutadiene	ug/l	2 <	0.8 <	ND		0.8 <	5 <		ND	ND	ND	ND		500
4-Chloro-3-methylphenol	ug/l	1 <	0.3 <	ND		0.3 <	5 <		ND	ND	ND	ND		-
2-methylnaphthalene	ug/l	1 <							ND	ND	ND	ND		-
Hexachlorocyclo-pentadiene	ug/l	5 <	1 <	ND		0.9 <	5 <		ND	ND	ND	ND		17,000
2,4,6-Trichlorophenol	ug/l	2 <	0.5 <	ND		0.5 <	5 <		ND	ND	ND	ND		-
2,4,5-trichlorophenol	ug/l	2 <							ND	ND	ND	ND		-
2-Chloronaphthalene	ug/l	1 <	0.2 <	ND		0.2 <	5 <		ND	ND	ND	ND		-
2-nitroaniline	ug/l	2 <							ND	ND	ND	ND		-
Dimethyl Phthalate	ug/l	2 <	0.2 <	ND		0.2 <	5 <		ND	ND	ND	ND		2,900,000
Acenaphthylene	ug/l	1 <	0.2 <	ND		0.2 <	5 <		ND	ND	ND	ND		-
														-
Chloromethane	ug/l	3 <	3 <	ND		3 <	0.87 <		ND	ND	ND	ND		-
Bromomethane	ug/l	3 <	3 <	ND		3 <	0.56 <		ND	ND	ND	ND		4,000
Vinyl Chloride	ug/l	2 <	2 <	ND		2 <	0.5 <		ND	ND	ND	ND		5,250
Chloroethane	ug/l	3 <	3 <	ND		3 <	0.89 <		ND	ND	ND	ND		-
Dichloromethane	ug/l	2 <	2 <	ND		3 J	2.2 J	3 J	ND	ND	ND	ND		-
acetone	ug/l	6 <							ND	ND	ND	6 J	6 J	-
carbon disulfide	ug/l	3 <							ND	ND	ND	ND		-
1,1- Dichloroeth(yl)ene	ug/l	1 <	0.9 <	ND		0.9 <	1.02 <		ND	ND	ND	ND		32
1,1- Dichloroethane	ug/l	2 <	2 J	ND	2	2 <	1.12 <		8	8	8	9	9	-
Chloroform	ug/l	1 <	1 <	ND		430	390 D	430	2 J	2 J	2 J	1 J	2 J	4,700
1,2 - Dichloroethane	ug/l	2 <	2 <	ND		2 <	0.5 <		ND	ND	ND	ND		990
2-butanone	ug/l	3 <							ND	ND	ND	ND		-
1,1,1 - Trichloroethane	ug/l	1 <	1 <	ND		1 <	0.55 <		ND	ND	ND	ND		-
Carbon Tetrachloride	ug/l	1 <	1 <	ND		1 <	0.8 <		ND	ND	ND	ND		44
Bromodichloromethane	ug/l	1 <	0.7 <	ND		1 J	1.4 J	1.4 J	ND	ND	ND	ND		220
1,1,2,2, - Tetrachloroethane	ug/l	2 <	1 <	ND		1 <	0.58 <		ND	ND	ND	ND		110
1,2 - Dichloropropane	ug/l	1 <	1 <	ND		1 <	0.5 <		ND	ND	ND	ND		-
trans - 1,3 - Dichloropropene	ug/l	1 <	0.6 <	ND		0.6 <	0.63 <		ND	ND	ND	ND		-
Trichloroethylene	ug/l	1 <	1 <	ND		1 <	0.5 <		1 J	1 J	1 J	1 J	1 J	810
Dibromochloromethane	ug/l	2 <	2 <	ND		2 <	0.6 <		ND	ND	ND	ND		340

Table B.2
Source Water Analytical Data vs. Water Quality Standards

Parameter	units	Seep: Lancaster 05/21/99	Seep: Lancaster-grab 09/14/99	Seep: NEL - grab 09/14/99	Seep: maximum detected value	Onsite Water: Lancaster 01/20/00	Onsite Water: NEL 01/20/00	Onsite Water: maximum detected value	Pittman Lateral PC-70: Lancaster 4/16/99	Pittman Lateral PC-70: Lancaster 4/19/99	Pittman Lateral PC-70: Lancaster 4/21/99	Pittman Lateral PC-70: Lancaster 4/24/99	Pittman Lateral PC-70: maximum detected value	Most Stringent Water Quality Standard
1,1,2 - Trichloroethane	ug/l	2 <	2 <	ND		2 <	0.59 <		ND	ND	ND	ND		420
Benzene	ug/l	1 <	1 <	ND		1 <	0.64 <		ND	ND	ND	ND		710
1,3 -Dichloropropylene	ug/l	1 <	1 <	ND			0.71 <		ND	ND	ND	ND		1700
Bromoform	ug/l	1 <	0.8 <	ND		0.8 <	1.1 J	1.1 J	ND	ND	ND	ND		3600
4 methyl 2-pentanone	ug/l	5 <							ND	ND	ND	ND		-
2 hexanone	ug/l	7 <							ND	ND	ND	ND		-
Tetrachloroethylene	ug/l	1 <	1 <	ND		1 <	0.8 <		2 J	2 J	2 J	ND	2 J	88.5
Toluene	ug/l	2 <	2 <	ND		2 <	1.2 J	2 J	2 J	ND	ND	2 J	2 J	200,000
Chlorobenzene	ug/l	1 <	0.8 <	ND		0.8 <	0.7 <		ND	ND	ND	ND		21,000
Ethylbenzene	ug/l	2 <	2 <	ND		2 <	0.57 <		ND	ND	ND	ND		29,000
Styrene	ug/l	1 <		ND			0.9 <		ND	ND	ND	ND		-
Xylenes	ug/l	1 <		ND			1.06 <		ND	ND	ND	ND		-
trans- 1,2 - Dichloroethylene	ug/l	2 <	2 <	ND		2 <	0.7 <		ND	ND	ND	ND		-
cis-1,2, Dichloroeth(yl)ene	ug/l	2 <	2 <	ND		2 <	1.11 <		ND	ND	ND	ND		-
Methyl Tert-butyl ether	ug/l			ND			0.56 <							-
2,3,7,8-TCDD (Dioxin)	ug/l			ND										0.00000014
Trichlorofluoromethane	ug/l		2 <	ND		2 <	4.06 <							-
2-Chloroethylvinyl Ether	ug/l					2 <	5 <							-
3 nitroaniline	ug/l	2 <							ND	ND	ND	ND		-
Acenaphthene	ug/l	1 <	0.2 <	ND		0.2 <	5 <		ND	ND	ND	ND		-
2,4 - Dinitrophenol	ug/l	14 <	20 <	ND		19 <	5 <		ND	ND	ND	ND		14,000
4-Nitrophenol	ug/l	10 <	2 <	ND		2 <	5 <		ND	ND	ND	ND		-
dibenzofuran	ug/l	1 <							ND	ND	ND	ND		-
2,4-Dinitrotoluene	ug/l	1 <	0.4 <	ND		0.4 <	5 <		ND	ND	ND	ND		91
2,6-Dinitrotoluene	ug/l	2 <	0.5 <	ND		0.5 <	5 <		ND	ND	ND	ND		-
Diethyl Phthalate	ug/l	2 <	0.5 <	ND		0.5 <	5 <		ND	ND	ND	ND		120,000
4-Chlorophenyl Phenyl Ether	ug/l	1 <	0.4 <	ND		0.4 <	5 <		ND	ND	ND	ND		-
Fluorene	ug/l	1 <	0.3 <	ND		0.3 <	5 <		ND	ND	ND	ND		14,000
4 nitroaniline	ug/l	2 <							ND	ND	ND	ND		-
4,6-Dinitro-2-Methylphenol	ug/l	5 <	0.6 <	ND		0.6 <	5 <		ND	ND	ND	ND		765
N-Nitrosodiphenylamine	ug/l	1 <	0.3 <	ND		0.3 <	5 <		ND	ND	ND	ND		160
4-Bromophenyl-phenyl-ether	ug/l	2 <	0.7 <	ND		0.7 <	5 <		ND	ND	ND	ND		-
Hexachlorobenzene	ug/l	2 <	2 <	ND		2 <	5 <		ND	ND	ND	ND		0.0077
Pentachlorophenol	ug/l	3 <	2 <	ND		2 <	5 <		ND	ND	ND	ND		13.45
Phenanthrene	ug/l	1 <	0.3 <	ND		0.3 <	5 <		ND	ND	ND	ND		-
Anthracene	ug/l	1 <	0.2 <	ND		0.2 <	5 <		ND	ND	ND	ND		110,000
carbazole	ug/l	1 <							ND	ND	ND	ND		-
Di-n-butyl Phthalate	ug/l	2 <	0.7 <	ND		0.7 <	5 <		ND	ND	ND	3 J	3 J	12,000
Fluoranthene	ug/l	1 <	0.2 <	ND		0.2 <	5 <		ND	ND	ND	ND		370
Pyrene	ug/l	1 <	0.3 <	ND		0.3 <	5 <		ND	ND	ND	ND		11,000
Butylbenzylphthalate	ug/l	2 <	0.5 <	ND		0.5 <	5 <		ND	ND	ND	ND		-
3,3'-Dichlorobenzidine	ug/l	2 <	0.6 <	ND		0.6 <	5 <		ND	ND	ND	ND		0.77
Benzo(a)anthracene	ug/l	1 <	0.3 <	ND		0.3 <	5 <		ND	ND	ND	ND		0.31
Bis(2-ethylhexyl)phthalate	ug/l	2 <	0.6 <	ND		0.6 <	5 <		ND	ND	ND	3 J	3 J	59
Chrysene	ug/l	1 <	0.3 <	ND		0.3 <	5 <		ND	ND	ND	ND		0.31
Di-n-Octylphthalate	ug/l	2 <	0.4 <	ND		0.4 <	5 <		ND	ND	ND	ND		-
Benzo(b)fluoranthene	ug/l	1 <	0.3 <	ND		0.3 <	5 <		ND	ND	ND	ND		0.31
Benzo(k)fluoranthene	ug/l	1 <	0.5 <	ND		0.5 <	5 <		ND	ND	ND	ND		0.31
Benzo(a)pyrene	ug/l	1 <	0.2 <	ND		0.2 <	5 <		ND	ND	ND	ND		0.31
Indeno (1,2,3-cd) pyrene	ug/l	1 <	2 <	ND		0.4 <	5 <		ND	ND	ND	ND		0.31
Dibenzo(a,h)anthracene	ug/l	1 <	0.5 <	ND		0.5 <	5 <		ND	ND	ND	ND		0.31

Table B.2
Source Water Analytical Data vs. Water Quality Standards

Parameter	units	Seep				Onsite Water			Pittman Lateral PC-70					Most Stringent Water Quality Standard
		Lancaster 05/21/99	Lancaster-grab 09/14/99	NEL - grab 09/14/99	maximum detected value	Lancaster 01/20/00	NEL 01/20/00	maximum detected value	Lancaster 4/16/99	Lancaster 4/19/99	Lancaster 4/21/99	Lancaster 4/24/99	maximum detected value	
Benzo(g,h,i)perylene	ug/l	1 <	0.3 <	ND		0.3 <	5 <		ND	ND	ND	ND		-
Bis(2-chloroisopropyl) ether	ug/l		0.3 <	ND		0.3 <	5 <							170,000
1,2-Dichlorobenzene (oDCB)	ug/l			ND			5 <							17,000
1,3-Dichlorobenzene (mDCB)	ug/l			ND			5 <							2,600
1,4-Dichlorobenzene (pDCB)	ug/l			ND			5 <							17,000
1,2 Diphenylhydrazine	ug/l					0.3 <								-
														-
diazanon	ug/l			ND			0.3 <							-
disolfoton	ug/l			ND			0.3 <							-
ethion	ug/l			ND			0.3 <							-
Mirex	ug/l		0.01 <			0.01 <								0.001
demeton-O	ug/l			ND			0.2 <							-
demeton-S	ug/l			ND			0.2 <							-
Guthion	ug/l		0.2 <	ND		0.19 <	0.3 <							0.01
Malathion	ug/l		0.2 <	ND		0.19 <	0.3 <							0.1
Ethyl Parathion	ug/l		0.2 <	ND		0.19 <	0.3 <							-
Methyl Parathion	ug/l			ND			0.3 <							-
Dichlorodifluoromethane	ug/l		2 <			1 <								-
Acrolein	ug/l		40 <											780
Acrylonitrile	ug/l		10 <											6.6
Benzidine	ug/l					8 <								0.0054
Benzidine	ug/l													0.0054
titanium	ug/l		8 <			0.0056 <								-
1,2 - Diphenylhydrazine	ug/l		0.0029 <											5.4
Chlordane (alpha+gamma)	ug/l	0.0044 J,<			0.0044 J	0.038 <	0.4 <		0.0025 J		0.0054 J		0.0054 J	0.0043
DDT & metabolites	ug/l	0.0226 ,J,	0.01459 <		0.0226 J	0.00228 <	0.074 <							0.001
Demeton (O+S)	ug/l						0.4 <							0.1
Parathion (ethyl+methyl)	ug/l		0.2 <			0.19 <	0.6 <							0.013
PCBs, Total	ug/l	0.679 <	0.523 <			0.505 <	1.974 <							0.014
Total Inorganic Nitrogen	mg/l	6.98	8.15	8.5	8.5	62.2	63	63		21.3	18		21.3	20

** Compound is an unidentified compound, is not MCPA, but has similar CC/MS residence time

Table B.3
Seep Water Parameters with Potential to Exceed Water Quality Standards

Parameter	units	Seep Lancaster 05/21/99	Seep Lancaster-grab 09/14/99	Seep NEL - grab 09/14/99	Seep maximum detected value	Most Stringent Water Quality Standard	Potential to Exceed Water Quality Standard Using factor of 9.1
Total Dissolved Solids	mg/l	7300			7300	1900	YES
Fluoride	mg/l		1.45	1.6	1.6	1.0	background
Arsenic	mg/l	0.103	0.115		0.115	0.100	others
Boron	mg/l			3.6	3.6	0.75	background
Copper	mg/l	0.0058 <	0.0058 <	0.0081	0.0081	0.033	background
Manganese	mg/l	0.946	1.68	1.8	1.8	0.2	YES
Molybdenum	mg/l		0.112	0.12	0.12	0.019	background
Selenium	mg/l	0.011	0.008 J	ND	0.011	0.005	background
alpha-BHC	ug/l	0.664	0.69	0.92	0.92	0.13	others
beta-BHC	ug/l	0.249	0.372	0.3	0.372	0.46	others
gamma-BHC (Lindane)	ug/l	0.0052 J	0.0511		0.0511	0.08	others
Aldrin	ug/l	0.0026 J	0.0155	ND	0.0155	0.0014	others
Total Inorganic Nitrogen	mg/l	6.98	8.15	8.5	8.5	20	YES

Table B.4
Onsite Water Parameters with Potential to Exceed Water Quality Standards

Parameter	units	Onsite Water			Most Stringent Water Quality Standard	Potential to Exceed Water Quality Standard Using factor of 9.1
		Lancaster 01/20/00	NEL 01/20/00	maximum detected value		
Total Dissolved Solids	mg/l		11700	11700	1900	YES
Total Suspended Solids	mg/l	51 J	43.2	51	135	YES
Sulfide	mg/l	0.15	0.011 <	0.15 *	0.002	
Fluoride	mg/l	0.98	0.93	0.98	1.0	background
Boron	mg/l	13.2	13	13.2	0.75	background
Chromium (Tot.)	mg/l	0.666	0.49	0.666 **	0.100	
Copper	mg/l	0.0035 <	0.0054	0.005	0.033	background
Iron	mg/l	2.57	3.7	3.7	1.000	YES
Manganese	mg/l	0.297	0.33	0.33	0.2	YES
Molybdenum	mg/l	0.045 J	0.042	0.045	0.019	background
alpha-BHC	ug/l	0.106	0.14	0.14	0.13	others
gamma-BHC (Lindane)	ug/l	0.0196	0.06 J	0.06	0.08	others
Total Inorganic Nitrogen	mg/l	62.2	63	63	20	YES

* Sulfide in Lancaster sample is believed to be an artifact of sample handling. Sulifde is not expected to be in the treatment plant discharge.

**The onsite treatment plant consistently operates at discharge levels of <0.05 mg/l. Therefore, the expected level of chromium in the onsite treatment plant discharge is <0.05 mg/l

Table B.5
PC-70 Water Parameters with Potential to Exceed Water Quality Standards

Parameter	units	Pittman Lateral PC-70					Most Stringent Water Quality Standard	Potential to Exceed Water Quality Standard Using factor of 3.2
		Lancaster 4/16/99	Lancaster 4/19/99	Lancaster 4/21/99	Lancaster 4/24/99	maximum detected value		
Total Dissolved Solids	mg/l	9020	9060	8980	9680	9680	1900	YES
Arsenic	mg/l	0.129	0.128	0.132	0.125	0.132	0.100	background
Chromium (Tot.)	mg/l	0.124	0.132	0.121	0.092	0.132	0.100	YES
Chromium (VI)	mg/l	0.129	0.114	0.102	0.055	0.129	0.010	YES
Copper	mg/l	ND	ND	ND	0.03	0.03	0.033	background
Iron	mg/l	0.046 J	ND	ND	6.71	6.71	1.000	YES
Manganese	mg/l	1.33	1.39	1.3	1.72	1.72	0.2	YES
alpha-BHC	ug/l	0.58	0.7	0.676	0.771	0.771	0.13	others
beta-BHC	ug/l	0.11	0.123	0.138	0.166	0.166	0.46	others
gamma-BHC (Lindane)	ug/l	0.0809	0.0762	0.0923	0.0966	0.0966	0.08	others
Total Inorganic Nitrogen(NO2+NO3+NH3)	mg/l		21.3	18		21.3	20	YES

KERR-McGEE CHEMICAL LLC
POST OFFICE BOX 55 - HENDERSON, NEVADA 89009

March 17, 2000

Cathe Pool
Supervisor, Permits Branch
Bureau of Water Pollution Control
Nevada Division of Environmental Protection
333 West Nye Lane
Carson City, NV 89710

RECEIVED
MAR 22 2000
ENVIRONMENTAL PROTECTION
LAS VEGAS OFFICE

Dear Ms. Pool:

Subject: NPDES Discharge Permit Application – Supporting Information

In September 1999 Kerr-McGee Chemical LLC (Kerr-McGee) submitted an NPDES Permit application for perchlorate remedial activities in the Henderson area. Since then, Kerr-McGee and NDEP have agreed that the NPDES permitting process can be streamlined by focusing on seep and on-site plant groundwater and delaying consideration of groundwater from the Pittman Lateral. By taking this approach, intake credits, as defined in the Great Lakes Initiative (40CFR132), will be available for the seep surface flow, thereby allowing the development of a permit that focuses primarily on perchlorate removal. Kerr-McGee is submitting this document to update the information given in the September 1999 application, reflecting the change. This document also contains information requested by your office, including:

- requested language describing the source of water, which will be treated to remove perchlorate and ultimately be discharged (Attachment A),
- a discussion of constituents in the discharge which appear to have the potential to be above the water quality standards for the Las Vegas Wash and Kerr-McGee's expectations for how these will be addressed in the NPDES permitting process, including a mixing zone application for appropriate constituents (Attachment B),
- laboratory analyses of the on-site extracted groundwater which is being treated for chromium and stored in an on-site double-lined pond (Attachment C), and
- a discussion of the Las Vegas Wash standards compared to a downstream drinking water location and its relevant standards (Attachment D).

Additionally, as discussed at our last meeting, Kerr-McGee will submit a "marked-up" draft permit incorporating this information in the near future. We hope this information will aid Nevada Division of Environmental Protection (NDEP) in reviewing the pending NPDES permit application. We look forward to meeting with NDEP to discuss this information in the near future. Please feel free to call me at (702) 651-2234 if you have any questions.

Sincerely,

SMCrowley

Susan Crowley
Staff Environmental Specialist

cc: EMSpore
JTSmith
FRStater
Brenda Pohlmann, NDEP
Leo Drozdoff, NDEP
Rick Simon, ENSR
Public Repository
LKBailey
WOGreen
PSCorbett
Doug Zimmerman, NDEP
Bill Gorham, ENSR
Dave Urban, ENSR

smc/NPDES Permit - Supporting Info-Rev 5.doc

ATTACHMENT A

Perchlorate NPDES Discharge
Permitted Water Sources

Perchlorate NPDES Permit Discharge
Water Source Language

The initial NPDES permit application filed by Kerr-McGee in September 1999 sought approval for discharge of water, following perchlorate removal, from three water sources:

- Groundwater from the Kerr-McGee site,
- Groundwater from the Pittman Lateral area, and
- Water from a "seep" near the Las Vegas Wash.

NDEP concern over constituents other than perchlorate, not resulting from Kerr-McGee activities, which may exceed Las Vegas Wash standards has prompted proposal of an approach similar to that included in the Great Lakes Water Quality Initiative (40CFR132) where such constituents would be "netted out" of the permit process. NDEP has generally concurred with the concept of granting "intake credits" for constituents in water from the seep, where the constituents are from the same water body and meet "no net addition limitations" as specified in 40 CFR 132 Appendix F. Considerable discussion has focused on whether groundwater from the Pittman Lateral area meets the criteria for application of no net addition limits.

To facilitate timely issuance of the proposed NPDES permit, Kerr-McGee requests that language in the NPDES application be amended to describe the source water as "surface water collected at the seep, on-site groundwater and other water as approved by NDEP, Bureau of Water Pollution Control". This approach would allow discharge from the perchlorate treatment facility of a blend of the seep water and on-site groundwater, while leaving open the possibility for later treatment of groundwater or surface flows from other sources that can be adequately handled by the treatment system, within the limits of the permit.

With this amendment, the application references to the Pittman Lateral area need to be modified in: Section 2, paragraph 3; Section 3, paragraph 1; Section 4, paragraph 1; Section 4.4, paragraph 1.

ATTACHMENT B

Discussion of Constituents Above
Water Quality Standards

Water Quality Standards

State and Federal water quality standards apply according to the designated beneficial uses of the receiving water. The designated beneficial uses of the Las Vegas Wash, as defined in NAC 445A.198, are:

- irrigation,
- watering of livestock,
- recreation not involving contact with the water,
- maintenance of a freshwater marsh,
- propagation of wildlife, and
- propagation of aquatic life, excluding fish.

Applicable state water quality standards are listed in NAC 445A.121, NAC 445A.122, NAC 445A.144, NAC 445A.198 and NAC 445A.199. Applicable Federal standards include 40 CFR 131.36 (the National Toxics Rule, or "NTR"). For the Las Vegas Wash, applicable NTR standards include heptachlor epoxide (freshwater acute and chronic) and all the human health standards (for organisms only) except the standard for arsenic.

Notes on the application of the standards:

1. The hardness of the receiving stream exceeds 400 mg/l as $CaCO_3$. Therefore 400 mg/l was used as the hardness in the calculation of those standards based on hardness.
2. A pH of 7.85 was used for the Las Vegas Wash. This value was used in the calculation of the standard for pentachlorophenol.
3. Per 40 CFR 131.136(d)(11), a risk level of 10^{-5} was used to determine the human health criteria.

Table B.1 provides the applicable and the most stringent standards for this discharge.

Water sources

Kerr-McGee is applying for a permit to discharge up to 825 gallons per minute of treated water. The anticipated sources of water include:

- Seep water at an anticipated flow rate of 360+ gpm
- Treated groundwater from wells located at the Kerr-McGee facility ("on-site" water)
- Water from other sources approved by the NDEP Bureau of Pollution Control, which may be identified for treatment within the capacity of the treatment system and meeting the limits of the NPDES permit.

In addition, during the beginning period of operation, the inventory of water in the on-site collection basin (GW-11) will be worked off through the treatment system. This water consists of on-site water and a small amount of groundwater from the Pittman Lateral area. As noted in NDEP's December 10, 1999 letter to Kerr-McGee, the small quantity of water from the Pittman Lateral area is considered de minimis and will not be specifically addressed further.

Untreated and Treated Water Quality

Source Water Quality

Seep water was sampled on May 21, 1999 and September 14, 1999 and analyzed for a wide range of parameters. The May 21 sample was analyzed by Lancaster laboratories (not Nevada certified), while the September 14 sample was analyzed by both Lancaster and NEL Laboratories (Nevada certified). On-site water was sampled on January 20, 2000 and analyzed by both Lancaster Laboratories and NEL Laboratories. The results of these analyses are provided in Table B.2.

Anticipated Effect of Treatment on Discharge Quality

Ion Exchange Treatment

Kerr-McGee is currently treating the seep water with ion exchange technology. The design flow rate of this system was 360 gpm and efforts are underway to increase the flow rate. In the ion exchange process, perchlorate ions are removed from the seep water by exchanging with chloride ions on the resin. The net effect is:

- A reduction in perchlorate. At an initial concentration of 60-100 mg/l and 97% removal, the perchlorate concentration reduction is 57-97 mg/l. At typical flow rates of 350 gallons per minute (gpm), 242 to 413 lbs/day of perchlorate are removed from the stream.
- The Total Dissolved Solids (TDS) content of the water will decrease by approximately 300 pounds per day, as a result of perchlorate removal and its corresponding perchlorate-to-chloride exchange. As a result of this exchange there will be a modest increase in chloride concentration. Chloride ions are released into the water at a molar rate equal to the perchlorate removal. In other words, for each pound of perchlorate (MW = 99.5) removed, 0.36 pounds of chloride (MW = 35.5) are exchanged to the water stream. At 97 mg/l perchlorate removal, the increase in chloride concentration will be 35 mg/l, and, at 350 gpm treated water flow, the mass of chloride discharged per day will increase by approximately 145 pounds. For comparison, the seep water currently contains about 2,300 mg/l chloride, representing over 60,000 pounds per day.

Treatment with ion exchange will cause no other significant changes in the quality of the water.

Biological Treatment

In the long term, Kerr-McGee plans to degrade perchlorate in the water using a biological process. The treatment system will have a feed capacity of 825 gpm, which will be adequate to treat not only the seep but also the onsite water and other sources of similar quality. The biological process will entail the addition of an organic carbon source to promote an adequate level of biological activity. Also, the process will require the addition of nitrogen (as urea) and phosphorus (as phosphoric acid) to ensure proper nutrient levels for effective biological treatment. The process will affect the quality of the water in the following ways:

- Perchlorate will be degraded, converting the ClO_4^- ion to chloride (Cl^-) and oxygen (used in cell respiration and synthesis). At a nominal feed concentration of about 300 mg/l perchlorate, and if 99% perchlorate destruction is achieved, perchlorate concentrations will be reduced by 297 mg/l. The mass of perchlorate destroyed will be about 3000 pounds per day. Chloride concentrations will increase modestly versus intake levels (just over 100 mg/l chloride, or less than 5 percent).

- The carbon source that is added will be nearly 100% degraded in the process; however, some residual organic carbon will remain at a low ppm level. The organic carbon to be used will be non-toxic and highly biodegradable.
- Nutrient nitrogen that is added will be consumed in the biological process. However, a slight excess of nitrogen will be needed to ensure biological effectiveness. Therefore, a low residual concentration of nitrogen in the form of ammonia, nitrite, nitrate, and/or organic nitrogen, is expected as a result of biological treatment. Ammonia-nitrogen discharge, as specified in the temporary discharge permit already issued by NDEP, will be limited to 40 pounds per day.
- Similarly, nutrient phosphorus will be added in the form of phosphoric acid or other inorganic phosphate, and the phosphorus is consumed in the biological process. A slight excess of phosphorus will be needed to ensure biological effectiveness. Therefore, a low residual concentration of phosphorus as phosphate is expected as a result of biological treatment. Total phosphorus discharge, as specified in the temporary discharge permit issued by NDEP, will be limited to 20 pounds per day.
- To maintain perchlorate destruction, the pH of the water being treated must be maintained in a specified range. For this process, Kerr-McGee plans to use sodium hydroxide (NaOH). The addition of these chemicals is expected to add modest quantities of total dissolved solids to the discharge. Biological pilot test effluent samples, generated by blending seep, Pittman Lateral and on-site water, have shown TDS levels of about 12,000 mg/l. This level is suggested as an average working value, with a proposed NPDES permit limit twenty percent higher, 14,400mg/l, to allow for possible process variability. The proposed 14,400 mg/l TDS limit will require a mixing zone, which is discussed subsequently in the Appendix to this section.

The biological treatment system may reduce the concentrations of other constituents in the water being treated. However, the system will be optimized for removal of perchlorate only. Therefore, Kerr-McGee is taking no credit for the removal of other constituents.

Anticipated Final Discharge Quality

Table B.2 shows the expected quality of the treatment plant feed and discharge compared with Water Quality Standards. The feed concentration values in the table are based on the seep and on-site water analyses combined at a 10:1 ratio. The effluent column takes into account both the effects of the treatment operations and the possible impact of treating water from other sources such as the Pittman Lateral area. Since biological treatment will have the greater effect than ion exchange on discharge quality, the table reflects the anticipated quality from the proposed biological system, as estimated based on bench-scale treatability studies and process design parameters.

Potential to Exceed Water Quality Standards Evaluation

Reasonable potential analysis is an evaluation of whether a discharge has a reasonable potential to cause or contribute to an excursion above an applicable water quality standard. The reasonable potential value (RPV) of a discharge parameter is determined statistically, according to EPA guidance[1], and is based on the number of analyses available for a particular discharge. For example, if only one analysis is available, then, per the guidance, the RPV is a factor of 9.1 times the measured value. With more analyses, this

[1] EPA, 1991. Technical Support Document for Water Quality-Based Toxics Control, EPA/505/2-90-001, March 1991.

factor decreases as the confidence in the likely range of values increases. If the RPV of an undiluted effluent concentration does not exceed the standard, then a permit limitation is not required for that parameter.

Using this procedure, the RPVs of the constituents in the proposed Kerr-McGee discharge were calculated and compared to the applicable water quality standards. Table B.2 provides the estimated discharge quality based on the feed water, as well as an estimate of the impact of biological treatment. Since only one analysis is available on some streams, a conservative factor of 9.1 was used to calculate the RPVs for the feed mixture. The average quality of biotreatment effluent shown in the corresponding column on the Table, is expected from the engineering design. Therefore those values were not multiplied by the 9.1 factor. Table B.2 indicates those parameters with a potential to exceed applicable standards.

Another consideration in this evaluation is the availability of intake credits. Per the Great Lakes Initiative regulations, which are being used as guidance for developing this NPDES permit, if specific constituents are in the intake water and are not contributed by the facility, then there is no reasonable potential for the facility discharge to cause an exceedance of applicable water quality standards. In such cases, the permit is not required to include a water quality-based effluent limit for those parameters, provided certain conditions are met. For the Kerr-McGee discharge, the conditions are met for obtaining intake credits for a number of parameters, as indicated in Table B.2. Estimated analytical (J) values have not been carried through the RPV analysis. The remaining parameters that have the potential to exceed standards, namely TDS, TSS, boron, iron, manganese, nickel, and total inorganic nitrogen, were carried forward for further permitting considerations and are discussed separately below. Other parameters with potential to exceed standards, but which are not associated with Kerr-McGee operations, are combined and discussed in the following section. Lastly, as requested by NDEP, chloride is also discussed, though there is no applicable chloride standard for this portion of the Las Vegas Wash.

Evaluation of Specific Parameters

TDS

The seep concentration is about 7,300 mg/l TDS. On-site and other possible water sources contain over 10,000 mg/l TDS. The combined stream bioplant effluent TDS level from blended groundwater feed is estimated to be about 12,000 mg/l, most coming from TDS already in the groundwater. The water quality standard in the Las Vegas Wash is 1,900 mg/l to maintain acceptable effluent quality, per NAC 445A.199. Because the Kerr-McGee operations will increase the TDS load to the Las Vegas Wash, and the discharge will exceed the applicable water quality standard, intake credits for TDS are not available. Therefore, TDS must be either removed from the water or addressed with a mixing zone.

Removal of TDS is a prohibitively costly approach when the dissolved solids consist of difficult-to-precipitate materials. In the Kerr-McGee discharge, the bulk of the dissolved solids will consist of sodium and chloride, both of which do not precipitate using conventional precipitation technology. Potentially effective treatment technologies for these materials include evaporation and membrane-based systems. These approaches are extremely expensive (both capital and operating costs), and they result in large volumes of residual materials that must be further treated/handled/disposed of. Some of the TDS will consist of sulfate, calcium, and magnesium. Although precipitation of these materials is possible with conventional technology, the water quality standard for TDS will not be achieved without additional treatment for sodium and chloride, as discussed above. It is concluded that adequate removal of TDS from these streams is economically infeasible.

A mixing zone for TDS can be established in the Las Vegas Wash to ensure that the applicable water quality standard is being met beyond the zone of mixing. According to available TDS data[2] on the Las Vegas Wash, the average TDS in the wash is 1,757 mg/l. On this basis, the maximum allowable TDS discharge from the treatment plant at the treatment system design flow of 825 gpm is 15,840 mg/l. Rather than request the maximum allocation, Kerr-McGee is requesting a 14,400 mg/L TDS limit (expected TDS level plus 20%). The required mixing zone calculations to support this request are included as an appendix to this attachment.

<u>TSS</u>
The TSS limit in the temporary discharge permit issued by NDEP is 135 mg/L, the Water Quality Standard. Kerr-McGee will meet the Water Quality Standard for TSS by application of suitable process technology. The biological system will include a final clarification process to remove biological solids. This system is expected to discharge at TSS levels below the 135 mg/l standard. TSS will not be carried into the mixing zone analysis.

<u>Boron</u>
The anticipated concentration of boron in the treatment plant discharge exceeds the water quality standard of 0.75 mg/l. Although Kerr-McGee currently handles a small amount of boron, we do not believe that this operation could have significantly impacted the quality of the seep, Las Vegas Wash or on-site groundwater. The boron found in the site water is believed to be the background concentration in the groundwater in the area. A sample from an up-gradient well on the Kerr-McGee site contained 4 mg/L boron. Therefore, Kerr-McGee believes that intake credits are appropriate for boron and no permit limitation is necessary.

<u>Iron</u>
The anticipated concentration of iron in the treatment plant discharge is dependent on the need to remove phosphorus to the daily limit of less than 20 pounds. Experience at other industrial facilities indicates that, to achieve the phosphorus limits using iron precipitation technology, iron levels in the discharge may be as high as 10 mg/l. This concentration exceeds the water quality standard of 1.0 mg/l.

Kerr-McGee will minimize the iron level in the discharge, as practical, while achieving required phosphorus levels. Further removing iron from the discharge would require additional neutralization, precipitation, clarification, filtration, and sludge disposal at a cost of several million dollars. Design and implementation of such a system would delay perchlorate remediation.

As an alternative, a mixing zone is being requested for iron, as presented in the Appendix to this document. Based on the mixing zone analysis, the allowable permit limit for iron would be 43.9 mg/l. Kerr-McGee proposes setting the mixing-zone-based treatment plant operating range for iron at 10 mg/l plus a twenty percent variability factor, or 12 mg/l and suggests that NDEP require monitoring of iron levels in the discharge. Since there is no potential to exceed the 43.9 mg/l mixing zone limit, there is no need to incorporate a numerical limit in the permit.

<u>Manganese</u>
Manganese in the discharge is expected to exceed the water quality standard in the wash. Because Kerr-McGee produces manganese dioxide at the facility, there is the potential that Kerr-McGee has impacted the source water. Manganese can be addressed through revision of the standard, high cost manganese removal, or a mixing zone. Kerr-McGee suggests that the mixing zone approach be adopted.

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[2] SNWA, 1998-1999

The water quality standard for manganese is an irrigation standard of 200 µg/l. This standard is based on a 200 µg/l criterion recommendation in the 1972 EPA Criteria Document (Blue Book)[3]. However, in the latest EPA Criteria Document (Gold Book)[4], it is stated that "no specific criterion for manganese in agricultural water is proposed." The Gold Book does state that "in select areas, and where acidophilic crops are cultivated and irrigated, a criterion of 200 ug/l is suggested for consideration." This document also states that "at concentrations of slightly less than 1 mg/l to a few milligrams per liter, manganese may be toxic to plants from irrigation water applied to soils with pH values lower than 6.0. The problem may be rectified by liming soils to increase the pH." It can be concluded that the water quality standard for manganese in the Las Vegas Wash is very conservative. As stated in the Nevada water quality standards regulation (NAC 445A.144), "if the standards are exceeded at a site and are not economically controllable, the commission will review and adjust the standards for the site." While Kerr-McGee believes that the applicable water quality standard (0.2 mg/l irrigation limit) is not economically justified for this site, the effort required to modify the standard would significantly delay issuance of the proposed permit and correspondingly delay perchlorate remediation.

Treatment technologies available for manganese removal include aeration, chemical oxidation, and ion exchange. These technologies can achieve effluent levels of 0.05 mg/l or less in the treatment of drinking water and industrial process waters. However, the processes require several steps, including pH adjustment, chemical addition, precipitation, settling, filtration and solids management. Such equipment would cost several million dollars and would add considerably to the complexity and cost of the perchlorate treatment system. The time required to design such a manganese removal system would also delay construction of the higher volume perchlorate biological treatment plant.

A third alternative is to establish a mixing zone for manganese in the Las Vegas Wash to ensure that the applicable water quality standard is being met beyond the zone of mixing. According to available manganese data[5] on the Las Vegas Wash, the average manganese in the wash is 137 µg/l. On the basis of the mixing zone, the maximum allowable manganese discharge from the treatment plant at the treatment system design flow of 825 gpm is 6.3 mg/l. Kerr-McGee requests a mixing-zone-based limit of 5 mg/l for the proposed perchlorate treatment plant. Application of a mixing zone is appropriate for addressing manganese in the discharge due to high treatment costs and the very low potential for adverse effects of the untreated stream with regard to agricultural use.

<u>Nickel</u>
Bench-scale biological treatability test results show levels of nickel in the effluent above the standard for Las Vegas Wash. Analysis of water feed samples does not show significant levels of nickel and nickel levels added in micronutrients are an order of magnitude below the standard. It is, therefore, likely that the high nickel levels are an artifact of the stainless steel agitators used in the study (some corrosion was observed at the air/water agitator interface). However, to cover the contingency that actual nickel levels from the full-scale biological treatment plant may exceed Wash standards, Kerr-McGee proposes that a mixing zone be approved by NDEP. Based on RPV analysis, no numerical permit level is required.

Removal of nickel from solution would require several steps including pH adjustment, chemical additions, precipitation, settling, filtration and solids management. This would significantly increase the complexity

[3] Water Quality Criteria 1972, EPA-R3-73-033-March 1973
[4] EPA, 1986 Quality Criteria for Water, 1986, EPA 440/5-86-001, May 1, 1986
[5] SNWA, 1998-1999

and cost of the perchlorate treatment system. The time required to conduct necessary nickel removal tests, design a system and initiate construction would likely delay perchlorate remediation.

While it is unlikely that actual nickel levels will exceed Wash standards, Kerr-McGee proposes adoption of a mixing zone as a protective measure. The average nickel concentration in the Las Vegas Wash is 0.0097 mg/l. As noted in the Appendix, mixing zone calculations indicate that up to 18.75 mg/l nickel would be allowed in the discharge. Based on RPV analysis shown in the Appendix, no numerical permit limit is required, but a mixing zone is requested from NDEP.

Total Inorganic Nitrogen

The total inorganic nitrogen (TIN) in the discharge is expected to exceed the water quality standard in the wash. Because the on-site water contains elevated levels of nitrogen, it is likely that Kerr-McGee is to some extent responsible for some of the nitrogen in the discharge. In addition, nutrient nitrogen will be added to the biological treatment system to ensure efficient biological activity. Therefore, TIN should be either removed from the water or addressed through a mixing zone.

The primary treatment technology for removal of TIN (nitrate, nitrite, and ammonia) at the expected concentration is biological treatment, in which ammonia is converted to nitrite, nitrite is converted to nitrate, and nitrate is converted to nitrogen gas. The proposed perchlorate treatment technology includes a biological treatment system, which may remove some of the TIN. However, because of the complex composition of the water to be treated, the objective of the biological treatment is to remove perchlorate. Therefore, additional biological treatment is neither economically feasible nor technically demonstrated for this stream.

A mixing zone for TIN can be established in the Lás Vegas Wash to ensure that the applicable water quality standard is being met beyond the zone of mixing. According to available TIN data[6] on the Las Vegas Wash, the average TIN in the wash is 14.3 mg/l. On this basis, the maximum allowable TIN discharge from the treatment plant at the treatment system design flow of 825 gpm is 576 mg/l. Bench scale test work on blends of feed water resulted in TIN values near 50 mg/l. Kerr-McGee requests a mixing-zone for TIN, but because the RPV does not exceed 576 mg/l, no numerical limit is required. It should be noted that the TIN mixing zone will not replace the 40 pound per day ammonia discharge limit already proposed by NDEP.

Chloride

NDEP requested that, while no standard has been established for chloride in the Las Vegas Wash, Kerr-McGee consider the constituent in this submission. A mixing zone analysis was prepared to address concerns raised by NDEP regarding the Nevada water quality criterion of 1,600 mg/l for chloride. Available data indicate an average Las Vegas Wash concentration of 480 mg/l chloride. The estimated chloride concentration in the Kerr-McGee effluent will vary with feed water sources. Some waters tested in bench scale studies exceed 5,000 mg/l chloride and will result in a similar effluent. The mixing zone calculations indicate an allowable chloride concentration of up to 110,780 mg/l in the Kerr-McGee discharge, well above expected levels. Therefore, it is expected that the 1600 mg/L chloride criterion, while not directly applicable, will be met in the Las Vegas Wash. Kerr-McGee believes it is not necessary to establish a numerical permit limit for chloride since there is no established standard for the Las Vegas Wash.

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[6] SNWA, 1998-1999

Other Parameters

The RPVs of several other parameters in the discharge (indicated in Table B.2) will exceed applicable water quality standards. Some of these compounds are believed to be naturally occurring in the area, including fluoride, copper, molybdenum, and selenium. Since Kerr-McGee's operations have had no impact on these parameters, Kerr-McGee believes that these parameters can be addressed with intake credits, and no permit limitations are necessary. Other parameters that exceed water quality standards are believed to be present as a result of past industrial activities by parties other than Kerr-McGee. These parameters include arsenic, alpha-BHC, beta-BHC, Lindane, Aldrin, Heptachlor epoxide, Dieldrin, 4-4"-DDE, Endrin, 4,4"-DDD, chlordane, and DDT & metabolites. These constituents are to be addressed separately by the Nevada DEP, Bureau of Corrective Actions.

Table B.1
Water Quality Standards Applicable to Las Vegas Wash

Parameter	Units	Minimum WQ Standard	Regulatory Basis for Minimum	Nevada- WQ Standards Applicable to designated Waters						National Toxics Rule		
				Aquatic Life				Irrigation	Livestock	Fresh Acute	Fresh Chronic	Human Hlth (Organisms)
				max	1 hr Avg	24 hr Avg	96 hr Avg					
pH	SU	6.5-9.0	NAC 445A.199	6.5-9.0				6.5-9.0	6.5-9.0			
Total Dissolved Solids	mg/l	1,900	NAC 445A.199	1,900	-	-	-	3,000	3,000			
Total Suspended Solids	mg/l	135	NAC 445A.199	135	-	-	-	-	-			--
Sulfide	ug/l	2	NAC 445A.144	2	-	-	-	-	-			--
Cyanide	ug/l	5.2	NAC 445A.144	-	22	-	5.2	-	-			220000
Fluoride	ug/l	1,000	NAC 445A.144	-	-	-	-	1,000	2,000			
Coliform, Fecal	#/100 ml	narrative 1	NAC 445A.199	narrative 1		-	-					--
Antimony	ug/l	4,300	40 CFR 131.36	-	-	-	-	-	-			4,300
arsenic	ug/l	100	NAC 445A.144	-	-	-	-	100	200			No NTR
Beryllium	ug/l	100	NAC 445A.144	-	-	-	-	100	-			-
Boron	ug/l	750	NAC 445A.144	-	-	-	-	750	5,000			--
Cadmium	ug/l	2.86	NAC 445A.144	-	16	-	2.86	10	50			-
Chromium (Tot.)	ug/l	100	NAC 445A.144	-	-	-	-	100	1,000			--
Chromium (VI)	ug/l	10	NAC 445A.144	-	15	-	10	-	-			-
Copper	ug/l	32.9	NAC 445A.144	-	56	-	32.9	200	500			-
Iron	ug/l	1,000	NAC 445A.144	1,000	-	-	-	5,000	-			
Lead	ug/l	4.6	NAC 445A.144	-	238	-	4.6	5,000	100			-
Manganese	ug/l	200	NAC 445A.144	-	-	-	-	200	-			--
Mercury	ug/l	0.012	NAC 445A.144	-	2	-	0.012	-	10			0.15
Molybdenum	ug/l	19	NAC 445A.144	19	-	-	-	-	-			
Nickel	ug/l	200	NAC 445A.144	-	3,895	-	433	200	-			4,600
Selenium	ug/l	5	NAC 445A.144	-	20	-	5	20	50			-
Silver	ug/l	37.4	NAC 445A.144	37	-	-	-	-	-			-
Thallium	ug/l	6.3	40 CFR 131.36	-	-	-	-	-	-			6.3
Zinc	ug/l	292	NAC 445A.144	-	322	-	292	2,000	25,000			-
Pentachlorophenol	ug/l	13.5	NAC 445A.144	-	21.3	-	13.5	-	-			82
alpha-BHC	ug/l	0.13	40 CFR 131.36									0.13
beta-BHC	ug/l	0.46	40 CFR 131.36									0.46
gamma-BHC (Lindane)	ug/l	0.08	NAC 445A.144	2.00	-	0.08	-	-	-			0.63
Heptachlor	ug/l	0.0021	40 CFR 131.36	0.52	-	0.0038	-	-	-			0.0021

Table B.1
Water Quality Standards Applicable to Las Vegas Wash

Parameter	Units	Minimum WQ Standard	Regulatory Basis for Minimum	Nevada- WQ Standards Applicable to designated Waters						National Toxics Rule		
				Aquatic Life				Irrigation	Livestock	Fresh Acute	Fresh Chronic	Human Hlth (Organisms)
				max	1 hr Avg	24 hr Avg	96 hr Avg					
Aldrin	ug/l	0.0014	40 CFR 131.36	3	-	-	-	-	-			0.0014
Heptachlor Epoxide	ug/l	0.0011	40 CFR 131.36							0.52	0.0038	0.0011
alpha-Endosulfan	ug/l	2	40 CFR 131.36									2
Dieldrin	ug/l	0.0014	40 CFR 131.36	2.5	-	0.0019	-	-	-			0.0014
4-4'-DDE	ug/l	0.0059	40 CFR 131.36									0.0059
Endrin	ug/l	0.0023	NAC 445A.144	0.18	-	0.0023	-	-	-			0.81
beta-Endosulfan	ug/l	2	40 CFR 131.36									2
4-4'-DDD	ug/l	0.0084	40 CFR 131.36									0.0084
Endosulfan Sulfate	ug/l	2	40 CFR 131.36									2
4-4'-DDT	ug/l	0.0059	40 CFR 131.36									0.0059
Methoxychlor	ug/l	0.03	NAC 445A.144	0.03	-	-	-	-	-			
Toxaphene	ug/l	0.0002	NAC 445A.144	-	0.73	-	0.0002	-	-			0.0075
Endrin Aldehyde	ug/l	0.81	40 CFR 131.36									0.81
Aroclor - 1016	ug/l	0.00045	40 CFR 131.36	-	-	0.014	-	-	-			0.00045
Aroclor - 1221	ug/l	0.00045	40 CFR 131.36	-	-	0.014	-	-	-			0.00045
Aroclor - 1232	ug/l	0.00045	40 CFR 131.36	-	-	0.014	-	-	-			0.00045
Aroclor - 1242	ug/l	0.00045	40 CFR 131.36	-	-	0.014	-	-	-			0.00045
Aroclor - 1248	ug/l	0.00045	40 CFR 131.36	-	-	0.014	-	-	-			0.00045
Aroclor - 1254	ug/l	0.00045	40 CFR 131.36	-	-	0.014	-	-	-			0.00045
Aroclor - 1260	ug/l	0.00045	40 CFR 131.36	-	-	0.014						0.00045
Phenol	ug/l	4,600,000	40 CFR 131.36	-	-	-	-	-	-			4,600,000
Bis(2-chloroethyl) ether	ug/l	14	40 CFR 131.36									14
1,3-Dichlorobenzene	ug/l	2,600	40 CFR 131.36	-	-	-	-	-	-			2,600
1,4-Dichlorobenzene	ug/l	2,600	40 CFR 131.36	-	-	-	-	-	-			2,600
1,2-Dichlorobenzene	ug/l	17,000	40 CFR 131.36	-	-	-	-	-	-			17,000
N-nitrosodimethylamine	ug/l	81	40 CFR 131.36									81
Hexachloroethane	ug/l	89	40 CFR 131.36									89
Nitrobenzene	ug/l	1,900	40 CFR 131.36	-	-	-	-	-	-			1,900
Isophorone	ug/l	6,000	40 CFR 131.36	-	-	-	-	-	-			6,000
2,4 - Dichlorophenol	ug/l	790	40 CFR 131.36	-								790

Table B.1
Water Quality Standards Applicable to Las Vegas Wash

Parameter	Units	Minimum WQ Standard	Regulatory Basis for Minimum	Nevada- WQ Standards Applicable to designated Waters: Aquatic Life max	Aquatic Life 1 hr Avg	Aquatic Life 24 hr Avg	Aquatic Life 96 hr Avg	Irrigation	Livestock	National Toxics Rule: Fresh Acute	Fresh Chronic	Human Hlth (Organisms)
Hexachlorobutadiene	ug/l	500	40 CFR 131.36									500
Hexachlorocyclo-pentadiene	ug/l	17,000	40 CFR 131.36	-	-	-	-	-	-			17,000
Dimethyl Phthalate	ug/l	2,900,000	40 CFR 131.36	-	-	-	-	-	-			2,900,000
Bromomethane	ug/l	4,000	40 CFR 131.36									4,000
Vinyl Chloride	ug/l	5,250	40 CFR 131.36	-	-	-	-	-	-			5,250
1,1- Dichloroeth(yl)ene	ug/l	32	40 CFR 131.36	-	-	-	-	-	-			32
Chloroform	ug/l	4,700	40 CFR 131.36									4,700
1,2 - Dichloroethane	ug/l	990	40 CFR 131.36	-	-	-	-	-	-			990
Carbon Tetrachloride	ug/l	44	40 CFR 131.36	-	-	-	-	-	-			44
Bromodichloromethane	ug/l	220	40 CFR 131.36									220
1,1,2,2, - Tetrachloroethane	ug/l	110	40 CFR 131.36									110
Trichloroethylene	ug/l	810	40 CFR 131.36	-	-	-	-	-	-			810
Dibromochloromethane	ug/l	340	40 CFR 131.36									340
1,1,2 - Trichloroethane	ug/l	420	40 CFR 131.36									420
Benzene	ug/l	710	40 CFR 131.36	-	-	-	-	-	-			710
1,3 -Dichloropropylene	ug/l	1,700	40 CFR 131.36	-								1,700
Bromoform	ug/l	3,600	40 CFR 131.36									3,600
Tetrachloroethylene	ug/l	89	40 CFR 131.36									89
Toluene	ug/l	200,000	40 CFR 131.36	-	-	-	-	-	-			200,000
Chlorobenzene or Monochlorobenzer	ug/l	21,000	40 CFR 131.36	-	-	-	-	-	-			21,000
Ethylbenzene	ug/l	29,000	40 CFR 131.36	-	-	-	-	-	-			29,000
2,3,7,8-TCDD (Dioxin)	ug/l	1.4E-07	40 CFR 131.36									0.00000014
2,4 - Dinitrophenol	ug/l	14,000	40 CFR 131.36	-								14,000
2,4-Dinitrotoluene	ug/l	91	40 CFR 131.36									91
Diethyl Phthalate	ug/l	120,000	40 CFR 131.36	-	-	-	-	-	-			120,000
Fluorene	ug/l	14,000	40 CFR 131.36									14,000
4,6-Dinitro-2-Methylphenol	ug/l	765	40 CFR 131.36	-	-	-	-	-	-			765
N-Nitrosodiphenylamine	ug/l	160	40 CFR 131.36									160
Hexachlorobenzene	ug/l	0.0077	40 CFR 131.36									0.0077
Anthracene	ug/l	110,000	40 CFR 131.36									110,000

Table B.1
Water Quality Standards Applicable to Las Vegas Wash

Parameter	Units	Minimum WQ Standard	Regulatory Basis for Minimum	Nevada- WQ Standards Applicable to designated Waters: Aquatic Life, max	Aquatic Life, 1 hr Avg	Aquatic Life, 24 hr Avg	Aquatic Life, 96 hr Avg	Irrigation	Livestock	National Toxics Rule: Fresh Acute	Fresh Chronic	Human Hlth (Organisms)
Di-n-butyl Phthalate	ug/l	12,000	40 CFR 131.36	-								12,000
Fluoranthene	ug/l	370	40 CFR 131.36	-	-	-	-	-	-			370
Pyrene	ug/l	11,000	40 CFR 131.36									11,000
3,3'-Dichlorobenzidine	ug/l	0.77	40 CFR 131.36									0.77
Benzo(a)anthracene	ug/l	0.31	40 CFR 131.36									0.31
Bis(2-ethylhexyl)phthalate	ug/l	59	40 CFR 131.36	-	-	-	-	-	-			59
Chrysene	ug/l	0.31	40 CFR 131.36									0.31
Benzo(b)fluoranthene	ug/l	0.31	40 CFR 131.36									0.31
Benzo(k)fluoranthene	ug/l	0.31	40 CFR 131.36									0.31
Benzo(a)pyrene	ug/l	0.31	40 CFR 131.36									0.31
Indeno (1,2,3-cd) pyrene	ug/l	0.31	40 CFR 131.36									0.31
Dibenzo(a,h)anthracene	ug/l	0.31	40 CFR 131.36									0.31
Bis(2-chloroisopropyl) ether	ug/l	170,000	40 CFR 131.36	-	-	-	-	-	-			170,000
Mirex	ug/l	0.001	NAC 445A.144	0.001	-	-	-	-	-			
Guthion	ug/l	0.01	NAC 445A.144	0.01	-	-	-	-	-			
Malathion	ug/l	0.1	NAC 445A.144	0.1	-	-	-	-	-			
Acrolein	ug/l	780.0000	40 CFR 131.36	-	-	-	-	-	-			780.0000
Acrylonitrile	ug/l	6.6	40 CFR 131.36									6.6
Benzidine	ug/l	0.0054	40 CFR 131.36									0.0054
1,2 - Diphenylhydrazine	ug/l	5.4	40 CFR 131.36									5.4
Chlordane	ug/l	0.0043	NAC 445A.144	2.4	-	0.0043	-	-	-			0.0059
Arsenic III	ug/l	180	NAC 445A.144		342	-	180					
Chromium (III)	ug/l	548	NAC 445A.144	-	4,594	-	548	-	-			-
DDT & metabolites	ug/l	0.001	NAC 445A.144	1.1	-	0.001	-	-	-			
Demeton	ug/l	0.1	NAC 445A.144	0.1	-	-	-	-	-			
endosulfan	ug/l	0.056	NAC 445A.144	0.22	-	0.056	-	-	-			
Chlorodibromomethane	ug/l	340.0	40 CFR 131.36									340
Dichlorobromomethane	ug/l	220.0	40 CFR 131.36									220
Methyl bromide	ug/l	4000.0	40 CFR 131.36									4,000
2,4,6-Trichlorophenol	ug/l	65	40 CFR 131.36									65

Table B.1
Water Quality Standards Applicable to Las Vegas Wash

Parameter	Units	Minimum WQ Standard	Regulatory Basis for Minimum	Nevada- WQ Standards Applicable to designated Waters: Aquatic Life				Irrigation	Livestock	National Toxics Rule: Fresh Acute	Fresh Chronic	Human Hlth (Organisms)
				max	1 hr Avg	24 hr Avg	96 hr Avg					
NO3+NO2+NH3 (Total Inorganic N)	mg/l	20	NAC 445A.199	20								--
Nitrate (NO3) (mg/L)	mg/l	100	NAC 445A.199		-	-	-	-	100			
2-Methyl-4,6-Dinitrophenol	ug/l	765.0	40 CFR 131.36									765
Parathion	ug/l	0.013	NAC 445A.144	-	0.065	-	0.013	-	-			
Nitrite (NO2) (mg/L)	mg/l	10	NAC 445A.199	-	-	-	-	-	10			--
PCBs, Total	ug/l	0.014	NAC 445A.144	-	-	0.014	-	-	-			

Notes:

1 Any discharge from a point source into the Las Vegas Wash must not exceed a log mean of 200 per 100 ml based on a minimum of not less than 5 samples taken over a 30-day period, nor may more than 10% of the total samples taken during any 30-day period exceed 400 per 100 ml.

2 Propagation of aquatic life, excluding fish, Propagation of wildlife, irrigation & watering of livestock.

-- No standard criteria available.

* Hardness adjusted, assuming hardness of > 400mg/L CaCO3

Table B.2
Source Water, Discharge, and Potential-to-Exceed Analyses For Parameters with Applicable Water Quality Standards

Parameter	units	Seep Lancaster 05/21/99	Seep Grab Lancaster 09/14/99	Seep Grab NEL 09/14/99	Onsite Water Lancaster 01/20/00	Onsite Water NEL 01/20/00	Maximum in Seep/Onsite Water Mixture	Estimated Quality of Biotreatment Effluent	Water Quality Standard***	Potential to Exceed WQ Std?
pH	SU	7.85	7.34	7.56	7.6	7.46	7.83	6.5-9.0	6.5-9.0	
ClO4 (Perchlorate)	mg/l	100				1600	236	3	-	
Total Dissolved Solids	mg/l	7300				11700	7,700	12,000	1900	YES
Total Suspended Solids	mg/l		3.7 <	13.2	51 J	43.2	17	<135	135	YES
Sulfide	mg/l		0.009 <	ND	0.15	0.011 <	0.02 <		0.002	
Cyanide	mg/l	0.004 <	0.004 <	ND	0.004 <	0.0064 <	0.004 <		0.0052	
Fluoride	mg/l		1.45	1.6	0.98	0.93	1.54		1	Background
Antimony	mg/l	0.025 <	0.25 <	ND	0.029 <	0.0009 J	0.23 <		4.3	
Arsenic	mg/l	0.103	0.115		0.005 <	0.0038 J	0.11		0.1	Others
Beryllium	mg/l	0.0017 <	0.00079 <	ND	0.0011 <	0.00034 J	0.002 <		0.1	
Boron	mg/l			3.6	13.2	13	4.47		0.75	Background
Cadmium	mg/l	0.0017 <	0.00063 <	ND	0.00081 <	0.00169 <	0.002 <		0.0029	
Chromium (Tot.)	mg/l	0.0054 <	0.0054 <	ND	0.666	0.49	0.065	0.050	0.1	
Chromium (VI)	mg/l	0.003 <				0.01 <	0.004 <		0.01	
Copper	mg/l	0.0058 <	0.0058 <	0.0081	0.0035 <	0.0054	0.008		0.033	Background
Iron	mg/l	0.016 <	0.016 <	ND	2.57	3.7	0.35	10	1	YES
Lead	mg/l	0.0065 <	0.023 <	ND	0.025 <	0.00056 <	0.02 <		0.005	
Manganese	mg/l	0.946	1.68	1.8	0.297	0.33	1.67		0.2	YES
Mercury	mg/l	4.2E-05 <	4.2E-05 <	ND	0.0001 <	0.00007 <	0.00005 <		0.000012	
Molybdenum	mg/l		0.112	0.12	0.045 J	0.042	0.11		0.019	Background
Nickel	mg/l	0.0152 J	0.0155	ND	0.006	0.01 <	0.02	0.51**	0.2	YES
Selenium	mg/l	0.011	0.008 J	ND	0.0083 J	0.0059	0.011		0.005	Background
Silver	mg/l	0.0057 <	0.0014 <	ND	0.0017 J	0.0012 <	0.01 <		0.037	
Thallium	mg/l	0.0097 <	0.0097 <	ND	0.0092 <	0.0006 J	0.01 <		0.0063	
Zinc	mg/l	0.003 <	0.003 <	ND	0.0076 J	0.0036 <	0.003 <		0.29	
Pentachlorophenol	ug/l	0.017 J					0.02		13.5	
alpha-BHC	ug/l	0.664	0.69	0.92	0.106	0.14	0.85		0.13	Others
beta-BHC	ug/l	0.249	0.372	0.3	0.0011 <	0.029 <	0.34		0.46	Others
gamma-BHC (Lindane)	ug/l	0.0052 J	0.0511		0.0196	0.06 J	0.05		0.08	Others
Heptachlor	ug/l	0.0019 <	0.0016 <	ND	0.0015 <	0.033 <	0.005 <		0.0021	
Aldrin	ug/l	0.0026 J	0.0155	ND	0.0061 <	0.03 <	0.02		0.0014	Others
Heptachlor Epoxide	ug/l	0.0044 J	0.00181 J	ND	0.00096 <	0.028 <	0.01		0.0011	Others
alpha-Endosulfan	ug/l	0.0019 <	0.002 <	ND	0.0019 <	0.032 <	0.005 <		2	
Dieldrin	ug/l	0.0039 <	0.00099 <	ND	0.00096 <	0.026 <	0.01		0.0014	Others
4-4'-DDE	ug/l	0.0073 J	0.00099 <	ND	0.00096 <	0.029 <	0.01		0.0059	Others
Endrin	ug/l	0.0042 J	0.007 <	ND	0.0068 <	0.022 <	0.01		0.0023	Others
beta-Endosulfan	ug/l	0.0039 <	0.0048 <	ND	0.0047 <	0.024 <	0.01 <		2	

Table B.2
Source Water, Discharge, and Potential-to-Exceed Analyses For Parameters with Applicable Water Quality Standards

Parameter	units	Seep Lancaster 05/21/99	Seep Grab Lancaster 09/14/99	Seep Grab NEL 09/14/99	Onsite Water Lancaster 01/20/00	Onsite Water NEL 01/20/00	Maximum In Seep/Onsite Water Mixture	Estimated Quality of Biotreatment Effluent	Water Quality Standard***	Potential to Exceed WQ Std?
4-4'-DDD	ug/l	0.0114 J	0.0047 <	ND	0.00046 <	0.018 <	0.01		0.0084	Others
Endosulfan Sulfate	ug/l	0.0039 <	0.003 <	ND	0.0029 <	0.1 <	0.01 <		2	
4-4'-DDT	ug/l	0.0039 <	0.0089 <	ND	0.00086 <	0.027 <	0.01 <		0.0059	
Methoxychlor	ug/l	0.019 <	0.02 <	ND	0.02 <	0.029 <	0.02 <		0.03	
Toxaphene	ug/l	0.19 <	0.3 <	ND	0.29 <	0.1 <	0.30 <		0.0002	
Endrin Aldehyde	ug/l	0.0039 <	0.0047 <	ND	0.0046 <	0.027 <	0.01 <		0.81	
Aroclor - 1016	ug/l	0.097 <	0.043 <	ND	0.041 <	0.54 <	0.14 <		0.00045	
Aroclor - 1221	ug/l	0.097 <	0.12 <	ND	0.12 <	0.44 <	0.15 <		0.00045	
Aroclor - 1232	ug/l	0.097 <	0.047 <	ND	0.046 <	0.054 <	0.09 <		0.00045	
Aroclor - 1242	ug/l	0.097 <	0.099 <	ND	0.096 <	0.27 <	0.11 <		0.00045	
Aroclor - 1248	ug/l	0.097 <	0.038 <	ND	0.037 <	0.2 <	0.11 <		0.00045	
Aroclor - 1254	ug/l	0.097 <	0.14 <	ND	0.13 <	0.13 <	0.14 <		0.00045	
Aroclor - 1260	ug/l	0.097 <	0.036 <	ND	0.035 <	0.34 <	0.12 <		0.00045	
Phenol	ug/l	1 <	0.3 <	ND	0.3 <	5 <	1.36 <		4600000	
Bis(2-chloroethyl) ether	ug/l	1 <	0.2 <	ND	0.2 <	5 <	1.36 <		14	
1,3-Dichlorobenzene	ug/l	1 <	0.5 J	ND	0.3 J	0.99 <	1.00		2600	
1,4-Dichlorobenzene	ug/l	1 <	0.7 J	ND	0.5 J	1.16 <	1.01		2600	
1,2-Dichlorobenzene	ug/l	1 <	0.6 J	ND	0.8 J	0.8 <	0.98		17000	
N-nitrosodimethylamine	ug/l		0.3 <	ND		5 <	0.73 <		81	
Hexachloroethane	ug/l	1 <	0.4 <	ND	0.4 <	5 <	1.36 <		89	
Nitrobenzene	ug/l	1 <	0.7 <	ND	0.7 <	5 <	1.36 <		1900	
Isophorone	ug/l	1 <	0.1 <	ND	0.09 <	5 <	1.36 <		6000	
2,4 - Dichlorophenol	ug/l	1 <	0.4 <	ND	0.4 <	5 <	1.36 <		790	
Hexachlorobutadiene	ug/l	2 <	0.8 <	ND	0.8 <	5 <	2.27 <		500	
Hexachlorocyclo-pentadiene	ug/l	5 <	1 <	ND	0.9 <	5 <	5.00 <		17000	
Dimethyl Phthalate	ug/l	2 <	0.2 <	ND	0.2 <	5 <	2.27 <		2900000	
Bromomethane	ug/l	3 <	3 <	ND	3 <	0.56 <	3.00 <		4000	
Vinyl Chloride	ug/l	2 <	2 <	ND	2 <	0.5 <	2.00 <		5250	
1,1- Dichloroeth(yl)ene	ug/l	1 <	0.9 <	ND	0.9 <	1.02 <	1.00 <		32	
Chloroform	ug/l	1 <	1 <	ND	430	390 D	40.00		4700	
1,2 - Dichloroethane	ug/l	2 <	2 <	ND	2 <	0.5 <	2.00 <		990	
Carbon Tetrachloride	ug/l	1 <	1 <	ND	1 <	0.8 <	1.00 <		44	
Bromodichloromethane	ug/l	1 <	0.7 <	ND	1 J	1.4 J	1.04		220	
1,1,2,2, - Tetrachloroethane	ug/l	2 <	1 <	ND	1 <	0.58 <	1.91 <		110	
Trichloroethylene	ug/l	1 <	1 <	ND	1 <	0.5 <	1.00 <		810	
Dibromochloromethane	ug/l	2 <	2 <	ND	2 <	0.6 <	2.00 <		340	
1,1,2 - Trichloroethane	ug/l	2 <	2 <	ND	2 <	0.59 <	2.00 <		420	
Benzene	ug/l	1 <	1 <	ND	1 <	0.64 <	1.00 <		710	

Table B.2
Source Water, Discharge, and Potential-to-Exceed Analyses For Parameters with Applicable Water Quality Standards

Parameter	units	Seep Lancaster 05/21/99	Seep Grab Lancaster 09/14/99	Seep Grab NEL 09/14/99	Onsite Water Lancaster 01/20/00	Onsite Water NEL 01/20/00	Maximum in Seep/Onsite Water Mixture	Estimated Quality of Biotreatment Effluent	Water Quality Standard***	Potential to Exceed WQ Std?
1,3 -Dichloropropylene	ug/l	1 <	1 <	ND		0.71 <	0.97 <		1700	
Bromoform	ug/l	1 <	0.8 <	ND	0.8 <	1.1 J	1.01		3600	
Tetrachloroethylene	ug/l	1 <	1 <	ND	1 <	0.8 <	1.00 <		88.5	
Toluene	ug/l	2 <	2 <	ND	2 <	1.2 J	2.00		200000	
Chlorobenzene or Monochlorobenzene	ug/l	1 <	0.8 <	ND	0.8 <	0.7 <	0.98 <		21000	
Ethylbenzene	ug/l	2 <	2 <	ND	2 <	0.57 <	2.00 <		29000	
2,3,7,8-TCDD (Dioxin)	ug/l			ND			- <		0.00000014	
2,4 - Dinitrophenol	ug/l	14 <	20 <	ND	19 <	5 <	19.91 <		14000	
2,4-Dinitrotoluene	ug/l	1 <	0.4 <	ND	0.4 <	5 <	1.36 <		91	
Diethyl Phthalate	ug/l	2 <	0.5 <	ND	0.5 <	5 <	2.27 <		120000	
Fluorene	ug/l	1 <	0.3 <	ND	0.3 <	5 <	1.36 <		14000	
4,6-Dinitro-2-Methylphenol	ug/l	5 <	0.6 <	ND	0.6 <	5 <	5.00 <		765	
N-Nitrosodiphenylamine	ug/l	1 <*	0.3 <*	ND	0.3 <	5 <	1.36 <		160	
Hexachlorobenzene	ug/l	2 <	2 <	ND	2 <	5 <	2.27 <		0.0077	
Pentachlorophenol	ug/l	3 <	2 <	ND	2 <	5 <	3.18 <		13.5	
Anthracene	ug/l	1 <	0.2 <	ND	0.2 <	5 <	1.36 <		110000	
Di-n-butyl Phthalate	ug/l	2 <	0.7 <	ND	0.7 <	5 <	2.27 <		12000	
Fluoranthene	ug/l	1 <	0.2 <	ND	0.2 <	5 <	1.36 <		370	
Pyrene	ug/l	1 <	0.3 <	ND	0.3 <	5 <	1.36 <		11000	
3,3'-Dichlorobenzidine	ug/l	2 <	0.6 <	ND	0.6 <	5 <	2.27 <		0.77	
Benzo(a)anthracene	ug/l	1 <	0.3 <	ND	0.3 <	5 <	1.36 <		0.31	
ethylhexyl)phthalate or di-2-Ethylhexyl ph	ug/l	2 <	0.6 <	ND	0.6 <	5 <	2.27 <		59	
Chrysene	ug/l	1 <	0.3 <	ND	0.3 <	5 <	1.36 <		0.31	
Benzo(b)fluoranthene	ug/l	1 <	0.3 <	ND	0.3 <	5 <	1.36 <		0.31	
Benzo(k)fluoranthene	ug/l	1 <	0.5 <	ND	0.5 <	5 <	1.36 <		0.31	
Benzo(a)pyrene	ug/l	1 <	0.2 <	ND	0.2 <	5 <	1.36 <		0.31	
Indeno (1,2,3-cd) pyrene	ug/l	1 <	2 <	ND	0.4 <	5 <	2.27 <		0.31	
Dibenzo(a,h)anthracene	ug/l	1 <	0.5 <	ND	0.5 <	5 <	1.36 <		0.31	
Bis(2-chloroisopropyl) ether	ug/l		0.3 <	ND	0.3 <	5 <	0.73 <		170000	
1,2-Dichlorobenzene (oDCB)	ug/l			ND		5 <	0.45 <		17000	
1,3-Dichlorobenzene (mDCB)	ug/l			ND		5 <	0.45 <		2600	
1,4-Dichlorobenzene (pDCB)	ug/l			ND		5 <	0.45 <		17000	
Mirex	ug/l		0.01 <		0.01 <		0.01 <		0.001	
Guthion	ug/l		0.2 <	ND	0.19 <	0.3 <	0.21 <		0.01	
Malathion	ug/l		0.2 <	ND	0.19 <	0.3 <	0.21 <		0.1	
Acrolein	ug/l		40 <				36.36 <		780	
Acrylonitrile	ug/l		10 <				9.09 <		6.6	
Benzidine	ug/l				8 <		0.73 <		0.0054	

Table B.2
Source Water, Discharge, and Potential-to-Exceed Analyses For Parameters with Applicable Water Quality Standards

Parameter	units	Seep Lancaster 05/21/99		Seep Grab Lancaster 09/14/99		Seep Grab NEL 09/14/99	Onsite Water Lancaster 01/20/00	Onsite Water NEL 01/20/00	Maximum in Seep/Onsite Water Mixture		Estimated Quality of Biotreatment Effluent	Water Quality Standard***	Potential to Exceed WQ Std?
Benzidine	ug/l								-			0.0054	
1,2 - Diphenylhydrazine	ug/l			0.0029	<				0.003	<		5.4	
Chlordane (alpha+gamma)	ug/l	0.0044							0.004			0.0043	Others
DDT & metabolites (DDD+DDE+DDT)	ug/l	0.0226		0.01459			0.00228	0.074	0.03			0.001	Others
Demeton (O+S)	ug/l							0.4	0.04	<		0.1	
Parathion (ethyl+methyl)	ug/l			0.2			0.19	0.6	0.24	<		0.013	
PCBs, Total	ug/l	0.679		0.523			0.505	1.974	0.80	<		0.014	
Total Inorganic Nitrogen(NO2+NO3+NH3	mg/l	6.98		8.15		8.5	62.2	63	13.45		50	20	YES

Shaded lines are based on the sum of individual parameters.

An * in the qualifier column indicates a note in the laboratory report.

**source of nickel is unknown. Where no value is shown, use seep/onsite mix column.

*** decimal place adjusted as necessary to match units reported by laboratory.

Appendix to Attachment B
Mixing Zone Analysis and Application
Calculation of Water Quality-Based Permit Limits

1.0 Introduction

This section constitutes the mixing zone application for the Kerr-McGee discharge. As required by NAC 445A.296, this application includes a description of the current conditions and the proposed zone of mixing, a demonstration that no violation of water quality standards will occur and that the designated uses of the water will not be affected, and identification of the parameters for which a zone of mixing is requested. These requirements are addressed in this document, as discussed below.

As discussed in the main text of this document, a mixing zone is being considered for those parameters for which:
- Kerr-McGee may be responsible for at least a portion of the mass in the treatment system discharge.
- The RPV exceeds the applicable water quality standard, and
- Treatment cannot be economically justified

The parameters that meet these criteria are Total Dissolved Solids (TDS), iron, manganese, nickel, and Total Inorganic Nitrogen (TIN). Other parameters that are either at natural background levels or are present as a result of the actions of other parties are being addressed through intake credits and/or separate NDEP actions.

2.0 Procedures

The procedures used in the mixing zone calculations involve:
- estimation of proposed discharge quality, and determination of the potential for specific parameters to exceed respective water quality standards at the end of pipe,
- determination of the available capacity in the receiving stream to handle additional loads of specific parameters, based on the receiving water low flow and estimated receiving water quality; and
- identification of the parameters for which a mixing zone is being requested.

For those parameters with the potential to exceed water quality standards *after* mixing in the receiving stream, numerical permit limits must be developed. If there is no potential to exceed water quality standards *after* mixing in the receiving stream, then only monitoring for that parameter is required. The details and results of each step are described below.

2.1 Discharge Characteristics and Reasonable Potential Analysis

2.1.1 Procedure

As presented in Attachment B, reasonable potential analysis is an evaluation of whether a discharge has a reasonable potential to cause or contribute to an excursion above an applicable water quality standard. If the reasonable potential values of undiluted effluent concentrations do not exceed the standard, then neither a mixing zone nor a permit limitation is required for that parameter.

EPA guidance (EPA, 1991) was used to calculate the reasonable potential value (RPV) of effluent concentrations of specific parameters. If only a single data point is available, the RPV is determined by multiplying the measured concentration value by a factor of 9.1. If the resulting RPV exceeds the applicable water quality standard, then the discharge is considered to have the potential to exceed the water quality standard, and a permit limit or mixing zone application is needed. All other parameters (those with RPV below the applicable water quality standard) were judged to be of no concern with this mixing zone application and were not considered further.

As discussed above, the parameters addressed in this analysis include those for which Kerr-McGee may be responsible for at least a portion of the mass in the treatment system discharge, i.e. TDS, iron, manganese, nickel, and TIN. Effluent concentrations of these parameters were estimated based on analyses of the raw water sources, mass balance of the combined sources, and the expected effect of the treatment system on discharge quality. Each parameter was then evaluated for the potential to exceed applicable standards using the methodology described above. Those parameters with the potential to exceed standards were considered further in this mixing zone evaluation.

2.1.2 Results of Reasonable Potential Analysis

A summary of the results of the reasonable potential analysis for constituents for which Kerr-McGee is responsible is presented in Table MZ.1.

Table MZ.1
Reasonable Potential Analysis
Constituents with Potential to Exceed

Parameter	Water Quality Standard, mg/l	Estimated Long-Term Average Discharge Concentration*, mg/l
Total Dissolved Solids	1,900	12,000
Iron	1.0	10
Manganese	0.200	1.7
Nickel	0.2	Possibly 0.51
Total Inorganic Nitrogen	20	50

* Daily fluctuations will require higher limits.

A mixing zone will be considered for TDS, iron, manganese, nickel, and TIN.

2.2 Receiving Water Characteristics

This section discusses the characteristics of the receiving water, the Las Vegas Wash.

2.2.1 Receiving Water Flow

Per EPA guidance (EPA, 1991), water quality standards should protect water quality for designated uses in critical low-flow situations. For a mixing zone analysis, a 7Q10 flow (7-day low flow with a 10-year recurrence) is typically used for the receiving stream. However, in the case of Las Vegas Wash, the receiving water dry weather flow is directly related to the discharges of the three municipal wastewater treatment plants upstream of the seep. The three POTWs that discharge to the Las Vegas Wash are the City of Las Vegas, Clark County Sanitation District, and the City of Henderson. Table MZ.2 provides a summary of plant flows for 1995 (Southwest Wetlands Consortium, undated). As there are no known stream gauging stations near the seep, the Las Vegas wash flows were estimated based on the 1995 POTW influent low flows, adjusted for 5% growth per year (the population growth from 1996 through 1998) (Nevada Development Authority). On this basis, the expected low flow in the wash from the POTW discharges is estimated to be 113 mgd. There are other dry weather flows discharging to the Las Vegas Wash. These other sources include Las Vegas Creek, Western Tributary, Flamingo Wash, and Duck Creek. Typical dry weather flows were estimated to be 22 mgd (1994 data in SWC). Flamingo Wash, at a typical flow of 25 cfs, is the largest source in this group. Historical data for Flamingo Wash include a low flow of 4.7 cfs (USGS 1999), or 19% of the typical flow. Therefore, the low flow contribution from these sources was estimated to be 19% of 22 mgd, or 4 mgd.

The total estimated low flow in the Las Vegas Wash in the mixing zone area is 117 mgd. This value was used in the mixing zone calculations for this application.

Table MZ.2
Discharge Flows to the Las Vegas Wash

Source	Minimum	Maximum	Average
City of Las Vegas *	44.39	52.36	47.87
Clark County Sanitation District *	39.44	67.09	61.96
City of Henderson *	8.99	11.04	9.86
Total	92.82	130.49	119.69
Update to 1999 (5% growth per year)	112.8	158.6	145.5
Las Vegas Creek **	0.1		0.6
Western Tributary **	0.5		2.6
Flamingo Wash **	3.0		16.2
Duck Creek **	0.3		1.6
Total	3.9		
Grand Total	117		

* 1995 data

** 1991-1995 data, minimum flow based upon Flamingo Wash historical minimum

All data from SNWA references

2.2.2 Receiving Water Quality

Kerr-McGee received Las Vegas Wash monitoring data for June 1998 through August 1999 from the Southern Nevada Water Authority (SNWA, 1999). These data for the parameters being addressed are summarized in Table MZ.3. No supporting documentation is available on this data set regarding the location of the samples, type of sample, flow conditions, sample handling, or laboratory QA/QC. Therefore, these data are being used as an indication of conditions in the Las Vegas Wash. Any conclusions drawn based on these data must be considered with these limitations. Kerr-McGee samples of up- and down-gradient water from the Las Vegas Wash are being collected as required in the temporary discharge permit and are expected to continue with issuance of a permanent NPDES permit. As the database is built up, assumptions made based on SNWA data can be verified.

Table MZ.3
Las Vegas Wash Background Concentrations
For Parameters Evaluated

Parameter	Las Vegas Wash Background Concentration, mg/l
TDS	1757
Iron	0.56[7]
Manganese	0.137
Nickel	0.0097
Total Inorganic Nitrogen (sum of nitrite, nitrate and ammonia nitrogen)	14.3

For this evaluation, it was conservatively assumed that these data represent the quality of the Las Vegas Wash upstream of the seep. That is, the ongoing impact of the seep on the quality of the Wash is not reflected in these samples.

2.3 Determination of available capacity in the Las Vegas Wash

2.3.1 Wasteload Allocation (WLA)

The WLA is the portion of a receiving water's allowable load of a parameter that is allocated to a point source, such as the Kerr-McGee treatment facility. The WLA is determined based on the background concentrations of the parameter and the amount of the remaining capacity that can be consumed by the point source. For the Kerr-McGee discharge, it is assumed that the entire remaining capacity of the receiving stream is available, though requested permit limits may not consume the entire available capacity.

The wasteload allocation for each parameter was calculated using the following steps (See Table MZ.4):

1. The total allowable load (in pounds) of a parameter in the Las Vegas Wash was calculated by multiplying the total flow (the assumed low flow of 117 mgd, assumed to include the treatment system flow of 1.2 mgd) by the water quality standard.
2. The allowable load that is available for new discharges was calculated by:

[7] In the SNWA data, a value of 31.8 mg/l in September 1998 was considered to be an anomaly and was dropped from the data set for calculation of the average iron concentration in Las Vegas Wash.

a. determining the existing load in the Las Vegas Wash by multiplying the low flow (117 mgd) by the available average concentration.
b. subtracting this existing load from the allowable load (step 1 above).

This value is the amount (mass) of a parameter that can be discharged from the treatment system, and is the wasteload allocation, or WLA. The WLA can be converted to a concentration, assuming a continuous treatment plant flow of 825 gpm, or 1.2 mgd.

For each of the parameters considered for a mixing zone, it was determined that a WLA is available, meaning that the mixing zone approach is viable.

Table MZ.4
WLA Calculations

Parameter	Water Quality Standard, mg/l	Allowable Load in Wash, lb/day	Background Concentration, mg/l	Background Load, lb/day	Allowable Load in Discharge = WLA, lb/day	Maximum Allowable Concentration based WLA @ 825 gpm, mg/l
TDS	1900	1,853,982	1,757	1,697,037	156,945	15,840
Iron	1	976	0.56	541	435	43.9
Manganese	0.2	195	0.137	132	63	6.3
Nickel	0.2	195	0.0097	9	186	18.8
TIN	20	19,516	14	13,812	5,704	576

2.4 Calculation of Permit Limits

As discussed previously, the reasonable potential values (RPVs) for the concentrations of each parameter requiring a mixing zone were determined by multiplying the maximum estimated discharge value by a statistical factor of 9.1, per EPA guidance (EPA, 1991). In this step, these values were compared to the respective concentration-based WLAs. When the RPV exceeded the WLA, the need for a water-quality-based permit limit was noted. Table MZ.5 indicates the parameters for which a permit limit is required. All other parameters do not require permit limits because there is no potential for the discharge to cause an exceedance of water quality standards after mixing.

Table MZ.5
Determination of Need for Permit Limits

Parameter	Concentration-based WLA, mg/l	Long-Term Average Estimated Discharge Concentration, mg/l	Numerical Permit Limit Required?	Proposed Permit Limit, mg/l (See Text)
TDS	15,840	12,000*	Yes	14,400
Iron	43.9	10*	No	-
Manganese	6.3	1.7	Yes	5
Nickel	18.8	0.51	No	-
TIN	576	50	No	-

* Based on engineering design, RPV factor of 9.1was not applied.

3.0 Summary

3.1 Parameters for Which a Mixing Zone is Requested

Based on the available data for the Las Vegas Wash and the potential Kerr-McGee discharges, a mixing zone is requested for the following parameters:

- TDS
- Iron
- Manganese
- Nickel
- Total Inorganic Nitrogen (nitrite + nitrate + ammonia nitrogen)

3.2 Proposed Numerical Limits

Based on the procedures provided by EPA (EPA 1991), proposed numerical limits for parameters with the potential to exceed water quality standards after mixing in the Las Vegas Wash are shown in Table MZ.6:

Table MZ.6
Proposed Permit Limits

Parameter	Proposed Permit Limit, mg/l
TDS, mg/L	14,400
Manganese	5

References

EPA, 1991. Technical Support Document for Water Quality-Based Toxics Control, EPA/505/2-90-001, March 19991.

Southwest Wetlands Consortium, "Final Program Environmental Impact Statement, Clark County Wetlands Park, Clark County, Nevada", undated.

USGS website for Gaging Station 094196783, 1999
http://wwwnv.wr.usgs.gov/rt-cgi/gen_stn_pg?station=094196783

Nevada Development Authority website, http://www.nevadadevelopment.org/pop.cfm, accesses 11/17/99.

SNWA, Las Vegas Wash Monitoring, June 98 - August 99.

ATTACHMENT C

On-Site Analytical Data

Attachment C

Analytical Data from the Kerr-McGee On-Site Groundwater Treatment System

(Data for Constituents with Established Standards for Las Vegas Wash are also reported on Table B.2 of Attachment B. Samples were analyzed by Lancaster and NEL Laboratories)

Laboratory Date Collected	Plant GWTS Lancaster 1/20/00	Plant GWTS NEL 1/20/00
Constituent		
pH	7.6	7.46
ClO4, mg/L, Avg		1600
TDS, mg/L		11700
TSS, mg/L	51 J	43.2
TOC, mg/L	4.9	5.1
TON, mg/L	1 <	
SO4,(sulfate) mg/L	1710	4300
Sulfide, mg/L	0.15	0.011 <
Sulfite, mg/l	0.94 <	
Tot Phosphorus, mg/L	0.04 <	0.0085 <
Total Cyanide, mg/L	0.004 <	0.0064 <
Total Nitrite/Nitrate N, mg/L	47	48
Total Nitrogen, mg/L		48
Ammonia, as N, mg/L	15.2	15
Biochem O2 Demand, Avg mg/L	12	18
Bromide, mg/L	250 <	
Chem O2 Demand, mg/L	3.1 J	28
Color, color units	75	60
Fluoride, mg/L	0.98	0.93
MBAS, mg/L	5.8	0.1
Oil & Grease, mg/L	2.7 <	16
TKN (Kjeldahl nitrogen), mg/L	0.63 <	0.05 <
Fecal Coliform, MPN/100ml	10 <	2 <
Chlorine residual, mg/L	0.03 <	
Odor		1 <
Metals, mg/L		
Aluminum	0.077 <	
Antimony	0.029 <	0.0009 J
Arsenic	0.005 <	0.0038 J
Barium	0.0383 <	0.041
Beryllium	0.0011 <	0.00034 J
Boron	13.2	13
Cadmium	0.00081 <	0.00169 <
Chromium Total	0.666 Note 1	0.49 Note 1
Chromium hexavalent (VI)		0.01 <
Cobalt	0.0066 <	
Copper	0.0035 <	0.0054
Iron	2.57	3.7
Lead	0.025 <	0.00056 <
Magnesium	386	380
Manganese	0.297	0.33

Attachment C

Analytical Data from the Kerr-McGee On-Site Groundwater Treatment System

(Data for Constituents with Established Standards for Las Vegas Wash are also reported on Table B.2 of Attachment B. Samples were analyzed by Lancaster and NEL Laboratories)

Laboratory Date Collected	Plant GWTS Lancaster 1/20/00	Plant GWTS NEL 1/20/00
Mercury	0.0001 <	0.00007 <
Molybdenum	0.045 J	0.042
Nickel	0.006	0.01 <
Potassium		36
Selenium	0.0083 J	0.0059
Silver	0.0017 J	0.0012 <
Sodium		1600
Strontium		21
Thallium	0.0092 <	0.0006 J
Tin	0.031 <	
Titanium	0.0056 <	
Vanadium		0.0051
Zinc	0.0076 J	0.0036 <
Herbicides, ug/L		
2,4-D		0.04 <
2,4,5-TP (silvex)	0.0297 J	0.01 <
2,4,5-T		0.02 <
Dinoseb		0.01 <
2,4-DP (dichloroprop)		0.1 <
2,4-DB		0.1 <
TCL Pesticides, ug/L		
Alpha BHC	0.106	0.14
Beta BHC	0.0011 <	0.029 <
Delta, BHC	0.0155	0.06 J
Gamma BHC, Lindane	0.0196	0.06 J
Heptachlor	0.0015 <	0.033 <
Aldrin	0.0061 <	0.03 <
Heptachlor Epoxide	0.00096 <	0.028 <
Endosulfan I (alpha)	0.0019 <	0.032 <
Dieldrin	0.00096 <	0.026 <
DDE (4,4-)	0.00096 <	0.029 <
Endrin	0.0068 <	0.022 <
Endosulfan II (beta)	0.0047 <	0.024 <
DDD (4,4-)	0.00046 <	0.018 <
Endosulfan Sulfate	0.0029 <	0.1 <
DDT (4,4-)	0.00086 <	0.027 <
Methoxychlor	0.02 <	0.029 <
Alpha Chlordane	0.019 <	0.2 <
Gamma Chlordane	0.019 <	0.2 <
Toxaphene	0.29 <	0.1 <
Endrin Aldehyde	0.0046 <	0.027 <

Attachment C

Analytical Data from the Kerr-McGee On-Site Groundwater Treatment System

(Data for Constituents with Established Standards for Las Vegas Wash are also reported on Table B.2 of Attachment B. Samples were analyzed by Lancaster and NEL Laboratories)

	Plant GWTS	Plant GWTS
Laboratory	Lancaster	NEL
Date Collected	1/20/00	1/20/00
PCB 1016 (Aroclor)	0.041 <	0.54 <
PCB 1221 (Aroclor)	0.12 <	0.44 <
PCB 1232 (Aroclor)	0.046 <	0.054 <
PCB 1242 (Aroclor)	0.096 <	0.27 <
PCB 1248 (Aroclor)	0.037 <	0.2 <
PCB 1254 (Aroclor)	0.13 <	0.13 <
PCB 1260 (Aroclor)	0.035 <	0.34 <
Semi-Volatiles ug/L		
Phenol	0.3 <	5 <
Bis(2-chlorethyl) ether	0.2 <	5 <
2-chlorophenol	0.4 <	5 <
1,3 dichlorobenzene, by svoc/purg	0.3 J	0.99 <
1,4 dichlorobenzene, by svoc/purg	0.5 J	1.16 <
1,2 dichlorobenzene, by svoc/purg	0.8 J	0.8 <
N-Nitroso-di-n-propylamine	0.5 <	5 <
N-Nitroso-dimethylamine		5 <
Hexachloroethane	0.4 <	5 <
Nitrobenzene	0.7 <	5 <
Isophorone	0.09 <	5 <
2-Nitrophenol	0.3 <	5 <
2,4-Dimethylphenol	0.8 <	5 <
Bis(2-chloroethoxy)methane	0.4 <	5 <
2,4-Dichlorophenol	0.4 <	5 <
1,2,4-Trichlorobenzene	0.3 <	5 <
Napthalene	0.2 <	5 <
Hexachlorobutadiene	0.8 <	5 <
4-Chloro-3-methylphenol	0.3 <	5 <
Hexachlorocyclopentadiene	0.9 <	5 <
2,4,6-Trichlorophenol	0.5 <	5 <
2-Chloronapthalene	0.2 <	5 <
Dimethylphthalate	0.2 <	5 <
Acenapthylene	0.2 <	5 <
TCL by 8260 ug/L		
Chloromethane	3 <	0.87 <
Bromomethane	3 <	0.56 <
Vinyl chloride	2 <	0.5 <
Chloroethane	3 <	0.89 <
Methylene chloride	3 J	2.2 J
1,1-dichloroethene	0.9 <	1.02 <
1,1-dichloroethane	2 <	1.12 <
Chloroform	430	390 D

Attachment C

Analytical Data from the Kerr-McGee On-Site Groundwater Treatment System

(Data for Constituents with Established Standards for Las Vegas Wash are also reported on Table B.2 of Attachment B. Samples were analyzed by Lancaster and NEL Laboratories)

Laboratory / Date Collected	Plant GWTS Lancaster 1/20/00	Plant GWTS NEL 1/20/00
1,2-Dichloroethane	2 <	0.5 <
1,1,1-trichloroethane	1 <	0.55 <
Carbon Tetrachloride	1 <	0.8 <
Bromodichloromethane	1 J	1.4 J
1,1,2,2-Tetrachloroethane	1 <	0.58 <
1,2-Dichloropropane	1 <	0.5 <
trans-1,3-Dichloropropene	0.6 <	0.63 <
Trichloroethene	1 <	0.5 <
Dibromochloromethane	2 <	0.6 <
1,1,2-Trichloroethane	2 <	0.59 <
Benzene	1 <	0.64 <
cis-1,3-Dichloropropene		0.71 <
Bromoform	0.8 <	1.1 J
Tetrachloroethene	1 <	0.8 <
Toluene	2 <	1.2 J
Chlorobenzene	0.8 <	0.7 <
Ethylbenzene	2 <	0.57 <
Styrene		0.9 <
Xylene (total)		1.06 <
trans-1,2-Dichloroethene	2 <	0.7 <
cis-1,2-Dichloroethene	2 <	1.11 <
MTBE		0.56 <
Trichlorofluoromethane	2 <	4.06 <
2-chloroethylvinyl ether	2 <	5 <
TCL SW846 semivols ug/L		
3-Nitroaniline		
Acenapthene	0.2 <	5 <
2,4-Dinitrophenol	19 <	5 <
4-Nitrophenol	2 <	5 <
2,4-Dinitrotoluene	0.4 <	5 <
2,6-Dinitrotoluene	0.5 <	5 <
Diethylphthalate	0.5 <	5 <
4-Chlorophenyl-phenylether	0.4 <	5 <
Fluorene	0.3 <	5 <
4,6-Dinitro-2-methylphenol	0.6 <	5 <
N-Nitrosodiphenylamine	0.3 <	5 <
4-Bromophenyl-phenylether	0.7 <	5 <
Hexachlorobenzene	2 <	5 <
Pentachlorophenol, by TCL	2 <	5 <
Phenanthrene	0.3 <	5 <
Anthracene	0.2 <	5 <
Di-n-butylphthalate	0.7 <	5 <

Attachment C

Analytical Data from the Kerr-McGee On-Site Groundwater Treatment System

(Data for Constituents with Established Standards for Las Vegas Wash are also reported on Table B.2 of Attachment B. Samples were analyzed by Lancaster and NEL Laboratories)

Laboratory / Date Collected	Plant GWTS Lancaster 1/20/00	Plant GWTS NEL 1/20/00
Fluoranthene	0.2 <	5 <
Pyrene	0.3 <	5 <
Butylbenzylphthalate	0.5 <	5 <
3,3-dichlorobenzidine	0.6 <	5 <
Benzo(a)anthracene	0.3 <	5 <
Bis(2-ethylhexyl)phthalate	0.6 <	5 <
Crysene	0.3 <	5 <
Di-n-octylphthalate	0.4 <	5 <
Benzo(b)fluoranthene	0.3 <	5 <
Benzo(k)fluoranthene	0.5 <	5 <
Benzo(a)pyrene	0.2 <	5 <
Indeno(1,2,3-cd)pyrene	0.4 <	5 <
Dibenz(a,h)anthracene	0.5 <	5 <
Benzo(g,h,I)perylene	0.3 <	5 <
Bis(2-chloroisopropyl)ether	0.3 <	5 <
1,2-Dichlorobenzene (oDCB) by TCL		5 <
1,3-Dichlorobenzene (mDCB)by TCL		5 <
1,4-Dichlorobenzene (pDCB)by TCL		5 <
1,2 Diphenylhydrazine	0.3 <	
Phos. Pesticides, ug/L		
Diazinon		0.3 <
Disolfoton		0.3 <
Ethion		0.3 <
Mirex	0.01 <	
Demeton-O		0.2 <
Demeton-S		0.2 <
Guthion	0.19 <	0.3 <
Malathion	0.19 <	0.3 <
Ethyl Parathion	0.19 <	0.3 <
Methyl Parathion		0.3 <
dichlorodifluromethane	1 <	
benzidine	8 <	

Note 1: Operation of the GWTS regularly produces effluent below the 0.05 mg/l chromium standard. However, on the date these samples were collected, the system was being restarted after maintenance and chromium levels are unusually high.

ATTACHMENT D

Comparison of
Las Vegas Wash Standards
To
Drinking Water Standards

Comparison of Las Vegas Wash Standards to Drinking Water Standards February 2000

In the meeting between Kerr-McGee and NDEP in Carson City, last January 18th, NDEP requested an analysis comparing Las Vegas Wash Standards and Drinking Water Standards. NDEP indicated that dilution of Las Vegas Wash water with Lake Mead water would likely meet the drinking water standards, but this assumption should be confirmed. Table D.1 compares Las Vegas Wash standards for parameters that have a potential to exceed the standards to the corresponding Drinking Water Standards; the Table demonstrates that the ratio of concentrations to achieve Drinking Water standards is a maximum of 2. Put another way, if Las Vegas Wash water flow is less than ½ of the total drinking water flow, the Las Vegas Wash standards are protective. It is evident from the lake's water balance that the dilution factor for Las Vegas Wash in Lake Mead is greatly in excess of 2.

Table D.1

Parameter	Units	Minimum Las Vegas Wash Standards	Drinking Water Quality Standard	Wash Standard/ Drinking Water Ratio	Notes
4-4'-DDD	ug/l	0.0059	No Std	None	No established Drinking Water Quality Standard
4-4'-DDE	ug/l	0.0059	No Std	None	No established Drinking Water Quality Standard
Aldrin	ug/l	0.0014	No Std	None	No established Drinking Water Quality Standard
alpha-BHC	ug/l	0.13	No Std	None	No established Drinking Water Quality Standard
arsenic	ug/l	100	50	2	NV MCL
beta-BHC	ug/l	0.46	No Std	None	No established Drinking Water Quality Standard
Boron	ug/l	750	No Std	None	No established Drinking Water Quality Standard
Chlordane (alpha + gamma)	ug/l	0.0046	2	0.0023	NV MCL
Chromium (Tot.)	ug/l	100	100	1	NV MCL
Copper	ug/l	32.9	1000	0.03	NV Secondary MCL
DDT & metabolites (DDD+DDE+DDT)	ug/l	0.001	No Std	None	No established Drinking Water Quality Standard
Dieldrin	ug/l	0.0014	No Std	None	No established Drinking Water Quality Standard
Endrin	ug/l	0.0023	2	0.001	NV MCL
Fluoride	ug/l	1000	2000	0.5	NV Secondary MCL
gamma-BHC (Lindane)	ug/l	0.08	0.2	0.4	NV MCL
Heptachlor Epoxide	ug/l	0.0011	0.2	0.0055	NV MCL
Iron	ug/l	1000	600	1.67	NV Secondary MCL
Manganese	ug/l	200	100	2	NV Secondary MCL
Molybdenum	ug/l	19	No Std	None	No established Drinking Water Quality Standard
Selenium	ug/l	5	50	0.1	NV MCL
Total Dissolved Solids	mg/l	1900	1000	1.9	NV Secondary MCL
Total Inorganic Nitrogen ($NO_2+NO_3+NH_3$)	mg/l	20	No Std	None	No established Drinking Water Quality Standard
Total Suspended Solids	mg/l	135	No Std	None	No established Drinking Water Quality Standard

PETER G. MORROS
Director

STATE OF NEVADA
KENNY C. GUINN
Governor

ALLEN BIAGGI
Administrator

(702) 486-2850

FAX (702) 486-2863

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

DIVISION OF ENVIRONMENTAL PROTECTION

(Las Vegas Office)
555 E. Washington, Suite 4300
Las Vegas, Nevada 89101-1049

February 15, 2000

Ms. Susan M. Crowley
Staff Environmental Specialist
Kerr-McGee Chemical LLC
P.O. Box 55
Henderson, NV 89009

RE: Workplan and Schedule for Long-Term Remedy for Removal of Perchlorate

Dear Ms. Crowley:

The Nevada Division of Environmental Protection (NDEP) has reviewed the above-referenced workplan for a long-term remedy for perchlorate removal from Henderson groundwater. The proposed remedy calls for the design and construction of a biodegration treatment system. Groundwater intercepted at the seep area, at the chromium treatment system area and eventually the Pittman Lateral will be diverted to this treatment system for perchlorate removal prior to discharge to the Las Vegas Wash.

Based on NDEP's review of this workplan, the following comments are provided. The interception of the seep water has shown encouraging decreases in the concentrations of perchlorate in Las Vegas Wash immediately downstream of the interception area. These concentration decreases appear to be on the order of fifty to sixty percent. Earlier calculations of the perchlorate loading indicated that the seep water reflected approximately fifty percent of the perchlorate entering Las Vegas Wash. Concentrations of perchlorate in locations further downstream of the interception point show that perchlorate is continuing to discharge into Las Vegas Wash, however. Based on this, the NDEP requests that Kerr McGee take steps to further investigate the groundwater system near the Las Vegas Wash in order to delineate the exact location that the remaining forty to fifty percent of perchlorate enters the wash system.

NDEP recommends that Kerr McGee consider conducting studies that will aid in the delineation of the perchlorate groundwater plume and identify where it enters Las Vegas Wash. Recommended studies include detailed sampling of Las Vegas Wash to identify as near as possible the location where perchlorate levels rise. Tracer studies that will indicate travel times from the Pittman Lateral to Las Vegas Wash would be helpful in identifying if groundwater interception at the Pittman Lateral would result in a timely removal of perchlorate from the wash system. Additionally, a detailed reconnaisance of the area near the wash should be conducted to determine whether additional "seeps" are contributing to contamination levels in Las Vegas Wash.

Additionally, Kerr McGee has recently initiated submittal of a monthly status report which is helpful in identifying progress and current status of this project. Please include in these reports a status on the total amount of groundwater captured and perchlorate removed up to the time of the report. This will be useful in monitoring the on-going effectiveness of the capture system.

Lastly, please find attached a copy of comments provided by EPA on your workplan for the long-term removal of perchlorate. You will see that their comments are very consistent with the comments and items that have already been discussed in various meetings between Kerr McGee and NDEP.

Please provide a plan to this office within 30 days which details Kerr McGee's plans for additional investigation of the groundwater in Henderson. This submittal can be in the form of an addendum to the previously-submitted workplan. Feel free to contact me at (702) 486-2857 or Doug Zimmerman at (775) 687-4670 ext. 3127 if you have any questions concerning this matter.

Sincerely,

Brenda Pohlmann

Brenda Pohlmann
Remedial Action Program Supervisor
Las Vegas Bureau of Corrective Actions

BLP:blp

enclosure (1) USEPA comments on Work Plan for the Long-Term Ground Water Perchlorate Removal Action Henderson, Nevada

cc: Doug Zimmerman, Chief, Bureau of Corrective Actions
Pat Corbett, Kerr-McGee Chemical LLC, PO Box 25861, Oklahoma City, OK 73125
Larry Bowerman, USEPA, 75 Hawthorne St., San Francisco, CA 94105-3901
Kay Brothers, SNWA, 1001 S. Valley View Blvd. Las Vegas, NV 89153

2/15/00 KMCC Conference Call

Bill Garner Susan Crowley Brenda Pohlmann

Ed Kress Doug Zimmerman

Background

Earliest concerns: separate alluvial aquifer from Muddy Creek

Believe Muddy Creek has eastward flow vs NNE

Ampac defined alluvial plume - diluted as it moves towards LV Wash. Believe would find Ampac perchlorate in deep

Lake Louise is near boundary of fine grained facies of Muddy Creek - as water moved to north would become part of alluvium. Appears that downward migration which moves east. Water chemistry in DX well, C well and Savage and Thatcher well which have similar chemistry. KMCC felt their Muddy Creek plume impacted their western boundary. Didn't find contamination when they drilled wells. Permeabilities are fairly low - lower than west of AmPac site.

Saturated thicknesses near Savage + Thatcher, calculate amount of perchlorate in subsurface - they think about 5 million pounds of perchlorate in the subsurface which they feel is moving towards KMCC.

4/99 KleinFelder report

evaluate vertical extent at LX

Construct water level maps. KMCC doesn't feel they did Muddy Creek

show closure to west
evaluate potential downgradient wells
put in LX wells & FX wells

DX-161 - perchlorate concentration went way down but same Stiff diagram

no log for MW-D2: not clear whether its alluvium or MC

FX cluster 180 high head
415 no perchlorate
upwelling of Muddy Creek water. FX 415 higher than 350 + 270. Therefore not downgradient of DX. Intermediate zone is downgradient of DX.

Need Muddy Creek potentiometric map. Recommends using shallowest Muddy Creek well.

AGX 90 - put on alluvial map but it had ≈60' head which implies it is probably MC.

Reports
Recommends additional wells to the west whereas KMCC feels that flow is eastward & wells need to be put in to the east.

No overall integration of data - everything is a snapshot in time.

kLr

Question about upgradient hits of perchlorate. KMCC feel that there is a groundwater mound which may have caused movement to the south.

KMC -- 2/15/00
teleconf. Bill Ganus, Susan C, Bierda, Ed ?
Alluvial aquifer from the Muddy Creek

Alluvial aquifer — North flow

Muddy Creek aquifer — Eastern flow

dilution of the alluvial aquifer plume

High Nitrates savage and thatcher and they used nitrates

KMC - Western Boundy Wells -

WSP 1780
6 miles to the west - K test
flow test on west wells - fairly low

gradient map -
15 to 18 water wells
upper most completion
strong eastward flow

Muddy Creek Well = water first encountered below a fine grained unit and then it rose by 20'

April 99 Kleinfelder Report – 4 recommend
#1) fulfilled
#2) water level map for alluvial but
#3) fulfilled
#4) partially fulfill

GES 9/99
DX161- showed a significant drop
~~at~~ same stiff diagram from earlier
report = something does not add up

* MWD2 – <u>no log</u> for new well
~~have~~ now show it as an alluvial
well – was completed

FX cluster – very high heads
FX415 has a higher head and no ClO4
than the DX series – FX415 is not
downgradient hydraulically of DX in
fact the graden

Tables 1+3 no

AGX 90 – shown as an alluvial well but
had 60' of Mead –

Cert

Recommendation #1

Suggest that they move to the east instead of the west

January 25, 00

Dear PMS:

RE: Additional Work Required Under the Consent Agreement

Dear Sirs with PMS:

On July 26, 1999 the Division entered into a Consent Agreement with Kerr McGee Chemical LLC which required an expedited remediation action for a seep encountered near the Las Vegas Wash. The seep was found to have perchlorate concentrations above the interim action level of 18 ppb. Kerr McGee has installed an ion-exchange treatment unit to treat the initial discharge which has been authorized under a temporary discharge permit. In preparation for a permanent NPDES permit, Kerr McGee was required to sample and analyze water from the seep and groundwater from the Pitman lateral for list of toxic constituents. The results of these analyses show organic constituents which the Division has reason to believe are attributable to PMS (see Attachment A). Several of the constituents do not meet the chronic aquatic lic standards established in NAC 445A.144, or 40 CFR 131.36 or the Las Vegas Wash standards NAC 445A.199. In order to permit the discharge for Kerr McGee the Division must require that PMS conduct the following activities to deal with the constituents found in the seep and the groundwater at the Pitman Lateral which are the responsibility of PMS.

1) Within 30 days of receipt of this letter, sample the following locations for the list of constituents on Attachment B, the seep, the effluent from the ion exchange unit, 100 feet upgradient from the seep in the Las Vegas Wash, 100 feet downgradient from the seep in Las Vegas Wash, groundwater from the Pitman Lateral wells known to encounter the PMS plume and within 30 days after start up of the effluent from the bio-treatment unit at Kerr McGee.

2) Within 60 days of receipt of this letter, submit a report with an evaluation of the data obtained pursuant to Item 1 and compare the results to water quality standards established in NAC 445A.144 and 201 and 40 CFR 131.36. For constituents which do not have a water quality established, propose a chronic and acute aquatic life standard.

3) Within 90 days of receipt of this letter, propose a strategy for treating the constituents which are the responsibility of PMS and exceed any water quality standard.

4) Within 120 days of receipt of this letter, submit a proposal to extract groundwater from wells along the Pitman Lateral which encounter the PMS organic plume.

KERR-McGEE CHEMICAL LLC
POST OFFICE BOX 55 - HENDERSON, NEVADA 89009

January 27, 2000
(LKA-073)

Ms. Brenda Pohlmann
Remediation Branch Supervisor
Nevada Division of Environmental Protection
555 E. Washington, Suite 4300
Las Vegas, NV 89101

Dear Ms. Pohlmann:

Subject: Perchlorate Activity Status

As you know, we have meetings regularly with Doug Zimmerman and yourself to discuss the status of perchlorate activities. We thought it might be helpful to provide this information in written format to facilitate its distribution to those who may be interested. Following is the current status of Kerr-McGee Chemical LLC's (Kerr-McGee) activities regarding the perchlorate issue:

- Kerr-McGee completed installation of a short-term remedy, an ion exchange process, in mid-November. All appropriate permits, including a Temporary Discharge Permit #TNEV99106 covering the period November 1999 to May 2000, were received and operation began on November 13, 1999. Since that time, the system has successfully removed perchlorate from water captured in the seep stream. Loaded resin has been shipped to an incinerator for disposal. Follow-on activities associated with the installation of seep stream capture equipment and the ion exchange process include:
  - Completing the requirements of the rolling stock permit, including mulching of the stream banks.
  - Installation of a permanent electrical power source to help ensure reliability.
  - Installation of a fence on the bermed perimeter to improve security.

- NPDES Permanent Discharge Permit – NDEP, Bureau of Water Pollution Control, is developing a permanent NPDES discharge permit for perchlorate treated waters. Towards that end, Kerr-McGee filed an NPDES permit application with NDEP in September 1999. Subsequent meetings allowed Kerr-McGee and NDEP to discuss important discharge issues, including ammonia and phosphorus loading in the Las Vegas wash, following installation of Kerr-McGee's long –term remedial alternative. NDEP indicates that with timely submission of additional Kerr-McGee data, a permanent (5-year) permit can be issued before the current temporary permit expires in May 2000.

- A Work Plan to cover the long-term remedial alternative for capture and treatment of perchlorate-impacted groundwater was submitted to NDEP September 1999. This Plan includes construction of a biodegradation process for perchlorate destruction in the seep stream matrix. This biodegradation process is expected to reduce perchlorate concentrations in the discharge to significantly below 3 ppm, which is the permitted limit for ion exchange perchlorate removal. The Work Plan is currently under review by NDEP, and comments are expected to Kerr-McGee shortly. Recent activities associated with the long-term remedial alternative include the following:

- Engineering for the long-term biodegradation alternative has begun.

- Private Property Easement Agreements – These are under development and will be needed as a pipeline is installed from the seep stream area to the Kerr-McGee Henderson facility.

- Building Permits for construction of the pipeline and the biodegradation process on the Kerr-McGee plant site are under development.

Kerr-McGee is committed to act responsibly and cooperate fully with local, state, and federal officials in determining appropriate remedial actions. Please feel free to contact me at (702) 651-2200 if you have any questions related to this information. Thank you.

Sincerely,

SMCrowley

Susan M. Crowley
Staff Environmental Specialist

By certified mail

cc: PSCorbett
EMSpore
TWReed
WOGreen
RHJones
LKBailey
ALDooley
NRWerber
DMoll
Rick Simon, ENSR
JTSmith, Covington and Burling
Robert Kelso, NDEP
Doug Zimmerman, NDEP
Jeanne-Marie Bruno, Metro Water District Of Southern California
Barry Conaty, City of Henderson
Pat Mulroy, Southern Nevada Water Authority
Kay Brothers, Southern Nevada Water Authority
Kevin Mayer, EPA Region IX

C:\DATA\DOCS\SMC\LTR\STATUS TO POHLMANN0199_.DOC

SEP 28 01

KERR-McGEE CHEMICAL LLC
POST OFFICE BOX 55 - HENDERSON, NEVADA 89009

January 25, 2000

Mr. LaVerne Rosse
Deputy Administrator
State of Nevada
Division of Environmental Protection
333 W. Nye Lane
Carson City, NV 89710

Subject: Closed Hazardous Waste Landfill
1999 Post Closure Monitoring Results

Dear Mr. Rosse:

Kerr-McGee Chemical Corporation's (KMCC) Henderson facility conducted RCRA groundwater monitoring as required by 40 CFR 265.92 (d)(1) in June 1999. The wells sampled are associated with the post closure requirements of the on-site closed hazardous waste landfill. Analytical results were compared with 1982/83 baseline values as required under 40 CFR 265.93 (c). All significant changes in downgradient water quality represented a movement towards improved quality.

Notice of a statistically significant change of an upgradient well groundwater quality parameter is made herein pursuant to 40 CFR 265.93 (c)(1). Because the downgradient conditions continue to indicate a better groundwater quality than is apparent upgradient of the landfill, there is no indication the landfill has impacted water quality parameters in the vicinity of the landfill.

In 1982, a monitoring program was established with one upgradient and three downgradient wells to follow the groundwater quality in the closed hazardous waste landfill area. M-5 was the upgradient well. M-6, M-7 and H-28 were the downgradient wells. During the June 1999 post closure sampling, a statistically significant change from baseline of the historical **upgradient** well M-5 was detected for parameters of pH, specific conductance (SpCd), total organic carbon (TOC) and total organic halides (TOX or TOH). Please see Table 1. The change from baseline was trending towards a **quality improvement** for parameters of pH, TOC and TOX. The trend for SpCd was toward higher level. This change is consistent with past sampling efforts. This same trend has been apparent since 1991 monitoring.

All statistically significant changes from baseline detected in the **downgradient** monitoring wells described below reflect a groundwater **quality improvement** when compared to the 1982/83 baseline values of upgradient well M-5. Please see Table 1. All parameters, pH, SpCd, TOC and TOX moved in the direction of quality improvement in all three downgradient wells, M-6, M-7 and H-23. Please note that H-23 was sampled in place of H-28. H-28 has been vandalized and will be replaced before 2000 sampling. Additional groundwater samples were collected, as required under 40 CFR 265.93 (c)(2), and analyzed for pH, SpCd, TOC and TOX at each well showing a significant difference from the historical upgradient well concentrations.

Statistically, analysis of the resampled parameters did show support for:

1. An increase in pH in M-5A, M-6A, M-7A and H-23, towards better water quality.

2. A decrease in SpCd in M-6A, M-7A and H-23, towards better water quality.

3. An increase in SpCd in 5A, the upgradient well.

4. A decrease in TOC in M-5A, M-6A, M-7A and H-23, towards better water quality.

4. A decrease in TOX in M-5A, M-6A, M-7A and H-23, towards better water quality.

The downgradient change from baseline was trending towards a **quality improvement** for parameters of pH, SpCd, TOC and TOX. This change is consistent with past sampling efforts. This same trend has been apparent since 1991 monitoring.

Water levels, statistical comparisons and analytical results are attached as Table 1. Resample results are attached as Table 2.

Based on information herein and the information presented since the June 1984 Closure/Post Closure Plan (revised October 1984) was submitted, the closed landfill has been demonstrated to have no impact on groundwater quality.

Please feel free to contact me at (702) 651-2234, if you have any questions. Thank you.

Sincerely,

SMCrowley

Susan M. Crowley
Staff Environmental Specialist

smc\Landfill Monitoring to NDEP 06-99.doc
cc: PSCorbett
FRStater
MJPorterfield

TABLE 1. KERR-McGEE CHEMICAL CORPORATION - HENDERSON, NV
Hazardous Waste Landfill Post Closure Monitoring
1998

Well #	Date	Water Level (feet)	Total Chromium (ppm)	Iron (ppm)	Manganese (ppm)	Sodium (ppm)	Chloride (ppm)	Sulfate (ppm)	Phenols (ppb)	TOC (ppm)	TOX (ppm)	pH	Specific Conductance (umhos/cm)
M-5A	06/29/99	1710.17	ND	2.6	1.7	1600	4200	1400	<0.25	26.6	14.0	7.04	14500
										25.0	10.5	7.12	14300
										24.9	15.1	7.75	14400
										25.0	14.4	7.13	14400
							M-5A Average			25.4	13.5	7.26	14400
							M-5A Standard Deviation			0.7	1.8	0.29	71
							Background (M-5) *			62.3	47.7	6.34	10469
							M-5A t-Test			**1.50**	**4.09**	**5.03**	**37.46**
M-6A	06/29/99	1690.44	ND	1.1	0.74	1200	2000	1500	<0.25	0.0	4.5	7.53	8160
										0.0	4.8	7.50	8080
										0.0	5.3	7.51	8180
										0.0	4.7	7.47	8190
							M-6A Average			0.0	4.8	7.50	8153
							M-6A Standard Deviation			0.0	0.3	0.02	43
							Background (M-5) *			62.3	47.7	6.34	10469
							M-6A t-Test			**2.53**	**5.14**	**7.57**	**22.29**
M-7A	06/28/99	1688.08	0.015	11	0.65	1200	1700	1500	<0.25	0.0	10.0	7.50	8360
										0.0	9.8	7.47	8350
										0.0	10.0	7.50	8390
										0.0	9.7	7.56	8330
							M-7A Average			0.0	9.9	7.51	8358
							M-7A Standard Deviation			0.0	0.1	0.03	22
							Background (M-5) *			62.3	47.7	6.34	10469
							M-7A t-Test			**2.53**	**4.53**	**7.59**	**20.41**
H-28	Not Sampled **	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
										NA	NA	NA	NA
										NA	NA	NA	NA
										NA	NA	NA	NA
							H-28 Average			0.0	0.0	0.00	0
							H-28 Standard Deviation			0.0	0.0	0.00	0
							Background (M-5) *			62.3	47.7	6.34	10469
							H-28 t-Test			**2.53**	**5.72**	**41.31**	**101.37**
Field Blank	06/28/99		ND	ND	ND	1.7	ND	ND	<10	<1.0	<0.1	6.80	3

* Values are the result of 16 replicates (4 per quarter from 6/82 to 3/83)
** H-28 well found with a blockage in the upper portion. Water level and sampling not possible for this sampling event.

TABLE 2.
Hazardous Waste Landfill Post Closure Monitoring - Confirmatory Resample

Well #	Date	TOC (mg/l)	TOX (mg/l)	pH	Specific Conductance (umhos/cm)
M-5A	12/17/99	47.00	32.00	7.08	14800
		38.00	25.00	7.18	14800
		37.00	33.00	7.12	14900
		2.00	31.00	7.10	14800
	M-5A Average	31.00	30.25	7.12	14825
	M-5A Standard Deviation	17.19	3.11	0.04	43
	Background (M-5) *	62.3	47.7	6.34	10469
	M-5 t-Test	**1.24**	**2.08**	**5.07**	**41.92**
M-6A	12/21/99	2.00	1.60	7.67	8560
		2.00	1.60	7.45	8400
		2.00	1.70	7.46	8400
		2.00	1.40	7.36	8480
	M-6A Average	2.00	1.58	7.49	8460
	M-6A Standard Deviation	0.00	0.11	0.11	66
	Background (M-5) *	62.3	47.7	6.34	10469
	M-6A t-Test	**2.45**	**5.53**	**7.32**	**19.18**
M-7A	12/21/99	2.00	3.80	7.47	8600
		2.00	1.90	7.51	8520
		2.00	1.80	7.51	8560
		2.00	1.70	7.36	8520
	M-7A Average	2.00	2.30	7.46	8550
	M-7A Standard Deviation	0.00	0.87	0.06	33
	Background (M-5) *	62.3	47.7	6.34	10469
	M-7A t-Test	**2.45**	**5.44**	**7.27**	**18.05**
H-23 **	12/21/99	4.00	1.10	7.43	9510
		12.00	1.20	7.46	9500
		7.00	1.10	7.36	9350
		35.00	1.90	7.33	9360
	H-28 Average	14.50	1.33	7.40	9430
	H-28 Standard Deviation	12.18	0.33	0.05	75
	Background (M-5) *	62.3	47.7	6.34	10469
	H-28 t-Test	**1.92**	**5.56**	**6.85**	**9.88**
Field Blank	12/17/99	<1.0	<0.1	6.6	3

* Values are the result of 16 replicates (4 per quarter from 6/82 to 3/83)
** H-28 plugged with debris from vandelism. H-23 sampled in place of H-28.

KERR-McGEE CHEMICAL LLC
POST OFFICE BOX 55 - HENDERSON, NEVADA 89009

July 25, 2000

Ms. Brenda Pohlmann
Remediation Branch Supervisor
Nevada Division of Environmental Protection
555 E. Washington, Suite 4300
Las Vegas, NV 89101

Dear Ms. Pohlmann:

Subject: Perchlorate Activity Status

Following is the current status of Kerr-McGee Chemical LLC's (Kerr-McGee) perchlorate related activities as outlined in the Perchlorate Consent Agreement (July 26, 1999) and its supporting Work Plans:

- Kerr-McGee's commitment to remove perchlorate from surfacing groundwater (seep) is continuing, utilizing Calgon Carbon's ion exchange process. During June 2000, 7,000 lbs of perchlorate were removed from the surface stream before it entered the wash. To date, 32.3 tons have been removed since ion exchange operation began in November 1999. The stream flow is down, dropping from an average of 250 gpm at the beginning of June to 210 gpm at the close. Perchlorate concentration is up, averaging 88 ppm over the month. These conditions appear typical of summertime conditions in the stream, although they represent lower flows than seen during 1999's summertime period. Although the ion exchange system is running well, we continue to have occasional operational difficulties due to the Clark County earthen dam installed upgradient from the stream capture point. Kerr-McGee is hopeful that this dam will be removed at the earliest opportunity.

- On-site groundwater continues to be extracted and treated for chromium removal, then placed in the on-site groundwater holding basin for eventual treatment for perchlorate removal. During June, approximately 13,150 lbs of perchlorate were removed from the shallow aquifer. Since initiation of impoundment in December 1998, considering the average perchlorate concentration of 1,500 ppm, 164 tons of perchlorate have been removed from the on-site shallow groundwater. The holding basin has had a very high evaporation rate due to lower than normal rainfall and above average temperature and wind conditions.

- Kerr-Gee is continuing transfer of groundwater extracted from the Pittman Lateral area to its groundwater holding basin by utilizing a tanker truck. Over the 239 days this transfer has been active, approximately 1.58 tons of perchlorate have been removed from the groundwater.

- Field activities to investigate hydrologic condition in the seep vicinity are continuing. The nested well installations, the seep area reconnaissance, and the near wash groundwater seep sampling are complete. Groundwater tracer studies are to be completed in September following NDEP approval of the tracer selection.

- NDEP's Bureau of Water Pollution Control is developing an NPDES discharge permit for perchlorate treated waters. Draft Permit #NEV0023060 was public noticed, and NDEP has received public comments. Until the NPDES permit is approved for use, Kerr-McGee has continued seep stream perchlorate removal under the authorization of a Temporary Discharge Permit.

- Engineering (by Biothane Corporation and Applied Research Associates) is nearing completion on the perchlorate treatment system. The cost estimate and schedule were received early in July for Kerr-McGee internal review and approval. Issued for construction drawings are expected in early August. Pre-construction activities, such as site preparation, have begun at the Henderson plant. Additional activities are pending a grading permit, currently in Clark County Planning and Zoning's control. This permit is pending reviews and resultant approval letters from NDEP and from Clark County Health District to continue the grading permit review process. Documents (drawings) have been submitted to NDEP's Las Vegas office for this review process. Additional information will be forwarded as it is available. It is expected that slightly over a year will be needed to construct and start up the biological treatment facility once internal approval and NDEP permits and approvals have been received.

- Pipeline and Lift Station #2 engineering drawings are 75 percent complete. Draft easements have been prepared for the entire run of the pipeline and for Lift Station #2. Maintenance work has begun on the section of existing pipeline that will be used to cross Warm Springs Road and Boulder Highway for the treated water return to the seep stream. This work is expected to be complete in 2-3 weeks. Legal descriptions and exhibits are being completed for the draft easements as the final engineering drawings are being completed.

- Kerr-McGee has been requested by NDEP to draft a second Consent Agreement as a follow-on to the existing Consent Agreement. The second Agreement would cover the permanent perchlorate treatment system, while the first covered the temporary seep issues.

KMC is committed to act responsibly and cooperate fully with local, state, and federal officials in determining appropriate remedial actions. Please feel free to contact me at (702) 651-2200 if you have any questions related to this information. Thank you.

Sincerely,

SM Crowley

Susan M. Crowley
Staff Environmental Specialist

By certified mail

cc: PSCorbett
EMSpore
FRStater
TWReed
WOGreen
RHJones
LKBailey
ALDooley
Rick Simon, ENSR
Robert Kelso, NDEP
Doug Zimmerman, NDEP
Jeanne-Marie Bruno, Metro Water District Of Southern California
Barry Conaty, City of Henderson
Pat Mulroy, Southern Nevada Water Authority
Kevin Mayer, EPA Region IX

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